2019 Annual Groundwater Monitoring and Corrective Action Report

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

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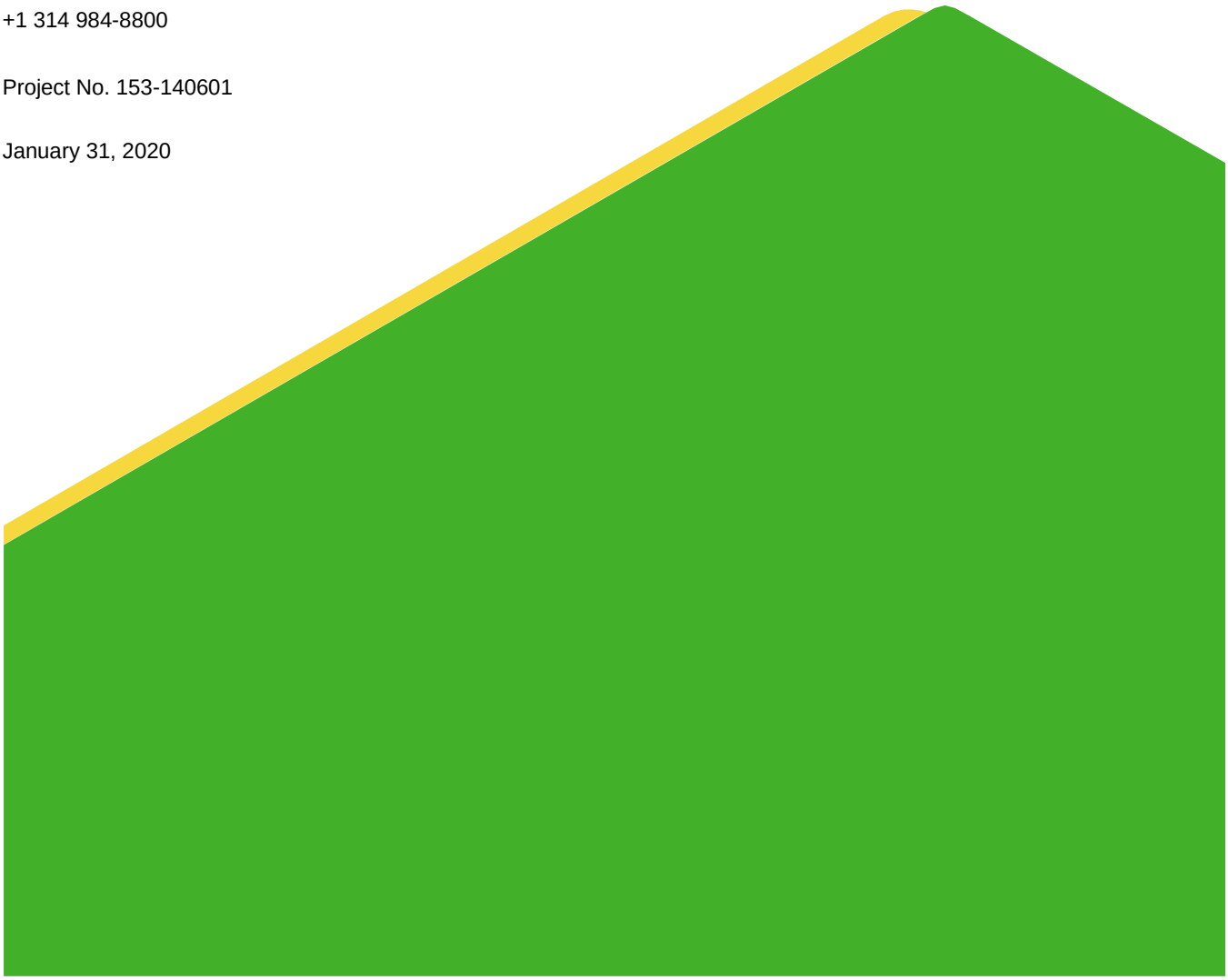

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1.0 INTRODUCTION

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule” (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§ 257.90(e)). Ameren Missouri (Ameren) has determined that the LCPA Surface Impoundment at the Labadie Energy Center (LEC) is subject to the requirements of the CCR Rule. This Annual Report for the LCPA describes CCR Rule groundwater monitoring activities from January 1, 2019 through December 31, 2019.

1.1 Overview of CCR Rule Activities Prior to 2019

The CCR Rule was published in the Federal Register on April 17, 2015. This rule required CCR surface impoundments and landfills to monitor groundwater around these CCR units. Prior to the first major deadline of October 17, 2017, Ameren completed the following tasks: (1) installation of a groundwater monitoring well system; (2) a Statistical Method Certification; (3) a Groundwater Monitoring Plan (GMP) that details design, installation, development, sampling procedures, as well as statistical methods; and (4) eight baseline groundwater sampling events for all Appendix III and Appendix IV parameters of the CCR Rule. In November 2017, the first Detection Monitoring event was completed. Results from this event demonstrated some Appendix III parameters were present at concentrations that were a Statistically Significant Increase (SSI) over background and were then verified in January 2018 testing. In accordance with the CCR Rule, Ameren placed a “Notification of the Establishment of a CCR Assessment Monitoring Program” and began Assessment Monitoring within 90 days. Results from the Assessment Monitoring events for the LCPA indicated the presence of molybdenum at a Statistically Significant Level (SSL) over the site-specific Groundwater Protection Standard (GWPS) in several of the compliance monitoring wells. As required, Ameren placed a “Notification of the Detection of Statistically Significant Levels Above CCR Groundwater Protection Standards” on its website and commenced an assessment of potential Corrective Measures.

2.0 2019 ACTIVITIES AND CURRENT STATUS OF THE LCPA GROUNDWATER MONITORING PROGRAM

The LCPA is currently in Corrective Action with Detection and Assessment Monitoring continuing concurrently. In 2019, Ameren Missouri completed a Corrective Measures Assessment (CMA). Due to the complexities of the site, the 60-day extension was used for the completion of the CMA. The CMA was placed on Ameren’s publicly available website (Ameren’s publicly available website is at: https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion) in May 2019 as required by the CCR Rule (§257.96(a)) and is provided in **Appendix A**. On May 29, 2019 Ameren held its public meeting on the findings of the CMA and accepted public comments. Ameren reviewed the comments and in August 2019 provided a response to the public comments, which is provided on Ameren’s publicly available website. After reviewing the options from the CMA and public comments, on August 30, Ameren selected a final remedy of source control through installation of a low permeability cover system and use of Monitored Natural Attenuation (MNA). As required by the CCR Rule (§257.97(a)), a report discussing this remedy selection as well as a certification by a Professional Engineer was placed in the operating record. After selecting a remedy, a Corrective Action Groundwater Monitoring Program was established within 90 days as required by the CCR Rule (§257.98(a)). Certifications of the Corrective Action Statistical Analysis Plan (SAP) and Groundwater Monitoring System (GMS) are provided on Ameren’s publicly available website. Additionally, Ameren began closure of the LCPA and placed a “Notification of Intent to Close a

CCR Unit and Certification for Final Cover Design System" onto its publicly available website. Detection and Assessment Monitoring continued on a semi-annual basis and the results are discussed in more detail below.

3.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

There are currently two (2) different networks used for monitoring the LCPA, the monitoring well network established under §257.91 used for Detection and Assessment Monitoring and the network established under §257.98 used for Corrective Action Monitoring. **Table 1** (in text) provides a list of the monitoring wells used for each program and the location of the monitoring wells is provided in **Figure 1**. In addition, a summary of well construction details is provided in **Table 2**.

Table 1 - LCPA Groundwater Monitoring Programs Monitoring Wells

Detection and Assessment Groundwater Monitoring Program Wells	Corrective Action Groundwater Monitoring Program Wells	
BMW-1D	TP-1D	BMW-1S
BMW-2D	TP-2M	BMW-2S
UMW-1D	TP-2D	LMW-1S
UMW-2D	TP-3M	LMW-2S
UMW-3D (R)	TP-3D	LMW-4S
UMW-4D	TP-4D	LMW-7S
UMW-5D	MW-33(D)	LMW-8S
UMW-6D	MW-34(D)	MW-24
UMW-7D	MW-35(D)	MW-26
UMW-8D	AMW-8	S-1
UMW-9D		
AM-1S (UMW-10S)		
AM-1D (UMW-10D)		

For the Detection and Assessment Groundwater Monitoring Network, all but two (2) monitoring wells are the same as in years past. Well construction diagrams for the previously used wells are provided in the 2017 and 2018 Annual Reports for this CCR Unit. AM-1S and AM-1D (UMW-10S and UMW-10D) were added to the network to satisfy the requirements of §257.95(g)(1), which required at least one (1) additional monitoring well be installed at the downgradient facility boundary. The well construction diagrams for these wells can be found in the 2018 Annual Report for this CCR Unit.

The Corrective Action Groundwater Monitoring Program consists of wells that have been used for different monitoring programs. Well construction diagrams are provided for these monitoring wells as follows:

- BMW-1S, BMW-2S, LMW-1S, LMW-2S, LMW-4S, LMW-7S, LMW-8S, and MW-26 are in the 2017 Annual Reports for the LCPB and LCL1 CCR Units.
- TP-1D, TP-2M, TP-2D, TP-3M, TP-3D, TP-4D, and TP-5D are in the 2018 Annual Report for the LCPA CCR Unit.
- MW-33(D), MW-34(D), MW-35(D), AMW-8, MW-24 and S1 are used in a State Utility Waste Landfill or National Pollutant Discharge Elimination System (NPDES) monitoring programs and are provided in **Appendix B**.

No monitoring wells used for CCR Rule monitoring were abandoned in 2019.

4.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the LCPA CCR Unit in 2019. **Table 3** provides a summary of the groundwater samples collected in 2019 including the number of samples, the date of the sample collection, and the monitoring program for the samples. **Appendix C** provides laboratory analytical data for CCR Rule sampling events.

4.1 Detection Monitoring Program

A Detection Monitoring event was completed November 7-9, 2018. Verification sampling and the statistical analysis to evaluate for SSIs for the November 2018 event were not completed until 2019 and are included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 2-3, 2019 and verified SSIs. **Table 4** summarizes the results and the statistical analysis of the November 2018 Detection Monitoring event.

A Detection Monitoring event was completed April 30-May 8, 2019, and testing was completed for all Appendix III analytes. Statistical analysis of the data determined that there were SSIs. Detections of Appendix III analytes triggered a verification sampling event, which was completed on August 21, 2019, following flooding (May-August). **Table 5** summarizes the results and the statistical analysis of the April-May 2019 Detection Monitoring event. UMW-10D (AM-1D) and UMW-10S (AM-1S) were added to the Detection and Assessment Monitoring Well Network for this event.

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

A Detection Monitoring event was completed November 5-7, 2019 and testing was performed for all Appendix III analytes. Statistical analyses to evaluate for SSIs in the November 2019 data were not completed in 2019 and this statistical evaluation will be included in the 2020 Annual Report. **Table 6** summarizes the results of the November 2019 Detection Monitoring event.

4.2 Assessment Monitoring Program

An Assessment Monitoring event was completed November 7-9, 2018 and testing was completed for Appendix IV parameters that were detected during the April 2018 sampling event. The statistical evaluation for this event was completed in 2019 and therefore is included in this report. **Table 7** summarizes the results of the November 2018 Assessment Monitoring event. Based on the results from the analysis, there were no new constituents or monitoring wells at which a SSL was detected for the LCPA. The results from this analysis and a table that displays the site-specific GWPS are provided in **Appendix D**. The SSLs for the LCPA continue to be:

- Molybdenum at UMW-3D, UMW-4D, UMW-5D, UMW-6D, and UMW-7D

An Assessment Monitoring event was completed April 30-May 8, 2019, and testing was completed for all Appendix IV analytes. Statistical analysis of the data is provided in **Appendix E** and determined that there were no new SSLs. **Table 8** summarizes the results of the April-May 2019 Assessment Monitoring event. UMW-10D (AM-1D) and UMW-10S (AM-1S) were added to the Detection and Assessment Monitoring Well Network for this event.

During the statistical analysis of the April-May 2019 sampling event, the site specific GWPS used to determine SSLs were updated in accordance with the Statistical Analysis Plan.

Since the April-May 2019 event was the first Assessment Monitoring sampling event for monitoring wells UMW-10D (AM-1D) and UMW-10S (AM-1S), resampling for all detected Appendix IV parameters was completed in October 2019 and the results for this sampling event are included in the April-October 2019 sampling results shown in **Table 8**.

On November 5-7, 2019, the November 2019 Assessment Monitoring event was completed. This sampling event analyzed the Appendix IV constituents detected in groundwater during the initial assessment monitoring event of 2019 (detected parameters from the April-May 2019 event). **Table 9** summaries the results of the November 2019 Assessment Monitoring event; however, statistical analyses to evaluate for SSLs over GWPS were not completed in 2019. Results of the statistical evaluation will be included in the 2020 Annual Report.

Statistical evaluations to determine if there is a concentration at an SSL above the site GWPS at UMW-10D (AM-1D) and UMW-10S (AM-1S) were not completed in 2019. As outlined in the Statistical Analysis Plan for this site, a minimum of four (4) samples are required to complete an SSL statistical evaluation. Statistical analysis for these monitoring wells will begin with the analysis of the November 2019 data, and will be included in the 2020 Annual Report.

4.2.1 Nature and Extent Evaluation

As required by the CCR Rule, after an SSL is determined to be above the site GWPS, an investigation into the nature and extent of impacts to groundwater must be initiated. Groundwater sampling for nature and extent was completed with an initial event in November 2018 and a second event in April-August 2019. A technical memorandum summarizing the results is provided in **Appendix F**. Results from this investigation were used for the CMA, remedy selection, and to select the Corrective Action monitoring well network.

4.3 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 G**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in water level of 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 (bluffs area) to the north (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 monitoring wells at the LEC using commercially available software. Results from this assessment indicate that while groundwater flow direction is variable, the overall net groundwater flow at the LCPA is from the bluffs toward the river. Horizontal gradients calculated by the program range from 0.0001 to 0.0007 feet/foot with an estimated net annual groundwater velocity of approximately 17 feet per year in the prevailing downgradient direction.

4.4 Sampling Issues

In January 2019, upon data validation of the November 2018 sampling data, it was discovered that an error was made in the laboratory sample analysis of L-UMW-FB-2. It was determined that a laboratory error had occurred for the Total Metals, EPA Method 200.7. Based on analysis of the data, it was determined that the sampling results for L-UMW-5D were reported for this field blank; however, when this error was recognized the laboratory had disposed of the sample bottles and the samples could not be re-analyzed. Based on professional judgement, these values were omitted and not used for data validation purposes.

In May 2019, UMW-10S (AM-1S) was sampled. However, chloride was not analyzed for due to lab error. Chloride was tested in subsequent verification sampling. Verification sampling confirmed that chloride was not at a statistically significant increase over background in UMW-10S (AM-1S).

As a part of the May-August 2019 Nature and Extent sampling event, sample analysis for EPA methods 200.7 and 200.8 for L-UWL-FB-1 were not performed due to laboratory error. Reported values for L-UWL-FB-1 were mistakenly reported from L-MW-26, and no 200.7 and 200.8 samples were analyzed from L-UWL-FB-1. These values were determined to be incorrect based on review of the results and professional judgement. The incorrect values were not used for statistical analysis or data validation for the Nature and Extent data obtained from monitoring wells used to monitor the LCL1.

From approximately May to August 2019, some of the monitoring wells at the LEC were under water due to the flooding of the Missouri River. This caused a delay in the planned sampling dates of some of the monitoring wells. On July 19, July 26 and August 12, 2019 Golder performed post-flood monitoring well inspections at the LEC and found that only Nature and Extent piezometers TP-4S and TP-4M had been impacted by the flood. These piezometers were re-developed to remove floodwater impacts to the well prior to groundwater elevation measurements or the collection of groundwater samples. After successful re-development, TP-4S and TP-4M were returned to service.

In August 2019, the riser pipe and protective cover at UMW-6D was modified. This monitoring well was modified due to construction requirements associated with the closures of the LCPA and LCPB CCR units. This modification is temporary, and the final protective cover and modification will be completed in 2020 as the capping of the LCPA is completed. **Appendix H** provides the Missouri Department of Natural Resources (MNDR) variance used for the monitoring well modification.

No other notable sampling issues were encountered in 2019.

5.0 ACTIVITIES PLANNED FOR 2020

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

Corrective Action sampling is also scheduled to begin in the second quarter of 2020. After the initial sampling event, a subsequent event for all Appendix III and detected Appendix IV parameters will be completed. A second semi-annual Corrective Action event for all Appendix III and the detected Appendix IV parameters is also scheduled to be completed in the fourth quarter 2020.

Tables

Table 2
Summary of Well Construction Details
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

Monitoring Well ID	Installation Date	Location		Top of Casing Elevation	Ground Surface Elevation	Top of Screen Elevation	Base of Well	Total Depth
		Northing[1]	Easting[1]	(FT MSL)[2]	(FT MSL)[2]	(FT MSL)[2]	(FT MSL)[2]	(FT BGS)[3]
CCR RULE COMPLIANCE NETWORK								
UMW-1D	11/19/2015	988822.5	723129.4	489.72	487.8	407.6	397.4	90.4
UMW-2D	11/21/2015	990437.2	722248.6	484.81	482.7	412.7	402.5	80.3
UMW-3D	11/22/2015	991830.7	723558.8	490.62	488.8	408.3	398.1	90.6
UMW-3D (R)	10/25/2018	991823.5	723545.1	491.13	488.9	409.4	399.2	89.7
UMW-4D	11/24/2015	992512.3	724538.1	494.95	493.2	407.9	397.7	95.5
UMW-5D	11/23/2015	992027.2	725067.9	496.76	494.9	408.2	398.0	96.9
UMW-6D	11/22/2015	991382.8	725540.9	496.19	494.5	410.4	400.2	94.3
UMW-7D	11/20/2015	990722.8	726032.4	469.79	468.0	412.6	402.4	65.6
UMW-8D	11/19/2015	989892.7	725179.5	469.47	467.5	407.0	396.8	70.6
UMW-9D	11/19/2015	989220.0	724447.8	470.61	468.8	408.9	398.7	70.1
BMW-1D	2/1/2016	988310.6	715138.4	473.54	471.2	410.5	400.3	70.9
BMW-2D	2/2/2016	987204.3	715104.2	474.39	472.4	413.0	402.8	69.6
UMW-10S (AM-1S)	5/31/2018	995288.1	723817.1	483.00	480.2	454.8	444.6	35.6
UMW-10D (AM-1D)	5/31/2018	995298.6	723827.3	482.78	480.0	409.8	399.6	80.4
CORRECTIVE ACTION MONITORING WELL NETWORK								
BMW-1S	2/1/2016	988310.0	715131.6	473.49	471.2	450.7	440.5	30.7
BMW-2S	2/2/2016	987210.1	715104.3	474.56	472.5	454.6	444.4	28.1
LMW-1S	11/20/2015	990727.7	726039.1	470.06	468.1	454.5	444.3	23.8
LMW-2S	11/23/2015	992017.5	725074.2	496.64	494.9	445.8	440.6	54.3
LMW-4S	11/18/2015	994194.9	725624.1	472.88	470.7	448.3	438.1	32.7
LMW-7S	11/20/2015	992330.1	726371.1	468.43	466.7	453.4	443.2	23.5
LMW-8S	11/20/2015	991371.2	726351.3	467.24	465.2	452.2	442.0	23.2
MW-24	3/20/2013	991819.3	727992.3	467.10	464.6	457.3	447.1	17.5
MW-26	3/20/2013	993976.5	726910.9	469.20	466.7	456.4	446.2	20.5
S-1	4/5/2017	994676.8	726055.1	472.64	470.4	453.2	442.9	27.5
TP-1D	6/3/2018	997122.3	734100.3	469.09	465.8	380.1	375.0	90.8
TP-2M	6/2/2018	993865.6	722603.7	471.22	468.2	412.9	407.8	60.5
TP-2D	6/2/2018	993865.6	722603.7	471.22	468.2	374.6	369.5	98.7
TP-3M	6/17/2018	996343.6	725783.7	475.64	472.6	417.8	412.7	59.9
TP-3D	6/17/2018	996343.6	725783.7	475.63	472.6	382.5	377.4	95.2
TP-4D	6/13/2018	999139.8	728578.3	472.08	469.1	379.0	373.9	95.2
MW-33(D)	3/6/2014	995742.0	727409.0	472.15	469.4	402.1	391.9	77.5
MW-34(D)	2/25/2014	995561.0	728820.0	470.19	467.4	401.5	391.3	76.1
MW-35(D)	3/8/2014	992693.0	727536.0	468.59	465.9	398.5	388.3	77.6
AMW-8	6/13/2018	994225.9	726113.0	471.06	468.4	411.1	400.9	67.5

Notes:
1) Horizontal Datum: State Plane Coordinates NAD83 (2000) Missouri East Zone feet.
2) FT MSL- Feet above mean sea level.
3) FT BGS - Feet below ground surface.
4) Vertical Datum: NAVD88 feet.

Prepared by: EMS
Checked by: RJF
Reviewed by: CMR

Table 3
Summary of Groundwater Sampling Dates
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

Groundwater Monitoring Wells	Date of Sample Collection					
	January 2019 Verification Sampling	April-May 2019 Assessment/ Detection Monitoring Sampling	May-August 2019 Nature and Extent Sampling	August - October 2019 Verification/ Assessment Monitoring Sampling	November 2019 Assessment/ Detection Monitoring Sampling	Total Number of Samples
CCR Rule Compliance Monitoring Well Network						
BMW-1D	-	5/1/2019	-	-	11/5/2019	2
BMW-2D	-	5/1/2019	-	-	11/5/2019	2
UMW-1D	1/2/2019	4/30/2019	-	8/21/2019	11/6/2019	4
UMW-2D	-	5/1/2019	-	-	11/7/2019	2
UMW-3D (R)	1/3/2019	4/30/2019	-	8/21/2019	11/7/2019	4
UMW-4D	1/3/2019	4/30/2019	-	-	11/7/2019	3
UMW-5D	1/3/2019	4/30/2019	-	-	11/7/2019	3
UMW-6D	-	4/30/2019	-	-	11/7/2019	2
UMW-7D	-	5/2/2019	-	-	11/6/2019	2
UMW-8D	1/2/2019	4/30/2019	-	8/21/2019	11/5/2019	4
UMW-9D	-	4/30/2019	-	8/21/2019	11/6/2019	3
UMW-10D (AM-1D)	-	5/8/2019	-	10/16/2019	11/7/2019	3
UMW-10S (AM-1S)	-	5/8/2019	-	10/16/2019	11/7/2019	3
Nature and Extent Investigation						
BMW-1S	-	-	5/1/2019	-	-	1
BMW-2S	-	-	5/1/2019	-	-	1
LMW-1S	-	-	5/1/2019	-	-	1
LMW-2S	-	-	4/30/2019	-	-	1
LMW-3S	-	-	5/2/2019	-	-	1
LMW-4S	-	-	5/1/2019	-	-	1
LMW-5S	-	-	5/1/2019	-	-	1
LMW-6S	-	-	5/8/2019	-	-	1
LMW-7S	-	-	5/8/2019	-	-	1
LMW-8S	-	-	5/2/2019	-	-	1
MW-26	-	-	5/8/2019	-	-	1
TMW-1	-	-	5/2/2019	-	-	1
TMW-2	-	-	5/2/2019	-	-	1
TMW-3	-	-	5/8/2019	-	-	1
L-TP-1D	-	-	5/8/2019	-	-	1
L-TP-1M	-	-	5/8/2019	-	-	1
L-TP-1S	-	-	5/8/2019	-	-	1
L-TP-2D	-	-	8/20/2019	-	-	1
L-TP-2M	-	-	8/20/2019	-	-	1
L-TP-2S	-	-	8/20/2019	-	-	1
L-TP-3D	-	-	5/9/2019	-	-	1
L-TP-3M	-	-	5/9/2019	-	-	1
L-TP-3S	-	-	5/9/2019	-	-	1
L-TP-4D	-	-	8/20/2019	-	-	1
L-TP-4M	-	-	8/20/2019	-	-	1
L-TP-4S	-	-	8/20/2019	-	-	1
L-TP-5D	-	-	5/9/2019	-	-	1
L-TP-5M	-	-	5/9/2019	-	-	1
L-TP-5S	-	-	5/9/2019	-	-	1
Detection or Assessment Monitoring	Detection	Assesment/ Detection	Assesment	Assessment/ Detection	Assessment/ Detection	NA

Notes:

1.) Detection Monitoring Events tested for Appendix III Parameters.

2.) Verification Sampling Events tested for Appendix III Parameters with initial exceedances that have not alread verified.

3.) Assessment Monitoring Events tested for Appendix IV Parameters.

4.) "-" No sample collected.

5.) NA - Not Applicable.

Prepared by: EMS
Checked by: RJF
Reviewed by: CMR

Table 4
November 2018 Detection Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
			BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D (R)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
November 2018 Detection Monitoring Event													
DATE	NA	NA	11/7/2018	11/7/2018	11/7/2018	11/7/2018	11/8/2018	11/9/2018	11/8/2018	11/9/2018	11/7/2018	11/7/2018	11/7/2018
pH	SU	6.634-7.617	7.17	7.36	7.13	7.59	8.87	8.25	9.62	8.68	7.47	7.58	7.48
BORON, TOTAL	µg/L	DQR	92.2 J	78.5 J	1,260	1,620	9,300	4,970	5,130	15,500	8,310	437	113
CALCIUM, TOTAL	µg/L	156,193	132,000	120,000	159,000	90,700	84,400	61,200	63,200	97,200	220,000	128,000	114,000
CHLORIDE, TOTAL	mg/L	18.10	11.2	6.3	16.0	24.1	18.6	21.2	19.0	21.2	14.5	11.3	20.7
FLUORIDE, TOTAL	mg/L	0.29	0.25	0.25	0.21	0.42	ND	0.49	ND	ND	0.29	0.23	0.21
SULFATE, TOTAL	mg/L	67.9	34.9	31.9	81.9	187	350	366	269	433	568	62.2	ND
TOTAL DISSOLVED SOLIDS	mg/L	579	550 J	427 J	556 J	1,080 J	600	1040	708	669	1,020 J	667 J	541 J
January 2019 Verification Sampling Event													
DATE	NA	NA			1/2/2019		1/3/2019	1/3/2019	1/3/2019			1/2/2019	
pH	SU	6.634-7.617			7.16		8.60	8.36	9.57			7.21	
BORON, TOTAL	µg/L	DQR											
CALCIUM, TOTAL	µg/L	156,193			168,000								
CHLORIDE, TOTAL	mg/L	18.10					17.7						
FLUORIDE, TOTAL	mg/L	0.29											
SULFATE, TOTAL	mg/L	67.9			83.5								
TOTAL DISSOLVED SOLIDS	mg/L	579						625	531			576	

NOTES:

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

Prepared By: JSI/RJF
Checked By: EMS
Reviewed By: CMR

Table 5
April-May 2019 Detection Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS										
			BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D (R)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D	UMW-10S (AM-1S)	UMW-10D (AM-1D)
April-May 2019 Detection Monitoring Event															
DATE	NA	NA	5/1/2019	5/1/2019	4/30/2019	5/1/2019	4/30/2019	4/30/2019	4/30/2019	4/30/2019	5/2/2019	4/30/2019	4/30/2019	5/8/2019	5/8/2019
pH	SU	6.33-7.50	6.82	6.35	6.24	6.66	8.43	7.29	9.34	8.33	6.99	6.24	6.23	5.81	6.52
BORON, TOTAL	µg/L	100.2	82.0 J	81.8 J	555	1,210	9,590 J	3,680	5,400	15,600	7,030	532	97.3 J	374	6,900
CALCIUM, TOTAL	µg/L	150,626	120,000	137,000	127,000	83,400	84,000 J	67,700	68,000	103,000	213,000	135,000	116,000	172,000 J	83,700
CHLORIDE, TOTAL	mg/L	17.72	12.3	10.4	12.6	22.1	18.8	24.3	19.8	21.8	13.9	10.9	23.0	NC	37.7
FLUORIDE, TOTAL	mg/L	0.2919	0.18 J	0.17 J	0.18 J	0.35	0.15 J	0.29	0.095 J	ND	0.13 J	0.16 J	0.14 J	0.13 J	0.35
SULFATE, TOTAL	mg/L	64.6	32.1	34.5	7.3	206	350	386	264	426	422	13.3	ND	17.6	332
TOTAL DISSOLVED SOLIDS	mg/L	577.8	492	506	559	547	579	657	503	758	1,030	531	473	931	752
August-October Verification Sampling Event															
DATE	NA	NA			8/21/2019		8/21/2019					8/21/2019	8/21/2019	10/16/2019	10/16/2019
pH	SU	6.33-7.50			6.78		8.60					6.55	6.51	6.35	7.36
BORON, TOTAL	µg/L	100.2												200	6,540
CALCIUM, TOTAL	µg/L	150,626												231,000	
CHLORIDE, TOTAL	mg/L	17.72					21.2							7.8	35.8
FLUORIDE, TOTAL	mg/L	0.2919													0.38
SULFATE, TOTAL	mg/L	64.6													275
TOTAL DISSOLVED SOLIDS	mg/L	577.8												783	684

NOTES:

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

Prepared By: JSI/RJF
Checked By: EMS
Reviewed By: CMR

Table 6
November 2019 Detection Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS										
		BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D (R)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D	UMW-10S (AM-1S)	UMW-10D (AM-1D)
November 2019 Detection Monitoring Event														
DATE	NA	11/5/2019	11/5/2019	11/6/2019	11/7/2019	11/7/2019	11/7/2019	11/7/2019	11/7/2019	11/6/2019	11/5/2019	11/6/2019	11/7/2019	11/7/2019
pH	SU	7.15	7.31	7.28	7.58	8.76	8.20	9.31	8.90	7.30	7.10	7.31	6.81	7.73
BORON, TOTAL	µg/L	82.3 J	65.6 J	1,340	1,010	9,090	4,810	10,200	13,200	11,000	1,680	106	242	7,010
CALCIUM, TOTAL	µg/L	124,000	124,000	130,000 J	85,000	119,000	90,000	96,100	118,000	266,000 J	143,000	119,000	218,000	87,800
CHLORIDE, TOTAL	mg/L	9.4	10.1	14.1	21.8	21.5	20.0	22.1	20.0	17.4	13.6	20.7	7.9	36.9
FLUORIDE, TOTAL	mg/L	0.23	0.25	0.24	0.34	ND	0.27	0.12 J	0.091 J	0.16 J	0.20 J	0.19 J	0.15 J	0.31
SULFATE, TOTAL	mg/L	12.2	28.2	86.0	172	298	410	292	504	992	227	ND	78	302
TOTAL DISSOLVED SOLIDS	mg/L	446	456	634	545	661	811	590	864	1,560	677	459	826	726

NOTES:

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

Prepared By: RJF
Checked By: TJG
Reviewed By: CMR

Table 7
November 2018 Assessment Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
		BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D (R)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
Field Parameters												
DATE	NA	11/7/2018	11/7/2018	11/7/2018	11/7/2018	11/8/2018	11/9/2018	11/8/2018	11/9/2018	11/7/2018	11/7/2018	11/7/2018
DISSOLVED OXYGEN	mg/L	0.17	0.11	0.15	0.11	1.35	1.19	0.12	0.99	0.71	0.64	1.45
pH	SU	7.17	7.36	7.13	7.59	8.87	8.25	9.62	8.68	7.47	7.58	7.48
REDOX POTENTIAL	mV	-40.7	-59.9	-55.1	-43.4	-44.2	108.8	-134.7	5.3	-96.7	-109.7	-110.2
SPECIFIC CONDUCTIVITY	mS/cm	0.60	0.51	0.79	0.61	0.76	0.82	0.51	0.94	1.29	0.86	0.79
TURBIDITY	NTU	1.74	3.31	0.31	1.35	3.91	3.52	0.13	3.89	3.89	4.26	4.10
Appendix IV Parameters												
ARSENIC, TOTAL	µg/L	0.90 J	33.5	69.5	1.8	1.7	0.16 J	16.1	15.4	20.7	24.3	34.5
BARIUM, TOTAL	µg/L	1,160	309	588	105	82.2	81.5	60.0	114	121	446	500
FLUORIDE, TOTAL	mg/L	0.25	0.25	0.21	0.42	ND	0.49	ND	ND	0.29	0.23	0.21
LITHIUM, TOTAL	µg/L	29.6	39.3	32.6	21.9	13.4	33.2	12.9	5.2 J	25.0	31.4	16.4
MOLYBDENUM, TOTAL	µg/L	ND	2.0 J	1.2 J	40.9	206	107	151	591	231	15.5 J	ND
RADIUM [226 + 228]	pCi/L	4.140	ND	4.330 J	1.839	ND	1.075	ND	0.987	ND	ND	ND

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.
6. Statistical Analysis for the Assessment Monitoring data is provided in Appendix D.

Prepared By: JSI
Checked By: EMS
Reviewed By: CMR

Table 8
April-October 2019 Assessment Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS													
		BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D(R)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D	AM-1S	AM-1D	AM-1S	AM-1D
Field Parameters																
DATE	NA	5/1/2019	5/1/2019	4/30/2019	5/1/2019	4/30/2019	4/30/2019	4/30/2019	4/30/2019	5/2/2019	4/30/2019	4/30/2019	5/8/2019	5/8/2019	10/16/2019	10/16/2019
DISSOLVED OXYGEN	mg/L	0.72	0.15	0.15	0.17	6.42	0.14	0.76	1.20	0.82	0.21	0.17	0.10	0.19	0.22	0.30
pH	SU	6.82	6.35	6.24	6.66	8.43	7.29	9.34	8.33	6.99	6.24	6.23	5.81	6.52	6.35	7.36
REDOX POTENTIAL	mV	-114.7	53.4	29.4	99.2	-165.8	93.3	-175.1	-211.6	-136.4	-27.4	-57.3	79.9	-1.9	166.5	-20.6
SPECIFIC CONDUCTIVITY	mS/cm	0.65	0.50	0.72	0.59	0.62	0.77	0.57	0.97	1.36	0.73	0.65	1.11	0.81	1.32	0.99
TURBIDITY	NTU	2.42	1.64	1.82	4.02	1.03	1.61	1.18	1.98	1.90	1.93	3.93	4.62	1.95	3.76	4.31
Appendix IV Parameters																
ANTIMONY, TOTAL	µg/L	ND	ND	0.082 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
ARSENIC, TOTAL	µg/L	0.94 J	29.8	34.7	1.8	4.6	0.13 J	16.7	17.3	20.3	27.5	32.2	2.9	2.7	3.0	2.3
BARIUM, TOTAL	µg/L	941	353	421	95.5	68.1	88.6	64.0	115	126	438	479	551	63.6	537	72.6
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.37 J	ND	ND	ND	0.26 J	-	-
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	0.10 J	0.050 J	0.078 J	0.27 J	0.082 J	ND	ND	ND	0.16 J	-	-
CHROMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	0.091 J	0.19 J	-	-
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.5 J	ND	-	-
FLUORIDE, TOTAL	mg/L	0.18 J	0.17 J	0.18 J	0.35	0.15 J	0.29	0.095 J	ND	0.13 J	0.16 J	0.14 J	0.13 J	0.35	0.25	0.38
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
LITHIUM, TOTAL	µg/L	26.6	40.6	24.8	22.8	18.0	33.3	16.7	9.2 J	20.8	32.8	15.9	33.8	36.1	23.4	37.0
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MOLYBDENUM, TOTAL	µg/L	ND	ND	ND	43.4	202	83.4	157	593	208	16.7 J	ND	2.9 J	370	ND	345
RADIUM [226 + 228]	pCi/L	3.380	ND	1.873	1.593	ND	ND	ND	ND	ND	2.690	ND	1.46	2.32 J	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	0.11 J	0.11 J	0.16 J	ND	0.14 J	0.24 J	0.089 J	ND	ND	ND	0.13 J	-	-
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.
6. Statistical Analysis for the Assessment Monitoring data is provided in Appendix E.
7. "-" Not Sampled.

Prepared By: JSI
Checked By: EMS
Reviewed By: CMR

Table 9
November 2019 Assessment Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

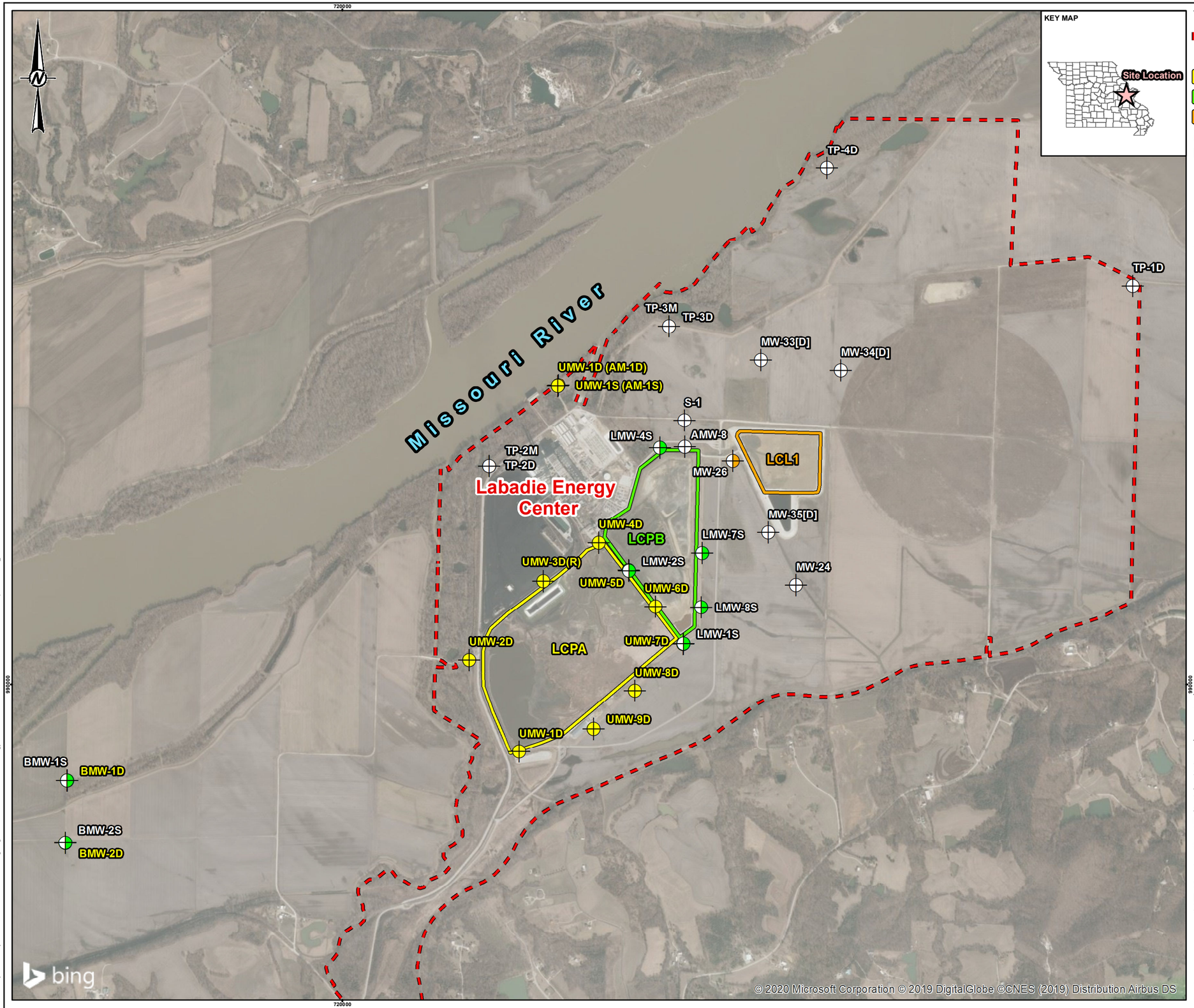
ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS										
		BMW-1D	BMW-2D	UMW-1D	UMW-2D	UMW-3D(r)	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D	AM-1S	AM-1D
Field Parameters														
DATE	NA	11/5/2019	11/5/2019	11/6/2019	11/7/2019	11/7/2019	11/7/2019	11/7/2019	11/7/2019	11/6/2019	11/5/2019	11/6/2019	11/7/2019	11/7/2019
DISSOLVED OXYGEN	mg/L	0.58	0.12	0.18	0.24	1.39	0.20	0.16	0.19	0.18	0.59	0.14	0.22	0.56
pH	SU	7.15	7.31	7.28	7.58	8.76	8.20	9.31	8.90	7.30	7.10	7.31	6.81	7.73
REDOX POTENTIAL	mV	-137.0	-141.6	127.7	-188.7	-116.4	159.2	126.4	128.4	-178.3	-142.3	96.2	113.5	104.0
SPECIFIC	mS/cm	0.812	0.781	1.110	0.857	0.923	1.210	0.840	1.200	1.994	1.029	0.850	1.360	1.060
TURBIDITY	NTU	4.88	9.53	0.82	3.63	2.12	1.32	1.05	2.98	4.09	1.52	1.27	3.34	2.80
Appendix IV Parameters														
ARSENIC, TOTAL	µg/L	1.9	44.2	49.7	1.5	52.1	0.14 J	11.9	29.0	24.1	30.5	35.6	3.7	4.0
BARIUM, TOTAL	µg/L	1,120	321	502	101	105	119	88.4	131	131	431	536	527	75.6
FLUORIDE, TOTAL	mg/L	0.23	0.25	0.24	0.34	ND	0.27	0.12 J	0.091 J	0.16 J	0.20 J	0.19 J	0.15 J	0.31
LITHIUM, TOTAL	µg/L	30.3	41.1	24.8	26.8	20	32.9	35.9	16.8	18.8	34.4	16.8	28.2	38.6
MOLYBDENUM, TOTAL	µg/L	ND	ND	6.9 J	40.7	168	120	263	535	342	29.1	ND	ND	390
RADIUM [226 + 228]	pCi/L	2.212	ND	2.197 J	ND	ND	ND	ND	1.197	ND	ND	ND	ND	1.446

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: JSI
Checked By: EMS/RJF
Reviewed By: CMR

Figures



KEY MAP

LEGEND

- Approximate Property Boundary

Labadie Energy Center CCR Units

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

Groundwater Monitoring Wells Used for LCPA CCR Rule Monitoring

- LCPA Detection/Assessment Monitoring Well Network
- LCPA Corrective Action Monitoring Well Network
- LCPB Detection and LCPA Corrective Action Monitoring Well Networks
- LCL1 Detection and LCPA Corrective Action Monitoring Well Networks

0 1,000 2,000 3,000 4,000

Feet

NOTE(S)

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.

REFERENCE(S)

1.) ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AND MONITORING WELL AND PIEZOMETER LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-12-31
DESIGNED	JSI
PREPARED	JSI
REVIEWED	EMS
APPROVED	MNH

PROJECT NO.	CONTROL	REV.	FIGURE
153140601	1240	0.0	1

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

1 in 0

PATH: G:\Projects\1560 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\2019 Annual Report\20191231_LCPAFIV1.mxd PRINTED ON: 2020-01-14 AT 4:07:24 PM

APPENDIX A

Corrective Measures Assessment and Certification

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

April 2019
Project No. 132002

SUBJECT: **Demonstration for 60-Day Extension – Corrective Measures Assessment (CMA)**
Coal Combustion Residual (CCR) Surface Impoundment (LCPA)
Ameren Missouri Labadie Energy Center
Franklin County, Missouri

Pursuant to CFR Title 40 Chapter I Subchapter I Part 257 Subpart D §257.96(a) (CCR Rule), I certify that Ameren Missouri, St. Louis, Missouri (Ameren) has demonstrated the need for additional time beyond the regulatory time period of 90 days to complete the assessment of corrective measures due to site-specific conditions and the evaluation of remedial treatment alternatives in support of an informed CMA process.

In the case of the assessment for the LCPA unit, the site has complex hydrogeological conditions. In addition, Ameren is in the process of reviewing possible groundwater remedies, and ongoing discussions with third-party experts regarding effectivity and implementation of critical steps in the treatment and remedy assessment process. Based on these site-specific conditions and related groundwater treatment alternatives evaluations in support of the CMA by Ameren, the CCR Rule allows for a 60-day extension to complete the CMA process.

This certification as submitted, is to the best of my knowledge, accurate and complete.

Signed:_____

Certifying Engineer

Print Name:	Steven F. Putrich, P.E.
Missouri License No.:	2014035813
Title:	CCR Practice Lead, Senior Consulting Engineer
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal

HALEY ALDRICH

www.haleyaldrich.com

CORRECTIVE MEASURES ASSESSMENT
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
Ameren Missouri
St. Louis, Missouri

May 2019

Overview

This Corrective Measures Assessment (CMA) was prepared by Haley & Aldrich, Inc. (Haley & Aldrich) for Union Electric Company d/b/a Ameren Missouri (Ameren) for the Coal Combustion Residual (CCR) surface impoundment (LCPA) located at the Ameren Labadie Energy Center (LEC). The LEC is a coal-fired power plant located along the Missouri River in Franklin County, Missouri. The CMA was completed in accordance with requirements stated in the U.S. Environmental Protection Agency's (USEPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21302 (Apr. 17, 2015) (promulgating 40 CFR §257.61); 83 Fed. Reg. 36435 (July 30, 2018) (amending 40 CFR §257.61) (CCR Rule).

Ameren implemented groundwater monitoring under the CCR Rule through a phased approach to allow for a graduated response and evaluation of steps to address groundwater quality. Assessment monitoring completed in 2018 evaluated the presence and concentration of constituents in groundwater specified in the CCR Rule (i.e. Appendix IV). Of the 23 CCR parameters evaluated, only one constituent of concern (COC), molybdenum, exceeded the Groundwater Protection Standards (GWPS) established for the LCPA in a very limited number of wells and to a limited extent. As described in **Section 3.3.1**, 96% of Appendix IV parameters tested comply with CCR Rule requirements.

Ameren completed a detailed environmental evaluation of the LCPA and surrounding area, including voluntary, supplemental surface water sampling and bedrock groundwater sampling. In 2018, a risk evaluation was undertaken to identify whether current groundwater conditions pose an unacceptable risk to human health and the environment, and whether corrective measures mitigate such an unacceptable risk, if present. The risk evaluations concluded that there are **no adverse effects on human health or the environment currently or under reasonably anticipated future uses** from either surface water or groundwater due to CCR management practices at LEC.

In performing this CMA, Haley & Aldrich considered the following: presence and distribution of molybdenum, LCPA configuration, hydrogeologic setting, and the results of the detailed risk evaluation. Within the LCPA, CCR is managed in an impoundment that extends to a depth of approximately 100 feet (ft) below ground surface (bgs). Groundwater within the Missouri River valley ranges in thickness from 0 ft thick at the aquifer pinch-out along the bedrock bluff to the south of the LCPA near the railroad, to up to greater than 120 ft thick where the sedimentary bedrock surface has been eroded by the Missouri River. Although flow direction is influenced by elevation changes of surface water in the Missouri River, groundwater generally/predominantly flows from the south to north beneath the LCPA, towards the Missouri River.

To provide a comprehensive CMA, this effort included surface impoundment closures and groundwater remediation alternatives, including:

- Alternative 1: Closure in place (CIP) with low permeability capping and monitored natural attenuation (MNA);
- Alternative 2: CIP with in-situ stabilization (ISS), low permeability capping and MNA;
- Alternative 3: CIP with low permeability capping and in-situ groundwater treatment;
- Alternative 4: CIP with low permeability capping, hydraulic containment (HC) of groundwater, and ex-situ groundwater treatment; and

- Alternative 5: Closure by removal (CBR) with MNA.

These five alternatives were evaluated based on the threshold criteria provided in the CCR Rule and then compared to three of the four balancing criteria stated in the CCR Rule. The four balancing criteria consider:

1. The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful;
2. The effectiveness of the remedy in controlling the source to reduce further releases;
3. The ease or difficulty of implementing a potential remedy; and
4. The degree to which community concerns are addressed by a potential remedy.

Balancing criteria four, which considers community concerns, will be evaluated following a public information session scheduled for May 2019.

The following observations are made regarding closure scenarios and groundwater remedial alternatives for the LCPA and are described more fully in this report:

- **Cap Integrity and Hydrogeologic Conditions:** For all CIP alternatives, Ameren intends to install a geomembrane and soil cover system that exceeds, by two orders-of-magnitude, the performance criteria set forth in the CCR Rule and is referred to in this CMA as a "low permeability cap." Vertical infiltration via precipitation is virtually eliminated following installation of the geomembrane cover system. Modelling predicts that post-closure, 99% of groundwater travels horizontally around the unit via a preferential pathway in the surrounding soils.

- **No Risk:** Risk assessment evaluations confirm that the LCPA, even prior to closure, presents **no unacceptable risk** to human health or the environment. In fact, concentration levels of molybdenum would need to be **more than 40,000 times higher**, than currently measured levels before an adverse impact in the Missouri River could occur. Therefore, since no adverse risk currently exists, implementation of any of the remedies considered will not result in a meaningful reduction in risk.

- **Groundwater Compliance**: Molybdenum concentrations are predicted to reduce below GWPS within an estimated 22 years after closure due to geochemical conditions of the groundwater. Such timeframe reduces to approximately 16 years following in-situ treatment according to predictive modeling performed by Gredell Engineering Resourcing, Inc. (Gredell). See **Figure 4-2.** Ameren has retained XDD Environmental (XDD) to evaluate and develop groundwater treatment methods to address molybdenum and potentially accelerate this timeframe.

- **Excavation Timeframe**: As described in an Extraction & Transportation Study prepared by the Lochmueller Group (Lochmueller), removal of large volumes of stored CCR creates extensive logistical challenges – including excavation, transportation, and disposal, and could take decades to complete during which time the impoundment would remain open and the would be subject to ongoing infiltration from precipitation.

- **Groundwater Treatment:** As noted, laboratory bench-scale testing and in-situ treatment evaluations are being performed by XDD. XDD expects to complete these evaluations this summer.

- **Residential Supply Wells:** Bedrock groundwater sampling performed to respond to expressed concerns about drinking water quality **confirms that the LEC is not impacting the groundwater used for drinking water**. Residential supply wells draw groundwater from the bedrock aquifer at depths of 500 to 700 ft bgs. The investigations demonstrate that the bedrock groundwater in the bluff area is upgradient of the LEC and all results meet drinking water standards. Even under extreme flood conditions, modeling confirms that such wells would not be impacted by CCR operations at the LEC.

In accordance with §257.98, Ameren will implement a groundwater monitoring program to document the effectiveness of the selected remedial alternative. Corrective measures are considered complete when monitoring reflects groundwater downgradient of the LCPA does not exceed the Appendix IV GWPS for three consecutive years. USEPA is in the process of modifying certain CCR Rule requirements and, depending upon the nature of such changes, assessments made herein could be modified or supplemented to reflect such future regulatory revisions. See *Federal Register (March 15, 2018; 83 FR 11584*).

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List of Acronyms and Abbreviations

Ameren	Ameren Missouri
AMSL	Above Mean Sea Level
bgs	Below Ground Surface
CBR	Closure by Removal
CCR	Coal Combustion Residuals
CIP	Closure In-Place
CMA	Corrective Measures Assessment
cm/sec	Centimeters per Second
COC	Constituents of Concern
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
ft	Feet
Golder	Golder Associates Inc.
GMP	Groundwater Monitoring Plan
Gredell	Gredell Engineering Resources, Inc.
GWPS	Groundwater Protection Standards
Haley & Aldrich	Haley & Aldrich, Inc.
HC	Hydraulic Containment
ISS	In-Situ Solidification
LCPA	Bottom Ash Surface Impoundment
LCPB	Fly Ash Surface Impoundment
LCL1	Utility Waste Landfill Cell 1
LEC	Labadie Energy Center
Lochmueller	Lochmueller Group
MM CY	Million Cubic Yards
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
MNA	Monitored Natural Attenuation
N&E	Nature and Extent
NAS	U.S. National Academy of Sciences
O&M	Operations and Maintenance
ORP	Oxidation Reduction Potential
ppm	Parts per Million
PRB	Permeable Reactive Barrier
RDA	Recommended Daily Allowance
RO	Reverse Osmosis
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
ug/L	Micrograms per liter
UL	Tolerable Upper Limit
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
XDD	XDD Environmental

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this Corrective Measures Assessment (CMA) for the Coal Combustion Residual (CCR) surface impoundment (LCPA) located at the Ameren Missouri (Ameren) Labadie Energy Center (LEC) located approximately 35 miles west of downtown St. Louis in Franklin County, Missouri. Ameren has conducted detailed geologic and hydrogeologic investigations under Missouri's utility and solid waste landfill requirements as well as the USEPA rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21302 (Apr. 17, 2015) (promulgating 40 CFR §257.61); 83 Fed. Reg. 36435 (July 30, 2018) (amending 40 CFR §257.61) (CCR Rule). These investigations were, in part, related to determination of requirements related to the potential for both LCPA closure and groundwater corrective action.

This CMA includes a summary of the results of groundwater and site investigations at the LEC. Groundwater impacted by the LCPA exceeds statistically-derived GWPS for only molybdenum at only five monitoring well locations. This report evaluates potential corrective measures to address the limited exceedances of the GWPS.

1.1 FACILITY DESCRIPTION/BACKGROUND

The LEC is located in rural Franklin County and surrounded by agricultural fields. The facility is bounded to the north by the Missouri River, to the west by Labadie Creek, and to the south by a railroad line and bedrock bluffs **(Figure 1-1)**. The LCPA is an unlined impoundment approximately 165 acres in size and is the focus of this CMA. Directly northeast of the LCPA is the lined fly ash surface impoundment (LCPB). East of LCPB is the utility waste landfill (UWL) used for managing dry CCR. Site features are illustrated on **Figure 1-2**.

Labadie Energy Center

Both fly ash and bottom ash have been historically managed in this LCPA. Construction drawings indicate that the base depth of CCR in the LCPA extends down approximately 100 ft bgs in the deepest portions of the unit. Over the past 17 years, Ameren has been able to beneficially use 64% of the bottom ash material with the remaining managed in the LCPA. The estimated volume of CCR currently within the limits of the LCPA is approximately 17.3 million cubic yards (MM CY). Ameren is constructing wastewater treatment facilities and will terminate usage of the impoundment system in September 2019 and commence closure of both the lined (LCPB) and unlined (LCBA) impoundments shortly thereafter.

1.2 SITE CHARACTERIZATION WORK SUMMARY

Extensive subsurface investigations have occurred pursuant to Missouri's utility and solid waste landfill requirements as well as the CCR Rule. In addition, in 2012 Ameren voluntarily installed an off-site well network to confirm groundwater flow direction and bedrock water quality in response to community

concerns. Ameren also voluntarily conducted surface water sampling. In 2011, and as part of state permitting requirements for UWLs, Gredell and Reitz & Jens, Inc., prepared a Detailed Site Investigation (DSI) Report to characterize geology and hydrogeology conditions. Haley & Aldrich used, in part, the DSI to support the development of a hydrogeologic Conceptual Site Model (CSM). The DSI investigation included:

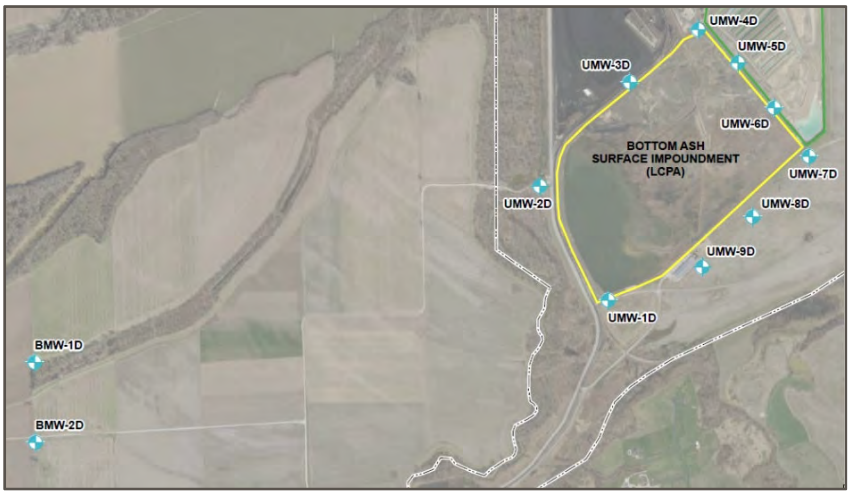
- Soil borings and sampling;
- Geotechnical testing;
- Rock coring;
- Well and piezometer installation;
- Slug testing; and
- Groundwater sampling.

The CSM has been further enhanced with ongoing CCR groundwater monitoring and supplemental subsurface investigation activities performed by Golder Associates, Inc. (Golder). Findings from these extensive and updated series of geologic, geotechnical, and hydrogeologic investigations including voluntary surface water sampling conducted, have produced a robust CSM that supports the CMA activities discussed in this report.

1.3 GROUNDWATER MONITORING

Groundwater monitoring under the CCR Rule occurs through a phased approach to allow for a graduated response (i.e., baseline, detection, and assessment monitoring as applicable) and evaluation of steps to address groundwater quality associated with a CCR unit. Golder prepared a Groundwater Monitoring Plan (GMP) as required by the CCR Rule. The GMP presents the design of the groundwater monitoring system, groundwater sampling and analysis procedures, and groundwater statistical analysis methods.

Monitoring wells were installed in November 2015 and February 2016 and includes two background wells (BMW-1D and BMW-2D) that are located off-site (west of the CCR unit) and nine downgradient monitoring wells (UMW-1 through UMW-9) located around the perimeter of the LCPA. In general, the monitoring wells are screened in the alluvial aquifer zone near the base elevation of the LCPA.



Groundwater Monitoring Well Locations

HALEY ALDRICH

Detection monitoring sampling events occurred in 2017 and 2018. The results of the sampling events were then compared to background, or natural groundwater values, using statistical methods to determine if Appendix III constituents at the base of the ash basin are present at concentrations above background, called statistically significant increases (SSI). Detection of Appendix III analytes triggered a verification sampling event in January 2018 and verified SSIs. The results of this analysis indicated SSIs necessitating the establishment of an Assessment Monitoring Program and respective notification of the same.

CCR Rule Monitoring Constituents			
Appendix III	Boron	Appendix IV	Antimony
	Calcium		Arsenic
	Chloride		Barium
	Fluoride		Beryllium
	Sulfate		Cadmium
	pH		Chromium
	Tot. Dissolved Solids		Cobalt
			Fluoride
			Lead
			Lithium
			Mercury
			Molybdenum
			Selenium
			Thallium
			Radium 226 & 228

During the Assessment Monitoring phase, CCR groundwater monitoring well samples were collected during April, May and November 2018 and subsequently analyzed for Appendix IV constituents. Appendix IV analytical results for the baseline and Assessment Monitoring events are summarized in **Table I**.

1.4 CORRECTIVE MEASURES ASSESSMENT PROCESS

The CMA process involves development of groundwater remediation technologies that will result in the following threshold criteria: protection of human health and the environment, attainment of GWPS, source control, COC removal and compliance with standards for waste management. Once these technologies are demonstrated to meet these criteria, they are then compared to one another with respect to long- and short-term effectiveness, source control, and implementability. Input from the community on such proposed measures will occur as part of a public meeting scheduled for May 2019.

1.5 RISK REDUCTION AND REMEDY

The CCR Rule at §257.97 (Selection of Remedy) at (b)(1) requires that remedies must be protective of human health and the environment. Further, at (c) the CCR Rule requires that in selecting a remedy, the owner or operator of the CCR unit shall consider specific evaluation factors, including the risk reduction achieved by each of the proposed corrective measures. Each of the evaluation factors listed here and discussed in **Section 4** are those that consider risk to human health or the environment.

> (1)(i) Magnitude of reduction of existing risks;
>
> (1)(ii) Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy;
>
> (1)(iv) Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant;

(1)(vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment;

(4) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy[1];

(5)(i) Current and future uses of the aquifer;

(5)(ii) Proximity and withdrawal rate of users; and

(5)(iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to CCR constituents.

[1] Factors 4 and 5 are not part of the CMA evaluation process as described in §257.97(d)(4), §257.97(d)(5)(i)(ii)(iv); rather they are factors the owner or operator must consider as part of the schedule for remedy implementation.

2. Groundwater Conceptual Site Model

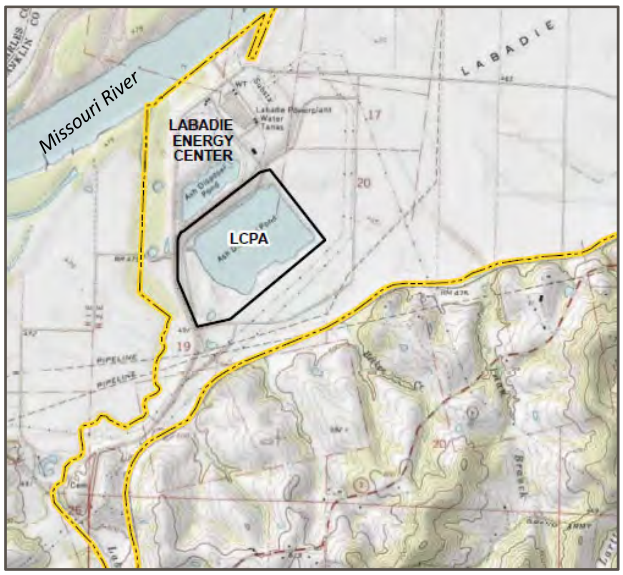
To evaluate the magnitude of risk reduction, the degree of existing risk must first be identified. Prior risk evaluations and data collected are summarized below.

2.1 SITE SETTING

The LEC is located in Franklin County adjacent to the Missouri River within a wide area known as the Missouri River Bottoms. The facility is surrounded by agricultural fields. Residential homes are located in the bluffs to the south and there are no residential structures within the bottoms area. The LEC is connected to a public water supply provided by the town of Labadie, Missouri. Residences within the bluffs area draw water from private supply wells drilled deep into the bedrock aquifer.

2.2 SITE TOPOGRAPHY

Ground surface elevation near the LEC ranges between roughly 468 ft to 495 ft above mean sea level (AMSL). A lined ash impoundment and a UWL are located northeast of the LCPA and all such CCR Units are protected by berms. The plant property was elevated during construction of the LEC and agricultural fields located to the south are at a lower elevation ranging from approximately 465 to 475 ft AMSL. South of bottoms, bedrock bluffs rise to an elevation of over 550 ft AMSL. The western side of the LCPA is bounded by Labadie Creek, which flows north to the Missouri River.



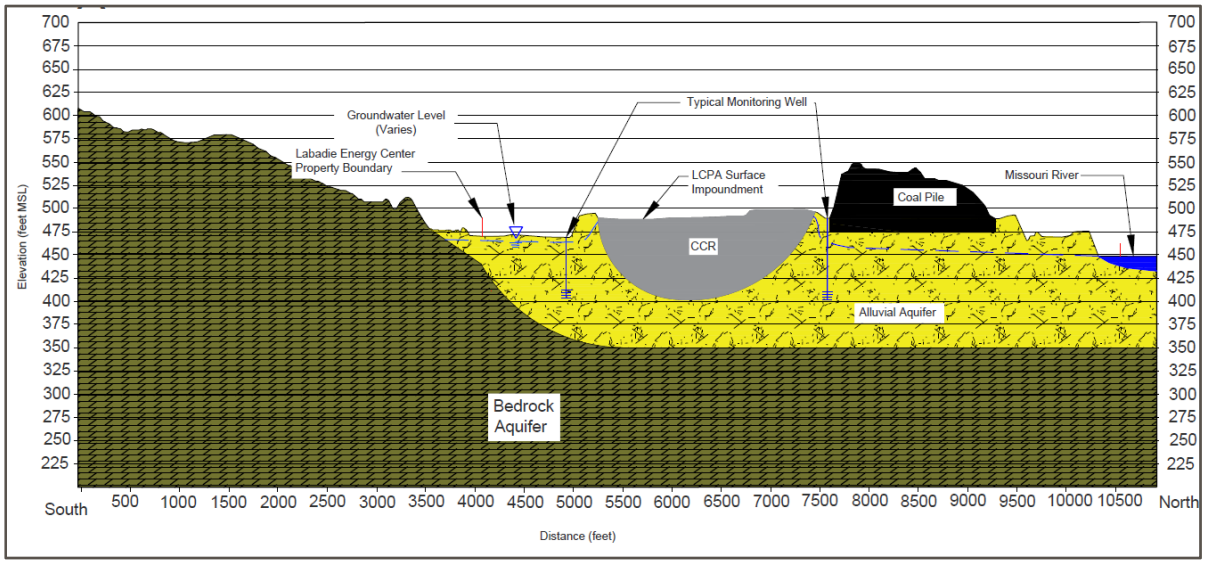
Topographic Map

2.3 GEOLOGY AND HYDROGEOLOGY

The geology immediately surrounding the LEC is composed of two distinctly different geological terrains; (1) floodplain deposits of the Missouri River Valley and (2) older sedimentary bedrock formations. The river valley in this region is an approximately 2 to 3-mile-wide area of floodplain with alluvial deposits (alluvium) that are the result of the water flow and deposition from the Missouri River [2]. The alluvial aquifer varies in thickness from 0 ft thick at the aquifer pinch-out along the bedrock bluff to the South near the railroad, to up to greater than 120 ft thick where the sedimentary bedrock surface has been eroded by the Missouri River.

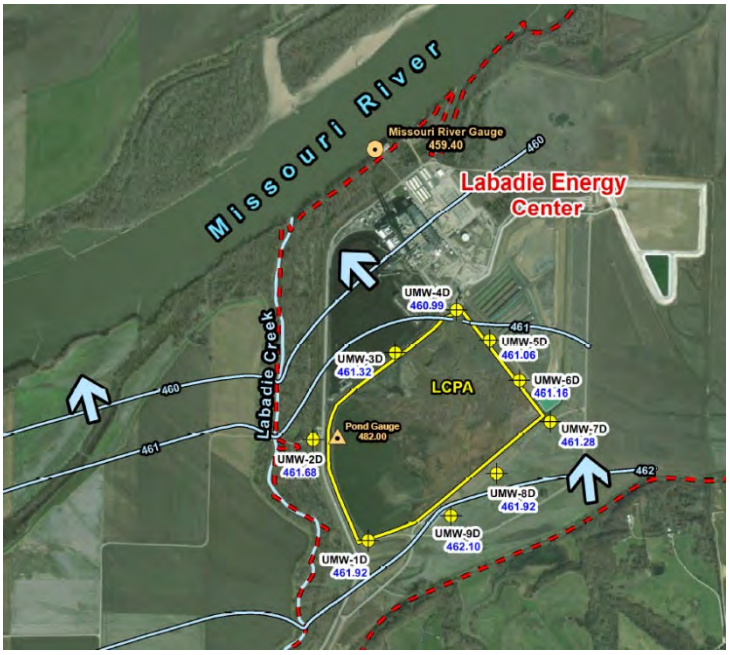
[2] 40 CFR Part 257, Groundwater Monitoring Plan LCPA, Labadie Energy Center, Franklin County, Missouri (Golder 2017)

The cross-section provides a depiction of the LCPA in relation to the bedrock and alluvial aquifers along with alluvial deposits consisting primarily of alluvial sands with some silt, clay, and gravel. This alluvium overlies Ordovician-aged sedimentary bedrock formations comprised of relatively flat-lying Ordovician-aged limestones, sandstones and dolomites.



Generalized Cross-Section
Image from Figure 3, Groundwater Monitoring Plan, LCPA LEC (Golder 2017)

Groundwater flow direction within the alluvium flows from the south (bluffs area) to the north (Missouri River) under normal river conditions. However, during periods of high river levels, groundwater can temporarily reverse flow until such time as the river surface elevation decreases. During these times of high river stage and temporary flow direction changes, horizontal groundwater gradients generally decrease, and little net movement of groundwater occurs. Modelling performed by Golder confirms that even under the most extreme flood event (i.e. a flood of record lasting 55 days), such temporary reversal does not impact the bedrock aquifer from which residents draw water.



Groundwater Flow Map-November 7, 2018
Image from Figure C3, 2018 Annual Groundwater Monitoring and Corrective Action Report (Golder 2019)

Groundwater flow direction and gradient were estimated for the downgradient CCR monitoring wells using the USEPA's On-line Tool for Site Assessment Calculation for Hydraulic Gradient (Magnitude and Direction) (USEPA, 2016). Results from this assessment indicate that

the overall net groundwater flow at the LCPA is from the bluffs toward the river[3] [4]. Horizontal gradients calculated by the program ranged from 0.0003 to 0.0006 ft/ft with an estimated net annual groundwater velocity of approximately 19 ft per year under current conditions[5].

Vertical hydraulic gradients from areas away from the LCPA are relatively variable and fluctuate between upward and downward with no consistent vertical gradient present between shallow and deeper zones of the alluvial aquifer. Areas adjacent to the LCPA demonstrate a downward gradient. While results vary, overall gradients are typically downward ranging up to 0.4 ft difference between the groundwater levels. Vertical gradients within the LCPA and the underlying alluvial groundwater zone changes seasonally based on river levels and fluctuating alluvial aquifer groundwater levels.

Groundwater flow modeling completed by Gredell evaluated the flux of groundwater passing through the CCR, following closure and dewatering of the LCPA. As shown in the figure below, the model results indicated that over 99% of groundwater moving laterally through the alluvial aquifer preferentially flows under (and around) the LCPA, due to the notably lower horizontal hydraulic conductivity of the CCR.

Groundwater Preferentially Flows Under/Around the LCPA

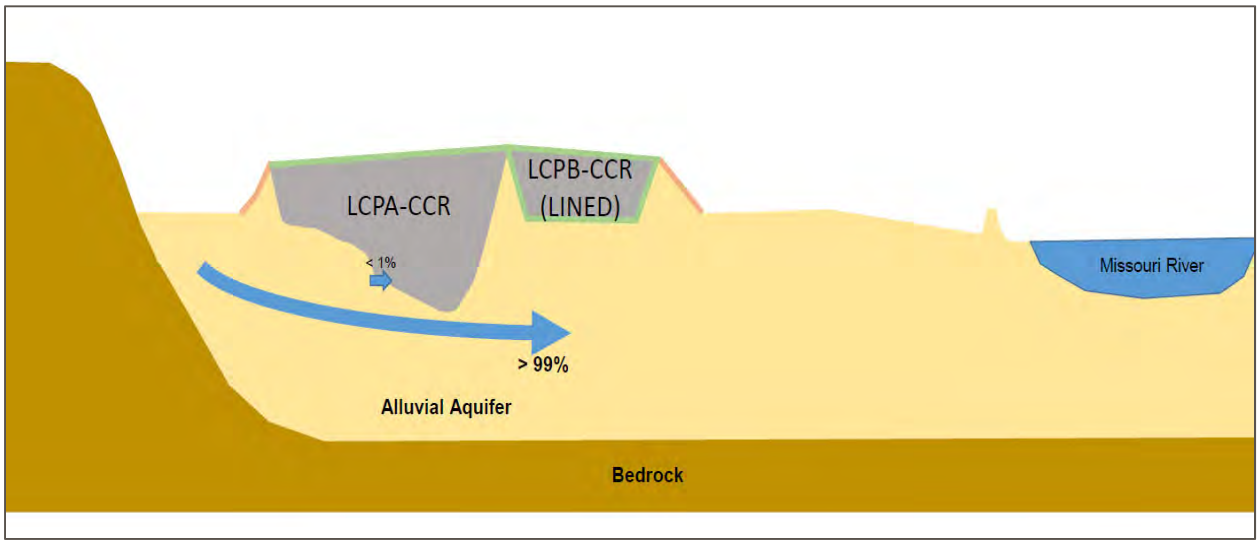


Image provided by Golder 2019

[3] Labadie Energy Center Groundwater Modeling Technical Memorandum (Golder 2015)
[4] 2016 Ground and Surface Water Assessment Labadie Energy Center (Ferrara, R.A., 2016)
[5] 2018 Annual Groundwater Monitoring and Corrective Action Report, LCPA Surface Impoundment, LEC, Franklin County, Missouri (Golder 2019)

2.4 GROUNDWATER PROTECTION STANDARDS

Golder completed a statistical evaluation of groundwater samples using the methods and procedures outlined in the Groundwater Monitoring Plan's *Statistical Analysis Plan* (Golder 2017) to develop site-specific GWPS for each Appendix IV constituents.

Groundwater results were compared to the site-specific GWPS. Statistically significant levels (SSL) above the GWPS are limited to five monitoring wells (UMW-3D, UMW-4D, UMW-5D, UMW-6D and UMW-7D) and only for one parameter, molybdenum.

Parameter	Site GWPS	Units
Antimony	6	µg/L
Arsenic	42.6	µg/L
Barium	2000	µg/L
Beryllium	4	µg/L
Cadmium	5	µg/L
Chromium	100	µg/L
Cobalt	6	µg/L
Fluoride	4	mg/l
Lead	15	µg/L
Lithium	54.85	µg/L
Mercury	2	µg/L
Molybdenum	100	µg/L
Radium 226+228	5	pCi/L
Selenium	50	µg/L
Thallium	2	µg/L

Groundwater Protection Standards
ug/L – micrograms per liter
mg/l – milligrams per liter
pCi/L – picoCuries per liter

2.5 NATURE AND EXTENT OF GROUNDWATER IMPACTS

Ameren initiated a nature and extent (N&E) investigation as required by the CCR Rule in 2018 and installed additional monitoring wells and piezometers (N&E wells). The N&E wells are screened in three different, generalized zones of the alluvial aquifer: shallow zone, middle/intermediate zone, and deep zone. Well screen lengths range from 5 to 10 ft long and total depths range from approximately 24 to 98 ft bgs.

Analytical results from the N&E wells indicate that molybdenum concentrations are limited in their extent. In the shallow alluvial aquifer zone, the results from monitoring wells at the property boundary are below the GWPS. In the intermediate and deep alluvial aquifer zone, molybdenum concentrations are below the GWPS at nested wells located east of the LCPA (TP-1, TP-4 and TP-5). Results from wells to the north of the LCPA are above the GWPS (TP-2, TP-3 and AM-1D). Concentrations of molybdenum are highest in the intermediate and deep alluvial aquifer zone samples. Monitoring Well locations are show on **Figure 2-1**.

The extent of molybdenum above the GWPS is limited to the alluvial aquifer and does not extend into the bedrock beneath and adjacent to the LCPA or the offsite bedrock well network. Results from the N&E wells were used to develop corrective measures alternatives.

2.6 SURFACE WATER SAMPLING

The limited elevated levels of molybdenum have not impacted surface waters. Prior to the CCR Rule, Ameren voluntarily collected samples of surface water from the Missouri River and Labadie Creek to evaluate whether ash management operations at the LEC have impacted these surface water bodies. Surface water sampling locations for these events are shown on **Figure 2-2.**

Golder collected surface water samples from 12 locations in the Missouri River and six locations in Labadie Creek. At each sample location, shallow samples were collected near the surface of the river. Where the depth of water was greater than four feet, a second sample was collected mid-depth in the

river (referred to here as a deep sample). A total of 55 samples were collected from the Missouri River and a total of 12 samples were collected in Labadie Creek.

Samples were analyzed for the same Appendix III and Appendix IV constituents listed in **Section 1.3**, with the exception of radium (all CCR monitoring well data are below the GWPS for radium). Sample results were also compared to human health and ecological risk-based screening levels. The screening levels and comparison of the surface water results to the screening levels are provided in **Appendix A**.

In summary, the results of this investigation demonstrate that the Missouri River and Labadie Creek sampling **do not** show evidence of impact of CCR constituents including molybdenum[6].

2.7 BEDROCK WELL SAMPLING

Ameren installed an off-site monitoring network to evaluate water quality within the bedrock aquifer and to confirm groundwater flow direction. In 2012 and 2014, Golder installed seven monitoring wells with screened intervals in bedrock at similar depths to residential water wells closest to the LEC property boundary (south of the LEC, in the bluff area). The bedrock groundwater monitoring well locations are shown on **Figure 2-3**. Bedrock groundwater sampling results **fully comply with federal and state drinking water standards.** See **Appendix A**.

[6] In some river samples, the concentrations of arsenic or lithium exceeded screening levels, however, the results are statistically **no different** in upstream and downstream samples indicating that the LCPA is not the source of the constituents detected in the rivers. At the LCPA, arsenic and lithium groundwater results comply with the CCR Rule's GWPS.

3. Risk Assessment and Exposure Evaluation

As described in this report, Ameren has conducted detailed environmental evaluations of the LEC and its environs. These investigations have been detailed in two risk evaluation reports available to the public on the Ameren website:

- January 2014: Groundwater and Surface Water Data Demonstrate No Adverse Human Health Impact from Coal Ash Management at the Ameren Labadie Energy Center. Available at: https://www.ameren.com/-/media/corporate site/files/environment/reports/amerenlabadiereport.ashx?la=en&hash=3B8226534EAF26E0A904A1D2C8453E5D9DAC1424
- February 2018: Human Health and Ecological Assessment of the Labadie Energy Center. Available at: https://www.ameren.com/-/media/corporate-site/files/environment/ccr-rule/2017/groundwater-monitoring/labadie-haley-aldrich-report.ashx?la=en&hash=76A0B8C34676EA9D3A7C8F61284917F50E02ED46

The purpose of the risk evaluations is to identify whether current groundwater conditions pose a risk to human health and the environment and, if so, whether the corrective measures identified in this report mitigate such risk.

3.1 APPROACH

The risk evaluation provided in the 2018 risk assessment report evaluated the environmental setting of the LEC, which has been in operation for 48 years, including its location and ash management operations at the facility. Golder provided information on groundwater location and direction, the rate(s) of groundwater flow, and where waterbodies may intercept groundwater flow.

A conceptual model was then developed based on this physical setting information and used to identify whether human populations could contact groundwater and/or surface water in the area of the facility. This information was also used to identify locations where ecological populations could come into contact with surface water. Based on this conceptual model approach, Ameren's environmental consultants and risk assessors identified sampling locations to evaluate potential impact to the environment. Sampling results were then evaluated, as appropriate, on both a human health and ecological risk basis.

Human health risk assessment is a process used to estimate the chance that contact with constituents in the environment may result in harm to people. Generally, there are four components to the process (USEPA, 1989): (1) Hazard Identification, (2) Toxicity Assessment, (3) Exposure Assessment, and (4) Risk Characterization.

The USEPA develops "screening levels" of constituent concentrations in groundwater (and other media) that are considered to be protective of specific human exposures. These screening levels are referred to as "Regional Screening Levels" and are published by USEPA and updated twice yearly (USEPA, 2018a). In developing the screening levels, USEPA uses a specific target risk level (component 4) combined with an assumed exposure scenario (component 3) and toxicity information from USEPA (component 2) to derive an estimate of a concentration of a constituent in an environmental medium, for example groundwater, (component 1) that is protective of a person in that exposure scenario (for example,

drinking water). Similarly, ecological screening levels for surface water are developed by Federal and State agencies to be protective of the wide range of potential aquatic ecological resources, or receptors.

Risk-based screening levels are designed to provide a conservative estimate of the concentration to which a receptor (human or ecological) can be exposed without experiencing adverse health effects. Due to the conservative methods used to derive risk-based screening levels, it can be assumed with reasonable certainty that concentrations below screening levels will not result in adverse health effects, and that no further evaluation is necessary. Concentrations above conservative risk-based screening levels do not necessarily indicate that a potential risk exists but indicate that further evaluation may be warranted.

The surface water and groundwater data were evaluated using human health risk-based and ecological risk-based screening levels drawn from Federal sources. The screening levels are used to determine if the concentration levels of constituents could pose an unacceptable risk to human health or the environment. The evaluation also considers whether constituents are present in groundwater and surface water above screening levels, and if so, if the results could be due to the ash management operations.

3.2 CONCEPTUAL SITE MODEL

There are no on-site users of alluvial groundwater adjacent to LEC. As documented in the 2018 risk assessment report, while there are approximately 76 private wells recorded within a one-mile radius of the facility, all are located in the bluff area south and upgradient of the facility (a detailed discussion of the wells is presented in the AECOM 2014 report).Thus, there are **no users** of groundwater impacted by molybdenum or any other CCR constituent in the vicinity of the LEC ash management areas and sampling results from the off-site network demonstrate that bedrock groundwater fully complies with federal and state drinking water standards.

3.3 RESULTS

3.3.1 Alluvial Aquifer

Figure 1-2 shows the location of the CCR monitoring wells at the LCPA. A summary of the screening results is presented in the table below:

Table: Assessment Monitoring Reflects High Percentage Compliance

	Labadie Energy Center LCPA – Shallow Alluvial Aquifer
Percent of Assessment Monitoring Parameter Compliance	96%
Percent of Assessment Monitoring Parameter Results Requiring Corrective Action (Constituents)	4% Molybdenum

This is striking, given that the wells are located directly adjacent to and at the base of the ash management area, and the facility has been in operation for 48 years. Note that out of the 2,170

groundwater analyses conducted, only 55 results are above the GWPS. Put another way, over 96% of the groundwater results for the CCR Rule monitoring wells located at the edges of LCPA (UMW-1D through UMW-9D) are below the GWPS.

3.3.2 Surface Water

The Missouri River and Labadie Creek sampling results do not show evidence of impact of constituents derived from LEC. There are no analytical results for the Labadie Creek that are above drinking water screening levels. While arsenic concentrations in the Missouri River and Labadie Creek are slightly above the human health recreational screening levels and lithium concentrations are above the drinking water screening level in the Missouri River, the concentrations are statistically no different in upstream and downstream samples for both arsenic and lithium indicating that **the facility is not the source**.

3.3.3 National Pollutant Discharge Elimination System Outfall

The outfall for the LCPA is identified as 002 and is shown on **Figure 2-2**. This is a permitted outfall under the National Pollutant Discharge Elimination System program. The outfall effluent water is tested for toxicity on a periodic basis as required by the permit. The biological toxicity testing results for Outfall 002 at the LCPA shows no evidence of aquatic toxicity in the outfall effluent.

3.3.4 Off-Site Bedrock Groundwater

The deep groundwater at locations south of the Site are upgradient of the LCPA, as shown on **Figure 2-3**. All results meet drinking water standards and do not show evidence of impact from coal ash (see **Appendix A**). This confirms that the coal ash management practices at the LEC have not had an impact on groundwater used as a source of drinking water.

3.4 CONCLUSION

The sampling results for the Missouri River and Labadie Creek are important. Although groundwater at the edge of ash shows that one constituent is present in some wells are above the GWPS, less than 4% of the results are above a GWPS, and the adjacent surface water bodies do not show evidence of impact of constituents derived from the LCPA. This is important because the absence of concentrations above risk-based screening levels means that there is not a significant pathway of exposure.

Impacts to groundwater do not mean that surface waters are impaired. The degree of interface between groundwater and surface waters is variable and complex and dependent upon a variety of factors including gradient and flow rate. It is possible, however, to determine the maximum concentration level that would need to be present on-site in groundwater and still be protective of the surface water environment. Groundwater and surface waters flow at very different rates and volumes. The Missouri River is the longest river system in North America and as groundwater at the facility flows into the river, it is diluted by more than 100,000 times.

This conservative estimate of dilution is used to further understand how high a molybdenum groundwater concentration would have to be to potentially have an adverse impact on the Missouri River. The table below shows how this factor is applied to the most conservative of the human health and ecological risk-based screening levels for surface water.

CALCULATING RISK-BASED SCREENING LEVELS FOR LCPA GROUNDWATER BASED ON THE MISSOURI RIVER

	Estimated Dilution Factor for the Missouri River	100,000			
Constituents	**Lowest of the Human Health and Ecological Screening Levels (mg/L)**	**Groundwater Risk-Based Screening Level* (mg/L)**	**Maximum LCPA Groundwater Concentration (mg/L)**		**Ratio Between Groundwater Risk-Based Screening Level and the Maximum LEC Groundwater Concentration**
Molybdenum	0.1	10000	0.674	L-UMW-6D	>40,000

***Where the Groundwater Risk-Based Screening Level = Screening Level x Dilution Factor.**

The groundwater alternative risk-based screening levels are calculated in units of milligrams of constituent per liter of water (mg/L). One mg/L is equivalent to one part per one million parts.

The table identifies the maximum groundwater concentration of molybdenum detected in the LCPA monitoring wells. The comparison between the target levels and the maximum concentrations indicates that there is a wide margin of safety between the two values. This margin is shown in the last column of the table. To illustrate, concentration levels molybdenum would need to be **more than 40,000 times higher** than currently measured levels before an adverse impact in the Missouri River could occur.

The comprehensive evaluation summarized here demonstrates that there are no adverse impacts on human health from either surface water or groundwater uses resulting from coal ash management practices at the LCPA.

3.4.1 Trace Elements in Coal Ash

All of the inorganic minerals and elements that are present in coal ash are also present naturally in our environment. Molybdenum is referred to as a trace element, so called because they are present in soils (and in coal ash) at such low concentrations (in the milligrams per kilogram (mg/kg) or part per million (ppm) range). Together, the trace elements generally make up less than 1 percent of the total mass of these materials. To put these concentrations into context, a mg/kg or ppm is equivalent to:

- 1 penny in a large container holding $10,000 worth of pennies, or
- 1 second in 11.5 days, or
- 1 inch in 15.8 miles

All of the constituents present in coal ash occur naturally in our environment. U.S. Geological Survey (USGS) data demonstrate the presence of these constituents in the soils across the U.S. These soils are found in our backyards, schools, parks, etc., and because of their presence in soil, these constituents are also present in the foods we eat. Some of these constituents are present in our vitamins, such as molybdenum. Thus, we are exposed to these trace elements in our natural environment every day, and in many ways.

3.4.2 Molybdenum

Haley & Aldrich has prepared a fact sheet (**Appendix B**) that provides information on molybdenum so that the groundwater data can be considered in context. There is no public exposure to groundwater at

the LEC and concentration levels of molybdenum in adjacent surface waters are all well below health-based regulatory standards.

As discussed in more detail in **Appendix B**, molybdenum is an essential nutrient for humans, and the Institute of Medicine of the U.S. National Academy of Sciences (NAS) has provided recommended daily allowances (RDA) and tolerable upper limits (UL) to be used as guidelines for vitamins and supplements and other exposures (NAS, 2001).

The RDA for a nutrient is "the average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) health individuals" (NAS, 2001). The RDA for molybdenum for adults set by the NAS in 2001 is 0.045 mg/day and is based on the amount of molybdenum needed to achieve a steady healthy balance in the body for the majority of the population.

The UL for molybdenum set by the NAS is 2 mg/day. This level is based on an evaluation of the potential toxicity of molybdenum at high levels of intake. Based on the UL, a safe drinking water level for molybdenum is 0.6 mg/L or 600 ug/L, or six-fold higher than the level set by USEPA of 0.1 mg/L or 100 ug/L in the CCR Rule. This difference serves to underscore the conservatism of the USEPA value when evaluating groundwater under the CCR Rule. Below is a chart that depicts groundwater and surface water samples collected from Ameren's four energy centers and compares concentration levels based on both the NAS UL and the GWPS established by the USEPA in the CCR Rule. As reflected in the chart below, over 90% of the GW results across all four energy centers and all but **three samples** at Labadie are below the standard the National Academy of Science developed for vitamins and supplements.

	Labadie	Meramec	Rush Island	Sioux
Groundwater				
Number of Samples	208	88	77	244
Molybdenum greater than CCR GWPS of 0.1 mg/L (a)	81	35	38	77
Molybdenum greater than NAS standard of 0.6 mg/L (b)	3	1	11	49
Surface Water				
Number of Samples	67	74	50	80
Molybdenum greater than 0.1 mg/L (a)	0	0	0	0

Notes:
mg/L - milligrams per liter.
(a) - Drinking water-based on GWPS specified in the CCR Rule.
(b) - Alternative health-protective drinking water screening level based on the NAS

3.5 EVALUATION OF RISK IN THE CORRECTIVE MEASURES ASSESSMENT

In summary, there are no adverse impacts resulting from coal ash management practices at the LCPA on human health or the environment from either surface water or groundwater uses. There are no users of groundwater near LCPA. In fact, as described above, concentrations of molybdenum detected in groundwater would need to be more than **40,000 times higher** before such an unacceptable risk could exist under current and reasonable anticipated future uses of the surface water.

Although the purpose of this CMA is to evaluate remedies to address the SSLs, the current conditions at the LCPA, even prior to closure, do not pose an unacceptable risk to human health or the environment. Therefore, the risk-based evaluation provides additional support for the selection of a remedy moving forward.

4. Corrective Measures Alternatives

4.1 CORRECTIVE MEASURES ASSESSMENT GOALS

The overall goal of this CMA is to identify and evaluate the appropriateness of potential corrective measures to prevent further releases of Appendix IV constituents above their GWPS, to remediate releases of Appendix IV constituents detected during groundwater monitoring above their GWPS that have already occurred, and to restore groundwater in the affected area to conditions that do not exceed the GWPS for these Appendix IV constituents. The corrective measures evaluation that is discussed below and subsequent sections provides an analysis of the effectiveness of five potential corrective measures in meeting the requirements and objectives of remedies as described under §257.97 (also shown graphically on **Figure 4-1**). This assessment also meets the requirements promulgated in §257.96 which require the assessment to evaluate:

- The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to residual contamination;
- The time required to complete the remedy; and
- The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy.

The criteria listed above are included in the balancing criteria considered during the corrective measures evaluation, described in **Section 5**.

4.2 GROUNDWATER MODELING

Modeling is an analytical tool used to create estimates based on computer-simulated conditions. Groundwater flow and geochemical modeling[7] performed by Gredell evaluated the hydrogeologic and geochemical conditions at the LCPA. Gredell used MT3DMS to model contaminant transport at the LCPA, conservatively assuming that hydrodynamic dispersion is the only process that attenuates the concentration molybdenum during transport in groundwater.

4.3 GROUNDWATER TREATMENT EVALUATION

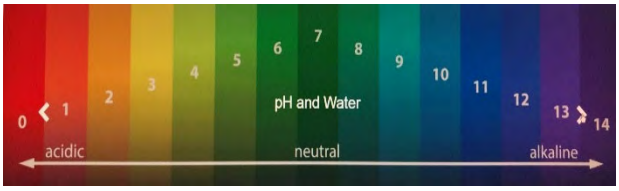
In-situ treatment to reduce the concentrations of dissolved metals in groundwater can occur via stabilization of metals through precipitation of a metal compound, co-precipitation of the target metal within the structure of another compound, and/or sorption of the target metal onto other compounds in the subsurface. In simple terms, groundwater amendments are injected into the aquifer to create a chemical reaction that attenuates metals through precipitation or sorption.

Chemical precipitation is an available and demonstrated groundwater treatment technology recognized by USEPA[8]. Groundwater geochemistry (including oxidation reduction potential (ORP)) can greatly

[7]Groundwater flow modeling was performed using MODFLOW 2000.

[8] EPA, "Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category: EPA's Response to Public Comments; Part 7 of 10", SE05958A6, p. 7-20

impact metals mobility at a site, where some metal compounds may be more soluble under highly oxidative (positive ORP) conditions while others are more soluble under reduced conditions (negative ORP). Also, the solubilities of many metal compounds are highly dependent on pH.



pH and Water (USGS - Water Science School publication).

Ameren has retained XDD to research and develop appropriate treatment options for molybdenum and is performing bench-scale treatability studies to demonstrate the effectiveness of treatment options on site-specific basis. Evaluations of the Rush and Meramec Energy Centers commenced earlier this year and XDD has collected soil and groundwater samples from the LEC impoundment area. Laboratory results for Rush Island indicate that molybdenum concentrations can decrease at certain pH levels. Bench-scale treatment results from such studies including potential treatment trains from all four of Ameren's energy centers are expected to be completed in the Summer of 2019.

4.4 CORRECTIVE MEASURES ALTERNATIVES

Corrective measures can terminate when groundwater impacted by the LCPA does not exceed the Appendix IV GWPS for three consecutive years of groundwater monitoring. In accordance with §257.97, the groundwater corrective measures to be considered must meet, at a minimum, the following threshold criteria:

1. Be protective of human health and the environment;
2. Attain the GWPS;
3. Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of COCs to the environment;
4. Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, considering factors such as avoiding inappropriate disturbance of sensitive ecosystems; and
5. Comply with standards (regulations) for waste management.

Each of the remedial alternatives assembled as part of this CMA meet the requirements of the threshold criteria listed above.

The remedial alternatives presented below contemplate both CIP (Alternative 1 through 4) and CBR (Alternative 5) of the LCPA. Both closure methods are expressly authorized under the CCR Rule.

4.4.1 Alternative 1 – Closure in Place with Capping and Monitored Natural Attenuation

The LCPA would be closed in place with a geomembrane and soil protective cap system to reduce infiltration of surface water to groundwater thereby isolating source material. This cap selection exceeds regulatory requirements by more than two orders of magnitude ($<1x10^{-7}$ centimeters per second (cm/sec) planned versus $1x10^{-5}$ cm/sec required by the CCR Rule). Over time, depletion of COCs in CCR would allow the concentration of COCs in downgradient groundwater to decline and overall groundwater concentrations of COCs to attenuate. Geochemical modeling results indicate that post closure 99% of groundwater will flow around and not through the LPCA, thereby isolating the source.

The dissolved phase plume of molybdenum remaining above the GWPS post-closure eventually attenuates. The timeline for MNA duration for molybdenum is shown on **Figure 4-2**.

CIP can be completed safely, in compliance with applicable federal and state regulations, and be protective of public health and the environment. In general, CIP consists of installing a cap/cover designed to significantly reduce infiltration from surface water or rainwater, resist erosion, contain CCR materials, and prevent exposures to CCR. For this alternative, Ameren would install a geomembrane with a permeability that is 100 times lower than what the CCR Rule requires thus further reducing infiltration. At the LEC, site preparation, construction and installation of cap and cover systems will take approximately 18 to 24 months.

MNA is a viable remedial technology recognized by both state and federal regulators that is applicable to inorganic compounds in groundwater. The USEPA defines MNA as "the reliance on natural attenuation processes to achieve site-specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods". The 'natural attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants" (USEPA, 2015). When combined with a low-permeability cap to address the source by limiting the infiltration of precipitation into and through the CCR, MNA can over time reduce concentrations of molybdenum in groundwater at the LCPA boundary.

Following the installation of the cap system, Ameren would implement post-closure care activities. Post-closure care includes long-term groundwater monitoring until such time that groundwater conditions return to regulatory levels and cap system maintenance. Future development of the capped surface could be used for solar photovoltaic arrays or other site staging/ancillary operational needs.

4.4.2 Alternative 2 – CIP with In-Situ Stabilization, Capping and Monitored Natural Attenuation

In-situ stabilization is a technique that uses mixing of the CCR with amendments to solidify the material in place. Amendments typically include Portland Cement and the solidification is completed in-situ using large diameter augers. CCR located beneath the water table would be isolated by ISS, followed by capping of the surface impoundment. Groundwater impacts would be addressed through the processes of natural attenuation. This alternative would isolate the source, and over time, allow the concentrations of COCs in downgradient groundwater to decline and overall groundwater concentrations of COCs to attenuate.

In-situ stabilization of the LCPA is predicted to take a number of years to complete, depending on the availability of specialized contractors and equipment. Additionally, implementation of ISS will require a detailed design effort with bench scale testing to determine the appropriate amendment mix. Pilot testing will also be needed to verify the ability of equipment to solidify material at depth. ISS has not been commonly used to stabilize entire ash units as part of a closure strategy. Changes to groundwater chemistry relative to the mobility of Appendix IV constituents following completion of ISS, where large volumes of amendments (typically Portland cement) are added to the subsurface, are unknown and would require pilot testing.

Following the ISS completion and low-permeability final cover system (<1 x 10^{-7} cm/sec), Ameren would implement post-closure care activities that includes long-term groundwater monitoring and cover system maintenance; future development of the capped surface could be used for solar photovoltaic arrays or other site staging/ancillary operational needs.

4.4.3 Alternative 3 – CIP with Capping and In-Situ Groundwater Treatment

Similar to Alternative 1, the LCPA would be CIP with a low-permeability (<1 x 10^{-7} cm/sec) cap to reduce infiltration of surface water to groundwater and to isolate source material. Molybdenum would be addressed through in-situ injection of groundwater amendments downgradient of the LCPA with the objective of accelerating the time required to achieve the GWPS within the treatment zone.

Following the installation of the low-permeability cap and in-situ treatment system, Ameren would implement post-closure care activities that include periodic amendment injections or periodic replenishment of the treatment reagents within the permeable reactive barrier (PRB), long-term groundwater sampling to monitor treatment system performance, and cover system maintenance. Future development of the capped surface could be used for solar photovoltaic arrays or other site staging/ancillary operational needs.

4.4.4 Alternative 4 – CIP with Capping and Hydraulic Containment Through Groundwater Pumping and Ex-Situ Treatment

The LCPA would be closed in place with a low-permeability (<1 x 10^{-7} cm/sec) cap to reduce infiltration and isolate source material. Pumping wells would be used to hydraulically control the downgradient migration of molybdenum. However, pumping wells would generate large volumes of effluent that would require ex-situ treatment, likely with an ion exchange or a reverse osmosis (RO) treatment system. Both treatment systems are complex with ongoing operation and maintenance and would generate a secondary waste stream – including regeneration/replacement of the ion exchange media or concentration reject water from the RO system. Approvals and permitting would be required for the construction and installation of the treatment systems and discharge of the treated groundwater.

Implementation of a large-scale hydraulic containment system will require a detailed design effort with bench scale testing to verify groundwater treatment. Pilot testing, such as pumping tests and additional groundwater modeling, will be needed to verify the hydraulic capture zone. While hydraulic containment is a widely used remediation technology, it has not been commonly used as part of a large-scale CCR unit closure strategy.

Following the installation of the low-permeability cap, groundwater pumping well network, and ex-situ treatment system, Ameren would implement post-closure care activities that includes operation and maintenance of the hydraulic containment (HC) system, long-term groundwater sampling to monitor HC system performance, and cover system maintenance. Future development of the capped surface could be used for solar photovoltaic arrays or other site staging/ancillary operational needs.

4.4.5 Alternative 5 – Closure by Removal with Monitored Natural Attenuation

This alternative consists of removal of LCPA contents followed by natural attenuation of molybdenum in groundwater. While this alternative would eliminate (through removal) the source, it takes decades to implement during which time the LCPA would remain open and the ponded ash subject to ongoing

infiltration for the duration of the removal activities. As with Alternative 1, 2, and 3 concentration of molybdenum in downgradient groundwater would decline via natural attenuation processes.

Lochmueller Group prepared an Extraction and Transportation Assessment (Lochmueller Study) to evaluate CBR excavation and disposal scenarios. On-site and off-site disposal options were considered. The LEC presents unique challenges that can impact cost estimates and closure times. It is important to note that the existing on-site UWL was designed and permitted to manage ongoing production through the retirement dates of the LEC. Accordingly, excavated material would need to be transported off-site to a commercial landfill **or** Ameren Missouri would need to permit and construct a new on-site landfill. The regulatory process for construction of an on-site landfill could require multiple levels of approval including environmental permits, conditional use local authorization and, if necessary, certificate issuance from the Missouri Public Service Commission. Opposition to such projects and regulatory approval would take years to resolve *before* construction could commence. As a point of reference, efforts to permit and construct the existing UWL commenced in 2008. Following years of litigation and opposition from environmental groups, the UWL was placed in service in 2016[9].

There are also several potential community impacts, safety concerns and project duration challenges associated with the CBR alternative for the off-site disposal option. Given the magnitude of the total estimated haul volume (17.3 MM CY) along with the travel distance required to transport the CCR to one or more off-site landfills, injuries and fatalities would be likely. The Lochmueller Study (**Appendix C**) estimated that the time period needed to transport off-site to a commercial landfill could be 35 years or greater. The Lochmueller Study bases its time estimate on assumed productivity rates that are subject to significant variability and potential disruptions (e.g., weather conditions, available landfill capacity, travel route traffic congestion, etc.) that could impact the overall CBR timeframe. As the report makes clear, there is simply a limit on how much excavation, and roundtrip truck hauls can occur on a given eight-hour workday.

Excavated materials from the LCPA would not be suitable for beneficial use applications, due to chemical reactions that occurred during the placement of class C fly ash via wet sluicing. Traditional beneficial use applications for class C fly ash, such as replacement for cement in the production of ready-mix concrete and concrete related products require the materials to be capable of reacting chemically to produce cementitious bonds. The capability to produce these chemical reactions have been expended with the wet-sluicing process of CCR into LCPA. In contrast, the chemistry of class F fly ash, produced at other utility sites, does not react with sluice water to create cementitious bonds, and thus may be suitable for recovery and processing for use in ready mix concrete and concrete related products[10].

In addition to the logistical challenges of designing and construction an on-site landfill, technical and logistical challenges of implementing a large-scale ash removal project also need to be considered. Removal activities will be difficult and require full-time dewatering, implementation of CCR stabilization methods and temporary staging/stockpiling of material for drying prior to transportation; these

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[9] See *Petition for Writ of Certiorari [to invalidate county landfill ordinance] Franklin County Circ. Ct., 11/23/11, Case # 11AB-C286; Appeal to Franklin County Board of Adjustment, #14-00002, Filed 1/8/14 (of Land Use Administrator 10/10/13 and 12/10/13 Decisions), Denied by BZA 6/24/14; Appealed to Circ. Ct. by Writ of Certiorari, Cause # 14AB-CC00155, 7/24/14; Intervention and Motion to Dismiss in PSC Case EA 2012-0281, Ameren Application to PSC for CCN to operate landfill (PSC overruled Motion to Dismiss on 4/17/13); Administrative Hearing Commission Petition for Review [of MDNR Solid Waste Disposal Construction Permit], Filed 1-30-15, #15-0136, dismissed by AHC 3/5/15. See also Campbell v. County Commission of Franklin County, 453 S.W.3d 762 (Mo. banc 2015).*

[10] Information provided by Ameren technical staff, May 2019.

considerations will affect productivity and increase removal duration. Excavation and construction safety during the removal duration is another major concern due to heavy equipment (bulldozers, excavators, front end loaders, off-road trucks) and dump truck operation within the active LEC site. Additional community impacts associated with the use of heavy equipment and truck traffic are also a consideration for this alternative. Lastly, further review of local restrictions and approvals would be required to verify that any selected landfill could receive the ash for disposal.

5. Comparison of Corrective Measures Alternatives

The purpose of this section is to evaluate, compare, and rank the five corrective measures alternatives using the balancing criteria described in §257.97.

5.1 EVALUATION CRITERIA

In accordance with §257.97, remedial alternatives that satisfy the threshold criteria are then compared to four balancing (evaluation) criteria. The balancing criteria allow a comparative analysis for each corrective measure, thereby providing the basis for final corrective measure selection. The four balancing criteria include the following:

1. The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful;
2. The effectiveness of the remedy in controlling the source to reduce further releases;
3. The ease or difficulty of implementing a potential remedy; and
4. The degree to which community concerns are addressed by a potential remedy.

Public input and feedback will be considered following a public information session to be held in May 2019.

5.2 COMPARISON OF ALTERNATIVES

This section compares the alternatives to each other based on evaluation of the balancing criteria listed above. The goal of this analysis is to identify the alternative that is technologically feasible, relevant and readily implementable, provides adequate protection to human health and the environment, and minimizes impacts to the community.

A graphic is provided within each subsection below to provide a visual snapshot of the favorability of each alternative, where green represents favorable, yellow represents less favorable, and red represents unfavorable.

5.2.1 The Long- and Short-Term Effectiveness and Protectiveness of the Potential Remedy, along with the Degree of Certainty That the Remedy Will Prove Successful

This balancing criterion takes into consideration the following sub criteria relative to the long-term and short-term effectiveness of the remedy, along with the anticipated success of the remedy.

5.2.1.1 Magnitude of reduction of existing risks

As summarized in **Section 3**, no unacceptable risk to human health and the environment exists with respect to the LCPA. Therefore, none of the remedial alternatives are necessary to reduce an assumed risk posed by Appendix IV constituents in groundwater because no such adverse risk currently exists. However, other types of impacts can be posed by the various remedial alternatives considered here. The remedial alternatives that pose the least external impact are Alternative 1 (CIP with MNA) and 3 (CIP with in-situ treatment) because they are implemented onsite and involve the least amount of construction and operations and maintenance (O&M) activities and associated impacts. Alternative 5

(CBR with MNA) has the highest potential impact due to prolonged truck traffic, which increases the likelihood of roadway accidents during the decades needed to complete the CBR project. Further, during the long removal process, CCR material will remain open to the environment. Construction and material transportation will also be required for Alternative 2 (CIP with ISS) during the process of solidifying the CCR. Aside from the cap construction, only minor construction will be required for Alternatives 3 (CIP with in-situ). Additional construction will be required for Alternative 4 (CIP with HC) during treatment system installation.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria i) Magnitude of reduction of risks					

5.2.1.2 Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy

Alternative 5 (CBR with MNA) has the lowest long-term residual risk in that the source material is removed. However, implementation of this alternative would take decades to implement during which time the source material (ash) is subject to ongoing infiltration (because it remains open to the environment during removal), relative to the other alternatives. For Alternatives 1 through 4, the CCR would be CIP with the installation of a low permeability ($<1 \times 10^{-7}$ cm/s) cap that virtually eliminates infiltration of precipitation and isolates the source material. Dissolved phase COCs to groundwater are addressed through MNA processes. Alternatives 3 and 4 also provide additional measures to address potential groundwater impacts through in-situ treatment and hydraulic controls. A low residual risk for releases exists with Alternative 2 (CIP with ISS) upon completion provided that solidification amendments do not have an adverse geochemical impact on the groundwater aquifer.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria ii) Magnitude of residual risk in terms of likelihood of further release					

5.2.1.3 The type and degree of long-term management required, including monitoring, operation, and maintenance

Alternative 1 (CIP with MNA) is the most favorable alternative with respect to this criterion because it requires the least amount of long-term management and involves no mechanical systems as part of the remedy. Alternative 5 (CBR with MNA) is least favorable because off- site removal is estimated to take approximately 40 years or greater to complete and involves coordination with off-site disposers (landfills). The design and construction of an on-site landfill is also logistically complex with the design, permitting, approvals and construction required and anticipated legal challenges. The remaining alternatives fall between Alternatives 1 and 5 because they involve more intensive systems to implement and/or maintain throughout their remediation life cycle.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 1 - Subcriteria iii) Type and degree of long-term management required					

5.2.1.4 Short-term risks that might be posed to the community or the environment during implementation of such a remedy

The highest short-term impact posed to the community or environment would be during implementation of Alternative 5 (CBR with MNA) followed by Alternative 2 (CIP with ISS), making these alternatives least favorable. Potential environmental impacts include noise and emissions from heavy equipment, the potential for a release during excavation and dewatering, and fugitive dust emissions. Community impacts include general impacts to the community due to increased truck traffic on public roads during the entire project duration, along with an increased potential for traffic accidents and fatalities, noise, and truck emissions. As noted, Alternative 5 (whether off-site disposal or a new onsite landfill) will require a substantial period of time when the LCPA will remain open to the environment posing risk during implementation of this remedy.

For Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC), risk to the community during implementation is considered the same and would be minimal compared to the other alternatives. Periodic sampling of the monitoring well network to verify treatment system effectiveness will pose no risk to the community.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 1 - Subcriteria iv) Short term risk to community or environment during implementation					

5.2.1.5 Time until full protection is achieved

There is currently no unacceptable risk to human health and the environment associated with groundwater at the LCPA; therefore, protection is already achieved. Based upon predictive modeling, Alternative 1 (CIP with MNA), molybdenum concentrations will attain GWPS in approximately 22 years (see **Figure 4-2**). With in-situ groundwater treatment, such time is predicted to occur in 16 years. Both Alternatives 3 (CIP with in-situ treatment) and 4 (CIP with HC) take the least amount of time to reduce COC concentrations (see **Figure 4-2**). These two alternatives are favorable given the shorter timeframe to achieve the requisite performance standard.

Alternative 5 (CBR with MNA) could take approximately 35 to 40 years to fully implement followed by a period of groundwater monitoring to verify natural attenuation of the existing groundwater plume, which makes this alternative unfavorable. As detailed in the Lochmueller report, implementation is limited mainly by the amount of material that can be excavated and hauled during a workday, disposal facility capacity, and the volume of ash. If a new on-site landfill is considered, the permitting and approval process will be lengthy and legal challenges are expected.

Implementation of Alternative 2 (CIP with ISS) would require extensive engineering analysis and field testing. Assuming such studies confirm the viability of ISS technology at the LCPA and equipment availability, field implementation could take a significant amount of time to implement due to the

volume of ash. Ongoing groundwater monitoring will be required as the MNA process addresses the existing dissolved phase plume. Including a five-year time horizon for planning and regulatory approvals, the total timeframe until achieving the GWPS for this alternative is comparable to the timeframe estimated for Alternatives 1, 3, and 4.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria v) Time until full protection is achieved					

5.2.1.6 Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment

Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC) all have similar, minimal potential for exposure to humans and environmental receptors during regrading and cap construction; monitoring well system installation; and installation of the in-situ treatment system, or HC system. Alternative 1 (CIP with MNA) is the most favorable alternative since, aside from capping, no additional contact with CCR or impacted groundwater would be needed. Alternative 3 (CIP with in-situ treatment) is also favorable because treatment occurs below ground and no waste stream is generated. A waste stream would be generated under Alternative 4 (CIP with HC) and need to be managed either on-site or off-site, which creates a potential for exposure.

Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) have moderate and high potential for exposure, respectively, which makes them the least favorable remedy for this criterion. A high potential for exposure exists during the excavation and transport (both off-site and on-site) of the CCR over local roadways if Alternative 5 is implemented. A moderate potential to exposure exists during ISS construction (Alternative 2) if some CCR needs to be disposed off-site as part of the preliminary removal effort prior to ISS implementation.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria vi) Potential for exposure of humans and environmental receptors to remaining wastes					

5.2.1.7 Long-term reliability of the engineering and institutional controls

Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC) are all expected to have high long-term reliability, as capping and long-term monitoring are common methods for long-term waste management. HC and ex-situ treatment (Alternative 4) are considered reliable, proven technologies and would have high long-term reliability, but require bench scale testing and rely on mechanical systems to operate. Alternative 3 will require bench scale and pilot scale testing to confirm treatability of molybdenum. Of the CIP alternatives, Alternative 1 (CIP with MNA) is considered the most favorable because no additional ongoing O&M would be needed, other than periodic groundwater sampling and verification of decreasing concentrations.

For Alternatives 1 through 4, which include CIP, institutional controls such as the recording of an environmental covenant restricting the use of groundwater can easily be implemented because the LCPA is located on property owned by Ameren.

Alternative 5 (CBR with MNA) engineering and institutional controls would have high long-term reliability because the CCR will have been removed from the LCPA. With the CCR no longer in place, no additional engineering and institutional controls are anticipated. Alternative 2 (CIP with ISS) is also expected to have a high long-term reliability because the CCR would be isolated within the ISS monolith.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria vii) Long-term reliability of engineering and institutional controls					

5.2.1.8 Potential need for replacement of the remedy

CIP of the LCPA with ISS (Alternatives 2) and CBR (Alternative 5) are both considered permanent and can be effective in appropriate circumstances. For Alternative 2 (CIP with ISS) detailed engineering assessments would need to be completed before the viability of such an approach could be considered at a unit such as the LCPA given its depth and volume. Field pilot testing would also be needed for ISS to confirm the ability of equipment to reach the bottom of CCR. From the perspective of needing to replace the remedy, source removal (Alternative 5) is permanent but takes decades to implement.

Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC) are expected to have permanent closures with capping in place. Should monitoring results indicate that the selected remedial alternative is not effective at reducing the concentration of COCs over time, alternate and/or additional active remedial methods for groundwater may be considered in the future.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 1 - Subcriteria viii) Potential need for replacement of the remedy					

5.2.1.9 Long- and short-term effectiveness and protectiveness criterion summary

The graphic below provides a summary of the long- and short-term effectiveness and protectiveness of the potential remedy, along with the degree of certainty that the remedy will prove successful. Alternatives 1 (CIP with MNA) and 3 (CIP with in-situ treatment) are the most favorable, while Alternative 5 (CBR with MNA) is the least favorable. Alternative 1 is expected to be effective both short- and long-term and does not include additional treatment technology aside from MNA. Alternative 3 (CIP with in-situ treatment) is comparable to Alternative 1 because it has a shorter timeframe to meet the GWPS despite requiring treatment. Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) will require a lengthy design and construction period, and therefore are not effective in the short-term. Further, to implement Alternative 5, the impoundment will be open to the environment during the lengthy removal process.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
CATEGORY 1 Long- and Short Term Effectiveness, Protectiveness, and Certainty of Success					

5.2.2 The Effectiveness of the Remedy in Controlling the Source to Reduce Further Releases

This balancing criterion takes into consideration the ability of the remedy to control a future release, and the extensiveness of treatment technologies that will be required.

5.2.2.1 The extent to which containment practices will reduce further releases

For remedial Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC) installation of the low permeability cap will reduce the infiltration of surface water into the LCPA and decrease the flux of COCs passing from ash porewater to groundwater over time. Groundwater mounding, and associated outward hydraulic gradient, present at the LCPA during operation is expected to dissipate after closure. Alternatives 3 and 4 are considered the most favorable because treatment technologies (in-situ treatment and HC) will be implemented to limit down-gradient migration of COCs in groundwater.

Under Alternatives 2 (CIP with ISS) and 5 (CBR with MNA), no further releases are anticipated following solidification or removal of the CCR material. However, the implementation of each of these alternatives is anticipated to require multiple years to complete with MNA monitoring following completion of construction. During the period of construction for Alternatives 2 and 5, the CCR material remains open to the environment.

For Alternatives 3 (CIP with in-situ treatment) and 4 (CIP with HC), additional containment or treatment practices (in-situ treatment and HC with ex-situ treatment) will address COCs in groundwater migrating downgradient, achieving the performance criteria at the waste boundary. Alternative 4, however, will create additional waste streams requiring management on and off site. Alternative 1 will not have an additional containment technology beyond natural attenuation but is expected to reduce the concentrations below the GWPS over time.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 2 - Subcriteria i) Extent to which containment practices will reduce further releases					

5.2.2.2 The extent to which treatment technologies may be used

No groundwater treatment technologies, other than natural attenuation, will be used for Alternatives 1 and 5. There would be no ongoing operation and maintenance of a treatment technology, other than periodic groundwater monitoring. Alternative 1 relies only on low-permeability capping, and therefore is the most favorable.

Alternative 2 (CIP with ISS) uses solidification of the CCR below the water table to address COCs in groundwater.

Alternative 3 will use one additional technology, in-situ treatment, while Alternative 4 will use two additional technologies, HC and ex-situ treatment. The operation of an ex-situ treatment system will create a secondary waste stream, such as concentrated reject water (RO) requiring off-site disposal, or depleted resin (ion exchange), requiring regeneration or off-site disposal.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 2 - Subcriteria ii) Extent to which treatment technologies may be used					

5.2.2.3 Effectiveness of the remedy in controlling the source to reduce further releases summary

The graphic below provides a summary of the effectiveness of the remedial alternatives to control the source to reduce further releases. Alternative 3 (CIP with in-situ treatment) is the most favorable, while Alternatives 1, 2, 4, and 5 are less favorable. The construction period for Alternative 3 (CIP with in-situ treatment) is expected to be brief and will begin treating groundwater at the unit boundary immediately. Further releases under Alternative 2 (CIP with ISS) and Alternative 5 (CBR with MNA) will not be addressed until construction is complete.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
CATEGORY 2 Effectiveness in controlling the source to reduce further releases					

5.2.3 The Ease or Difficulty of Implementing a Potential Remedy

This balancing criterion takes into consideration technical and logistical challenges required to implement a remedy, including practical considerations such as equipment availability and disposal facility capacity.

5.2.3.1 Degree of difficulty associated with constructing the technology

CIP with a low permeability cap will be straightforward and can be implemented with common construction methods for Alternatives 1 (CIP with MNA), 3 (CIP with in-situ treatment), and 4 (CIP with HC). No construction difficulties are anticipated if Alternatives 1, 3, and 4 are implemented. Specialty equipment or contractors are not required. Alternative 3 may be slightly more difficult to implement should a subsurface trench be required for a permeable barrier. For Alternative 1, no additional treatment technology is needed other than monitoring wells for groundwater monitoring. Installation of an in-situ treatment system (Alternative 3) or groundwater pumping wells with an ex-situ treatment system (Alternative 4) is expected to be straightforward, although with Alternative 4, an additional waste stream will require handling.

Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) will be difficult to implement due to technical and logistical challenges. Alternative 5 will include a deep excavation below the water table, ongoing excavation dewatering, and the transportation of 17.3 MM CY of CCR over local roadways. If an on-site landfill is considered, complex and lengthy design, permitting and construction is required, and litigation is expected. Under Alternative 2, the successful completion of ISS to target depths will be technically challenging and will require field pilot testing to confirm equipment reach. Alternatives 2 and 5 will both

include large-scale construction, specialty equipment and contractors, long project durations, and significant technical challenges.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 3 - Subcriteria i) Degree of difficulty associated with constructing the technology					

5.2.3.2 Expected operational reliability of the technologies

Alternative 1 (CIP with MNA) is considered the most favorable from an operational perspective because capping with MNA has a proven track record and requires limited O&M. While Alternative 2 (CIP with ISS) is a proven technology and isolates the ponded material, pilot testing would be required to ensure ISS will be able to solidify CCR at depth and implementation is challenging. The potential for geochemical impact on the groundwater aquifer from the solidification amendments would need to be evaluated. Alternatives 3 and 4 are expected to be reliable but will utilize additional groundwater treatment technologies. Alternative 5 (CBR with MNA) is considered a reliable alternative as all CCR material would be removed, although implementation would be challenging (whether by off-site disposal or a new on-site landfill).

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 3 - Subcriteria ii) Expected operational reliability of the technologies					

5.2.3.3 Need to coordinate with and obtain necessary approvals and permits from other agencies

Alternative 1 (CIP with MNA) is the most favorable since the implementation of the remedy is straightforward and only includes capping and MNA. Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) will require extensive permitting and approvals for large-scale construction whereas the permitting is expected to be straightforward for CIP Alternatives 1, 3, and 4. Alternative 5 in particular, has the potential to present the greatest need for coordination of and obtaining numerous permits and approvals if on-site landfilling is selected. Additional approval and permitting may be required for Alternative 3 (CIP with in-situ treatment) because this alternative may include subsurface treatment via groundwater amendment and permitting would likely be required for Alternative 4 for the construction and installation of the treatment systems and discharge of treated groundwater.

	Alternative 1 CIP with Cap & MNA	Alternative 2 CIP with Cap, ISS, & MNA	Alternative 3 CIP with Cap & In-Situ GW Treatment	Alternative 4 CIP with Cap & Hydraulic Containment	Alternative 5 CBR with MNA
Category 3 - Subcriteria iii) Need to coordinate with and obtain necessary approvals and permits from other agencies					

5.2.3.4 Availability of necessary equipment and specialists

Alternative 1 (CIP with MNA) is the most favorable since specialty equipment and specialists will not be required to implement the MNA remedy. For Alternative 3, specialists have already been retained by Ameren. Alternative 4 will require equipment for pumping and treatment and is less favorable than Alternatives 1 and 3 but equipment required should not present great challenge.

Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) are the least favorable since both will require specialty remediation contractors to implement ISS or full removal, respectively, which will include large-scale construction dewatering and effluent management and treatment, deep excavations below the water table, transportation of material to off-site disposal facilities, and implementation of ISS at depth (for Alternative 2 only). Alternative 4 does require the availability of necessary equipment so this Alternative is less favorable than Alternative 1. The specialists for Alternative 3 have already been retained so Alternative 3 is favorable as well.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 3 - Subcriteria iv) Availability of necessary equipment and specialists					

5.2.3.5 Available capacity and location of needed treatment, storage, and disposal services

The Lochmueller Study assists in the consideration of the CBR alternative (Alternative 5) by evaluating available capacity at landfills reasonably proximate to the LEC that could potentially receive CCR for disposal. Three such landfills were identified. However, as Lochmueller notes, Ameren intends to close ash impoundments at **all** of its energy centers over the next four years and it is uncertain whether these landfills would have sufficient available capacity to accommodate such massive excavation projects in addition to their general municipal solid waste requirements. Due to the disposal requirements, Alternative 5 (CBR with MNA) is the least favorable alternative. Alternative 2 (CIP with ISS), includes amendments such as Portland Cement and would need to be imported to the LEC to solidify the material in-situ.

Because the LCPA will be CIP for Alternatives 1, 2, 3, and 4, storage, and disposal services for CCR material will not be needed. Temporary stockpiling of CCR during regrading and capping can be completed within the current boundaries of the ash unit. Alternative 1 is the most favorable alternative since no active treatment is included. Both Alternatives 2 & 3 include treatment. For Alternative 4, the ex-situ treatment system may generate a concentrated waste stream which would require onsite treatment or off-site transportation and disposal that the other alternatives would not require. For Alternative 5, the existing on-site UWL was designed and permitted to manage ongoing production through the retirement date of the LEC and not ponded CCR material. As such there is no available on-site capacity. Excavated material would need to be transported off-site to a commercial landfill **or** Ameren Missouri would need to permit and construct a new on-site landfill.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
Category 3 - Subcriteria v) Available capacity and location of needed treatment, storage, and disposal services					

5.2.3.6 Ease or difficulty of implementation summary

The graphic below provides a summary of the ease or difficulty that will be needed to implement each alternative. Alternatives 1 (CIP with MNA) is the most favorable, while Alternatives 2 (CIP with ISS) and 5 (CBR with MNA) are the least favorable.

	Alternative 1 CIP with Cap & MNA	**Alternative 2** CIP with Cap, ISS, & MNA	**Alternative 3** CIP with Cap & In-Situ GW Treatment	**Alternative 4** CIP with Cap & Hydraulic Containment	**Alternative 5** CBR with MNA
CATEGORY 3 Ease of implementation					

6. Summary

This Corrective Measures Assessment has evaluated the following alternatives:

- Alternative 1 – Closure in Place with Capping and Monitored Natural Attenuation
- Alternative 2 – CIP with In-Situ Stabilization, Capping and MNA
- Alternative 3 – CIP with Capping and In-Situ Groundwater Treatment
- Alternative 4 – CIP with Capping and Hydraulic Containment Through Groundwater Pumping and Ex-situ Treatment
- Alternative 5 – Closure by Removal with MNA

In accordance with §257.97, each of these alternatives has been evaluated in the context of the following threshold criteria:

- Be protective of human health and the environment;
- Attain the GWPS;
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of COCs to the environment;
- Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, considering factors such as avoiding inappropriate disturbance of sensitive ecosystems; and
- Comply with standards (regulations) for waste management.

In addition, in accordance with §257.96, each of the alternatives has been evaluated in the context of the following balancing criteria:

- The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to residual contamination;
- The time required to complete the remedy; and
- The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy.

This Corrective Measures Assessment, and the input received during the public comment period, will be used to identify a final corrective measure for implementation at the LEC.

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TABLES

TABLE I
GROUNDWATER ANALYTICAL RESULTS - APPENDIX IV CONSTITUENTS
CORRECTIVE MEASURES ASSESSMENT
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

		Constituents													
Monitoring Well ID	Date Sampled	Antimony Total	Arsenic, Total	Barium Total	Beryllium Total	Cadmium Total	Chromium Total	Cobalt Total	Fluoride Total	Lead Total	Lithium Total	Mercury Total	Molybdenum Total	Selenium Total	Thallium Total
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	Site GWPS	6	42.6	2000	4	5	100	6	4	15	54.85	2	100	50	2
BMW-1D	3/22/2016	1 U	0.26 J	1120	1 U	0.5 U	0.52 J	5 U	0.18 J	5 U	31.8	0.2 U	1.2 J	1 U	1 U
	5/3/2016	1 U	0.12 J	1210	1 U	0.5 U	0.95 J	5 U	0.18 J	5 U	31.4	0.2 U	1.8 J	1 U	1 U
	7/11/2016	1 U	0.47 J	1150	1 U	0.5 U	1 U	5 U	0.19 J	5 U	30.7	0.2 U	1.2 J	1 U	1 U
	9/13/2016	1 U	0.51 J	1100	1 U	0.5 U	1 U	5 U	0.17 J	5 U	26.9	0.2 U	1.4 J	1 U	1 U
	11/11/2016	1 U	0.70 J	1170	1 U	0.5 U	0.46 J	5 U	0.20 J	5 U	32.8	0.2 U	20 U	1 U	1 U
	1/16/2017	1 U	0.63 J	1290	1 U	0.5 U	1 U	5 U	0.2	5 U	30.5	0.2 U	1.4 J	1 U	1 U
	3/1/2017	0.036 J	0.99 J	1220	1 U	0.5 U	1 U	5 U	0.19 J	2.9 J	30.9	0.2 U	1.6 J	1 U	1 U
	5/31/2017	1 U	0.85 J	1200	1 U	0.5 U	1 U	5 U	0.18 J	5 U	27.5	0.2 U	1.6 J	1 U	1 U
	4/9/2018	1 U	0.72 J	1160	1 U	0.5 U	1 U	5 U	0.23	3.3 J	30.2	0.2 U	1.3 J	1 U	1 U
	5/21/2018		1.1	1210					0.23		29.9		1.4 J		
	11/7/2018		0.90 J	1160					0.25		29.6		20 U		
BMW-2D	3/22/2016	1 U	28.2	364	1 U	0.5 U	0.54 J	5 U	0.21	5 U	47.4	0.2 U	7.0 J	1 U	1 U
	5/4/2016	1 U	14.7	392	1 U	0.5 U	0.70 J	5 U	0.18 J	5 U	45.1	0.2 U	2.3 J	1 U	1 U
	7/11/2016	1 U	16.2	363	1 U	0.5 U	1 U	5 U	0.2	5 U	44.1	0.2 U	3.3 J	1 U	1 U
	9/9/2016	1 U	31.6	377	1 U	0.5 U	0.48 J	5 U	0.22	2.6 J	43.2	0.2 U	20 U	1 U	1 U
	11/11/2016	1 U	38.4	325	1 U	0.5 U	0.48 J	5 U	0.27	5 U	46.1	0.2 U	20 U	1 U	1 U
	1/16/2017	1 U	42.6	307	1 U	0.5 U	1 U	5 U	0.29	5 U	40	0.2 U	2.7 J	1 U	1 U
	3/1/2017	0.031 J	39.1	306	1 U	0.5 U	1 U	5 U	0.25	5 U	41.5	0.2 U	4.8 J	1 U	1 U
	5/31/2017	1 U	34.7	354	0.17 J	0.5 U	1 U	5 U	0.19 J	5 U	39.2	0.2 U	3.5 J	1 U	1 U
	4/9/2018	1 U	31.3	313	1 U	0.5 U	1 U	5 U	0.26	3.4 J	41.5	0.2 U	2.4 J	1 U	1 U
	5/21/2018		32.7	311					0.26		41.8		2.8 J		
	11/7/2018		33.5	309					0.25		39.3		2.0 J		
UMW-1D	3/22/2016	1 U	25.6	379	1 U	0.5 U	1 U	5 U	0.21	5 U	26.5	0.2 U	1.4 J	1 U	1 U
	5/4/2016	1 U	14.8	413	1 U	0.5 U	1 U	5 U	0.2	4.9 J	27.7	0.2 U	1.8 J	1 U	1 U
	7/12/2016	1 U	28.5	379	1 U	0.5 U	1 U	5 U	0.2	5 U	25.1	0.2 U	1.8 J	1 U	1 U
	9/9/2016	1 U	27	421	1 U	0.5 U	2.4	5 U	0.18 J	5 U	23.3	0.2 U	20 U	1 U	1 U
	11/14/2016	1 U	31.1	371	1 U	0.5 U	0.36 J	5 U	0.22	5 U	24.4	0.2 U	20 U	1 U	1 U
	1/16/2017	1 U	35	410	1 U	0.5 U	1 U	5 U	0.19 J	3.6 J	24.4	0.2 U	1.8 J	1 U	1 U
	3/2/2017	1 U	35.3	398	1 U	0.5 U	1 U	5 U	0.20 J	3.0 J	23.3	0.2 U	1.5 J	1 U	0.039 J
	5/31/2017	0.029 J	30.9	437	1 U	0.5 U	1 U	5 U	0.19 J	5 U	23.8	0.2 U	2.0 J	1 U	0.075 J
	4/9/2018	1 U	**47.1**	494	1 U	0.5 U	0.061 J	5 U	0.26	3.4 J	26.8	0.2 U	1.2 J	1 U	1 U
	5/21/2018		35.8	386					0.25		21.7		20 U		
	11/7/2018		**69.5**	588					0.21		32.6		1.2 J		
UMW-2D	3/22/2016	1 U	2	127	1 U	0.5 U	0.36 J	5 U	0.41	5 U	31.6	0.2 U	45.2	1 U	1 U
	5/4/2016	1 U	1.4	113	1 U	0.5 U	0.56 J	5 U	0.36	5 U	29.1	0.2 U	46.9	1 U	1 U
	7/12/2016	1 U	2	124	1 U	0.5 U	1 U	5 U	0.34	5 U	28.9	0.2 U	44.3	1 U	1 U
	9/9/2016	1 U	2.2	114	1 U	0.5 U	1 U	5 U	0.34	5 U	26.9	0.2 U	45.9	1 U	1 U
	11/11/2016	1 U	2.7	138	1 U	0.5 U	0.47 J	5 U	0.34	5 U	31.3	0.2 U	36.9	1 U	1 U
	1/17/2017	1 U	2.9	105	1 U	0.5 U	1 U	5 U	0.38	3.0 J	24.2	0.2 U	44.4	1 U	1 U
	3/2/2017	1 U	2.8	99	1 U	0.5 U	1 U	5 U	0.37	5 U	24.9	0.2 U	45.4	1 U	1 U
	6/2/2017	1 U	1.7	107	1 U	0.5 U	1 U	5 U	0.37	5 U	25.4	0.2 U	40.6	1 U	1 U
	4/10/2018	1 U	1.9	104	1 U	0.5 U	1 U	5 U	0.46	4.1 J	23.3	0.2 U	44.7	1 U	1 U
	5/21/2018		2.2	112					0.37		22.4		38.4		
	11/7/2018		1.8	105					0.42		21.9		40.9		
UMW-3D	3/23/2016	1 U	0.57 J	81	1 U	0.5 U	1 U	5 U	0.13 J	5 U	21.2	0.2 U	**195**	0.19 J	1 U
	5/5/2016	0.066 J	2.3	114	1 U	0.5 U	1 U	5 U	0.12 J	5 U	24	0.2 U	**171**	1 U	1 U
	7/12/2016	1 U	2	92	1 U	0.5 U	1 U	5 U	0.13 J	5 U	18.2	0.2 U	**192**	0.19 J	1 U
	9/13/2016	1 U	1.1	118	1 U	0.5 U	1 U	5 U	0.12 J	5 U	18.8	0.2 U	**175**	1 U	1 U
	11/14/2016	1 U	1 U	185	1 U	0.5 U	1 U	5 U	0.16 J	5 U	31.4	0.2 U	**113**	1 U	1 U
	1/17/2017	1 U	0.11 J	136	1 U	0.5 U	1 U	5 U	0.24	3.1 J	26.3	0.2 U	**127**	1 U	1 U
	3/2/2017	1 U	0.46 J	163	1 U	0.5 U	1 U	5 U	0.17 J	5 U	27.4	0.2 U	**116**	0.14 J	1 U
	6/1/2017	1 U	4	139	1 U	0.5 U	1 U	5 U	0.2 U	5 U	20.4	0.2 U	**171**	1 U	1 U
	4/10/2018	1 U	2.4	102	1 U	0.036 J	0.069 J	5 U	0.18 J	3.0 J	18.2	0.2 U	**200**	0.17 J	1 U
	5/22/2018		2.6	86.7					0.17 J		17.2		**233**		
	11/9/2018		1.7	82.2					0.2 U		13.4		**206**		
	12/6/2018	0.14 J	3.2	73.3	1 U	0.082 J	0.57 J	5 U	0.2 U	10 U	16.5	0.2 U	**220**	0.28 J	1 U
UMW-4D	3/23/2016	1 U	0.26 J	71.4	1 U	0.5 U	0.36 J	5 U	0.35	5 U	35.9	0.2 U	**148**	1 U	1 U
	5/4/2016	1 U	0.25 J	68.2	1 U	0.5 U	0.55 J	5 U	0.35	5 U	36.2	0.2 U	**145**	1 U	1 U
	7/13/2016	1 U	1 U	78.6	1 U	0.5 U	1 U	5 U	0.32	5 U	37.6	0.2 U	**192**	1 U	1 U
	9/13/2016	0.061 J	0.11 J	75.2	1 U	0.5 U	1 U	5 U	0.34	5 U	34.7	0.2 U	**156**	1 U	1 U
	11/14/2016	1 U	1 U	56.5	1 U	0.5 U	1 U	5 U	0.4	5 U	32.1	0.2 U	**122**	1 U	1 U
	1/17/2017	1 U	1 U	43.3	1 U	0.5 U	1 U	5 U	0.44	5 U	25	0.2 U	98.8	1 U	1 U
	3/3/2017	1 U	0.12 J	50.6	1 U	0.5 U	1.8	5 U	0.4	5 U	29.3	0.2 U	**116**	1 U	1 U
	6/1/2017	1 U	0.10 J	78.6	1 U	0.5 U	1 U	5 U	0.36	5 U	33.2	0.2 U	**192**	1 U	1 U
	4/9/2018	1 U	0.088 J	68	1 U	0.5 U	0.11 J	5 U	0.41	10 U	31.1	0.2 U	**134**	1 U	1 U
	5/22/2018		1 U	72.1					0.38		29.9		**157**		
	11/9/2018		0.16 J	81.5					0.49		33.2		**107**		

TABLE I
GROUNDWATER ANALYTICAL RESULTS - APPENDIX IV CONSTITUENTS
CORRECTIVE MEASURES ASSESSMENT
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

		Constituents													
Monitoring Well ID	Date Sampled	Antimony Total	Arsenic, Total	Barium Total	Beryllium Total	Cadmium Total	Chromium Total	Cobalt Total	Fluoride Total	Lead Total	Lithium Total	Mercury Total	Molybdenum Total	Selenium Total	Thallium Total
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	Site GWPS	6	42.6	2000	4	5	100	6	4	15	54.85	2	100	50	2
UMW-5D	3/23/2016	1 U	17.2	67.8	1 U	0.5 U	0.54 J	5 U	0.081 J	5 U	23.8	0.2 U	**109**	1 U	1 U
	5/5/2016	0.094 J	27.1	81.5	1 U	0.5 U	0.58 J	5 U	0.075 J	5.1	15.9	0.2 U	**130**	1 U	1 U
	7/13/2016	0.079 J	19.3	70.6	1 U	0.5 U	1 U	5 U	0.096 J	5 U	19	0.2 U	**117**	1 U	1 U
	9/9/2016	0.084 J	17.7	68.9	1 U	0.5 U	1 U	5 U	0.082 J	5 U	23.4	0.2 U	**120**	1 U	1 U
	11/14/2016	1 U	16.4	61.6	1 U	0.5 U	1 U	5 U	0.13 J	5 U	26.3	0.2 U	**122**	1 U	1 U
	1/17/2017	1 U	22.1	54.8	1 U	0.5 U	1 U	5 U	0.11 J	3.6 J	20.8	0.2 U	**106**	1 U	1 U
	3/2/2017	0.10 J	26.2	61.4	1 U	0.5 U	1 U	5 U	0.13 J	5 U	16.6	0.2 U	**111**	0.15 J	1 U
	6/1/2017	0.10 J	21	69.2	1 U	0.5 U	1 U	5 U	0.2 U	5 U	13.5	0.2 U	**136**	0.12 J	1 U
	4/9/2018	0.10 J	26	70.8	1 U	0.5 U	0.067 J	5 U	0.15 J	10 U	12.7	0.2 U	**152**	0.11 J	1 U
	5/22/2018		24.6	70.6					0.13 J		12.6		**162**		
	11/8/2018		16.1	60					0.2 U		12.9		**151**		
UMW-6D	3/23/2016	0.11 J	1.8	129	1 U	0.5 U	0.54 J	5 U	0.12 J	5 U	10.1	0.2 U	**668**	1 U	1 U
	5/4/2016	1 U	5.7	139	1 U	0.5 U	0.80 J	5 U	0.14 J	3.2 J	7.8 J	0.2 U	**634**	0.20 J	1 U
	7/13/2016	1 U	9.6	123	1 U	0.5 U	1 U	5 U	0.14 J	5 U	6.5 J	0.2 U	**674**	1 U	1 U
	9/9/2016	1 U	16.6	127	1 U	0.5 U	0.56 J	5 U	0.12 J	5 U	6.6 J	0.2 U	**596**	0.28 J	1 U
	11/14/2016	1 U	12.9	129	1 U	0.5 U	1 U	5 U	0.15 J	3.6 J	7.0 J	0.2 U	**554**	0.33 J	1 U
	1/17/2017	1 U	15.2	141	1 U	0.052 J	1 U	5 U	0.11 J	5 U	5.9 J	0.2 U	**504**	0.22 J	1 U
	3/2/2017	1 U	14	150	1 U	0.5 U	1 U	5 U	0.14 J	5 U	7.4 J	0.2 U	**496**	0.26 J	1 U
	6/1/2017	1 U	12.8	145	1 U	0.5 U	1 U	5 U	0.11 J	5 U	5.8 J	0.2 U	**548**	0.21 J	0.092 J
	4/9/2018	1 U	9.4	152	1 U	0.034 J	0.079 J	5 U	0.17 J	10 U	6.9 J	0.2 U	**564**	0.26 J	1 U
	5/22/2018		8.7	137					0.15 J		5.0 J		**534**		
	11/9/2018		15.4	114					0.2 U		5.2 J		**591**		
UMW-7D	3/23/2016	1 U	10.6	180	1 U	0.5 U	0.54 J	5 U	0.33	5 U	20.2	0.2 U	**201**	1 U	1 U
	5/4/2016	1 U	9.6	187	1 U	0.5 U	0.77 J	5 U	0.28	5 U	21	0.2 U	**182**	1 U	1 U
	7/11/2016	1 U	13.7	159	1 U	0.5 U	0.81 J	5 U	0.29	5 U	17.7	0.2 U	**198**	1 U	1 U
	9/12/2016	1 U	21.6	105	1 U	0.5 U	1 U	5 U	0.28	5 U	19.1	0.2 U	**205**	1 U	1 U
	11/14/2016	1 U	21.1	101	1 U	0.5 U	1 U	5 U	0.29	2.7 J	22.7	0.2 U	**191**	1 U	1 U
	1/18/2017	1 U	20.9	113	1 U	0.5 U	1 U	5 U	0.28	5 U	18.2	0.2 U	**205**	1 U	1 U
	3/2/2017	1 U	20.7	123	1 U	0.5 U	1 U	5 U	0.27	2.7 J	20.6	0.2 U	**191**	1 U	1 U
	6/1/2017	1 U	16.5	164	1 U	0.5 U	1 U	5 U	0.26	5 U	14.6	0.2 U	**188**	0.091 J	1 U
	4/9/2018	1 U	19.7	157	1 U	0.5 U	0.085 J	5 U	0.28	10 U	19.4	0.2 U	**214**	0.089 J	1 U
	5/22/2018		17.8	154					0.37		19.9		**203**		
	11/7/2018		20.7	121					0.29		25		**231**		
UMW-8D	3/22/2016	1 U	27.9	454	1 U	0.5 U	0.48 J	5 U	0.14 J	5 U	34.6	0.2 U	14.8 J	1 U	1 U
	5/4/2016	1 U	28	458	1 U	0.5 U	0.62 J	0.79 J	0.15 J	5 U	34.8	0.2 U	9.5 J	1 U	1 U
	7/12/2016	1 U	31.2	448	1 U	0.5 U	1 U	5 U	0.16 J	5 U	32	0.2 U	13.6 J	1 U	1 U
	9/12/2016	1 U	31.8	497	1 U	0.5 U	1	5 U	0.15 J	5 U	31.2	0.2 U	14.5 J	1 U	1 U
	11/14/2016	1 U	32.5	481	1 U	0.5 U	1 U	5 U	0.20 J	3.9 J	31.7	0.2 U	11.7 J	1 U	1 U
	1/18/2017	1 U	32.8	492	1 U	0.5 U	1 U	5 U	0.19 J	5 U	30.7	0.2 U	14.5 J	1 U	1 U
	3/2/2017	1 U	35.4	482	1 U	0.5 U	1 U	5 U	0.17 J	4.4 J	32.4	0.2 U	12.2 J	1 U	1 U
	5/31/2017	1 U	27.6	465	1 U	0.5 U	1 U	5 U	0.15 J	5 U	26.4	0.2 U	11.5 J	1 U	1 U
	4/9/2018	1 U	27.9	452	1 U	0.5 U	0.064 J	5 U	0.23	10 U	30.9	0.2 U	11.0 J	0.087 J	1 U
	5/22/2018		29.5	449					0.22		31.8		10.7 J		
	11/7/2018		24.3	446					0.23		31.4		15.5 J		
UMW-9D	3/22/2016	1 U	33.1	516	1 U	0.5 U	0.65 J	5 U	0.14 J	5 U	18.2	0.2 U	2.0 J	1 U	1 U
	5/4/2016	1 U	32.4	545	1 U	0.5 U	1.1	5 U	0.15 J	3.0 J	20.4	0.2 U	1.6 J	1 U	1 U
	7/12/2016	1 U	33.1	507	1 U	0.5 U	1 U	5 U	0.16 J	5 U	16.6	0.2 U	1.3 J	1 U	1 U
	9/9/2016	1 U	35.4	536	1 U	0.5 U	1 U	5 U	0.15 J	4.8 J	17.2	0.2 U	20 U	1 U	1 U
	11/14/2016	1 U	35.6	506	1 U	0.5 U	1 U	5 U	0.18 J	2.7 J	18.5	0.2 U	0.76 J	1 U	1 U
	1/18/2017	1 U	33.5	520	1 U	0.5 U	1 U	5 U	0.17 J	5 U	15.7	0.2 U	20 U	1 U	1 U
	3/2/2017	1 U	33.2	505	1 U	0.5 U	1 U	5 U	0.17 J	2.5 J	16.9	0.2 U	2.2 J	1 U	1 U
	5/31/2017	1 U	34.2	538	1 U	0.5 U	1 U	5 U	0.15 J	5 U	14	0.2 U	2.6 J	1 U	1 U
	4/9/2018	0.035 J	31.9	515	1 U	0.5 U	0.064 J	5 U	0.21	3.0 J	17.1	0.2 U	1.3 J	1 U	1 U
	5/22/2018		34	517					0.22		15.8		1.1 J		
	11/7/2018		34.5	500					0.21		16.4		20 U		
AM-1D	11/9/2018	1 U	2.7	76.4	1 U	0.14 J	1 U	5 U	0.41	10 U	32.5	0.2 U	**375**	1 U	1 U
AM-1S	11/9/2018	1 U	4.5	539	1 U	0.5 U	1 U	5.6	0.27	10 U	37	0.2 U	3.6 J	1 U	1 U
TP-1D	11/8/2018	1 U	1 U	1420	1 U	0.5 U	0.26 J	5 U	0.2 U	10 U	26.4	0.2 U	20 U	1 U	1 U
TP-1M	11/8/2018	1 U	1 U	980	1 U	0.5 U	0.081 J	5 U	0.20 J	10 U	21.8	0.2 U	20 U	1 U	1 U
TP-1S	11/8/2018	1 U	12.8	355	1 U	0.5 U	0.10 J	5 U	0.2 U	10 U	14.3	0.2 U	4.5 J	1 U	1 U

TABLE I
GROUNDWATER ANALYTICAL RESULTS - APPENDIX IV CONSTITUENTS
CORRECTIVE MEASURES ASSESSMENT
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Monitoring Well ID	Date Sampled	Constituents													
		Antimony Total	Arsenic, Total	Barium Total	Beryllium Total	Cadmium Total	Chromium Total	Cobalt Total	Fluoride Total	Lead Total	Lithium Total	Mercury Total	Molybdenum Total	Selenium Total	Thallium Total
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	Site GWPS	6	42.6	2000	4	5	100	6	4	15	54.85	2	100	50	2
TP-2D	11/9/2018	1 U	5.9	112	1 U	0.057 J	1 U	5 U	0.43	3.2 J	42.7	0.2 U	**125**	1 U	1 U
TP-2M	11/9/2018	1 U	0.26 J	115	0.18 J	0.057 J	1 U	5 U	0.47	10 U	34.3	0.2 U	**117**	1 U	1 U
TP-2S	11/9/2018	1 U	11	315	1 U	0.080 J	1 U	5 U	0.31	10 U	39.7	0.2 U	43	1 U	1 U
TP-3D	11/8/2018	0.10 J	1.8	83.7	1 U	0.5 U	1 U	5 U	0.27	10 U	37.0 J	0.2 U	**547**	0.14 J	1 U
TP-3M	11/8/2018	1 U	1 U	238	1 U	0.5 U	1 U	5 U	0.22	10 U	26.9	0.2 U	**355**	1 U	1 U
TP-3S	11/8/2018	0.18 J	0.27 J	246	1 U	0.5 U	1 U	5 U	0.2 U	10 U	22.3	0.2 U	7.3 J	3.5	1 U
TP-4D	11/8/2018	0.097 J	5.2	418	1 U	0.5 U	1 U	5 U	0.2 U	3.6 J	26.1	0.2 U	1.8 J	0.091 J	1 U
TP-4M	11/8/2018	0.084 J	4.5	374	1 U	0.5 U	1 U	5 U	0.24	10 U	12.5	0.2 U	2.2 J	0.11 J	1 U
TP-4S	11/8/2018	0.12 J	24.2	302	1 U	0.5 U	1 U	5 U	0.23	10 U	18.2	0.2 U	20 U	0.19 J	1 U
TP-5D	11/8/2018	1 U	11.8	534	1 U	0.5 U	1 U	5 U	0.2 U	10 U	23.9	0.2 U	1.4 J	1 U	1 U
TP-5M	11/8/2018	1 U	0.72 J	888	1 U	0.5 U	1 U	5 U	0.2 U	3.4 J	26.5	0.2 U	0.98 J	1 U	1 U
TP-5S	11/8/2018	1 U	11.9	431	1 U	0.5 U	1 U	1.4 J	0.2 U	10 U	30.5	0.2 U	1.8 J	0.15 J	1 U

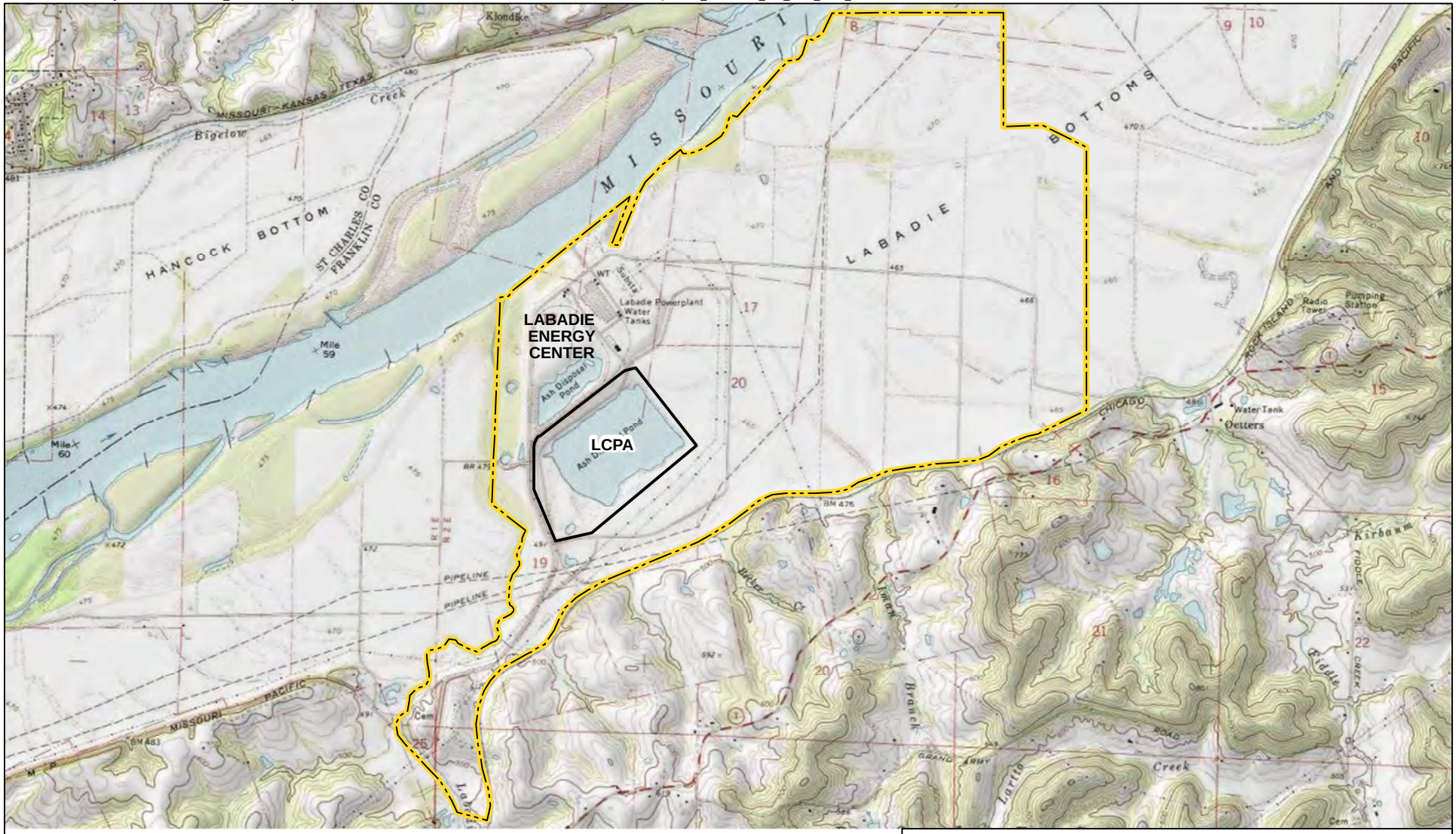
Notes:
102 Bold denotes concentration exceeding the GWPS
Blank cells - Constituent not included in this analysis.
mg/L - milligrams per liter.
ug/L - micrograms per liter.
GWPS - Groundwater Protection Standard.

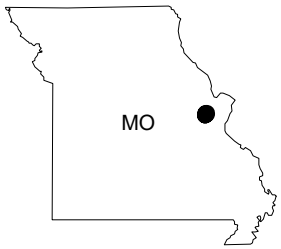
Qualifiers:
J - Value is estimated.
U - Constituent was not detected, value is the reporting limit.

Site GWPS is either the MCL/Health Based GWPS or based on background levels (calculated as described in the Statistical Analysis Plan for Assessment Monitoring), whichever is higher. GWPS and background values calculated using baseline sampling results from monitoring wells BMW-1D and BMW-2D.

FIGURES

GIS FILE PATH: \\haleyaldrich.com\share\cle_common\Projects\132002 - Ameren Ash Pond Closure Assessment\006-Labadie\GIS\Maps\2019_04\132002_006_0001_SITE_LOCUS2.mxd — USER: hwachholz — LAST SAVED: 5/2/2019 10:37:42 AM





LEGEND

- LCPA - BOTTOM ASH SURFACE IMPOUNDMENT
- LABADIE ENERGY CENTER PROPERTY BOUNDARY

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. IMAGERY SOURCE: ESRI

N

0 1,500 3,000
SCALE IN FEET

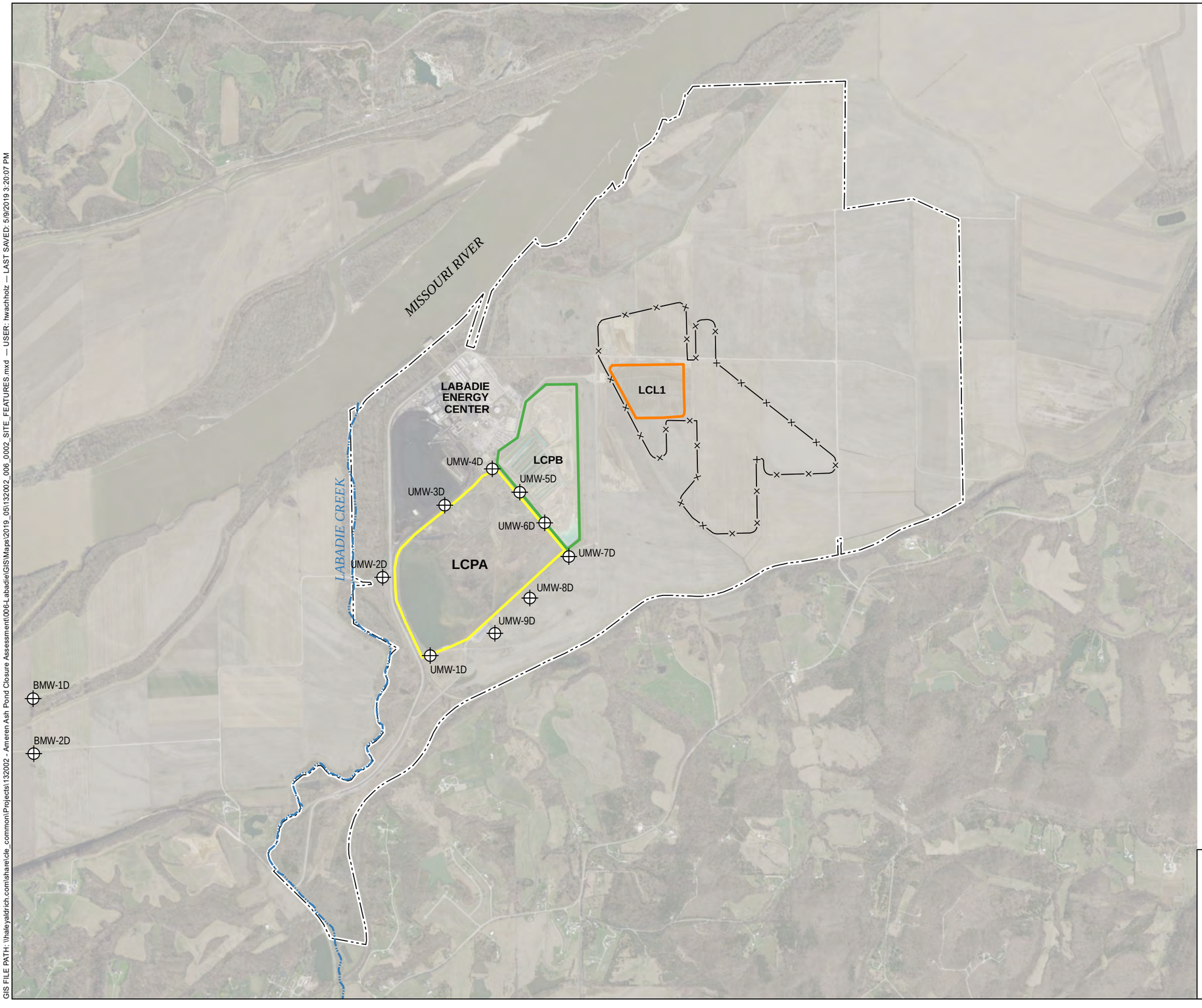
HALEY ALDRICH

CORRECTIVE MEASURES EVALUATION
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

SITE LOCATION MAP

MAY 2019

FIGURE 1-1



LEGEND

- LCPA BOTTOM ASH SURFACE IMPOUNDMENT MONITORING WELL
- LABADIE CREEK
- LABADIE ENERGY CENTER APPROXIMATE PROPERTY BOUNDARY
- LCPA - BOTTOM ASH SURFACE IMPOUNDMENT
- LCPB - FLY ASH SURFACE IMPOUNDMENT
- LCL1 - UTILITY WASTE LANDFILL CELL 1
- PROPOSED UTILITY WASTE LANDFILL FINAL FENCE PERIMETER

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. CCR - COAL COMBUSTION RESIDUALS.
3. AERIAL IMAGERY SOURCE: ESRI

N

0 2,000 4,000
SCALE IN FEET

HALEY ALDRICH

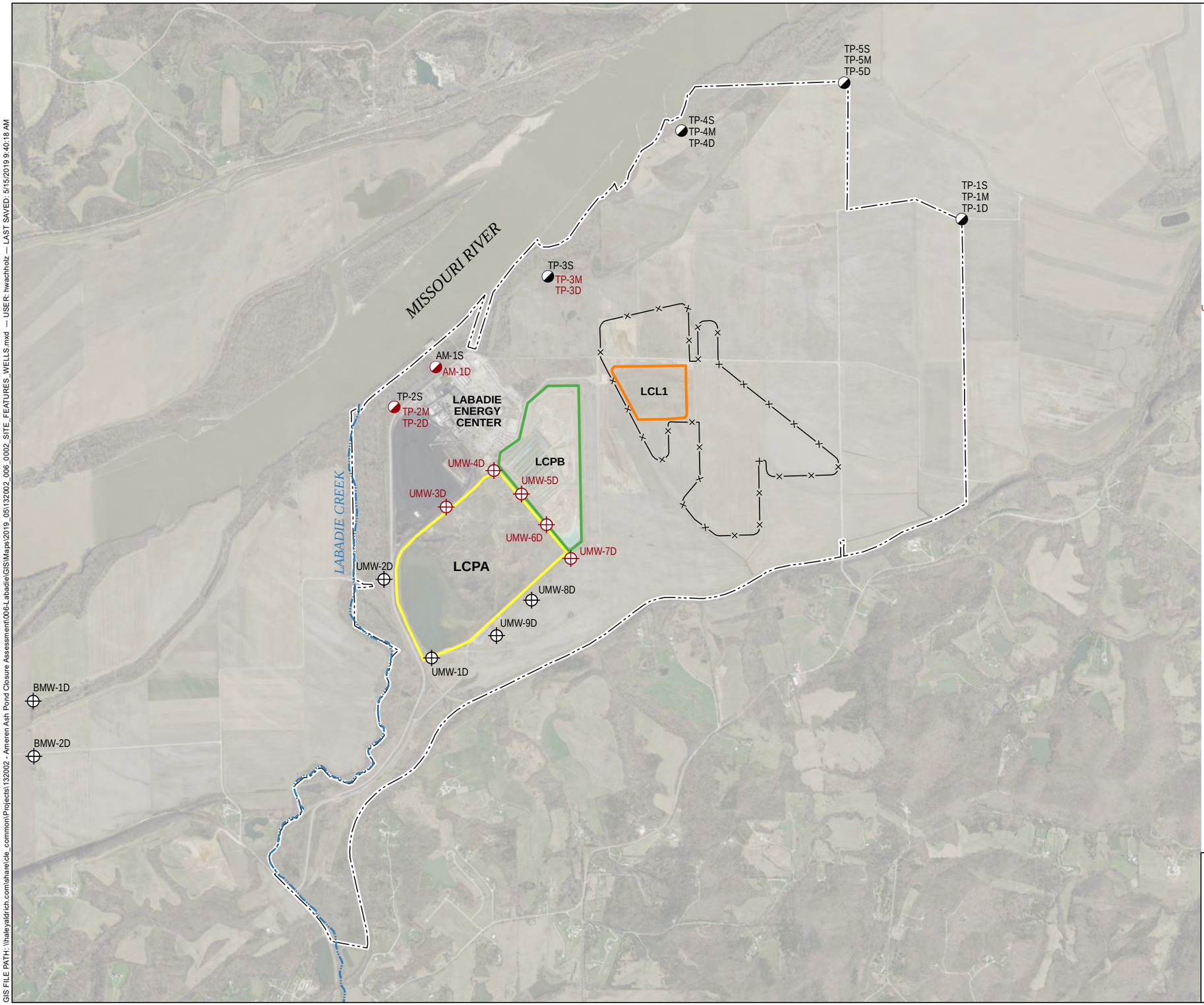
CORRECTIVE MEASURES EVALUATION
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

SITE FEATURES

MAY 2019

FIGURE 1-2

GIS FILE PATH: \\haleyaldrich.com\share\cle_common\Projects\132002 - Ameren Ash Pond Closure Assessment\006-Labadie\GIS\Maps\2019_05\132002_006_0002_SITE_FEATURES.mxd — USER: hwachholz — LAST SAVED: 5/9/2019 3:20:07 PM



LEGEND

- NATURE AND EXTENT MONITORING WELL
- LCPA BOTTOM ASH SURFACE IMPOUNDMENT MONITORING WELL
- LCL1 - UTILITY WASTE LANDFILL CELL 1
- LABADIE CREEK
- PROPOSED UTILITY WASTE LANDFILL FINAL FENCE PERIMETER
- LABADIE ENERGY CENTER APPROXIMATE PROPERTY BOUNDARY
- LCPA - BOTTOM ASH SURFACE IMPOUNDMENT
- LCPB - FLY ASH SURFACE IMPOUNDMENT
- UMW-3D / TP-2D — MOLYBDENUM CONCENTRATION ABOVE THE GWPS

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. CCR - COAL COMBUSTION RESIDUALS.
3. GWPS GROUNDWATER PROTECTION STANDARD
4. AERIAL IMAGERY SOURCE: ESRI

N

0 2,000 4,000
SCALE IN FEET

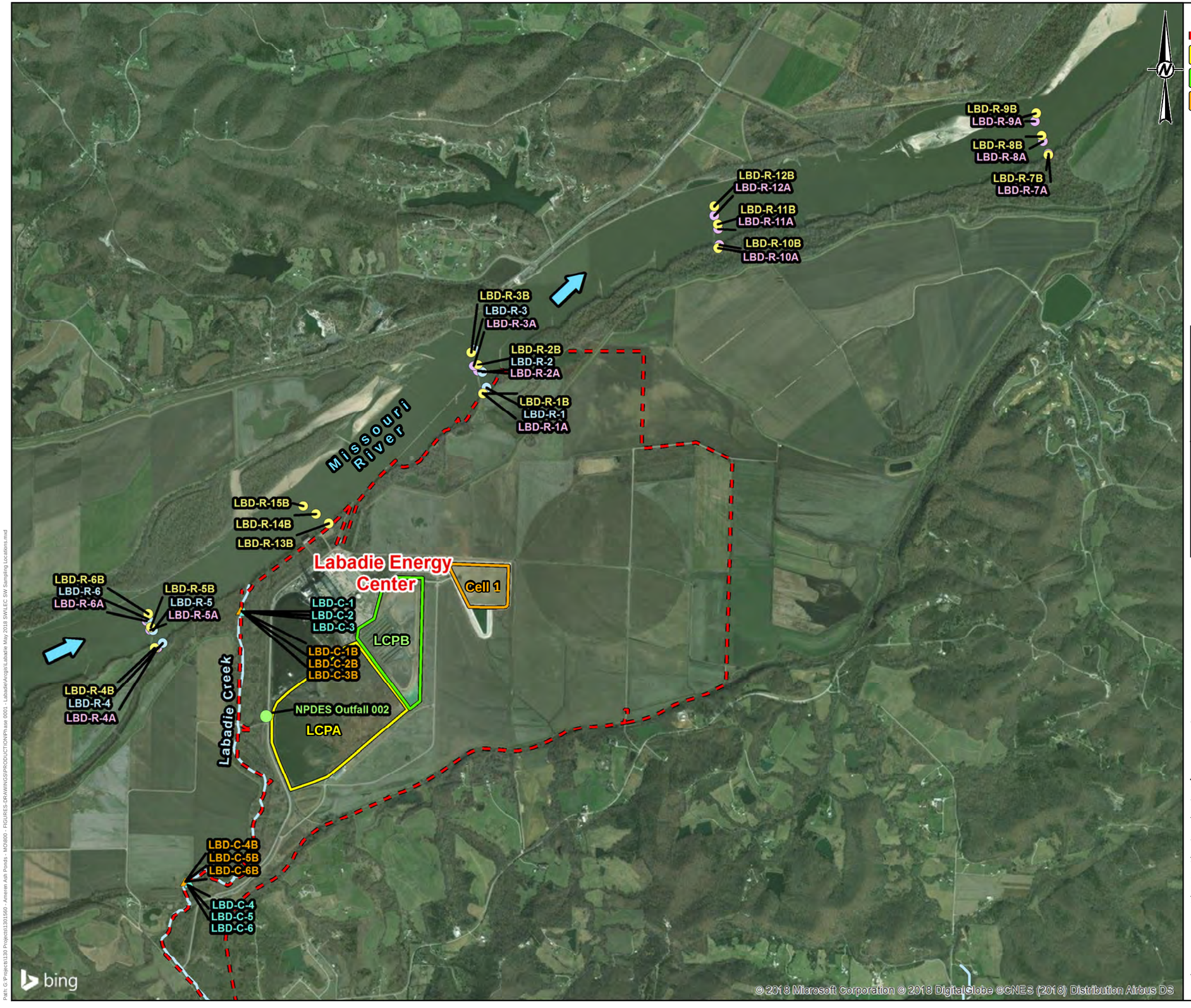
HALEY ALDRICH

CORRECTIVE MEASURES EVALUATION
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

MONITORING WELL LOCATIONS

MAY 2019

FIGURE 2-1



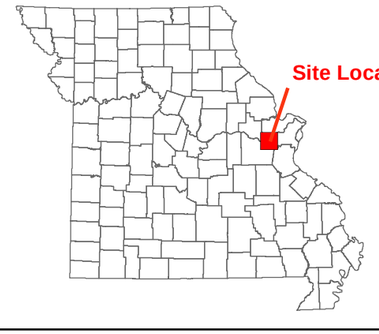
LEGEND

- Approximate Property Boundary
- LCPA - Bottom Ash Surface
- LCPB - Fly Ash Surface
- LCL1 - Utility Waste Landfill Cell 1
- NPDES Outfall Location

Surface Water Sampling Locations

- May 2018 Labadie Creek Sample
- May 2018 Missouri River Sample
- November 2014 Missouri River Sample
- October 2013 Labadie Creek Sample
- October 2013 Missouri River Sample
- Surface Water Flow Direction

KEY MAP



NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. SAMPLE LOCATIONS BASED ON HANDHELD TRIMBLE GPS MEASUREMENTS. SAMPLE LOCATION REPRESENTS CENTERPOINT BETWEEN STARTING AND ENDING LOCATION.
3. NPDES - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
AMEREN HYDROGEOLOGICAL CONSULTING

TITLE
SURFACE WATER SAMPLE LOCATIONS
LABADIE ENERGY CENTER

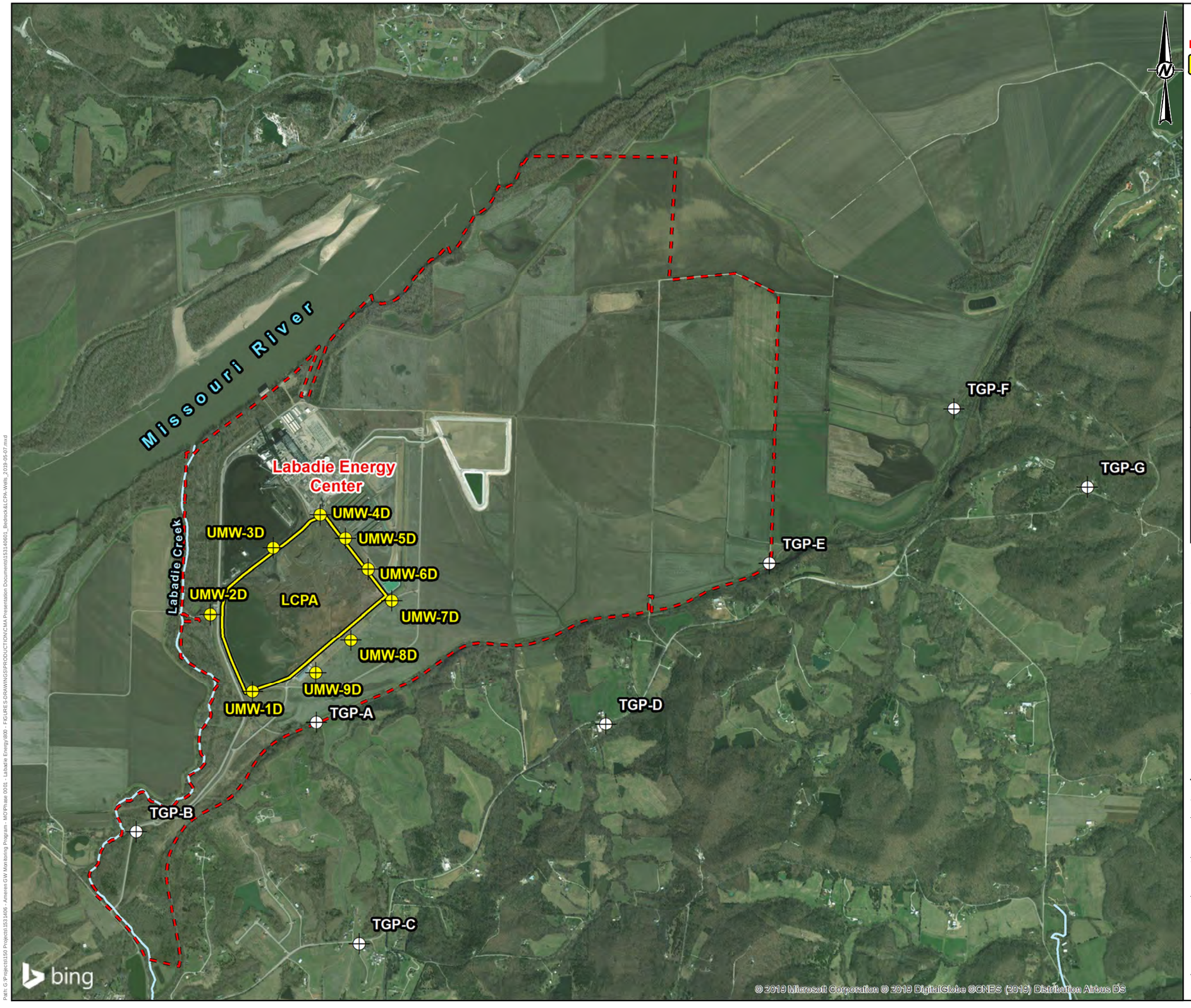
CONSULTANT
GOLDER

YYYY-MM-DD	2018-06-04
PREPARED	JS
DESIGN	JSI
REVIEW	JSI
APPROVED	MNH

PROJECT No. 130-1560
Rev. 0
Figure 2-2

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

Path: G:\Projects\1130 Projects\1301560 - Ameren Ash Ponds - MO\800 - FIGURES-DRAWINGS\PRODUCTION\Phase 0001 - Labadie\Arcgis\Labadie May 2018 SWLEC SW Sampling Locations.mxd



LEGEND

- Labadie Energy Center Property Boundary
- LCPA - Bottom Ash Surface Impoundment

Groundwater Sampling Locations

- LCPA - Bottom Ash Surface Impoundment Monitoring Well
- Bedrock Aquifer Monitoring Well

KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.

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

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
BEDROCK MONITORING WELL LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-07
PREPARED	JSI
DESIGN	JSI
REVIEW	EMS
APPROVED	XXX

PROJECT No. 153-140601
PHASE 0001

Figure 2-3

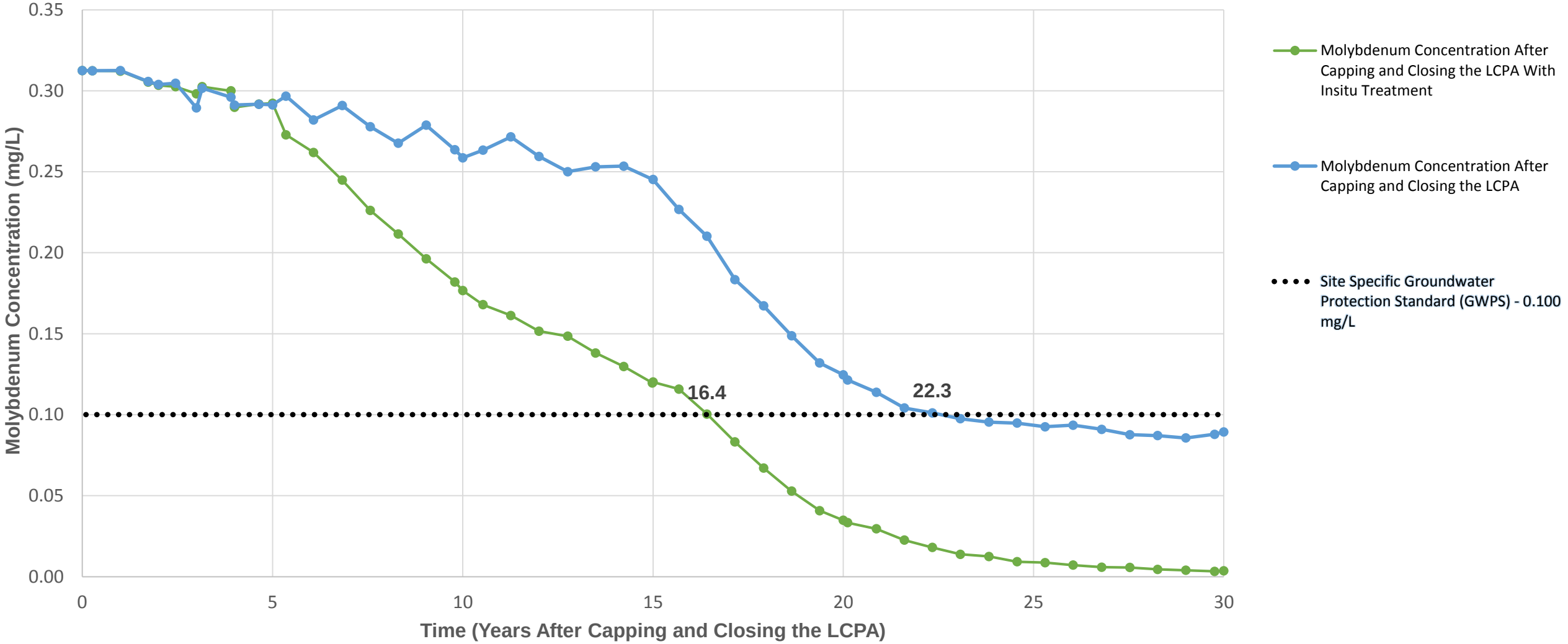
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 1in

Path: G:\Projects\1150 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\CMA Presentation Documents\153140601_Bedrock&LCPA-Wells_2019-05-07.mxd

FIGURE 4-1
REMEDIAL ALTERNATIVE ROADMAP
CORRECTIVE MEASURES ASSESSMENT
BOTTOM ASH SURFACE IMPOUNDMENT (LCPA)
LABADIE ENERGY CENTER - FRANKLIN COUNTY, MISSOURI

Alternative Number	Remedial Alternative Description	LCPA Closure Description	Groundwater Remedy Components		
			A. Groundwater Remedy Approach	B. Groundwater Treatment Method	C. Post-Closure Actions
1	**Closure In Place (CIP) with Capping and Monitored Natural Attenuation (MNA)**	**CIP with Geomembrane and Soil Cap**	**Natural Attenuation with Monitoring** Mitigate off-site migration of groundwater with CCR constituents above GWPS through process of natural attenuation	**No Active Treatment** No active treatment technologies for groundwater to address CCR constituents	**MNA** Long-term groundwater monitoring to confirm reduction of CCR constituents
2	**CIP with In-Situ Stabilization (ISS), Capping and MNA**	**CIP with ISS, Geomembrane and Soil Cap**			
3	**CIP with Capping and In-Situ Groundwater Treatment**	**CIP with Geomembrane and Soil Cap**	**Subsurface Treatment System** Mitigate off-site migration of groundwater with CCR constituents above GWPS using in-situ amendments	**In-Situ Treatment** Subsurface treatment to reduce Appendix IV constituent concentrations in groundwater	**In-Situ Treatment Long-Term** Continue periodic in-situ treatment of groundwater to maintain reduction of CCR constituents in groundwater
4	**CIP with Capping and Hydraulic Containment through Groundwater Pumping and Ex-Situ Treatment**	**CIP with Geomembrane and Soil Cap**	**Hydraulic Containment** Mitigate off-site migration of groundwater with CCR constituents above GWPS using extraction wells	**Ex-Situ Treatment** Treatment system (ion exchange or reverse osmosis) to remove CCR constituents from groundwater	**Pump & Treat Long-Term** Operate groundwater treatment system long-term to maintain reduction of CCR constituents in groundwater.
5	**Closure by Removal (CBR) with MNA**	**CBR**	**Natural Attenuation with Monitoring** Mitigate off-site migration of groundwater with CCR constituents above GWPS through process of natural attenuation	**No Active Treatment** No active treatment technologies for groundwater to address CCR constituents	**MNA** Long-term groundwater monitoring to confirm reduction of CCR constituents

Figure 4-2
Modeled Molybdenum Concentrations After Capping and Closing the LCPA
Labadie Energy Center - Franklin County, Missouri



NOTES:
1. mg/L - Milligrams per liter.
2. GWPS - Groundwater Protection Standard.
3. Concentrations are representative of the intermediate zone of the alluvial aquifer at Alternative Source Demonstration Location L-ASD-5.

GREDELL Engineering Resources, Inc.
ENVIRONMENTAL ENGINEERING LAND - AIR - WATER

APPENDIX A

Surface Water Screening Tables

Appendix A
Labadie Energy Center Surface Water Screening Tables – TOC

TABLES

1	HUMAN HEALTH SCREENING LEVELS
2	ECOLOGICAL SCREENING LEVELS - MISSOURI RIVER
3	ECOLOGICAL SCREENING LEVELS – LABADIE CREEK
4	SUMMARY OF SCREENING RESULTS
5a	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
5b	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
5c	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
5d	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
5e	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
5f	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
6a	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
6b	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
6c	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
6d	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS

6e	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
6f	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER TO HUMAN HEALTH RECREATIONAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
7a	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
7b	COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
7c	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
7d	COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
7e	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS
7f	COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
8a	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS- TOTAL (UNFILTERED) SAMPLE RESULTS
8b	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
8c	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS- TOTAL (UNFILTERED) SAMPLE RESULTS
8d	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
9a	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVEL- TOTAL (UNFILTERED) SAMPLE RESULTS
9b	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH REACREATIONAL SCREENING LEVEL - DISSOLVED (FILTERED) SAMPLE RESULTS
9c	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVEL- TOTAL (UNFILTERED) SAMPLE RESULTS

Appendix A
Labadie Energy Center Surface Water Screening Tables – TOC

9d	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO HUMAN HEALTH RECREATIONAL SCREENING LEVEL - DISSOLVED (FILTERED) SAMPLE RESULTS
10a	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS- TOTAL (UNFILTERED) SAMPLE RESULTS
10b	COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
10c	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS- TOTAL (UNFILTERED) SAMPLE RESULTS
10d	COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
11	COMPARISON OF BLUFF AREA GROUNDWATER MONITORING RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS

TABLE 1
HUMAN HEALTH SCREENING LEVELS
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

		Drinking Water Screening Levels (mg/L)			Surface Water Screening Levels (mg/L)	
Constituent	**CASRN**	**MCLs (b)**	**SMCLs (b)**	**November 2018 USEPA Tapwater RSLs (c)**	**Drinking Water (d)**	**Recreational Use (a) (e)**
Antimony	7440-36-0	0.006	NA	0.0078 (m)	0.006	0.64
Arsenic	7440-38-2	0.01	NA	0.000052	0.01	0.00014 (i)
Barium	7440-39-3	2	NA	3.8	2	NA
Beryllium	7440-41-7	0.004	NA	0.025	0.004	NA
Boron	7440-42-8	NA	NA	4	4	NA
Cadmium	7440-43-9	0.005	NA	0.0092	0.005	NA
Calcium	7440-70-2	NA	NA	NA	NA	NA
Chloride	7647-14-5	NA	250	NA	250	NA
Chromium	16065-83-1 (g)	0.1 (j)	NA	22 (n)	0.1	NA
Cobalt	7440-48-4	NA	NA	0.006	0.006	NA
Fluoride	16984-48-8	4	2	0.8	4	NA
Lead	7439-92-1	0.015 (k)	NA	0.015	0.015	NA
Lithium	7439-93-2	NA	NA	0.04	0.04	NA
Mercury	7487-94-7 (h)	0.002 (l)	NA	0.0057 (o)	0.002	NA
Molybdenum	7439-98-7	NA	NA	0.1	0.1	NA
Radium 226/228 (pCi/L)	RADIUM226228	5	NA	NA	5	NA
Selenium	7782-49-2	0.05	NA	0.1	0.05	4.2
Sulfate	7757-82-6	NA	250	NA	250	NA
Thallium	7440-28-0	0.002	NA	0.0002 (f)	0.002	0.00047
Total Dissolved Solids	TDS	NA	500	NA	500	NA
pH (std)	PHFLD	NA	6.5 - 8.5	NA	6.5 - 8.5	NA

Notes:

AWQC - Ambient Water Quality Criteria. NA - not available.
CASRN - Chemical Abstracts Service Re pCi/L - picoCurie per liter.
GWPS - Groundwater Protection Standar RSL - Risk-based Screening Levels (USEPA).
HI - Hazard Index (noncancer child). TR - Target Risk (carcinogenic).
MCL - Maximum Contaminant Level. USEPA - United States Environmental Protection Agency.
mg/L - milligram per liter.

(a) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.
(e) - The selected Human Health Recreational Use Screening Level is the Federal USEPA AWQC for Human Health Consumption of Orga
(f) - RSL for Thallium (Soluble Salts) used for Thallium.
(g) - CAS number for Trivalent Chromium.
(h) - CAS number for Mercuric Chloride.
(i) - Value applies to inorganic form of arsenic only.
(j) - Value for Total Chromium.
(k) - Lead Treatment Technology Action Level is 0.015 mg/L.
(l) - Value for Inorganic Mercury.
(m) - RSL for Antimony (metallic) used for Antimony.
(n) - RSL for Chromium (III), Insoluble Salts used for Chromium.
(o) - RSL for Mercuric Chloride used for Mercury.

TABLE 2
ECOLOGICAL SCREENING LEVELS - MISSOURI RIVER
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

		Federal Water Quality Criteria (mg/L)							
		Site-Specific USEPA Aquatic Life AWQC - 2018 Hardness Data Freshwater Acute (a)		Site-Specific USEPA Aquatic Life AWQC - 2018 Hardness Data Freshwater Chronic (a)		Site-Specific USEPA Aquatic Life AWQC - 2013 and 2014 Hardness Data Freshwater Acute (b)		Site-Specific USEPA Aquatic Life AWQC - 2013 and 2014 Hardness Data Freshwater Chronic (b)	
Constituent	**CASRN**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	0.34	0.34	0.15	0.15	0.34	0.34	0.15	0.15
Barium	7440-39-3	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	7440-41-7	NA	NA	NA	NA	NA	NA	NA	NA
Boron	7440-42-8	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	0.0058 (c)	0.0052 (d)	0.0020 (c)	0.0017 (d)	0.0053 (f)	0.0048 (g)	0.0018 (f)	0.0016 (g)
Calcium	7440-70-2	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	16887-00-6	860	NA	230	NA	860	NA	230	NA
Chromium	7440-47-3	4.6 (e,c)	1.5 (e,d)	0.22 (e,c)	0.19 (e,d)	4.2 (e,f)	1.3 (e,g)	0.20 (e,f)	0.17 (e,g)
Cobalt	7440-48-4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoride	16984-48-8	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	0.35 (c)	0.22 (d)	0.014 (c)	0.0085 (d)	0.31 (f)	0.20 (g)	0.012 (f)	0.0077 (g)
Lithium	7439-93-2	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	0.0016	0.0014	0.00091	0.00077	0.0016	0.0014	0.00091	0.00077
Molybdenum	7439-98-7	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	NA	NA	3.1	NA	NA	NA	3.1	NA
Sulfate	14808-79-8	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA
Total Dissolved Solids	TDS	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
AWQC - USEPA Ambient Water Quality Criteria.
CASRN - Chemical Abstracts Service Registry Number.
CMC - Criterion Maximum Concentration.

(a) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness using hardness data collected in May 2018 - see note (c).
USEPA provides AWQC for both total and dissolved results.

(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness using hardness data collected in November 2014 - see note (f).
USEPA provides AWQC for both total and dissolved results.

(c) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

(d) - Hardness dependent value for total metals adjusted for dissolved fraction. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

(e) - Value for trivalent chromium used.

(f) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

(g) - Hardness dependent value for total metals adjusted for dissolved fraction. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 3
ECOLOGICAL SCREENING LEVELS - LABADIE CREEK
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

		Federal Water Quality Criteria (mg/L)							
		Site-Specific USEPA Aquatic Life AWQC - 2018 Hardness Data Freshwater Acute (a)		Site-Specific USEPA Aquatic Life AWQC - 2018 Hardness Data Freshwater Chronic (a)		Site-Specific USEPA Aquatic Life AWQC - 2013 Hardness Data Freshwater Acute (b)		Site-Specific USEPA Aquatic Life AWQC - 2013 Hardness Data Freshwater Chronic (b)	
Constituent	**CASRN**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	0.34	0.34	0.15	0.15	0.34	0.34	0.15	0.15
Barium	7440-39-3	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	7440-41-7	NA	NA	NA	NA	NA	NA	NA	NA
Boron	7440-42-8	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	0.0043 (c)	0.0039 (d)	0.0015 (c)	0.0013 (d)	0.0050 (f)	0.0045 (g)	0.0017 (f)	0.0015 (g)
Calcium	7440-70-2	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	16887-00-6	860	NA	230	NA	860	NA	230	NA
Chromium	7440-47-3	3.6 (e,c)	1.1 (e,d)	0.17 (e,c)	0.15 (e,d)	4.1 (e,f)	1.3 (e,g)	0.19 (e,f)	0.17 (e,g)
Cobalt	7440-48-4	NA	NA	NA	NA	NA	NA	NA	NA
Fluoride	16984-48-8	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	0.24 (c)	0.16 (d)	0.0092 (c)	0.0062 (d)	0.29 (f)	0.19 (g)	0.011 (f)	0.0073 (g)
Lithium	7439-93-2	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	0.0016	0.0014	0.00091	0.00077	0.0016	0.0014	0.00091	0.00077
Molybdenum	7439-98-7	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	NA	NA	3.1	NA	NA	NA	3.1	NA
Sulfate	14808-79-8	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA
Total Dissolved Solids	TDS	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
AWQC - USEPA Ambient Water Quality Criteria.
CASRN - Chemical Abstracts Service Registry Number.
CMC - Criterion Maximum Concentration.

(a) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness using hardness data collected in May 2018 - see note (c).
USEPA provides AWQC for both total and dissolved results.

(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness using hardness data collected in October 2013 - see note (f).
USEPA provides AWQC for both total and dissolved results.

(c) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Labadie Creek of 231 mg/L as CaCO3 used.

(d) - Hardness dependent value for total metals adjusted for dissolved fraction. Site-specific total recoverable mean hardness value for the Labadie Creek of 231 mg/L as CaCO3 used.

(e) - Value for trivalent chromium used.

(f) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Labadie Creek of 270 mg/L as CaCO3 used.

(g) - Hardness dependent value for total metals adjusted for dissolved fraction. Site-specific total recoverable mean hardness value for the Labadie Creek of 270 mg/L as CaCO3 used.

TABLE 4
SUMMARY OF SCREENING RESULTS
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

Constituent	Off-Site Bluff Area Wells - Drinking Water	Missouri River - Human Health Drinking Water									
		Dissolved					Total				
		Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream	Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream
Antimony											
Arsenic											
Barium											
Beryllium											
Boron											
Cadmium											
Calcium											
Chloride											
Chromium											
Cobalt											
Fluoride											
Lead											
Lithium								4 : 5 80%		2 : 10 20%	
Mercury											
Molybdenum											
pH											
Selenium											
Sulfate											
Thallium											
TDS							7 : 10 70%	3 : 5 60%	8 : 10 80%	9 : 10 90%	9 : 10 90%
Radium 226/228											

Notes:
Blank cells - no results above screening levels for the specified constituent / media.
Number of exceedences : total number of samples.

TABLE 4
SUMMARY OF SCREENING RESULTS
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

Constituent	Missouri River - Human Health Recreational									
	Dissolved					Total				
	Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream	Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream
Antimony										
Arsenic	15 : 15 100%	5 : 5 100%	15 : 15 100%	10 : 10 100%	10 : 10 100%	15 : 15 100%	5 : 5 100%	15 : 15 100%	10 : 10 100%	10 : 10 100%
Barium										
Beryllium										
Boron										
Cadmium										
Calcium										
Chloride										
Chromium										
Cobalt										
Fluoride										
Lead										
Lithium										
Mercury										
Molybdenum										
pH										
Selenium										
Sulfate										
Thallium										
TDS										
Radium 226/228										

Notes:
Blank cells - no results above screening levels for the specified constituent / media.
Number of exceedences : total number of samples.

TABLE 4
SUMMARY OF SCREENING RESULTS
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

Constituent	Missouri River - Ecological									
	Dissolved					Total				
	Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream	Upstream	Adjacent	Downstream	Further Downstream	Furthest Downstream
Antimony										
Arsenic										
Barium										
Beryllium										
Boron										
Cadmium										
Calcium										
Chloride										
Chromium										
Cobalt										
Fluoride										
Lead										
Lithium										
Mercury										
Molybdenum										
pH										
Selenium										
Sulfate										
Thallium										
TDS										
Radium 226/228										

Notes:
Blank cells - no results above screening levels for the specified constituent / media.
Number of exceedences : total number of samples.

TABLE 4
SUMMARY OF SCREENING RESULTS
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

	Labadie Creek - Human Health Drinking Water				Labadie Creek - Human Health Recreational				Labadie Creek - Ecological			
	Dissolved		Total		Dissolved		Total		Dissolved		Total	
Constituent	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Antimony												
Arsenic					6 : 6 100%	6 : 6 100%	6 : 6 100%	6 : 6 100%				
Barium												
Beryllium												
Boron												
Cadmium												
Calcium												
Chloride												
Chromium												
Cobalt												
Fluoride												
Lead												
Lithium												
Mercury												
Molybdenum												
pH												
Selenium												
Sulfate												
Thallium												
TDS												
Radium 226/228												

Notes:
Blank cells - no results above screening levels for the specified constituent / media.
Number of exceedences : total number of samples.

TABLE 5a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006															
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.004	0.0041	0.0044	0.0044	0.0046	0.0042	0.0046	0.0046	0.0047	0.0045	0.0053	0.0041	0.0041	0.0045	0.0046
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.146	0.173	0.18	0.184	0.193	0.173	0.201	0.201	0.198	0.204	0.162	0.181	0.169	0.187	0.192
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004															
Boron	7440-42-8	mg/L	NA	NA	4	4	0.0787 J	0.0814 J	0.0824 J	0.0812 J	0.0836 J	0.085 J	0.0903 J	0.0885 J	0.0898 J	0.0916 J	0.0818 J	0.0829 J	0.0813 J	0.0849 J	0.0833 J
Cadmium	7440-43-9	mg/L	0.005	NA	0.0092	0.005						0.00059 J							0.00054 J		
Calcium (f)	7440-70-2	mg/L	NA	NA	NA	NA	74.1	75.1	76.8	76.2	79	72.8	77	77.2	78.6	77.8	75.4	76.7	75.9	79.6	78.9
Chloride	16887-00-6	mg/L	NA	250	NA	250	22.5	22.8	22.7	23.5	23.9	23.8	24	24.5	25.1	25.2	22.6	22.8	22.6	23.6	23.3
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1	0.0024 J	0.005	0.007	0.0064	0.0068	0.0052	0.0071	0.0076	0.0059	0.0075	0.0033 J	0.0067	0.0048 J	0.0061	0.0068
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006	0.002 J	0.0029 J	0.0034 J	0.0037 J	0.0039 J	0.0028 J	0.0038 J	0.0044 J	0.0035 J	0.0033 J	0.0028 J	0.0028 J	0.0028 J	0.0028 J	0.0032 J
Fluoride	16984-48-8	mg/L	4	2	0.8	4	0.36	0.37	0.36	0.38	0.37	0.39	0.42	0.4	0.41	0.41	0.37	0.36	0.36	0.37	0.38
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015		0.0052 J	0.0046 J	0.004 J	0.0046 J	0.0057 J	0.0051 J	0.006 J	0.006 J	0.0054 J	0.0034 J		0.0057 J	0.0079 J	0.0038 J
Lithium	7439-93-2	mg/L	NA	NA	0.04	0.04	0.0354	0.0353	0.0379	0.038	0.0396	0.0379	0.0408	0.0403	0.0414	0.0428	0.0357	0.0377	0.0366	0.0386	0.0398
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002															
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0022 J	0.0026 J	0.003 J	0.0025 J	0.003 J	0.0021 J	0.0024 J	0.002 J	0.002 J	0.0026 J	0.0026 J	0.0026 J	0.0027 J	0.0029 J	0.0028 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0074 J	0.007 J	0.0077 J	0.0076 J							0.009 J				
Sulfate	14808-79-8	mg/L	NA	250	NA	250	176	178	177	183	180	172	173	174	179	180	175	178	179	185	186
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002															
Total Hardness as CaCO3 (f)	471-34-1	mg/L	NA	NA	NA	NA	301	304	310	308	319	302	316	316	319	319	304	311	307	320	318
Total Dissolved Solids	TDS	mg/L	NA	500	NA	500	506	507	491	491	488	479	505	506	517	523	500	505	509	519	522

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River Further Downstream					Missouri River Furthest Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006										
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0039	0.0041	0.0042	0.0045	0.0044	0.0034	0.0046	0.0043	0.0044	0.0045
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.17	0.163	0.158	0.18	0.194	0.128	0.178	0.19	0.188	0.174
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004										
Boron	7440-42-8	mg/L	NA	NA	4	4	0.0825 J	0.0825 J	0.0818 J	0.0873 J	0.0854 J	0.0814 J	0.0879 J	0.0869 J	0.0875 J	0.0899 J
Cadmium	7440-43-9	mg/L	0.005	NA	0.0092	0.005	0.0005 J									
Calcium (f)	7440-70-2	mg/L	NA	NA	NA	NA	76.6	76	78.5	75.7	79.8	72.5	78.6	80.2	78.9	82.6
Chloride	16887-00-6	mg/L	NA	250	NA	250	22.8	22.4	22.7	23	22.9	22.5	23	23	23.5	23.8
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1	0.0051	0.0042 J	0.0023 J	0.0054	0.0066	0.0016 J	0.0047 J	0.0073	0.0064	0.0048 J
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006	0.0024 J	0.0027 J	0.0024 J	0.0029 J	0.0037 J	0.0013 J	0.0036 J	0.0036 J	0.0033 J	0.0024 J
Fluoride	16984-48-8	mg/L	4	2	0.8	4	0.36	0.36	0.36	0.37	0.37	0.36	0.37	0.37	0.37	0.39
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015		0.0034 J	0.0043 J	0.0051 J	0.005 J		0.003 J	0.0048 J	0.0046 J	0.0057 J
Lithium	7439-93-2	mg/L	NA	NA	0.04	0.04	0.0368	0.0349	0.036	0.0412	0.0415	0.0342	0.039	0.0396	0.0379	0.04
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002										
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0028 J	0.0023 J	0.0023 J	0.0021 J	0.0028 J	0.0024 J	0.0029 J	0.0028 J	0.0029 J	0.0025 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0088 J						0.0102 J	0.0065 J	0.0089 J	0.0063 J
Sulfate	14808-79-8	mg/L	NA	250	NA	250	175	178	178	181	179	176	180	181	187	187
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002										
Total Hardness as CaCO3 (f)	471-34-1	mg/L	NA	NA	NA	NA	310	307	315	308	323	296	317	325	319	331
Total Dissolved Solids	TDS	mg/L	NA	500	NA	500	492	519	486	517	508	481	512	513	525	519

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
(a) AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006															
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0031	0.003	0.003	0.003	0.0029	0.0029	0.0029	0.0032	0.003	0.0029	0.003	0.003	0.0029	0.0032	0.003
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.111	0.108	0.11	0.111	0.111	0.109	0.106	0.108	0.103	0.111	0.107	0.109	0.103	0.113	0.109
Beryllium	7440-41-7	mg/L	0.004	NA	0.025	0.004						0.00017 J									
Boron	7440-42-8	mg/L	NA	NA	4	4	0.081 J	0.0806 J	0.0785 J	0.0846 J	0.0837 J	0.0817 J	0.0798 J	0.0777 J	0.0765 J	0.0805 J	0.079 J	0.0859 J	0.078 J	0.0842 J	0.0836 J
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005															
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	71.7	71.5	71.1	72.2	73	70.5	69.3	70.4	67.4	71.5	68.5	72	68.1	72.4	71
Chromium*	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1															
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006								0.00099 J							
Lead*	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015															
Lithium	7439-93-2	mg/L	NA	NA	0.04	0.04	0.0328	0.0334	0.0361	0.0357	0.036	0.038	0.0348	0.0371	0.0355	0.0362	0.0331	0.0335	0.0314	0.0359	0.0351
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002															
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0026 J	0.0029 J	0.0029 J	0.0031 J	0.0026 J	0.0028 J	0.0028 J	0.0025 J	0.0024 J	0.0029 J	0.003 J	0.0028 J	0.0027 J	0.003 J	0.0026 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0069 J	0.007 J	0.0103 J												
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002															

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS
(a) AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River Further Downstream					Missouri River Furthest Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006										
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0027	0.0028	0.0028	0.003	0.003	0.0028	0.003	0.0028	0.0028	0.003
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.107	0.112	0.112	0.109	0.11	0.114	0.107	0.105	0.112	0.114
Beryllium	7440-41-7	mg/L	0.004	NA	0.025	0.004										
Boron	7440-42-8	mg/L	NA	NA	4	4	0.0793 J	0.0838 J	0.0812 J	0.0777 J	0.0828 J	0.0825 J	0.082 J	0.0798 J	0.0849 J	0.0869 J
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005										
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	68.8	72.4	71.4	71	69.4	73.2	68.6	67.6	72.7	73.5
Chromium*	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1										
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006										
Lead*	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015										
Lithium	7439-93-2	mg/L	NA	NA	0.04	0.04	0.035	0.0385	0.0354	0.0366	0.0328	0.0368	0.0344	0.0341	0.0363	0.0378
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002										
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0028 J	0.0029 J	0.0026 J	0.0021 J	0.0026 J	0.0027 J	0.0028 J	0.0031 J	0.003 J	0.0031 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05			0.0065 J				0.0074 J			
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002										

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5c
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO
HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River					Missouri River					Missouri River					Missouri River				
							River Upstream					River Downstream					River Further Downstream					River Furthest Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4AS Total	LBD-R-5AS Total	LBD-R-5AM Total	LBD-R-6AS Total	LBD-R-6AM Total	LBD-R-1AS Total	LBD-R-2AS Total	LBD-R-2AM Total	LBD-R-3AS Total	LBD-R-3AM Total	LBD-R-10S Total	LBD-R-11S Total	LBD-R-11M Total	LBD-R-12S Total	LBD-R-12M Total	LBD-R-7S Total	LBD-R-8S Total	LBD-R-8M Total	LBD-R-9S Total	LBD-R-9M Total
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006																				
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0033	0.0032	0.0035	0.003	0.0031	0.0038	0.0032	0.0034	0.0034	0.0028	0.0037	0.0033	0.0032	0.0035	0.0035	0.0046	0.0034	0.0034	0.0035	0.0037
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.124	0.131	0.128	0.132	0.118	0.134	0.124	0.129	0.13	0.131	0.135	0.132	0.13	0.129	0.127	0.17	0.13	0.13	0.135	0.135
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004																				
Boron	7440-42-8	mg/L	NA	NA	4	4	0.111	0.112	0.109	0.111	0.109	0.115	0.111	0.113	0.11	0.11	0.111	0.11	0.111	0.11	0.111	0.115	0.111	0.11	0.111	0.109
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005																				
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	69.9	71.7	70.7	70	66.2	70.7	69.2	70.8	70.2	71.4	70.5	69.5	69.5	69.4	70.2	71.6	70.1	69.6	70.8	70.2
Chloride	16887-00-6	mg/L	NA	250	NA	250	19.5	20.2	20.1	20.9	18.6	20.5	20.4	19.9	18.6	20.8	18.8	20.4	20.5	20.9	18.7	16.6	18.5	18.4	17.7	19.4
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1	0.0015 J	0.0025 J	0.0016 J	0.0019 J	0.0023 J	0.0024 J	0.0019 J	0.0016 J	0.0019 J	0.0023 J	0.0025 J	0.0024 J	0.0018 J	0.002 J	0.0018 J	0.0056 J	0.0017 J	0.0018 J	0.003 J	0.0019 J
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006											0.0012 J	0.001 J				0.0022 J		0.001 J	0.0011 J	
Fluoride	16984-48-8	mg/L	4	2	0.8	4	0.52	0.55	0.52	0.55	0.52	0.54	0.55	0.52	0.5 J	0.57		0.5	0.53	0.54	0.5 J		0.37 J			0.31 J
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015	0.00056 J	0.00076 J	0.00072 J	0.0011	0.0011	0.001	0.00062 J	0.00068 J	0.00088 J	0.00098 J	0.0013	0.0012	0.001	0.00088 J	0.00077 J	0.0033	0.0011	0.0011	0.0013	0.0015
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002																				
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0033 J	0.0031 J	0.0028 J	0.0036 J	0.0029 J	0.0035 J	0.0035 J	0.0031 J	0.0031 J	0.0029 J	0.0036 J	0.0033 J	0.0031 J	0.0034 J	0.0032 J	0.0062 J	0.0038 J	0.003 J	0.003 J	0.0032 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0015 J	0.0017 J	0.0018 J	0.0018 J	0.0017 J	0.0015 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J	0.0018 J	0.0017 J	0.0017 J	0.0017 J	0.0017 J	0.0019 J	0.0019 J	0.0019 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	250	NA	250	209	210	203	212	210	209	210	213	208	205	215	210	210	213	211	208	210	224	206	211
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002																				
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	284,000	291,000	287,000	285,000	268,000	287,000	281,000	287,000	285,000	289,000	286,000	282,000	283,000	283,000	285,000	291,000	285,000	283,000	287,000	284,000
Total Dissolved Solids	TDS	mg/L	NA	500	NA	500	539	553	548	550	544	532	541	531	540	541	550	543	546	516	555	524	538	551	547	551

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Value is estimated.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in November 2014.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5d
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO
HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River					Missouri River					Missouri River					Missouri River				
							River Upstream					River Downstream					River Further Downstream					River Furthest Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4AS Filtered	LBD-R-5AS Filtered	LBD-R-5AM Filtered	LBD-R-6AS Filtered	LBD-R-6AM Filtered	LBD-R-1AS Filtered	LBD-R-2AS Filtered	LBD-R-2AM Filtered	LBD-R-3AS Filtered	LBD-R-3AM Filtered	LBD-R-10S Filtered	LBD-R-11S Filtered	LBD-R-11M Filtered	LBD-R-12S Filtered	LBD-R-12M Filtered	LBD-R-7S Filtered	LBD-R-8S Filtered	LBD-R-8M Filtered	LBD-R-9S Filtered	LBD-R-9M Filtered
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006																				
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0024	0.0027	0.0023	0.0026	0.0026	0.0028	0.0024	0.0022	0.0026	0.0026	0.0026	0.0027	0.0025	0.0026	0.0023	0.0027	0.0028	0.0026	0.0025	0.0027
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.111	0.108	0.11	0.11	0.0999	0.111	0.113	0.11	0.109	0.109	0.112	0.111	0.111	0.11	0.109	0.113	0.111	0.111	0.109	0.111
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004																				
Boron	7440-42-8	mg/L	NA	NA	4	4	0.109	0.107	0.108	0.108	0.103	0.113	0.113	0.111	0.108	0.11	0.11	0.109	0.11	0.109	0.11	0.11	0.108	0.108	0.105	0.108
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005																				
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	70.2	67.8	68.7	67.8	62.5	70.7	69.8	69.4	68.6	69.4	68.6	68.4	68.5	69.4	69.2	69	67.8	68.7	68.7	69.1
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1																				
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006																				
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015																				
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002																				
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0036 J	0.0038 J	0.0037 J	0.0041 J	0.0027 J	0.0031 J	0.0035 J	0.0036 J	0.0034 J	0.0037 J	0.0037 J	0.004 J	0.0048 J	0.004 J	0.0034 J	0.0059 J	0.0038 J	0.004 J	0.0035 J	0.0036 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0016 J	0.0017 J	0.0017 J	0.0018 J	0.0016 J	0.0015 J	0.0017 J	0.0016 J	0.0015 J	0.0016 J	0.0015 J	0.0016 J	0.0017 J	0.0015 J	0.0017 J	0.0016 J	0.0017 J	0.0015 J	0.0019 J	0.0017 J
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002																				

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Value is estimated.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in November 2014.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5e
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River River Upstream					Missouri River River Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4S Total	LBD-R-5S Total	LBD-R-5M Total	LBD-R-6S Total	LBD-R-6M Total	LBD-R-1S Total	LBD-R-2S Total	LBD-R-2M Total	LBD-R-3S Total	LBD-R-3M Total
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006										
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.005	0.005	0.0048	0.0047	0.0047	0.0044	0.0045	0.0047	0.0048	0.0049
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.113	0.119	0.12	0.123	0.119	0.113	0.122	0.123	0.123	0.124
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004										
Boron	7440-42-8	mg/L	NA	NA	4	4	0.111	0.114	0.114	0.115	0.113	0.12	0.121	0.123	0.118	0.119
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005										
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	62.3	63.5	63.4	65.1	64.5	63.8	64.7	63.6	64.2	65.5
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1	0.0022 J	0.0026 J	0.0029 J	0.0031 J	0.0023 J	0.0023 J	0.0027 J	0.0031 J	0.0029 J	0.0032 J
Cobalt*	7440-48-4	mg/L	NA	NA	0.006	0.006										
Fluoride	16984-48-8	mg/L	4	2	0.8	4	0.41 J	0.48 J	0.45 J	0.51 J	0.44 J	0.5 J	0.47 J	0.48 J	0.47 J	0.43 J
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015	0.0015	0.0018	0.0018	0.0019	0.0019	0.0015	0.0018	0.0018	0.0019	0.0019
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002										
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.004 J	0.0044 J	0.0042 J	0.0043 J	0.0041 J	0.0044 J	0.0044 J	0.0044 J	0.0044 J	0.0041 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0016 J	0.0018 J	0.0016 J	0.0017 J	0.0018 J	0.0017 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	250	NA	250	194	194	193	194	197	174	187	193	189	192
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	249	254	253	260	257	255	258	254	256	261

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in October 2013.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium
that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 5f
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Missouri River River Upstream					Missouri River River Downstream				
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-R-4S Filtered	LBD-R-5S Filtered	LBD-R-5M Filtered	LBD-R-6S Filtered	LBD-R-6M Filtered	LBD-R-1S Filtered	LBD-R-2S Filtered	LBD-R-2M Filtered	LBD-R-3S Filtered	LBD-R-3M Filtered
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006										
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0035	0.0035	0.0038	0.0037	0.0034	0.004	0.0037	0.0036	0.0033	0.0035
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.0928	0.0906	0.0917	0.0907	0.0886	0.0936	0.0912	0.0914	0.0915	0.0938
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004										
Boron	7440-42-8	mg/L	NA	NA	4	4	0.12	0.115	0.118	0.115	0.113	0.123	0.122	0.123	0.116	0.119
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005										
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1										
Cobalt*	7440-48-4	mg/L	NA	NA	0.006	0.006										
Fluoride	16984-48-8	mg/L	4	2	0.8	4	--	--	--	--	--	--	--	--	--	--
Lead*	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015										
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002										
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0035 J	0.0035 J	0.0041 J	0.0038 J	0.0036 J	0.0042 J	0.0039 J	0.0042 J	0.0036 J	0.0037 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05	0.0016 J	0.0015 J	0.0015 J	0.0016 J	0.0014 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J
Sulfate	14808-79-8	mg/L	NA	250	NA	250	--	--	--	--	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in October 2013.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium
that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(f) - Screening levels from the presented sources are not available for this constituent.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 6a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA	Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
			AWQC (b)	LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	0.64															
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.004	0.0041	0.0044	0.0044	0.0046	0.0042	0.0046	0.0046	0.0047	0.0045	0.0053	0.0041	0.0041	0.0045	0.0046
Barium	7440-39-3	mg/L	NA	0.146	0.173	0.18	0.184	0.193	0.173	0.201	0.201	0.198	0.204	0.162	0.181	0.169	0.187	0.192
Beryllium*	7440-41-7	mg/L	NA															
Boron	7440-42-8	mg/L	NA	0.0787 J	0.0814 J	0.0824 J	0.0812 J	0.0836 J	0.085 J	0.0903 J	0.0885 J	0.0898 J	0.0916 J	0.0818 J	0.0829 J	0.0813 J	0.0849 J	0.0833 J
Cadmium	7440-43-9	mg/L	NA						0.00059 J							0.00054 J		
Calcium	7440-70-2	mg/L	NA	74.1	75.1	76.8	76.2	79	72.8	77	77.2	78.6	77.8	75.4	76.7	75.9	79.6	78.9
Chloride	16887-00-6	mg/L	NA	22.5	22.8	22.7	23.5	23.9	23.8	24	24.5	25.1	25.2	22.6	22.8	22.6	23.6	23.3
Chromium	7440-47-3	mg/L	NA	0.0024 J	0.005	0.007	0.0064	0.0068	0.0052	0.0071	0.0076	0.0059	0.0075	0.0033 J	0.0067	0.0048 J	0.0061	0.0068
Cobalt	7440-48-4	mg/L	NA	0.002 J	0.0029 J	0.0034 J	0.0037 J	0.0039 J	0.0028 J	0.0038 J	0.0044 J	0.0035 J	0.0033 J	0.0028 J	0.0028 J	0.0028 J	0.0028 J	0.0032 J
Fluoride	16984-48-8	mg/L	NA	0.36	0.37	0.36	0.38	0.37	0.39	0.42	0.4	0.41	0.41	0.37	0.36	0.36	0.37	0.38
Lead	7439-92-1	mg/L	NA		0.0052 J	0.0046 J	0.004 J	0.0046 J	0.0057 J	0.0051 J	0.006 J	0.006 J	0.0054 J	0.0034 J		0.0057 J	0.0079 J	0.0038 J
Lithium	7439-93-2	mg/L	NA	0.0354	0.0353	0.0379	0.038	0.0396	0.0379	0.0408	0.0403	0.0414	0.0428	0.0357	0.0377	0.0366	0.0386	0.0398
Mercury*	7439-97-6	mg/L	NA															
Molybdenum	7439-98-7	mg/L	NA	0.0022 J	0.0026 J	0.003 J	0.0025 J	0.003 J	0.0021 J	0.0024 J	0.002 J	0.002 J	0.0026 J	0.0026 J	0.0026 J	0.0027 J	0.0029 J	0.0028 J
Selenium	7782-49-2	mg/L	4.2	0.0074 J	0.007 J	0.0077 J	0.0076 J							0.009 J				
Sulfate	14808-79-8	mg/L	NA	176	178	177	183	180	172	173	174	179	180	175	178	179	185	186
Thallium*	7440-28-0	mg/L	0.00047															
Total Hardness as CaCO3	471-34-1	mg/L	NA	301	304	310	308	319	302	316	316	319	319	304	311	307	320	318
Total Dissolved Solids	TDS	mg/L	NA	506	507	491	491	488	479	505	506	517	523	500	505	509	519	522

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River Further Downstream					Missouri River Furthest Downstream				
				LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0039	0.0041	0.0042	0.0045	0.0044	0.0034	0.0046	0.0043	0.0044	0.0045
Barium	7440-39-3	mg/L	NA	0.17	0.163	0.158	0.18	0.194	0.128	0.178	0.19	0.188	0.174
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.0825 J	0.0825 J	0.0818 J	0.0873 J	0.0854 J	0.0814 J	0.0879 J	0.0869 J	0.0875 J	0.0899 J
Cadmium	7440-43-9	mg/L	NA	0.0005 J									
Calcium	7440-70-2	mg/L	NA	76.6	76	78.5	75.7	79.8	72.5	78.6	80.2	78.9	82.6
Chloride	16887-00-6	mg/L	NA	22.8	22.4	22.7	23	22.9	22.5	23	23	23.5	23.8
Chromium	7440-47-3	mg/L	NA	0.0051	0.0042 J	0.0023 J	0.0054	0.0066	0.0016 J	0.0047 J	0.0073	0.0064	0.0048 J
Cobalt	7440-48-4	mg/L	NA	0.0024 J	0.0027 J	0.0024 J	0.0029 J	0.0037 J	0.0013 J	0.0036 J	0.0036 J	0.0033 J	0.0024 J
Fluoride	16984-48-8	mg/L	NA	0.36	0.36	0.36	0.37	0.37	0.36	0.37	0.37	0.37	0.39
Lead	7439-92-1	mg/L	NA		0.0034 J	0.0043 J	0.0051 J	0.005 J		0.003 J	0.0048 J	0.0046 J	0.0057 J
Lithium	7439-93-2	mg/L	NA	0.0368	0.0349	0.036	0.0412	0.0415	0.0342	0.039	0.0396	0.0379	0.04
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0028 J	0.0023 J	0.0023 J	0.0021 J	0.0028 J	0.0024 J	0.0029 J	0.0028 J	0.0029 J	0.0025 J
Selenium	7782-49-2	mg/L	4.2	0.0088 J						0.0102 J	0.0065 J	0.0089 J	0.0063 J
Sulfate	14808-79-8	mg/L	NA	175	178	178	181	179	176	180	181	187	187
Thallium*	7440-28-0	mg/L	0.00047										
Total Hardness as CaCO3	471-34-1	mg/L	NA	310	307	315	308	323	296	317	325	319	331
Total Dissolved Solids	TDS	mg/L	NA	492	519	486	517	508	481	512	513	525	519

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS -
DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
				LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	0.64															
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0031	0.003	0.003	0.003	0.0029	0.0029	0.0029	0.0032	0.003	0.0029	0.003	0.003	0.0029	0.0032	0.003
Barium	7440-39-3	mg/L	NA	0.111	0.108	0.11	0.111	0.111	0.109	0.106	0.108	0.103	0.111	0.107	0.109	0.103	0.113	0.109
Beryllium	7440-41-7	mg/L	NA						0.00017 J									
Boron	7440-42-8	mg/L	NA	0.081 J	0.0806 J	0.0785 J	0.0846 J	0.0837 J	0.0817 J	0.0798 J	0.0777 J	0.0765 J	0.0805 J	0.079 J	0.0859 J	0.078 J	0.0842 J	0.0836 J
Cadmium*	7440-43-9	mg/L	NA															
Calcium	7440-70-2	mg/L	NA	71.7	71.5	71.1	72.2	73	70.5	69.3	70.4	67.4	71.5	68.5	72	68.1	72.4	71
Chromium*	7440-47-3	mg/L	NA															
Cobalt	7440-48-4	mg/L	NA								0.00099 J							
Lead*	7439-92-1	mg/L	NA															
Lithium	7439-93-2	mg/L	NA	0.0328	0.0334	0.0361	0.0357	0.036	0.038	0.0348	0.0371	0.0355	0.0362	0.0331	0.0335	0.0314	0.0359	0.0351
Mercury*	7439-97-6	mg/L	NA															
Molybdenum	7439-98-7	mg/L	NA	0.0026 J	0.0029 J	0.0029 J	0.0031 J	0.0026 J	0.0028 J	0.0028 J	0.0025 J	0.0024 J	0.0029 J	0.003 J	0.0028 J	0.0027 J	0.003 J	0.0026 J
Selenium	7782-49-2	mg/L	4.2	0.0069 J	0.007 J	0.0103 J												
Thallium*	7440-28-0	mg/L	0.00047															

Notes:
Blank cells - Non-detect value.
J - Estimated value.
* - Constituent was not detected in any samples.
mg/L - milligrams per liter.
AWQC - Ambient Water Quality Criteria.
NA - Not Available.
CAS - Chemical Abstracts Service.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS -
DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River Further Downstream					Missouri River Furthest Downstream				
				LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0027	0.0028	0.0028	0.003	0.003	0.0028	0.003	0.0028	0.0028	0.003
Barium	7440-39-3	mg/L	NA	0.107	0.112	0.112	0.109	0.11	0.114	0.107	0.105	0.112	0.114
Beryllium	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.0793 J	0.0838 J	0.0812 J	0.0777 J	0.0828 J	0.0825 J	0.082 J	0.0798 J	0.0849 J	0.0869 J
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	68.8	72.4	71.4	71	69.4	73.2	68.6	67.6	72.7	73.5
Chromium*	7440-47-3	mg/L	NA										
Cobalt	7440-48-4	mg/L	NA										
Lead*	7439-92-1	mg/L	NA										
Lithium	7439-93-2	mg/L	NA	0.035	0.0385	0.0354	0.0366	0.0328	0.0368	0.0344	0.0341	0.0363	0.0378
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0028 J	0.0029 J	0.0026 J	0.0021 J	0.0026 J	0.0027 J	0.0028 J	0.0031 J	0.003 J	0.0031 J
Selenium	7782-49-2	mg/L	4.2			0.0065 J				0.0074 J			
Thallium*	7440-28-0	mg/L	0.00047										

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6c
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH AWQC SCREENING LEVELS -

TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Upstream LBD-R-4AS Total	LBD-R-5AS Total	LBD-R-5AM Total	LBD-R-6AS Total	LBD-R-6AM Total	Missouri River River Downstream LBD-R-1AS Total	LBD-R-2AS Total	LBD-R-2AM Total	LBD-R-3AS Total	LBD-R-3AM Total
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0033	0.0032	0.0035	0.003	0.0031	0.0038	0.0032	0.0034	0.0034	0.0028
Barium	7440-39-3	mg/L	NA	0.124	0.131	0.128	0.132	0.118	0.134	0.124	0.129	0.13	0.131
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.111	0.112	0.109	0.111	0.109	0.115	0.111	0.113	0.11	0.11
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	69.9	71.7	70.7	70	66.2	70.7	69.2	70.8	70.2	71.4
Chloride	16887-00-6	mg/L	NA	19.5	20.2	20.1	20.9	18.6	20.5	20.4	19.9	18.6	20.8
Chromium	7440-47-3	mg/L	NA	0.0015 J	0.0025 J	0.0016 J	0.0019 J	0.0023 J	0.0024 J	0.0019 J	0.0016 J	0.0019 J	0.0023 J
Cobalt	7440-48-4	mg/L	NA										
Fluoride	16984-48-8	mg/L	NA	0.52	0.55	0.52	0.55	0.52	0.54	0.55	0.52	0.5 J	0.57
Lead	7439-92-1	mg/L	NA	0.00056 J	0.00076 J	0.00072 J	0.0011	0.0011	0.001	0.00062 J	0.00068 J	0.00088 J	0.00098 J
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0033 J	0.0031 J	0.0028 J	0.0036 J	0.0029 J	0.0035 J	0.0035 J	0.0031 J	0.0031 J	0.0029 J
Selenium	7782-49-2	mg/L	4.2	0.0015 J	0.0017 J	0.0018 J	0.0018 J	0.0017 J	0.0015 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	209	210	203	212	210	209	210	213	208	205
Thallium*	7440-28-0	mg/L	0.00047										
Total Hardness as CaCO3	471-34-1	mg/L	NA	284,000	291,000	287,000	285,000	268,000	287,000	281,000	287,000	285,000	289,000
Total Dissolved Solids	TDS	mg/L	NA	539	553	548	550	544	532	541	531	540	541

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6c
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH AWQC SCREENING LEVELS -

TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Further Downstream					Missouri River River Furthest Downstream				
				LBD-R-10S Total	LBD-R-11S Total	LBD-R-11M Total	LBD-R-12S Total	LBD-R-12M Total	LBD-R-7S Total	LBD-R-8S Total	LBD-R-8M Total	LBD-R-9S Total	LBD-R-9M Total
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0037	0.0033	0.0032	0.0035	0.0035	0.0046	0.0034	0.0034	0.0035	0.0037
Barium	7440-39-3	mg/L	NA	0.135	0.132	0.13	0.129	0.127	0.17	0.13	0.13	0.135	0.135
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.111	0.11	0.111	0.11	0.111	0.115	0.111	0.11	0.111	0.109
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	70.5	69.5	69.5	69.4	70.2	71.6	70.1	69.6	70.8	70.2
Chloride	16887-00-6	mg/L	NA	18.8	20.4	20.5	20.9	18.7	16.6	18.5	18.4	17.7	19.4
Chromium	7440-47-3	mg/L	NA	0.0025 J	0.0024 J	0.0018 J	0.002 J	0.0018 J	0.0056 J	0.0017 J	0.0018 J	0.003 J	0.0019 J
Cobalt	7440-48-4	mg/L	NA	0.0012 J	0.001 J				0.0022 J		0.001 J	0.0011 J	
Fluoride	16984-48-8	mg/L	NA		0.5	0.53	0.54	0.5 J		0.37 J			0.31 J
Lead	7439-92-1	mg/L	NA	0.0013	0.0012	0.001	0.00088 J	0.00077 J	0.0033	0.0011	0.0011	0.0013	0.0015
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0036 J	0.0033 J	0.0031 J	0.0034 J	0.0032 J	0.0062 J	0.0038 J	0.003 J	0.003 J	0.0032 J
Selenium	7782-49-2	mg/L	4.2	0.0018 J	0.0017 J	0.0017 J	0.0017 J	0.0017 J	0.0019 J	0.0019 J	0.0019 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	215	210	210	213	211	208	210	224	206	211
Thallium*	7440-28-0	mg/L	0.00047										
Total Hardness as CaCO3	471-34-1	mg/L	NA	286,000	282,000	283,000	283,000	285,000	291,000	285,000	283,000	287,000	284,000
Total Dissolved Solids	TDS	mg/L	NA	550	543	546	516	555	524	538	551	547	551

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6d
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH AWQC SCREENING LEVELS -

DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Upstream					Missouri River River Downstream				
				LBD-R-4AS Filtered	LBD-R-5AS Filtered	LBD-R-5AM Filtered	LBD-R-6AS Filtered	LBD-R-6AM Filtered	LBD-R-1AS Filtered	LBD-R-2AS Filtered	LBD-R-2AM Filtered	LBD-R-3AS Filtered	LBD-R-3AM Filtered
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0024	0.0027	0.0023	0.0026	0.0026	0.0028	0.0024	0.0022	0.0026	0.0026
Barium	7440-39-3	mg/L	NA	0.111	0.108	0.11	0.11	0.0999	0.111	0.113	0.11	0.109	0.109
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.109	0.107	0.108	0.108	0.103	0.113	0.113	0.111	0.108	0.11
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	70.2	67.8	68.7	67.8	62.5	70.7	69.8	69.4	68.6	69.4
Chromium*	7440-47-3	mg/L	NA										
Cobalt*	7440-48-4	mg/L	NA										
Lead*	7439-92-1	mg/L	NA										
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0036 J	0.0038 J	0.0037 J	0.0041 J	0.0027 J	0.0031 J	0.0035 J	0.0036 J	0.0034 J	0.0037 J
Selenium	7782-49-2	mg/L	4.2	0.0016 J	0.0017 J	0.0017 J	0.0018 J	0.0016 J	0.0015 J	0.0017 J	0.0016 J	0.0015 J	0.0016 J
Thallium*	7440-28-0	mg/L	0.00047										

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6d
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS TO HUMAN HEALTH AWQC SCREENING LEVELS -

DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Further Downstream					Missouri River River Furthest Downstream				
				LBD-R-10S Filtered	LBD-R-11S Filtered	LBD-R-11M Filtered	LBD-R-12S Filtered	LBD-R-12M Filtered	LBD-R-7S Filtered	LBD-R-8S Filtered	LBD-R-8M Filtered	LBD-R-9S Filtered	LBD-R-9M Filtered
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0026	0.0027	0.0025	0.0026	0.0023	0.0027	0.0028	0.0026	0.0025	0.0027
Barium	7440-39-3	mg/L	NA	0.112	0.111	0.111	0.11	0.109	0.113	0.111	0.111	0.109	0.111
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.11	0.109	0.11	0.109	0.11	0.11	0.108	0.108	0.105	0.108
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	68.6	68.4	68.5	69.4	69.2	69	67.8	68.7	68.7	69.1
Chromium*	7440-47-3	mg/L	NA										
Cobalt*	7440-48-4	mg/L	NA										
Lead*	7439-92-1	mg/L	NA										
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0037 J	0.004 J	0.0048 J	0.004 J	0.0034 J	0.0059 J	0.0038 J	0.004 J	0.0035 J	0.0036 J
Selenium	7782-49-2	mg/L	4.2	0.0015 J	0.0016 J	0.0017 J	0.0015 J	0.0017 J	0.0016 J	0.0017 J	0.0015 J	0.0019 J	0.0017 J
Thallium*	7440-28-0	mg/L	0.00047										

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6e
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO AWQC SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Upstream					Missouri River River Downstream				
				LBD-R-4S Total	LBD-R-5S Total	LBD-R-5M Total	LBD-R-6S Total	LBD-R-6M Total	LBD-R-1S Total	LBD-R-2S Total	LBD-R-2M Total	LBD-R-3S Total	LBD-R-3M Total
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.005	0.005	0.0048	0.0047	0.0047	0.0044	0.0045	0.0047	0.0048	0.0049
Barium	7440-39-3	mg/L	NA	0.113	0.119	0.12	0.123	0.119	0.113	0.122	0.123	0.123	0.124
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.111	0.114	0.114	0.115	0.113	0.12	0.121	0.123	0.118	0.119
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	62.3	63.5	63.4	65.1	64.5	63.8	64.7	63.6	64.2	65.5
Chromium	7440-47-3	mg/L	NA	0.0022 J	0.0026 J	0.0029 J	0.0031 J	0.0023 J	0.0023 J	0.0027 J	0.0031 J	0.0029 J	0.0032 J
Cobalt*	7440-48-4	mg/L	NA										
Fluoride	16984-48-8	mg/L	NA	0.41 J	0.48 J	0.45 J	0.51 J	0.44 J	0.5 J	0.47 J	0.48 J	0.47 J	0.43 J
Lead	7439-92-1	mg/L	NA	0.0015	0.0018	0.0018	0.0019	0.0019	0.0015	0.0018	0.0018	0.0019	0.0019
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.004 J	0.0044 J	0.0042 J	0.0043 J	0.0041 J	0.0044 J	0.0044 J	0.0044 J	0.0044 J	0.0041 J
Selenium	7782-49-2	mg/L	4.2	0.0016 J	0.0018 J	0.0016 J	0.0017 J	0.0018 J	0.0017 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	194	194	193	194	197	174	187	193	189	192
Thallium*	7440-28-0	mg/L	0.00047										
Total Hardness as CaCO3	471-34-1	mg/L	NA	249	254	253	260	257	255	258	254	256	261

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Scienceand Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 6f
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO AWQC SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Missouri River River Upstream					Missouri River River Downstream				
				LBD-R-4S Filtered	LBD-R-5S Filtered	LBD-R-5M Filtered	LBD-R-6S Filtered	LBD-R-6M Filtered	LBD-R-1S Filtered	LBD-R-2S Filtered	LBD-R-2M Filtered	LBD-R-3S Filtered	LBD-R-3M Filtered
Antimony*	7440-36-0	mg/L	0.64										
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0035	0.0035	0.0038	0.0037	0.0034	0.004	0.0037	0.0036	0.0033	0.0035
Barium	7440-39-3	mg/L	NA	0.0928	0.0906	0.0917	0.0907	0.0886	0.0936	0.0912	0.0914	0.0915	0.0938
Beryllium*	7440-41-7	mg/L	NA										
Boron	7440-42-8	mg/L	NA	0.12	0.115	0.118	0.115	0.113	0.123	0.122	0.123	0.116	0.119
Cadmium*	7440-43-9	mg/L	NA										
Calcium	7440-70-2	mg/L	NA	--	--	--	--	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	NA										
Cobalt*	7440-48-4	mg/L	NA										
Fluoride	16984-48-8	mg/L	NA	--	--	--	--	--	--	--	--	--	--
Lead*	7439-92-1	mg/L	NA										
Mercury*	7439-97-6	mg/L	NA										
Molybdenum	7439-98-7	mg/L	NA	0.0035 J	0.0035 J	0.0041 J	0.0038 J	0.0036 J	0.0042 J	0.0039 J	0.0042 J	0.0036 J	0.0037 J
Selenium	7782-49-2	mg/L	4.2	0.0016 J	0.0015 J	0.0015 J	0.0016 J	0.0014 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J
Sulfate	14808-79-8	mg/L	NA	--	--	--	--	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	0.00047										
Total Hardness as CaCO3	471-34-1	mg/L	NA	--	--	--	--	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Scienceand Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 7a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	NA	NA															
Arsenic	7440-38-2	mg/L	0.34	0.15	0.004	0.0041	0.0044	0.0044	0.0046	0.0042	0.0046	0.0046	0.0047	0.0045	0.0053	0.0041	0.0041	0.0045	0.0046
Barium	7440-39-3	mg/L	NA	NA	0.146	0.173	0.18	0.184	0.193	0.173	0.201	0.201	0.198	0.204	0.162	0.181	0.169	0.187	0.192
Beryllium*	7440-41-7	mg/L	NA	NA															
Boron	7440-42-8	mg/L	NA	NA	0.0787 J	0.0814 J	0.0824 J	0.0812 J	0.0836 J	0.085 J	0.0903 J	0.0885 J	0.0898 J	0.0916 J	0.0818 J	0.0829 J	0.0813 J	0.0849 J	0.0833 J
Cadmium*	7440-43-9	mg/L	0.0058 (d)	0.0020 (d)						0.00059 J							0.00054 J		
Calcium	7440-70-2	mg/L	NA	NA	74.1	75.1	76.8	76.2	79	72.8	77	77.2	78.6	77.8	75.4	76.7	75.9	79.6	78.9
Chloride	16887-00-6	mg/L	860	230	22.5	22.8	22.7	23.5	23.9	23.8	24	24.5	25.1	25.2	22.6	22.8	22.6	23.6	23.3
Chromium	7440-47-3	mg/L	4.59 (c,d)	0.219 (c,d)	0.0024 J	0.005	0.007	0.0064	0.0068	0.0052	0.0071	0.0076	0.0059	0.0075	0.0033 J	0.0067	0.0048 J	0.0061	0.0068
Cobalt	7440-48-4	mg/L	NA	NA	0.002 J	0.0029 J	0.0034 J	0.0037 J	0.0039 J	0.0028 J	0.0038 J	0.0044 J	0.0035 J	0.0033 J	0.0028 J	0.0028 J	0.0028 J	0.0028 J	0.0032 J
Fluoride	16984-48-8	mg/L	NA	NA	0.36	0.37	0.36	0.38	0.37	0.39	0.42	0.4	0.41	0.41	0.37	0.36	0.36	0.37	0.38
Lead	7439-92-1	mg/L	0.35 (d)	0.014 (d)		0.0052 J	0.0046 J	0.004 J	0.0046 J	0.0057 J	0.0051 J	0.006 J	0.006 J	0.0054 J	0.0034 J		0.0057 J	0.0079 J	0.0038 J
Lithium	7439-93-2	mg/L	NA	NA	0.0354	0.0353	0.0379	0.038	0.0396	0.0379	0.0408	0.0403	0.0414	0.0428	0.0357	0.0377	0.0366	0.0386	0.0398
Mercury*	7439-97-6	mg/L	0.0016	0.001															
Molybdenum	7439-98-7	mg/L	NA	NA	0.0022 J	0.0026 J	0.003 J	0.0025 J	0.003 J	0.0021 J	0.0024 J	0.002 J	0.002 J	0.0026 J	0.0026 J	0.0026 J	0.0027 J	0.0029 J	0.0028 J
Selenium	7782-49-2	mg/L	NA	3.1	0.0074 J	0.007 J	0.0077 J	0.0076 J							0.009 J				
Sulfate	14808-79-8	mg/L	NA	NA	176	178	177	183	180	172	173	174	179	180	175	178	179	185	186
Thallium*	7440-28-0	mg/L	NA	NA															
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	301	304	310	308	319	302	316	316	319	319	304	311	307	320	318
Total Dissolved Solids	TDS	mg/L	NA	NA	506	507	491	491	488	479	505	506	517	523	500	505	509	519	522

Notes:
Blank cells - Non-detect value.
J - Estimated value.
* Constituent was not detected in any samples.
mg/L - milligrams per liter.
AWQC - USEPA Ambient Water Quality Criteria.
NA - Not Available.
CAS - Chemical Abstracts Service.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

TABLE 7a
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River Further Downstream					Missouri River Furthest Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0039	0.0041	0.0042	0.0045	0.0044	0.0034	0.0046	0.0043	0.0044	0.0045
Barium	7440-39-3	mg/L	NA	NA	0.17	0.163	0.158	0.18	0.194	0.128	0.178	0.19	0.188	0.174
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.0825 J	0.0825 J	0.0818 J	0.0873 J	0.0854 J	0.0814 J	0.0879 J	0.0869 J	0.0875 J	0.0899 J
Cadmium*	7440-43-9	mg/L	0.0058 (d)	0.0020 (d)	0.0005 J									
Calcium	7440-70-2	mg/L	NA	NA	76.6	76	78.5	75.7	79.8	72.5	78.6	80.2	78.9	82.6
Chloride	16887-00-6	mg/L	860	230	22.8	22.4	22.7	23	22.9	22.5	23	23	23.5	23.8
Chromium	7440-47-3	mg/L	4.59 (c,d)	0.219 (c,d)	0.0051	0.0042 J	0.0023 J	0.0054	0.0066	0.0016 J	0.0047 J	0.0073	0.0064	0.0048 J
Cobalt	7440-48-4	mg/L	NA	NA	0.0024 J	0.0027 J	0.0024 J	0.0029 J	0.0037 J	0.0013 J	0.0036 J	0.0036 J	0.0033 J	0.0024 J
Fluoride	16984-48-8	mg/L	NA	NA	0.36	0.36	0.36	0.37	0.37	0.36	0.37	0.37	0.37	0.39
Lead	7439-92-1	mg/L	0.35 (d)	0.014 (d)		0.0034 J	0.0043 J	0.0051 J	0.005 J		0.003 J	0.0048 J	0.0046 J	0.0057 J
Lithium	7439-93-2	mg/L	NA	NA	0.0368	0.0349	0.036	0.0412	0.0415	0.0342	0.039	0.0396	0.0379	0.04
Mercury*	7439-97-6	mg/L	0.0016	0.001										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0028 J	0.0023 J	0.0023 J	0.0021 J	0.0028 J	0.0024 J	0.0029 J	0.0028 J	0.0029 J	0.0025 J
Selenium	7782-49-2	mg/L	NA	3.1	0.0088 J						0.0102 J	0.0065 J	0.0089 J	0.0063 J
Sulfate	14808-79-8	mg/L	NA	NA	175	178	178	181	179	176	180	181	187	187
Thallium*	7440-28-0	mg/L	NA	NA										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	310	307	315	308	323	296	317	325	319	331
Total Dissolved Solids	TDS	mg/L	NA	NA	492	519	486	517	508	481	512	513	525	519

Notes:
Blank cells - Non-detect value.
J - Estimated value.
* Constituent was not detected in any samples.
mg/L - milligrams per liter.
AWQC - USEPA Ambient Water Quality Criteria.
NA - Not Available.
CAS - Chemical Abstracts Service.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

TABLE 7b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River Upstream					Missouri River Adjacent					Missouri River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4BS	LBD-R-5BM	LBD-R-5BS	LBD-R-6BM	LBD-R-6BS	LBD-R-13BS	LBD-R-14BM	LBD-R-14BS	LBD-R-15BM	LBD-R-15BS	LBD-R-1BS	LBD-R-2BM	LBD-R-2BS	LBD-R-3BM	LBD-R-3BS
Antimony*	7440-36-0	mg/L	NA	NA															
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0031	0.003	0.003	0.003	0.0029	0.0029	0.0029	0.0032	0.003	0.0029	0.003	0.003	0.0029	0.0032	0.003
Barium	7440-39-3	mg/L	NA	NA	0.111	0.108	0.11	0.111	0.111	0.109	0.106	0.108	0.103	0.111	0.107	0.109	0.103	0.113	0.109
Beryllium	7440-41-7	mg/L	NA	NA						0.00017 J									
Boron	7440-42-8	mg/L	NA	NA	0.081 J	0.0806 J	0.0785 J	0.0846 J	0.0837 J	0.0817 J	0.0798 J	0.0777 J	0.0765 J	0.0805 J	0.079 J	0.0859 J	0.078 J	0.0842 J	0.0836 J
Cadmium*	7440-43-9	mg/L	0.0052 (d)	0.0017 (d)															
Calcium	7440-70-2	mg/L	NA	NA	71.7	71.5	71.1	72.2	73	70.5	69.3	70.4	67.4	71.5	68.5	72	68.1	72.4	71
Chromium*	7440-47-3	mg/L	1.45 (c,d)	0.19 (c,d)															
Cobalt	7440-48-4	mg/L	NA	NA								0.00099 J							
Lead*	7439-92-1	mg/L	0.218 (d)	0.0085 (d)															
Lithium	7439-93-2	mg/L	NA	NA	0.0328	0.0334	0.0361	0.0357	0.036	0.038	0.0348	0.0371	0.0355	0.0362	0.0331	0.0335	0.0314	0.0359	0.0351
Mercury*	7439-97-6	mg/L	0.0014	0.00077															
Molybdenum	7439-98-7	mg/L	NA	NA	0.0026 J	0.0029 J	0.0029 J	0.0031 J	0.0026 J	0.0028 J	0.0028 J	0.0025 J	0.0024 J	0.0029 J	0.003 J	0.0028 J	0.0027 J	0.003 J	0.0026 J
Selenium	7782-49-2	mg/L	NA	NA	0.0069 J	0.007 J	0.0103 J												
Thallium*	7440-28-0	mg/L	NA	NA															

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

TABLE 7b
COMPARISON OF MAY 2018 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River Further Downstream					Missouri River Furthest Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-10BS	LBD-R-11BM	LBD-R-11BS	LBD-R-12BM	LBD-R-12BS	LBD-R-7BS	LBD-R-8BM	LBD-R-8BS	LBD-R-9BM	LBD-R-9BS
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0027	0.0028	0.0028	0.003	0.003	0.0028	0.003	0.0028	0.0028	0.003
Barium	7440-39-3	mg/L	NA	NA	0.107	0.112	0.112	0.109	0.11	0.114	0.107	0.105	0.112	0.114
Beryllium	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.0793 J	0.0838 J	0.0812 J	0.0777 J	0.0828 J	0.0825 J	0.082 J	0.0798 J	0.0849 J	0.0869 J
Cadmium*	7440-43-9	mg/L	0.0052 (d)	0.0017 (d)										
Calcium	7440-70-2	mg/L	NA	NA	68.8	72.4	71.4	71	69.4	73.2	68.6	67.6	72.7	73.5
Chromium*	7440-47-3	mg/L	1.45 (c,d)	0.19 (c,d)										
Cobalt	7440-48-4	mg/L	NA	NA										
Lead*	7439-92-1	mg/L	0.218 (d)	0.0085 (d)										
Lithium	7439-93-2	mg/L	NA	NA	0.035	0.0385	0.0354	0.0366	0.0328	0.0368	0.0344	0.0341	0.0363	0.0378
Mercury*	7439-97-6	mg/L	0.0014	0.00077										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0028 J	0.0029 J	0.0026 J	0.0021 J	0.0026 J	0.0027 J	0.0028 J	0.0031 J	0.003 J	0.0031 J
Selenium	7782-49-2	mg/L	NA	NA			0.0065 J				0.0074 J			
Thallium*	7440-28-0	mg/L	NA	NA										

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 313 mg/L as CaCO3 used.

TABLE 7c
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River					Missouri River				
					River Upstream					River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4AS Total	LBD-R-5AS Total	LBD-R-5AM Total	LBD-R-6AS Total	LBD-R-6AM Total	LBD-R-1AS Total	LBD-R-2AS Total	LBD-R-2AM Total	LBD-R-3AS Total	LBD-R-3AM Total
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0033	0.0032	0.0035	0.003	0.0031	0.0038	0.0032	0.0034	0.0034	0.0028
Barium	7440-39-3	mg/L	NA	NA	0.124	0.131	0.128	0.132	0.118	0.134	0.124	0.129	0.13	0.131
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.111	0.112	0.109	0.111	0.109	0.115	0.111	0.113	0.11	0.11
Cadmium*	7440-43-9	mg/L	0.0053 (d)	0.0018 (d)										
Calcium	7440-70-2	mg/L	NA	NA	69.9	71.7	70.7	70	66.2	70.7	69.2	70.8	70.2	71.4
Chloride	16887-00-6	mg/L	860	230	19.5	20.2	20.1	20.9	18.6	20.5	20.4	19.9	18.6	20.8
Chromium	7440-47-3	mg/L	4.2 (c,d)	0.20 (c,d)	0.0015 J	0.0025 J	0.0016 J	0.0019 J	0.0023 J	0.0024 J	0.0019 J	0.0016 J	0.0019 J	0.0023 J
Cobalt	7440-48-4	mg/L	NA	NA										
Fluoride	16984-48-8	mg/L	NA	NA	0.52	0.55	0.52	0.55	0.52	0.54	0.55	0.52	0.5 J	0.57
Lead	7439-92-1	mg/L	0.31 (d)	0.012 (d)	0.00056 J	0.00076 J	0.00072 J	0.0011	0.0011	0.001	0.00062 J	0.00068 J	0.00088 J	0.00098 J
Mercury*	7439-97-6	mg/L	0.0016	0.00091										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0033 J	0.0031 J	0.0028 J	0.0036 J	0.0029 J	0.0035 J	0.0035 J	0.0031 J	0.0031 J	0.0029 J
Selenium	7782-49-2	mg/L	NA	3.1	0.0015 J	0.0017 J	0.0018 J	0.0018 J	0.0017 J	0.0015 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	NA	209	210	203	212	210	209	210	213	208	205
Thallium*	7440-28-0	mg/L	NA	NA										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	284,000	291,000	287,000	285,000	268,000	287,000	281,000	287,000	285,000	289,000
Total Dissolved Solids	TDS	mg/L	NA	NA	539	553	548	550	544	532	541	531	540	541

Notes:

Blank cells - Non-detect value.

* Constituent was not detected in any samples.

AWQC - USEPA Ambient Water Quality Criteria.

CAS - Chemical Abstracts Service.

J - Value is estimated.

mg/L - milligrams per liter.

NA - Not Available.

USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.

Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in November 2014.

(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.

(c) - Value for trivalent chromium used.

(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 7c
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River					Missouri River				
					River Further Downstream					River Furthest Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-10S Total	LBD-R-11S Total	LBD-R-11M Total	LBD-R-12S Total	LBD-R-12M Total	LBD-R-7S Total	LBD-R-8S Total	LBD-R-8M Total	LBD-R-9S Total	LBD-R-9M Total
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0037	0.0033	0.0032	0.0035	0.0035	0.0046	0.0034	0.0034	0.0035	0.0037
Barium	7440-39-3	mg/L	NA	NA	0.135	0.132	0.13	0.129	0.127	0.17	0.13	0.13	0.135	0.135
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.111	0.11	0.111	0.11	0.111	0.115	0.111	0.11	0.111	0.109
Cadmium*	7440-43-9	mg/L	0.0053 (d)	0.0018 (d)										
Calcium	7440-70-2	mg/L	NA	NA	70.5	69.5	69.5	69.4	70.2	71.6	70.1	69.6	70.8	70.2
Chloride	16887-00-6	mg/L	860	230	18.8	20.4	20.5	20.9	18.7	16.6	18.5	18.4	17.7	19.4
Chromium	7440-47-3	mg/L	4.2 (c,d)	0.20 (c,d)	0.0025 J	0.0024 J	0.0018 J	0.002 J	0.0018 J	0.0056 J	0.0017 J	0.0018 J	0.003 J	0.0019 J
Cobalt	7440-48-4	mg/L	NA	NA	0.0012 J	0.001 J				0.0022 J		0.001 J	0.0011 J	
Fluoride	16984-48-8	mg/L	NA	NA		0.5	0.53	0.54	0.5 J		0.37 J			0.31 J
Lead	7439-92-1	mg/L	0.31 (d)	0.012 (d)	0.0013	0.0012	0.001	0.00088 J	0.00077 J	0.0033	0.0011	0.0011	0.0013	0.0015
Mercury*	7439-97-6	mg/L	0.0016	0.00091										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0036 J	0.0033 J	0.0031 J	0.0034 J	0.0032 J	0.0062 J	0.0038 J	0.003 J	0.003 J	0.0032 J
Selenium	7782-49-2	mg/L	NA	3.1	0.0018 J	0.0017 J	0.0017 J	0.0017 J	0.0017 J	0.0019 J	0.0019 J	0.0019 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	NA	215	210	210	213	211	208	210	224	206	211
Thallium*	7440-28-0	mg/L	NA	NA										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	286,000	282,000	283,000	283,000	285,000	291,000	285,000	283,000	287,000	284,000
Total Dissolved Solids	TDS	mg/L	NA	NA	550	543	546	516	555	524	538	551	547	551

Notes:

Blank cells - Non-detect value.

* Constituent was not detected in any samples.

AWQC - USEPA Ambient Water Quality Criteria.

CAS - Chemical Abstracts Service.

J - Value is estimated.

mg/L - milligrams per liter.

NA - Not Available.

USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.

Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in November 2014.

(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.

(c) - Value for trivalent chromium used.

(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 7d
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River					Missouri River				
					River Upstream					River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4AS Filtered	LBD-R-5AS Filtered	LBD-R-5AM Filtered	LBD-R-6AS Filtered	LBD-R-6AM Filtered	LBD-R-1AS Filtered	LBD-R-2AS Filtered	LBD-R-2AM Filtered	LBD-R-3AS Filtered	LBD-R-3AM Filtered
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0024	0.0027	0.0023	0.0026	0.0026	0.0028	0.0024	0.0022	0.0026	0.0026
Barium	7440-39-3	mg/L	NA	NA	0.111	0.108	0.11	0.11	0.0999	0.111	0.113	0.11	0.109	0.109
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.109	0.107	0.108	0.108	0.103	0.113	0.113	0.111	0.108	0.11
Cadmium*	7440-43-9	mg/L	0.0048 (d)	0.0016 (d)										
Calcium	7440-70-2	mg/L	NA	NA	70.2	67.8	68.7	67.8	62.5	70.7	69.8	69.4	68.6	69.4
Chromium*	7440-47-3	mg/L	1.3 (c,d)	0.17 (c,d)										
Cobalt*	7440-48-4	mg/L	NA	NA										
Lead*	7439-92-1	mg/L	0.20 (d)	0.0077 (d)										
Mercury*	7439-97-6	mg/L	0.0014	0.00077										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0036 J	0.0038 J	0.0037 J	0.0041 J	0.0027 J	0.0031 J	0.0035 J	0.0036 J	0.0034 J	0.0037 J
Selenium	7782-49-2	mg/L	NA	NA	0.0016 J	0.0017 J	0.0017 J	0.0018 J	0.0016 J	0.0015 J	0.0017 J	0.0016 J	0.0015 J	0.0016 J
Thallium*	7440-28-0	mg/L	NA	NA										

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 7d
COMPARISON OF NOVEMBER 2014 MISSOURI RIVER SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River					Missouri River				
					River Further Downstream					River Furthest Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-10S Filtered	LBD-R-11S Filtered	LBD-R-11M Filtered	LBD-R-12S Filtered	LBD-R-12M Filtered	LBD-R-7S Filtered	LBD-R-8S Filtered	LBD-R-8M Filtered	LBD-R-9S Filtered	LBD-R-9M Filtered
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0026	0.0027	0.0025	0.0026	0.0023	0.0027	0.0028	0.0026	0.0025	0.0027
Barium	7440-39-3	mg/L	NA	NA	0.112	0.111	0.111	0.11	0.109	0.113	0.111	0.111	0.109	0.111
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.11	0.109	0.11	0.109	0.11	0.11	0.108	0.108	0.105	0.108
Cadmium*	7440-43-9	mg/L	0.0048 (d)	0.0016 (d)										
Calcium	7440-70-2	mg/L	NA	NA	68.6	68.4	68.5	69.4	69.2	69	67.8	68.7	68.7	69.1
Chromium*	7440-47-3	mg/L	1.3 (c,d)	0.17 (c,d)										
Cobalt*	7440-48-4	mg/L	NA	NA										
Lead*	7439-92-1	mg/L	0.20 (d)	0.0077 (d)										
Mercury*	7439-97-6	mg/L	0.0014	0.00077										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0037 J	0.004 J	0.0048 J	0.004 J	0.0034 J	0.0059 J	0.0038 J	0.004 J	0.0035 J	0.0036 J
Selenium	7782-49-2	mg/L	NA	NA	0.0015 J	0.0016 J	0.0017 J	0.0015 J	0.0017 J	0.0016 J	0.0017 J	0.0015 J	0.0019 J	0.0017 J
Thallium*	7440-28-0	mg/L	NA	NA										

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Value is estimated.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in November 2014.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 7e
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Missouri River River Upstream					Missouri River River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4S Total	LBD-R-5S Total	LBD-R-5M Total	LBD-R-6S Total	LBD-R-6M Total	LBD-R-1S Total	LBD-R-2S Total	LBD-R-2M Total	LBD-R-3S Total	LBD-R-3M Total
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.005	0.005	0.0048	0.0047	0.0047	0.0044	0.0045	0.0047	0.0048	0.0049
Barium	7440-39-3	mg/L	NA	NA	0.113	0.119	0.12	0.123	0.119	0.113	0.122	0.123	0.123	0.124
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.111	0.114	0.114	0.115	0.113	0.12	0.121	0.123	0.118	0.119
Cadmium*	7440-43-9	mg/L	0.0053 (d)	0.0018 (d)										
Calcium	7440-70-2	mg/L	NA	NA	62.3	63.5	63.4	65.1	64.5	63.8	64.7	63.6	64.2	65.5
Chromium	7440-47-3	mg/L	4.2 (c,d)	0.20 (c,d)	0.0022 J	0.0026 J	0.0029 J	0.0031 J	0.0023 J	0.0023 J	0.0027 J	0.0031 J	0.0029 J	0.0032 J
Cobalt*	7440-48-4	mg/L	NA	NA										
Fluoride	16984-48-8	mg/L	NA	NA	0.41 J	0.48 J	0.45 J	0.51 J	0.44 J	0.5 J	0.47 J	0.48 J	0.47 J	0.43 J
Lead	7439-92-1	mg/L	0.31 (d)	0.012 (d)	0.0015	0.0018	0.0018	0.0019	0.0019	0.0015	0.0018	0.0018	0.0019	0.0019
Mercury*	7439-97-6	mg/L	0.0016	0.00091										
Molybdenum	7439-98-7	mg/L	NA	NA	0.004 J	0.0044 J	0.0042 J	0.0043 J	0.0041 J	0.0044 J	0.0044 J	0.0044 J	0.0044 J	0.0041 J
Selenium	7782-49-2	mg/L	NA	3.1	0.0016 J	0.0018 J	0.0016 J	0.0017 J	0.0018 J	0.0017 J	0.0016 J	0.0017 J	0.0017 J	0.0017 J
Sulfate	14808-79-8	mg/L	NA	NA	194	194	193	194	197	174	187	193	189	192
Thallium*	7440-28-0	mg/L	NA	NA										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	249	254	253	260	257	255	258	254	256	261

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 7f
COMPARISON OF OCTOBER 2013 MISSOURI RIVER SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality		Missouri River River Upstream					Missouri River River Downstream				
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-R-4S Filtered	LBD-R-5S Filtered	LBD-R-5M Filtered	LBD-R-6S Filtered	LBD-R-6M Filtered	LBD-R-1S Filtered	LBD-R-2S Filtered	LBD-R-2M Filtered	LBD-R-3S Filtered	LBD-R-3M Filtered
Antimony*	7440-36-0	mg/L	NA	NA										
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0035	0.0035	0.0038	0.0037	0.0034	0.004	0.0037	0.0036	0.0033	0.0035
Barium	7440-39-3	mg/L	NA	NA	0.0928	0.0906	0.0917	0.0907	0.0886	0.0936	0.0912	0.0914	0.0915	0.0938
Beryllium*	7440-41-7	mg/L	NA	NA										
Boron	7440-42-8	mg/L	NA	NA	0.12	0.115	0.118	0.115	0.113	0.123	0.122	0.123	0.116	0.119
Cadmium*	7440-43-9	mg/L	0.0048 (d)	0.0016 (d)										
Calcium	7440-70-2	mg/L	NA	NA	--	--	--	--	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	1.3 (c,d)	0.17 (c,d)										
Cobalt*	7440-48-4	mg/L	NA	NA										
Fluoride	16984-48-8	mg/L	NA	NA	--	--	--	--	--	--	--	--	--	--
Lead*	7439-92-1	mg/L	0.20 (d)	0.0077 (d)										
Mercury*	7439-97-6	mg/L	0.0014	0.00077										
Molybdenum	7439-98-7	mg/L	NA	NA	0.0035 J	0.0035 J	0.0041 J	0.0038 J	0.0036 J	0.0042 J	0.0039 J	0.0042 J	0.0036 J	0.0037 J
Selenium	7782-49-2	mg/L	NA	NA	0.0016 J	0.0015 J	0.0015 J	0.0016 J	0.0014 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J	0.0016 J
Sulfate	14808-79-8	mg/L	NA	NA	--	--	--	--	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	NA	NA										
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	--	--	--	--	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for the Missouri River of 284.5 mg/L as CaCO3 used.

TABLE 8a
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Labadie Creek Upstream			Labadie Creek Downstream		
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006						
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0036	0.0036	0.0032	0.0044	0.0045	0.0045
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.136	0.136	0.132	0.168	0.17	0.171
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004						
Boron	7440-42-8	mg/L	NA	NA	4	4	0.0736 J	0.0731 J	0.0711 J	0.0955 J	0.0997 J	0.099 J
Cadmium	7440-43-9	mg/L	0.005	NA	0.0092	0.005					0.00089 J	
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	48.3	47.8	46.7	53.7	54.3	54.7
Chloride	16887-00-6	mg/L	NA	250	NA	250	28.8	28.6	28.6	29.9	30.1	30
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1				0.0013 J	0.0013 J	0.0013 J
Cobalt	7440-48-4	mg/L	NA	NA	0.006	0.006		0.00089 J	0.0011 J	0.0016 J	0.0013 J	0.0016 J
Fluoride	16984-48-8	mg/L	4	2	0.8	4	0.24	0.24	0.23	0.27	0.26	0.26
Lead*	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015						
Lithium*	7439-93-2	mg/L	NA	NA	0.04	0.04						
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002						
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.002 J	0.0019 J	0.0019 J	0.0034 J	0.0036 J	0.0036 J
Selenium*	7782-49-2	mg/L	0.05	NA	0.1	0.05						
Sulfate	14808-79-8	mg/L	NA	250	NA	250	19	19.1	19.1	26.4	25.4	24.8
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002						
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	225	222	218	237	240	242
Total Dissolved Solids	TDS	mg/L	NA	500	NA	500	309	304	304	350	342	334

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 8b
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Labadie Creek Upstream			Labadie Creek Downstream		
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006						
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.003	0.003	0.0016	0.0033	0.0036	0.0037
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.13	0.121	0.09	0.155	0.156	0.156
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004						
Boron	7440-42-8	mg/L	NA	NA	4	4	0.0723 J	0.0797	0.0478 J	0.0995 J	0.098 J	0.097 J
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005						
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	51	51	61.7	57.8	57.4	57.6
Chromium*	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1						
Cobalt*	7440-48-4	mg/L	NA	NA	0.006	0.006				0.00098 J		
Lead*	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015						
Lithium*	7439-93-2	mg/L	NA	NA	0.04	0.04						
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002						
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0024 J			0.004 J	0.0039 J	0.0041 J
Selenium*	7782-49-2	mg/L	0.05	NA	0.1	0.05						
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002						

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
CAS - Chemical Abstracts Service.
J - Estimated value.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in May 2018.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 8c
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Labadie Creek					
							Creek Upstream			Creek Downstream		
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-C-4 Total	LBD-C-5 Total	LBD-C-6 Total	LBD-C-1 Total	LBD-C-2 Total	LBD-C-3 Total
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006						
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0056	0.0055	0.0061	0.0065	0.0061	0.0066
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.124	0.122	0.125	0.161	0.164	0.172
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004						
Boron	7440-42-8	mg/L	NA	NA	4	4	0.166	0.164	0.167	0.0978	0.0959	0.0999
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005						
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	65.6	64.4	65.7	56.1	55.4	57.7
Chromium	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1				0.0026 J	0.0027 J	0.0031 J
Cobalt*	7440-48-4	mg/L	NA	NA	0.006	0.006						
Fluoride*	16984-48-8	mg/L	4	2	0.8	4						
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015	0.00014 J	0.00013 J	0.0002 J	0.0017	0.0018	0.0021
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002						
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0029 J	0.0024 J	0.0024 J	0.0092 J	0.0055 J	0.0046 J
Selenium*	7782-49-2	mg/L	0.05	NA	0.1	0.05						
Sulfate	14808-79-8	mg/L	NA	250	NA	250	17.8 J	17.6 J	16.6 J	19.4 J	16.3 J	15.3 J
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002						
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	291	286	291	249	246	256

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
CAS - Chemical Abstracts Service.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
J - Estimated value.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in October 2013.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium
that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 8d
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Screening Levels			Selected Drinking Water Screening Level (h)	Labadie Creek Creek Upstream			Labadie Creek Creek Downstream		
			USEPA MCLs (b)	USEPA SMCLs (b)	USEPA Tapwater RSLs (c)		LBD-C-4 Filtered	LBD-C-5 Filtered	LBD-C-6 Filtered	LBD-C-1 Filtered	LBD-C-2 Filtered	LBD-C-3 Filtered
Antimony*	7440-36-0	mg/L	0.006	NA	0.0078	0.006						
Arsenic	7440-38-2	mg/L	0.01	NA	0.000052	0.01	0.0056	0.0051	0.0051	0.0039	0.0039	0.0043
Barium	7440-39-3	mg/L	2	NA	3.8	2	0.116	0.118	0.12	0.141	0.145	0.146
Beryllium*	7440-41-7	mg/L	0.004	NA	0.025	0.004						
Boron	7440-42-8	mg/L	NA	NA	4	4	0.165	0.169	0.17	0.108	0.1	0.0994
Cadmium*	7440-43-9	mg/L	0.005	NA	0.0092	0.005						
Calcium	7440-70-2	mg/L	NA	NA	NA	NA	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	0.1 (e)	NA	22 (f)	0.1						
Cobalt*	7440-48-4	mg/L	NA	NA	0.006	0.006						
Fluoride	16984-48-8	mg/L	4	2	0.8	4	--	--	--	--	--	--
Lead	7439-92-1	mg/L	0.015 (g)	NA	0.015	0.015				0.0001 J		
Mercury*	7439-97-6	mg/L	0.002	NA	0.0057 (d)	0.002						
Molybdenum	7439-98-7	mg/L	NA	NA	0.1	0.1	0.0018 J	0.0022 J	0.002 J	0.0036 J	0.0031 J	0.003 J
Selenium	7782-49-2	mg/L	0.05	NA	0.1	0.05						
Sulfate	14808-79-8	mg/L	NA	250	NA	250	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	0.002	NA	0.0002	0.002						
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	NA	NA	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
CAS - Chemical Abstracts Service.
MCL - Maximum Contaminant Level.
mg/L - milligrams per liter.
J - Estimated value.
NA - Not Available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level.
USEPA - United States Environmental Protection Agency.

Detected Concentration > Selected Drinking Water Screening Level.

(a) - Surface water samples collected in October 2013.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. Spring 2018.
http://water.epa.gov/drink/contaminants/index.cfm
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
(d) - RSL for Mercuric Chloride used for Mercury.
(e) - The drinking water standard or MCL for chromium is based on total chromium.
(f) - Value for trivalent chromium used. USEPA provides a screening level for hexavalent chromium
that is not a drinking water standard, the basis of which has been questioned by USEPA's Science Advisory Board.
(g) - The Action Level presented is recommended in the USEPA Drinking Water Standards.
(h) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.

TABLE 9a
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Labadie Creek Upstream			Labadie Creek Downstream		
				LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	0.64						
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0036	0.0036	0.0032	0.0044	0.0045	0.0045
Barium	7440-39-3	mg/L	NA	0.136	0.136	0.132	0.168	0.17	0.171
Beryllium*	7440-41-7	mg/L	NA						
Boron	7440-42-8	mg/L	NA	0.0736 J	0.0731 J	0.0711 J	0.0955 J	0.0997 J	0.099 J
Cadmium	7440-43-9	mg/L	NA					0.00089 J	
Calcium	7440-70-2	mg/L	NA	48.3	47.8	46.7	53.7	54.3	54.7
Chloride	16887-00-6	mg/L	NA	28.8	28.6	28.6	29.9	30.1	30
Chromium	7440-47-3	mg/L	NA				0.0013 J	0.0013 J	0.0013 J
Cobalt	7440-48-4	mg/L	NA		0.00089 J	0.0011 J	0.0016 J	0.0013 J	0.0016 J
Fluoride	16984-48-8	mg/L	NA	0.24	0.24	0.23	0.27	0.26	0.26
Lead*	7439-92-1	mg/L	NA						
Lithium*	7439-93-2	mg/L	NA						
Mercury*	7439-97-6	mg/L	NA						
Molybdenum	7439-98-7	mg/L	NA	0.002 J	0.0019 J	0.0019 J	0.0034 J	0.0036 J	0.0036 J
Selenium*	7782-49-2	mg/L	4.2						
Sulfate	14808-79-8	mg/L	NA	19	19.1	19.1	26.4	25.4	24.8
Thallium*	7440-28-0	mg/L	0.00047						
Total Hardness as CaCO3	471-34-1	mg/L	NA	225	222	218	237	240	242
Total Dissolved Solids	TDS	mg/L	NA	309	304	304	350	342	334

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 9b
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO HUMAN HEALTH AWQC SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Labadie Creek Upstream			Labadie Creek Downstream		
				LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	0.64						
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.003	0.003	0.0016	0.0033	0.0036	0.0037
Barium	7440-39-3	mg/L	NA	0.13	0.121	0.09	0.155	0.156	0.156
Beryllium*	7440-41-7	mg/L	NA						
Boron	7440-42-8	mg/L	NA	0.0723 J	0.0797	0.0478 J	0.0995 J	0.098 J	0.097 J
Cadmium*	7440-43-9	mg/L	NA						
Calcium	7440-70-2	mg/L	NA	51	51	61.7	57.8	57.4	57.6
Chromium*	7440-47-3	mg/L	NA						
Cobalt*	7440-48-4	mg/L	NA				0.00098 J		
Lead*	7439-92-1	mg/L	NA						
Lithium*	7439-93-2	mg/L	NA						
Mercury*	7439-97-6	mg/L	NA						
Molybdenum	7439-98-7	mg/L	NA	0.0024 J			0.004 J	0.0039 J	0.0041 J
Selenium*	7782-49-2	mg/L	4.2						
Thallium*	7440-28-0	mg/L	0.00047						

Notes:
Blank cells - Non-detect value.
* - Constituent was not detected in any samples.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only
apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 9c
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO AWQC SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA	Labadie Creek					
				Creek Upstream			Creek Downstream		
			AWQC (b)	LBD-C-4 Total	LBD-C-5 Total	LBD-C-6 Total	LBD-C-1 Total	LBD-C-2 Total	LBD-C-3 Total
Antimony*	7440-36-0	mg/L	0.64						
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0056	0.0055	0.0061	0.0065	0.0061	0.0066
Barium	7440-39-3	mg/L	NA	0.124	0.122	0.125	0.161	0.164	0.172
Beryllium*	7440-41-7	mg/L	NA						
Boron	7440-42-8	mg/L	NA	0.166	0.164	0.167	0.0978	0.0959	0.0999
Cadmium*	7440-43-9	mg/L	NA						
Calcium	7440-70-2	mg/L	NA	65.6	64.4	65.7	56.1	55.4	57.7
Chromium	7440-47-3	mg/L	NA				0.0026 J	0.0027 J	0.0031 J
Cobalt*	7440-48-4	mg/L	NA						
Fluoride*	16984-48-8	mg/L	NA						
Lead	7439-92-1	mg/L	NA	0.00014 J	0.00013 J	0.0002 J	0.0017	0.0018	0.0021
Mercury*	7439-97-6	mg/L	NA						
Molybdenum	7439-98-7	mg/L	NA	0.0029 J	0.0024 J	0.0024 J	0.0092 J	0.0055 J	0.0046 J
Selenium*	7782-49-2	mg/L	4.2						
Sulfate	14808-79-8	mg/L	NA	17.8 J	17.6 J	16.6 J	19.4 J	16.3 J	15.3 J
Thallium*	7440-28-0	mg/L	0.00047						
Total Hardness as CaCO3	471-34-1	mg/L	NA	291	286	291	249	246	256

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology. Accessed November 2014.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 9d
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO AWQC SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	USEPA AWQC (b)	Labadie Creek Creek Upstream			Labadie Creek Creek Downstream		
				LBD-C-4 Filtered	LBD-C-5 Filtered	LBD-C-6 Filtered	LBD-C-1 Filtered	LBD-C-2 Filtered	LBD-C-3 Filtered
Antimony*	7440-36-0	mg/L	0.64						
Arsenic	7440-38-2	mg/L	0.00014 (c)	0.0056	0.0051	0.0051	0.0039	0.0039	0.0043
Barium	7440-39-3	mg/L	NA	0.116	0.118	0.12	0.141	0.145	0.146
Beryllium*	7440-41-7	mg/L	NA						
Boron	7440-42-8	mg/L	NA	0.165	0.169	0.17	0.108	0.1	0.0994
Cadmium*	7440-43-9	mg/L	NA						
Calcium (f)	7440-70-2	mg/L	NA	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	NA						
Cobalt*	7440-48-4	mg/L	NA						
Fluoride	16984-48-8	mg/L	NA	--	--	--	--	--	--
Lead	7439-92-1	mg/L	NA				0.0001 J		
Mercury*	7439-97-6	mg/L	NA						
Molybdenum	7439-98-7	mg/L	NA	0.0018 J	0.0022 J	0.002 J	0.0036 J	0.0031 J	0.003 J
Selenium	7782-49-2	mg/L	4.2						
Sulfate	14808-79-8	mg/L	NA	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	0.00047						
Total Hardness as CaCO3 (f)	471-34-1	mg/L	NA	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration > AWQC.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology. Accessed November 2014.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
USEPA AWQC Human Health for the Consumption of Organism Only apply to total concentrations.
(c) - Value applies to inorganic form of arsenic only.

TABLE 10a
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Labadie Creek Upstream			Labadie Creek Downstream		
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	NA	NA						
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0036	0.0036	0.0032	0.0044	0.0045	0.0045
Barium	7440-39-3	mg/L	NA	NA	0.136	0.136	0.132	0.168	0.17	0.171
Beryllium*	7440-41-7	mg/L	NA	NA						
Boron	7440-42-8	mg/L	NA	NA	0.0736 J	0.0731 J	0.0711 J	0.0955 J	0.0997 J	0.099 J
Cadmium	7440-43-9	mg/L	0.0043 (d)	0.0015 (d)					0.00089 J	
Calcium	7440-70-2	mg/L	NA	NA	48.3	47.8	46.7	53.7	54.3	54.7
Chloride	16887-00-6	mg/L	860	230	28.8	28.6	28.6	29.9	30.1	30
Chromium	7440-47-3	mg/L	3.6 (c,d)	0.17 (c,d)				0.0013 J	0.0013 J	0.0013 J
Cobalt	7440-48-4	mg/L	NA	NA		0.00089 J	0.0011 J	0.0016 J	0.0013 J	0.0016 J
Fluoride	16984-48-8	mg/L	NA	NA	0.24	0.24	0.23	0.27	0.26	0.26
Lead*	7439-92-1	mg/L	0.24 (d)	0.0092 (d)						
Lithium*	7439-93-2	mg/L	NA	NA						
Mercury*	7439-97-6	mg/L	0.0016	0.00091						
Molybdenum	7439-98-7	mg/L	NA	NA	0.002 J	0.0019 J	0.0019 J	0.0034 J	0.0036 J	0.0036 J
Selenium*	7782-49-2	mg/L	NA	3.1						
Sulfate	14808-79-8	mg/L	NA	NA	19	19.1	19.1	26.4	25.4	24.8
Thallium*	7440-28-0	mg/L	NA	NA						
Total Hardness as CaCO3	471-34-1	mg/L	NA	NA	225	222	218	237	240	242
Total Dissolved Solids	TDS	mg/L	NA	NA	309	304	304	350	342	334

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Analyzed/Not Available.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for Labadie Creek of 231 mg/L as CaCO3 used.

TABLE 10b
COMPARISON OF MAY 2018 LABADIE CREEK SURFACE WATER RESULTS
TO ECOLOGICAL SCREENING LEVELS - DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Labadie Creek Upstream			Labadie Creek Downstream		
			USEPA Aquatic Life AWQC Freshwater Acute (c)	USEPA Aquatic Life AWQC Freshwater Chronic (c)	LBD-C-4BS 5/17/2018	LBD-C-5BS 5/17/2018	LBD-C-6BS 5/17/2018	LBD-C-1BS 5/17/2018	LBD-C-2BS 5/17/2018	LBD-C-3BS 5/17/2018
Antimony*	7440-36-0	mg/L	NA	NA						
Arsenic	7440-38-2	mg/L	0.34	0.15	0.003	0.003	0.0016	0.0033	0.0036	0.0037
Barium	7440-39-3	mg/L	NA	NA	0.13	0.121	0.09	0.155	0.156	0.156
Beryllium*	7440-41-7	mg/L	NA	NA						
Boron	7440-42-8	mg/L	NA	NA	0.0723 J	0.0797	0.0478 J	0.0995 J	0.098 J	0.097 J
Cadmium*	7440-43-9	mg/L	0.0039 (d)	0.0013 (d)						
Calcium	7440-70-2	mg/L	NA	NA	51	51	61.7	57.8	57.4	57.6
Chromium*	7440-47-3	mg/L	1.1 (c,d)	0.15 (c,d)						
Cobalt*	7440-48-4	mg/L	NA	NA				0.00098 J		
Lead*	7439-92-1	mg/L	0.16 (d)	0.0062 (d)						
Lithium*	7439-93-2	mg/L	NA	NA						
Mercury*	7439-97-6	mg/L	0.0014	0.00077						
Molybdenum	7439-98-7	mg/L	NA	NA	0.0024 J			0.004 J	0.0039 J	0.0041 J
Selenium*	7782-49-2	mg/L	NA	NA						
Thallium*	7440-28-0	mg/L	NA	NA						

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
U - Constituent was not detected.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in May 2018.
(b) - USEPA National Recommended Water Quality Criteria.
USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for Labadie Creek of 231 mg/L as CaCO3 used.

TABLE 10c
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS - TOTAL (UNFILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Labadie Creek					
			USEPA Aquatic Life AWQC Freshwater	USEPA Aquatic Life AWQC Freshwater	Creek Upstream			Creek Downstream		
					LBD-C-4 Total	LBD-C-5 Total	LBD-C-6 Total	LBD-C-1 Total	LBD-C-2 Total	LBD-C-3 Total
Antimony*	7440-36-0	mg/L	NA	NA						
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0056	0.0055	0.0061	0.0065	0.0061	0.0066
Barium	7440-39-3	mg/L	NA	NA	0.124	0.122	0.125	0.161	0.164	0.172
Beryllium*	7440-41-7	mg/L	NA	NA						
Boron	7440-42-8	mg/L	NA	NA	0.166	0.164	0.167	0.0978	0.0959	0.0999
Cadmium*	7440-43-9	mg/L	0.0050 (g)	0.0017 (g)						
Calcium (h)	7440-70-2	mg/L	NA	NA	65.6	64.4	65.7	56.1	55.4	57.7
Chromium	7440-47-3	mg/L	4.1 (e,g)	0.19 (e,g)				0.0026 J	0.0027 J	0.0031 J
Cobalt*	7440-48-4	mg/L	NA	NA						
Fluoride*	16984-48-8	mg/L	NA	NA						
Lead	7439-92-1	mg/L	0.29 (g)	0.011 (g)	0.00014 J	0.00013 J	0.0002 J	0.0017	0.0018	0.0021
Mercury*	7439-97-6	mg/L	0.0016	0.00091						
Molybdenum	7439-98-7	mg/L	NA	NA	0.0029 J	0.0024 J	0.0024 J	0.0092 J	0.0055 J	0.0046 J
Selenium*	7782-49-2	mg/L	NA	3.1						
Sulfate	14808-79-8	mg/L	NA	NA	17.8 J	17.6 J	16.6 J	19.4 J	16.3 J	15.3 J
Thallium*	7440-28-0	mg/L	NA	NA						
Total Hardness as CaCO3 (h)	471-34-1	mg/L	NA	NA	291	286	291	249	246	256

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for Labadie Creek of 270 mg/L as CaCO3 used.

TABLE 10d
COMPARISON OF OCTOBER 2013 LABADIE CREEK SURFACE WATER RESULTS TO ECOLOGICAL SCREENING LEVELS
- DISSOLVED (FILTERED) SAMPLE RESULTS (a)
AMEREN MISSOURI LABADIE ENERGY CENTER
FRANKLIN COUNTY, MISSOURI

Constituent	CAS	Units	Federal Water Quality Criteria		Labadie Creek Creek Upstream			Labadie Creek Creek Downstream		
			USEPA Aquatic Life AWQC Freshwater Acute (b)	USEPA Aquatic Life AWQC Freshwater Chronic (b)	LBD-C-4 Filtered	LBD-C-5 Filtered	LBD-C-6 Filtered	LBD-C-1 Filtered	LBD-C-2 Filtered	LBD-C-3 Filtered
Antimony*	7440-36-0	mg/L	NA	NA						
Arsenic	7440-38-2	mg/L	0.34	0.15	0.0056	0.0051	0.0051	0.0039	0.0039	0.0043
Barium	7440-39-3	mg/L	NA	NA	0.116	0.118	0.12	0.141	0.145	0.146
Beryllium*	7440-41-7	mg/L	NA	NA						
Boron	7440-42-8	mg/L	NA	NA	0.165	0.169	0.17	0.108	0.1	0.0994
Cadmium*	7440-43-9	mg/L	0.0045 (d)	0.0015 (d)						
Calcium	7440-70-2	mg/L	NA	NA	--	--	--	--	--	--
Chromium*	7440-47-3	mg/L	1.3 (c,d)	0.17 (c,d)						
Cobalt*	7440-48-4	mg/L	NA	NA						
Fluoride	16984-48-8	mg/L	NA	NA	--	--	--	--	--	--
Lead	7439-92-1	mg/L	0.19 (d)	0.0073 (d)				0.0001 J		
Mercury*	7439-97-6	mg/L	0.0014	0.00077						
Molybdenum	7439-98-7	mg/L	NA	NA	0.0018 J	0.0022 J	0.002 J	0.0036 J	0.0031 J	0.003 J
Selenium	7782-49-2	mg/L	NA	NA						
Sulfate	14808-79-8	mg/L	NA	NA	--	--	--	--	--	--
Thallium*	7440-28-0	mg/L	NA	NA						
Total Hardness as CaCO3	HARDNESS	mg/L	NA	NA	--	--	--	--	--	--

Notes:
Blank cells - Non-detect value.
* Constituent was not detected in any samples.
-- - Constituent not included in this analysis.
AWQC - USEPA Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
J - Estimated value.
mg/L - milligrams per liter.
NA - Not Available.
USEPA - United States Environmental Protection Agency.

Detected Concentration> USEPA Aquatic Life AWQC Chronic.
Detected Concentration> USEPA Aquatic Life AWQC Acute and Chronic.

(a) - Surface water samples collected in October 2013.
(b) - USEPA National Recommended Water Quality Criteria. USEPA Office of Water and Office of Science and Technology.
http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
Total values provided. Values adjusted for site-specific hardness - see note (d).
USEPA provides AWQC for both total and dissolved results.
(c) - Value for trivalent chromium used.
(d) - Hardness dependent value for total metals. Site-specific total recoverable mean hardness value for Labadie Creek of 270 mg/L as CaCO3 used.

TABLE 11
COMPARISON OF BLUFF AREA GROUNDWATER MONITORING RESULTS TO HUMAN HEALTH DRINKING WATER SCREENING LEVELS (a)
LABADIE ENERGY CENTER, FRANKLIN COUNTY, MO
AMEREN MISSOURI

Monitoring Well ID (e)	Date	Boron mg/L	Calcium mg/L	Chloride mg/L	Fluoride mg/L	Sulfate mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Lead mg/L	Mercury mg/L	Molybdenum mg/L	Selenium mg/L	Thallium mg/L
MCL (b)		NA	NA	NA	4	NA	0.006	0.01	2	0.004	0.005	0.1	NA	0.015	0.002	NA	0.05	0.002
SMCL (b)		NA	NA	250	2	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RSL (c)		4	NA	NA	0.8	NA	0.0078	0.000052	3.8	0.025	0.0092	22	0.006	0.015	0.0057	0.1	0.1	0.0002
Selected Drinking Water Screening Level (d)		4	NA	250	4	250	0.006	0.01	2	0.004	0.005	0.1	0.006	0.015	0.002	0.1	0.05	0.002
TGP-A	Apr-12			5.8	0.2	13			0.21			0.0029	--	0.0031		--		
	Mar-14	0.0094	70.9	--		15.3		0.00087	0.211			0.0034		0.00062		0.002	0.00064	
	Sep-14	0.009	69.4	--		15.1		0.0011	0.216			0.0036		0.00055	0.000063		0.00062	
DUP-1 (f)	Apr-12			5.7	0.18	14			0.22			0.0034	--	0.0037		--		
	Mar-14		71.2	--		15.4		0.00085	0.214			0.0048		0.0005			0.00062	
TGP-B	Apr-12			29	0.25	25	0.0026		0.1			0.0025	--	0.0036		--		
	Mar-14	0.0164	77.6	--		22.5		0.0021	0.106			0.0029		0.00015		0.0024		
	Sep-14	0.0168	73.8	--	0.34	23.2		0.00089	0.105			0.0027				0.0021		
DUP-1 (g)	Sep-14	0.0159	72.4	--		23.7		0.00095	0.102			0.0029			0.000097			
TGP-C	Apr-12			43	0.16	34			0.15			0.0013	--	0.0044		--		
	Mar-14	0.0088	79.1	--		27.8		0.00082	0.177					0.0011			0.00087	
	Sep-14	0.0531	73.9	--		28.8		0.00088	0.202			0.0022		0.0013			0.0012	
TGP-D	Mar-14	0.0144	72.0	--		14.1			0.147			0.0017		0.00015		0.002	0.0012	
	Sep-14	0.0114	66.4	--		15.9			0.151					0.00027			0.0013	
TGP-E	Mar-14	0.0465	79.5	--		21.8		0.0016	0.122					0.00016		0.0022		
	Sep-14	0.0399	77.2	--	0.34	23.1			0.127			0.0016						
TGP-F	Sep-14	0.113	76.2	--	0.3	25.2		0.0061	0.111			0.0029		0.0036		0.002	0.00072	
TGP-G	Sep-14	0.0063	93.6	--	0.32	27.7		0.00088	0.114			0.0029				0.0032		

Notes:
-- Constituent not sampled.
Blank data cells indicate a non-detect value.
HI - Hazard Index.
MCL - Maximum Contaminant Level.
mg/L - Milligrams per liter.
NA - Not available.
RSL - Regional Screening Level.
SMCL - Secondary Maximum Contaminant Level. Value used if no MCL available.
USEPA - United States Environmental Protection Agency.
(a) - Numerical values were obtained from the Ameren Missouri Labadie Energy Center Utility Waste Landfill, Solid Waste Disposal Area, Franklin County, Missouri, Solid Waste Disposal Area, Franklin County, Laboratory Analytical Results for Groundwater Monitoring Samples Collected on April 12-13, 2012, March 12th and 25th, 2014, and September 3rd through October 6th 2014 from Temporary Groundwater Piezometers Installed Near Labadie Plant.
(b) - USEPA 2018 Edition of the Drinking Water Standards and Health Advisories. https://www.epa.gov/dwstandardsregulations/2018-drinking-water-standards-and-advisory-tables
(c) - USEPA Regional Screening Levels (November 2018). Values for tapwater. HI = 1. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
(d) - Selected Drinking Water Screening Level uses the following hierarchy:
Federal USEPA MCL for Drinking Water.
Federal USEPA SMCL for Drinking Water.
Federal November 2018 USEPA Tapwater RSL.
(e) - Piezometers are screened in bedrock.
(f) - Duplicate sample from TGP-A.
g) - Duplicate sample from TGP-B.

Detected Concentration > Selected Drinking Water Screening Level.

APPENDIX B

What You Need to Know About Molybdenum

WHAT YOU NEED TO KNOW ABOUT MOLYBDENUM

Molybdenum is the one constituent that is present in at least one groundwater sample at each of the four Ameren energy centers in Missouri above the screening level used by the U.S. Environmental Protection Agency (USEPA) under the Coal Combustion Residuals (CCR) Rule. The purpose of this fact sheet is to provide information on molybdenum so that data can be considered in context. There is no public exposure to groundwater at the Ameren energy centers and concentration levels of molybdenum in adjacent surface waters are all well below health-based regulatory standards.

SOURCES OF INFORMATION ON MOLYBDENUM

Molybdenum had been evaluated by regulatory and health agencies in the U.S. As discussed below, molybdenum is an essential nutrient for humans, and the Institute of Medicine of the U.S. National Academy of Sciences (NAS) has provided recommended daily allowances and tolerable upper limits to be used as guidelines for vitamins and supplements and other exposures (NAS, 2001).

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency within the U.S. Department of Health and Human Services. The ATSDR Toxicological Profile for Molybdenum (ATSDR, 2017) provides a comprehensive summary and interpretation of available toxicological and epidemiological information on molybdenum and provides information on the naturally occurring levels in our environment and in our diet.

The U.S. Environmental Protection Agency (USEPA) published an oral toxicity value for molybdenum in 1992 (USEPA, 1992); this value serves as the basis for the tapwater screening level for molybdenum of 0.1 milligrams per liter (mg/L) or 100 micrograms per liter (ug/L) that was included in the Phase 1 Part update to the CCR Rule (USEPA, 2018a).

MOLYBDENUM IS NATURALLY OCCURRING AND AN ESSENTIAL NUTRIENT FOR PLANTS AND HUMANS

Molybdenum is a naturally occurring trace element that can be found extensively in nature. Biologically, molybdenum plays an important role as a micronutrient in plants and animals, including humans.

Molybdenum in Our Natural Environment

Molybdenum naturally accumulates in poorly drained soils and soils with high organic content (for example, peat bogs and wetlands). It is also present at high concentrations in “black shales,” which are shale deposits with high organic content. The U.S. Geological Survey (USGS, 2013) reports that the average concentration in U.S. soils is approximately 1 milligram per kilogram of soil (mg/kg). USGS (2011) estimates the median concentration of molybdenum in groundwater is 0.001 milligrams per liter (mg/L), with most concentrations below 0.008 mg/L.

Molybdenum in Our Diet

Molybdenum is considered an essential nutrient or trace element for living beings. It is required in several mammalian enzyme systems and is present in most adult multi-vitamins. A deficiency syndrome has only been seen in people with a genetic defect that prevents the synthesis of a specific enzyme for which molybdenum is a cofactor. The deficiency leads to severe neurological damage and early death.

Because it is present in soils, it is also present in our diet. Food derived from above ground plants, such as legumes, leafy vegetables, and cauliflower generally has a relatively higher concentration of molybdenum in comparison to food from tubers or animals. Beans, cereal grains, leafy vegetables, legumes, liver, and milk are reported as the richest sources of molybdenum in the average diet (ATSDR, 2017). The amount of molybdenum in plants varies according to the amount in the soil. The National Academy of Sciences (NAS) has estimated that the average dietary intakes of molybdenum by adult men and women are 0.109 and 0.076 milligrams per day (mg/day), respectively. A study of the dietary intake of adult residents in Denver, Colorado reported a mean molybdenum ingestion rate of 180 µg/day (range 120–240 µg/day) (ATSDR, 2017).

Molybdenum for Health

How Much Do You Need - Daily Allowance:

The Institute of Medicine of the NAS sets dietary intake values for essential nutrients. The recommended dietary allowance (RDA) for a nutrient is "the average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) health individuals" (NAS, 2001). The RDA for molybdenum for adults set by the NAS in 2001 is 0.045 milligram per day (mg/day) and is based on the amount of molybdenum needed to achieve a steady healthy balance in the body for the majority of the population.

How Much is Too Much - Upper Limits:

In addition to the RDA, the NAS also defines a Tolerable Upper Intake Level (UL) for essential nutrients. The UL is "the highest average daily nutrient intake level that is likely to pose no risk of adverse health effects to almost all individuals in the general population." Thus, the RDA is a level that is considered to be sufficient for the health of the general population, while intake can be as high as the UL and pose no adverse health effects.

The UL for molybdenum set by the NAS is 2 mg/day. This level is based on an evaluation of the potential toxicity of molybdenum at high levels of intake. The most sensitive effect in the literature is associated with reproductive outcomes in rats, and the study was used to develop an oral toxicity value for humans of 0.03 milligrams of molybdenum ingested per day per kilogram of body weight (mg/kg-day). This value is used with an average adult body weight of 68-70 kg (154 lbs) to set the UL[1].

[1] The oral toxicity value identifies a level of intake in terms of milligrams of constituent per kilogram of body weight per day (mg/kg-day) that is considered to be safe for daily exposure for a lifetime. The oral toxicity value is used to calculate a safe drinking water level as follows: if the oral toxicity value is 0.03 mg/kg-day, and a 70 kg adult that consumes 2 liters of water per day, then the safe drinking water level = (0.03 mg/kg-day) x (70 kg) ÷ (2 liters water/day) = 1.05 milligrams per liter (mg/L).

USEPA'S ORAL TOXICITY VALUE FOR MOLYBDENUM

USEPA developed a lower oral toxicity value for molybdenum of 0.005 mg/kg-day (USEPA, 1992) based on a 1962 study of a small population (52 exposure subjects) in Armenia that had a high level of molybdenum in their diet. This population had high levels of uric acid and experienced gout. The findings from the Armenian study have not been replicated, and other regulatory bodies such as the NAS and ATSDR have rejected the study due to its many deficiencies. [It is likely that the observance of gout in the Armenian population had some other cause.]

The NAS concluded that there were "serious methodological difficulties with the [Armenian] study" and noted that no other studies in humans or animals have replicated this effect. The NAS toxicity value is 0.03 mg/kg-day, six-fold higher than the USEPA value. Based on the NAS toxicity value and USEPA assumptions (for body weight and drinking water intake) results in a calculated safe drinking water level of 0.6 mg/L or 600 ug/L.

ATSDR noted the study of the Armenian population was not considered suitable for derivation of a chronic-duration oral toxicity value for molybdenum due to deficiencies in the control group size and composition, and a lack of controlling for confounders, such as diet and alcohol, that could affect the results. ATSDR developed an oral toxicity value of 0.008 mg/kg-day, using the same study reproductive outcomes in rats as the NAS, but applying different assumptions, most notably a 3-fold higher uncertainty factor. Based on the ATSDR toxicity value and USEPA assumptions (for body weight and drinking water intake) results in a calculated safe drinking water level of 0.16 mg/L or 160 ug/L.

MOLYBDENUM UNDER THE CCR RULE

When the CCR Rule was published in 2015, groundwater standards were provided only for those Appendix IV constituents that have primary drinking water standards published by the USEPA under the Safe Drinking Water Act – values known as MCLs or maximum contaminant levels. Molybdenum does not have an MCL[2]. In a subsequent 2018 CCR rule-making, USEPA designated a health-based groundwater protection standard for molybdenum of 0.1 mg/L or 100 ug/L. That is the value used to evaluate groundwater at the Ameren facilities. This level is very conservative and could be much higher and still protective of human health, as described above. [Note that in its March 3, 2019 report the Environmental Integrity Project used a screening level for molybdenum of 0.04 mg/L (or 40 ug/L), which is not the level USEPA has required in the CCR Rule.]

However, based on the USEPA toxicity value, the drinking water levels USEPA has developed for molybdenum are:

[2] USEPA is in the process of gathering information on the occurrence of molybdenum in public drinking water systems. The decision to develop an MCL (which is a multi-year process) is based on occurrence in public drinking water systems, the severity of adverse health effects, whether the constituent is present in public drinking water systems at levels of public health concern, and whether regulation would provide a meaningful opportunity for health risk reduction. No decision has yet been made as to whether molybdenum will be a candidate for the development of a drinking standard. Note that when USEPA included molybdenum for public water supply testing, it cited USEPA 1992, ATSDR 2017, and NAS 2001 as toxicity references. No mention was made of the differences in toxicity studies used or the values developed.

- 0.1 mg/L – The USEPA tapwater value in its Regional Screening Level (RSL) table and the value identified by USEPA for the CCR Rule (USEPA, 2018b). This is the value USEPA uses in the CCR Rule (USEPA, 2018a).
- 0.2 mg/L – The USEPA Office of Water value for the Drinking Water Equivalent Level (DWEL), which is a *lifetime exposure* concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a constituent is from drinking water (USEPA, 2018c).
- 0.04 mg/L – The USEPA Office of Water value for the Health Advisory Level (HA), which is based on the DWEL, but using a default assumption that only 20% of intake can come from water (USEPA, 2018c).

Therefore, drinking water concentrations of molybdenum up to 0.2 mg/L to are expected to be **without** adverse health effects. Based on the NAS review, daily exposure to drinking water concentrations of molybdenum up to 0.6 mg/L would be **without** adverse health effects.

WHAT THIS MEANS FOR THE AMEREN ENERGY CENTERS

This information from the NAS has been used to evaluate the levels of molybdenum in groundwater at the Ameren Energy Centers and in nearby surface waters. A total of 930 groundwater and surface water samples were collected from the four energy centers. The concentration levels in approximately 866 samples were below the screening level based on the National Academy of Science Tolerable Upper Intake Level (UL), while 241 are above the GWPS established by USEPA in the CCR Rule.

	Labadie	Meramec	Rush Island	Sioux
Groundwater				
Number of Samples	208	88	77	244
Molybdenum greater than CCR GWPS of 0.1 mg/L (a)	81	35	38	77
Molybdenum greater than NAS standard of 0.6 mg/L (b)	3	1	11	49
Surface Water				
Number of Samples	67	74	50	80
Molybdenum greater than 0.1 mg/L (a)	0	0	0	0

Notes:
mg/L - milligrams per liter.
(a) - Drinking water-based groundwater protection standard specified in the Coal Combustion Residuals Rule.
(b) - Alternative health-protective drinking water screening level based on the National Academy of Sciences review of molybdenum.

The groundwater results were collected from monitoring wells placed as close as practical to the ash basins' boundaries and provide near-source groundwater monitoring results. The groundwater downgradient of each of the Ameren ash basins is not used as a source of drinking water. Deep bedrock groundwater used as drinking water in the vicinity of Labadie and in the vicinity of Rush Island was sampled and demonstrated no impacts from CCR.

Surface water adjacent to each of the energy centers was sampled and all results for molybdenum in surface water are well below the USEPA drinking water screening level of 0.1 mg/L.

Thus, although there are some results for molybdenum in groundwater that are above the USEPA drinking water screening level, the groundwater at these facilities is not used as a source of drinking water, and molybdenum is not present in any of the adjacent water bodies above the drinking water screening level. These results confirm that molybdenum does not pose a risk to human health or the environment at any of the Ameren facilities.

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APPENDIX C

Extraction and Transportation Study

ADDENDUM

Meramec, Labadie and Sioux Ash Pond Closure: Extraction and Transportation Assessment

Lochmueller Group applied the methodology from the Extraction and Transportation Study for the Rush Island Energy Center to develop high-level estimates of the costs and timeframes associated with hypothetical CCR excavation processes at the Labadie, Sioux and Meramec Energy Centers. Specifically, the formula used to estimate daily productivity (i.e. number of trucks hauling excavated material offsite) was adapted for use at Labadie, Sioux and Meramec along with site-specific considerations.

Estimates from the Rush Island Study assumed a maximum of 192 truck loads per day over an 8-hour work day (24 per hour), with 155 to 193 days of annual operation. Once loaded, trucks would make multiple roundtrips to the closest available commercial landfill. Such estimates assume that the excavation, staging, and loading process is capable of accommodating a steady stream of trucks loading **every 2.5 minutes** and that such material can be quickly unloaded at the receiving commercial landfill without significant delay. While such productivity rates are undoubtedly optimistic, the resulting estimates nevertheless are useful in capturing the enormity of such projects and are sufficient at a planning-level.

It is important to note that the existing onsite utility waste landfills (UWLs) at Labadie and Sioux were designed and permitted to manage production needs of the energy centers through each facility's retirement date. To facilitate permanent storage, excavated CCR material would need to be transported offsite to a commercial landfill **or** Ameren Missouri would need to permit and construct new onsite landfills. Given the absence of an existing utility waste landfill at Meramec, onsite disposal options were considered for the Labadie and Sioux locations only.

Each facility presents unique challenges that are likely to impact cost estimates and closure times beyond the scope of this assessment. For example, the regulatory process for construction of an onsite landfill would require multiple levels of approval, including environmental permits, zoning or land use authorization, and potentially a certificate of issuance from the Missouri Public Service Commission. Opposition to such projects may further delay the regulatory approval process such that it would be years *before* construction could commence.[1]

---

[1] Efforts to permit and construct the Labadie UWL commenced in 2008 with the completion of Preliminary Site Investigation (PSI). The landfill was placed in service in 2016 after years of opposition from environmental groups and litigation. See *Petition for Writ of Certiorari [to invalidate county landfill ordinance] Franklin County Circ. Ct., 11/23/11, Case # 11AB-C286; Appeal to Franklin County Board of Adjustment, #14-00002, Filed 1/8/14 (of Land Use Administrator 10/10/13 and 12/10/13 Decisions), Denied by BZA 6/24/14; Appealed to Circ. Ct. by Writ of Certiorari, Cause # 14AB-CC00155, 7/24/14; Intervention and Motion to Dismiss in PSC Case EA 2012-0281, Ameren Application to PSC for CCN to operate landfill (PSC overruled Motion to Dismiss on 4/17/13); Administrative Hearing Commission Petition for Review [of MDNR Solid Waste Disposal Construction Permit], Filed 1-30-15, #15-0136, dismissed by AHC 3/5/15. See also Campbell v. County Commission of Franklin County, 453 S.W.3d 762 (Mo. banc 2015).*

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Based on experience, it would be virtually impossible to sustain productivity at the planning level rate over extended, multi-year timeframe due to a variety of unpredictable factors. Excavation activities could be limited or precluded for several days following weather events. Other potential disruptions could include:

- loading equipment failure
- site restrictions that limit the number of excavation equipment
- traffic congestion on travel route
- truck breakdown
- staffing
- weather conditions
- commercial landfill available capacity in Illinois and Missouri
- landfill unloading equipment failure

In addition, site specific conditions can impact productivity. For example, an elementary school is located along Fine Road between the Meramec Energy Center and Telegraph Road. To accommodate local safety concerns, the hauling company would likely limit trips during the beginning and end of the school day, thereby limiting effective hauling hours to 5-6 per day during the school year.

Route 94 east of the Sioux Energy Center travels beneath multiple narrow, low-clearance railroad overpasses in the West Alton area. An entirely new roadway by-passing West Alton would avoid the railroad entirely, but would require regulatory approvals, land acquisition, and potentially eminent domain. Assumptions were adjusted to account for these impacts, but it is not possible to foresee every challenge and quantify every impact likely to surface.

Scenarios:

The following summarizes the assessment of five scenarios for CCR removal for the Meramec, Labadie and the Sioux Energy Centers. The assessment utilized the same methodology, assumptions, and unit costing information as for Rush Island. The volume of ash, hauling distances, and the anticipated infrastructure upgrades were adjusted for each site.

For each scenario, the total volume of excavated ash, total cost of removal, and closure duration are summarized. The reported volume of ash incorporates a swell factor. The closure duration is measured from the time the decision is made to close the ponds (i.e. removal from service) until such time that the CCR material is fully removed. It was assumed that 5 years of preparation time would be needed in advance of starting an offsite removal operation, whereas an onsite removal operation would require 10 years of preparation time to account for the regulatory process to secure approvals for construction of new onsite landfills.

The five scenarios are as follows:

1. Labadie Bottom Ash and Fly Ash Pond CCR Removal to an Offsite Landfill
2. Labadie Bottom Ash and Fly Ash Pond CCR Removal to an Onsite Landfill

3. Sioux Bottom Ash and Fly Ash Pond CCR Removal to an Offsite Landfill
4. Sioux Bottom Ash and Fly Ash Pond CCR Removal to an Onsite Landfill
5. Meramec Bottom Ash and Fly Ash Pond CCR Removal to an Offsite Landfill

Scenario 1: Offsite CCR Removal for Labadie

This scenario assumes offsite removal for the Labadie ash pond sites and includes the following:

- Pre-CCR removal preparation (5 years, included on a prorated basis in the Closure Duration for each pond);
- Stabilization, loading, and pond restoration;
- Seasonal impacts from wet and winter weather conditions impeding productivity;
- Hauling to an offsite landfill in Missouri;
- Landfill placement; and
- Loading and transportation infrastructure.

Labadie Energy Center	Estimated Ash Volume (CY) [2]	Estimated Total Removal Cost	Closure Duration (Years)
	17,325,126	**$2,440 M – $2,930 M**	**35 plus years**

Scenario 2: Onsite CCR Removal for Labadie

This scenario assumes onsite disposal the Labadie ash pond sites and includes the following:

- Pre-CCR removal preparation (10 years, included on a prorated basis in the Closure Duration for each pond);
- Stabilization, loading, and pond restoration;
- Hauling to an onsite landfill located near the existing ponds;
- Seasonal impacts from wet and winter weather conditions impeding productivity;
- Landfill placement; and
- Loading infrastructure.

Labadie Energy Center	Estimated Ash Volume (CY)	Estimated Total Removal Cost	Closure Duration (Years)
	17,325,126	**$1,270 M - $1,520 M**	**40 plus years**

[2]Estimated volumes do not include any dry amendment materials.

Scenario 3: Offsite CCR Removal for Sioux

This scenario assumes offsite removal for the Sioux ash pond sites and includes the following:

- Pre-CCR removal preparation (5 years, included on a prorated basis in the Closure Duration for each pond);
- Stabilization, loading, and pond restoration;
- Hauling to an offsite landfill in Illinois[3];
- Seasonal impacts from wet and winter weather conditions impeding productivity;
- Landfill placement; and
- Loading and transportation infrastructure.

Sioux Energy Center	Estimated Ash Volume (CY)	Estimated Total Removal Cost	Closure Duration (Years)
	6,079,808	**$890 M - $1,060 M**	**15 plus years**

Scenario 4: Onsite CCR Removal for Sioux

This scenario assumes onsite disposal the Sioux ash pond sites and includes the following:

- Pre-CCR removal preparation (10 years, included on a prorated basis in the Closure Duration for each pond);
- Stabilization, loading, and pond restoration;
- Hauling to an onsite landfill located near the existing ponds;
- Seasonal impacts from wet and winter weather conditions impeding productivity;
- Landfill placement; and
- Loading infrastructure.

Sioux Energy Center	Estimated Ash Volume (CY)	Estimated Total Removal Cost	Closure Duration (Years)
	6,079,808	**$470 M - $570 M**	**20 plus years**

Scenario 5: Onsite CCR Removal for Meramec

This scenario assumes offsite removal for the Meramec ash pond sites and includes the following:

- Pre-CCR removal preparation (5 years, included on a prorated basis in the Closure Duration for each pond);

[3] Lochmueller did not review local siting requirements but many Illinois counties contain such restrictions.

- Stabilization, loading, and pond restoration;
- Hauling to an offsite landfill in Illinois;
- Seasonal impacts from wet and winter weather conditions impeding productivity;
- Site specific constraints with transportation access and associated limitations;
- Landfill placement; and
- Loading and transportation infrastructure.

Meramec Energy Center	Estimated Ash Volume (CY)	Estimated Total Removal Cost	Closure Duration (Years)
	5,194,923	**$740 M - $890 M**	**20 plus years**

APRIL 29, 2019

EXTRACTION & TRANSPORTATION STUDY: Rush Island Ash Pond Closure Assessment

Rush Island Site

Jefferson County, Missouri

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Introduction

Lochmueller Group completed the following planning-level assessment of the costs and logistics associated with extracting, stabilizing, and transporting coal combustion residuals (CCR) from the existing ash pond system at the Rush Island Power Generation Center to existing offsite, commercially available landfill facilities. The Rush Island site is located along the Mississippi River in Jefferson County, Missouri approximately nine (9) miles southeast of Festus, Missouri. The purpose of this assessment is to describe the methods, determine the impacts, and quantify the order-of-magnitude costs associated with removing and transporting all CCR from its current disposal location at the Rush Island site to a private landfill for permanent storage.

Extraction & Stabilization

Description of Method

Extraction and stabilization of the CCR material from the CCR unit at Rush Island Energy Center is complicated due to its depth and location. In addition, the CCR unit contains both Class C and F fly ash that complicates excavation methods. CCR material from the unit would need to be excavated at depths of up to 100 feet, dewatered, dried and conditioned, before being and loaded into trucks and transported offsite.

Removal of the CCR material would require multiple phases including dry extraction, partially wet extraction and fully submerged extraction. The various phases are described below:

Dry Extraction:

This phase includes the handling and removal of the existing CCR material from the current surface elevation down to the groundwater elevation (approximately 18' below the ground surface (BGS) elevation) (Geotechnical Investigation and Report, prepared by CEC and dated December 20, 2011). Generally, it is assumed that this material can be direct loaded and transported without additional drying or conditioning procedures (moisture content between approximately 25% and 35%). The work associated with this phase includes the extraction, on-site transportation to Staging/Loading Areas, storage, and loading onto transportation for off-site removal. Standard earth-moving equipment and procedures would be utilized including dozers, loaders, and excavators. In general, dozers would be used to excavate and move the CCR material into piles and loaders would be used to load the CCR material into the waiting trucks for transport off-site. Excavators would be used in a support role to dig in areas where dozers are not efficient. Sub-areas of the pond area would need to be established to facilitate extraction operations. The general size of these sub-areas, laterally and vertically, will be determined based on on-site conditions as the operation progresses and the CCR material is removed.

Partially Wet Extraction:

This phase includes the handling and removal of the existing CCR material from the groundwater elevation to a point in which hydraulic excavation is feasible (18' below ground surface to 28' below ground surface). This material is assumed to be in acceptable condition for loading and transportation with no additional drying and conditioning after the dewatering procedure described below is completed.

Dewatering of this material would involve excavation of channels to promote material drying prior to excavation and transportation. Water would be diverted from excavated depressions utilizing pumps and piping systems to transport the water away from the material excavation area. After sufficient dewatering and drying time, the CCR materials would be removed using the same means as described for dry excavation.

Fully Submerged Extraction:

CCR materials located further down in the pond (28' below ground surface to 100' below ground surface) may be saturated and would require drying and conditioning prior to off-site transport. Such materials would need to be extracted via hydraulic dredging methods. The complexities and potential costs associated with such dredging efforts are significantly higher per unit volume than the "Dry Extraction" and "Partially Wet Extraction" phases. In fact, successful pond closures at the depths

required for the Rush Island site could were not discovered. Removal operations for CCR ponds with depths up to 50 feet were found.

This method employs equipment that removes the CCR material directly from the bottom of the CCR unit and pumps the “slurry” through a piping system to “geotubes” located in nearby drying areas. Geotubes are a geotextile filtration “bag” manufactured by sewing together multiple sheets of geotextiles using polyester or polypropylene. As the dredged water enters the geotubes, the geotextile captures the CCR materials as the water drains. Chemical addition during the pumping and piping operation using coagulants and flocculants will be necessary to aid in the dewatering process. The specific makeup of CCR materials are site specific. Therefore, selection of the most effective and efficient coagulants and flocculants will require bench testing. Maintenance of the dredging equipment, piping system, drying areas, settling ponds, and temporary roads will be necessary to facilitate the operation.

Significantly large drying areas will be required to accommodate the multi-week week drying procedure. After dewatering is complete, the geotubes are opened and the CCR material is loaded onto transportation for off-site removal. The transportation of material for off-site removal was the assumed limiting factor for the overall CCR disposal process flow based on the analysis performed in this study. However, extended, unforeseen weather conditions can contribute to additional lost working time due to icy conditions, mechanical system freeze-ups, or flooding.

Site Restoration:

This phase includes the final restoration of the site. This would include removal of all temporary access roads and residual ash in project area. Backfilling would likely need to occur for at least some volume of the remaining pond in conjunction with excavation activities to minimize infiltration from the Mississippi River. The closest source of backfill material would be sand dredged from the Mississippi River. Stabilization of the site with vegetative practices would be required for erosion control. The river banks and the remaining embankment along the river would require additional analysis and appropriate stabilization, but may include a combination of vegetation, large rocks or manufactured concrete products.

Extraction and Stabilization Impacts

Safety

Accidents

Workforce safety during the operation is a significant risk factor. With several unit processes operating with heavy machinery, proper safety planning is important. Accidents can be minimized during operations, but the planning and implementation of a safety plan will have significant costs associated with the effort.

Exposure

There is not only immediate physical injury risks, but there is also exposure risk to the people working on the site. Proper safety equipment will be necessary to limit exposure to potentially harmful substances in the CCR material removal process such as flocculants and coagulant used for the dewatering process.

Environment

Floodplain

The project area is currently shown within the 100 year floodplain for both the current and pending FIRM maps. The potential for the area to experience flooding during excavation activities creates additional risk to the extraction and stabilization operations.

River Embankment

The existing ash ponds are adjacent to the Mississippi River. There is a strip of land that separates these surface water bodies and serves and an embankment that separates the pond from the river. Proper excavation techniques and monitoring will need to be employed to ensure the land between the two surface water bodies remains stable during excavation and dredging activities. After dredging activities are complete, the embankment will require analysis to confirm stability. Removal of the embankment and/or significant re-stabilization may be necessary for the restoration of the site.

Emissions

The heavy equipment used during the extraction and stabilization phase of the project includes dozers, loaders, excavators, hydraulic dredges, and onsite hauling trucks. These types of equipment typically utilize diesel fuel and would generate emissions during operations. These emissions are in addition to the emissions discussed in the transportation impacts section of this assessment.

Fugitive Ash Particulate

As the CCR material is being extracted and stabilized, fugitive ash particulate will be created and would need to be managed through an ash management plan.

Capital Projects

Onsite Access Roads

The onsite access road utilized for the offsite hauling trucks is discussed in the transportation section of this assessment. The construction of temporary on-site hauling roads will be required throughout the extraction and stabilization process. These haul roads will need to be modified frequently in order to provide efficient transportation of the CCR to the stabilization and loading areas and to maintain dust control.

Geotube Staging Areas

Geotube staging areas will need to be constructed within the project area that are relatively flat to allow for proper dewatering of the CCR. These staging areas will be temporary and will need to be moved throughout the closure process as CCR is removed during different phases of the operation. Filtrate from the geotubes would be directed back to the settling ponds for treatment.

Water Treatment Facilities

The existing ponds could be utilized throughout the CCR removal process for settling any remaining solids from the filtrate from the drying process. There may be a need for the construction of new settling ponds toward the end of the process to fully remove CCR from the existing ponds. The filtrate will likely contain suspended solids and some form of treatment or settling may need to be evaluated depending on the final characteristics of the filtrate.

Loading Areas

Once the CCR is stabilized, the material may require some additional layout and loading area to ensure the material is dry enough for offsite hauling and ultimate placement in a landfill. The loading areas will need to be constructed as appropriate for the CCR removal areas that are active. The loading areas will require the construction of scales for measuring the weight of trucks and truck washing facilities to wash down tires of residual ash material.

Restoration of Former Ash Ponds

The post-CCR-removal condition of the ponds will be dependent on the final planned use of the area. Some options may include backfilling, removing embankment, creating or restoring habitat, etc. Achieving the desired future use may include utilizing the soil material that would remain between the pond and the river to backfill some of the remaining pond area. Sand backfill material could also be dredged from the Mississippi river for additional backfill material. Overall stabilization of the site would be required and would include vegetative, natural rock, and manufactured products to meet regulatory requirements.

Transportation & Disposal

This section addresses the transportation of CCR material from the site and its permanent disposal at a private landfill.

Modal Options (Truck, Rail, Barge)

The Rush Island site is located along the Mississippi River. Additionally, a BNSF rail line runs adjacent to the site. Therefore, the ability to haul CCR by barge and rail from Rush Island may be possible. However, significant infrastructure improvements would be required at the Rush Island site to provide ash loading capabilities for these modes.

The preferred landfill locations are all located within 80 miles of Rush Island. None of the sites have direct water access. Therefore, any CCR transported by barge from Rush Island would need to be transferred from barge to truck to reach the landfill destinations. The inefficiency of this transfer would render barge transportation considerably more costly than truck hauling. Moreover, most of the landfill sites are located further inland (east or west) from Rush Island such that north-south travel along the Mississippi River would not be beneficial.

With regards to rail, none of the preferred landfill sites have direct rail access. Several sites are located adjacent to rail corridors but spurs would need to be constructed to facilitate direct landfill access and allow for the temporary storage and unloading of rail cars. Additionally, three of the four preferred landfill sites are located in Illinois, which would require trains to travel through the congested St. Louis rail network to cross the Mississippi River. Rail is most efficient when transporting bulk materials over long distances. Given the relatively short travel distance to each landfill site, rail would not be cost-competitive with truck hauling.

This assessment assumed truck hauling to be the most cost-effective and feasible mode of transport. All subsequent analyses reflect truck hauling.

Truck Hauling

To determine a timeframe for extraction and removal of all CCR from its current, impounded location, the following was assumed:

- Truck hauling via 40-foot end load dump trucks loaded via conventional equipment – each trailer has a payload capacity of 25 tons based on a typical 80,000 lb. gross loaded maximum;
- 8-hour daily operation and a range of 155 to 193 days of annual operation (accounting for weekends, holidays, and time lost due to weather and imperfect execution);
- Loading operations on the Rush Island site occur adjacent to the impoundment and on the south portion of the site; and
- A maximum daily haul rate of 5,000 tons.

The resulting transportation haul assumptions are summarized in **Table 1**.

Table 1: Transportation Haul Summary

Total Tons of CCR Removed	Annual Tons of CCR Removed	Closure Duration*
21.6 million	742,772 to 928,465	28-34 Years

*Measured from the decision to begin extraction until fully removed

To accommodate the volume of truck traffic identified in **Table 1**, roadways internal to the Rush Island site would need to be improved. Specifically, a heavy-duty concrete roadway would need to be constructed along the western perimeter of the site extending from Big Hollow Road south to the ash pond area. Multiple at-grade railroad crossings with the site's rail spur would be required.

In the vicinity of the pond area, staging would need to be provided to accommodate several trucks in queue for multiple loading stations. Hence, a large loading station would need to be constructed. Once loaded, trucks would need to proceed to a washout area and scaled to verify the truck is loaded properly. A quick route back to the loading pad from the scale area would be needed for any overweight trucks.

Landfill Options

Four preferred landfills were identified as potential destinations for the CCR removed from the Rush Island site as shown in **Table 2**. Landfill disposal costs supplied by Ameren are similar across the four locations. With costs paid to the landfill being essentially equal, transportation costs would drive the landfill location decision. Assumed haul rates per ton to each landfill location were also supplied by Ameren. The lowest cost haul rate would be to the Progressive Waste site in Richwoods, which is also significantly closer to Rush Island than the other sites. Therefore, this assessment prioritized CCR disposal at the Progressive Waste landfill.

Table 2: Preferred Landfill Locations

Landfill Site	Address	Distance to Site (mi)	Travel Time to Site (min)
Progressive Waste	12581 State Hwy H, Richwoods, MO	34.7	44
Republic Services	4601 Cahokia Road, Roxana, IL	67.3	67
Waste Management	10400 Hillstown Road, Marissa, IL	73.4	82
Perry Ridge	6305 Sacred Heart Road, DuQuoin, IL	79.8	97

Capacity calculations were performed to determine the total space available for CCR disposal in aggregate. The annual disposal amount currently received by the landfill was assumed to remain constant over time and the incremental annual disposal amount due to the Rush Island CCR was added. Based on the capacity of the Progressive Waste site, at the combined disposal volume, it was estimated that the Progressive Waste landfill would become full upon receiving approximately 80 percent of the total CCR from Rush Island.

It was also assumed that the Progressive Waste site could feasibly accept the maximum daily load of trucks (192) and that Progressive Waste would be willing to receive the maximum amount of CCR possible and dedicate the necessary space on site for monofill construction to isolate the CCR material from other waste on site.

Given these assumptions, the calculations indicate that a second landfill site with available capacity would need to receive the final 20 percent of Rush Island CCR material once Progressive Waste reaches capacity. However, for purposes of the subsequent routing and transportation evaluations, it was assumed that the entire Rush Island CCR volume would be disposed at Progressive Waste.

Transportation Route

Many factors were considered when establishing a preferred route suitable for the removal of the CCR from the Rush Island site to the Progressive Waste landfill, including roadway functional classification and the available connectivity between the two sites using the existing roadway network. The selected route is approximately 36.5 miles long and utilizes the following roadways:

- Begin at the Rush Island site on Big Hollow Road
- Johnson Road west
- Danby Road west
- Highway 61 south
- Highway TT west
- Interstate 55 north
- Highway 67 south
- MO-110 west
- MO-21 south
- Highway H west
- End off Highway H at Progressive Waste

This route prioritizes roadways with the highest functional classifications along a reasonably direct line of travel. While a shorter route may be possible, it would rely upon roadways less suitable for truck traffic and therefore was not considered. The selected route emphasizes major numbered state routes, with the exception of leaving the Rush Island site (via Big Hollow Road, Johnson Road, and Danby Road) and accessing Progressive Waste (via Highway H).

The egress route from the Rush Island site utilizes Johnson Road and Danby Road instead of remaining on Big Hollow Road to Drury Road. Johnson Road/Danby Road is the designated route for truck traffic in and out of the Rush Island site. This route also promotes use of the half diamond interchange on Interstate 55 at Route TT, which was constructed approximately 10 years ago for purposes of serving truck traffic to/from the nearby Holcim Cement Plant.

Transportation Impacts

The following transportation impacts would be anticipated as a result of the hauling operation.

Traffic Flow

The selected route between Rush Island and Progressive Waste was evaluated in terms of its ability to accommodate the additional truck traffic, including both loaded and unloaded trucks. Overall, the truck volume distributed over the course of the day would not be expected to generate significant traffic flow impacts. The route emphasizes major roadways, which would be capable of handling the additional traffic. In fact, no improvements were assumed for Interstate 55 or Highway 67.

That said, the following transportation improvements would be recommended to mitigate anticipated impacts of the additional truck traffic at select locations:

- Big Hollow Road, Johnson Road, and Danby Road, which connect the Rush Island site with Highway 61, are not suitable for the volume of truck traffic anticipated. These roadways typically have 11-foot lanes and no shoulders. The horizontal and vertical geometry is substandard in places. The existing asphalt pavement would not likely withstand the effects of heavy truck traffic. It is recommended that this corridor be upgraded to provide an appropriate truck route between Rush Island and Highway 61. The assumed improvements consist of heavy-duty concrete pavement and alignment corrections along the existing roadway.
- The intersection of Danby Road with Highway 61 should be improved to include a dedicated northbound right-turn lane on Highway 61 and enlarged right-turn radius. This turn lane would serve trucks en route to Rush Island from Interstate 55. This intersection would be expected to remain unsignalized.
- The intersection of Route TT with Highway 61 should be improved to include a dedicated southbound right-turn lane on Highway 61 and enlarged right-turn radius. This turn lane would serve trucks en route to Progressive Waste. This intersection would be expected to remain unsignalized.
- The intersection of Highway 21 and Highway 110 was recently realigned and upgraded to current standards, so it should be well-equipped to serve truck turning maneuvers. However, the intersection remains unsignalized. Installation of a signal would be recommended in order to safely and efficiently serve trucks turning from westbound Highway 110 to southbound Highway 21 en route to Progressive Waste.
- The intersection of Highway 21 with Route H is signalized and currently includes a dedicated southbound right-turn lane and dedicated eastbound left-turn lane to serve truck turning movements along the selected route. It is recommended that the eastbound left-turn lane be extended to provide additional storage capacity. The existing turn lane is approximately 75 feet in length, which would accommodate only a single truck and possibly one additional vehicle.
- Route H is a low-volume and narrow two-lane highway with lane widths of approximately 10 feet, low shoulders, and substandard alignment in select areas. While upgrades to this corridor would be beneficial, given the length of the route, significant upgrades for purposes of the hauling operation would likely be deemed cost prohibitive.

Safety & Environment

The safety implications of the truck hauling operation were evaluated using information provided in the Highway Safety Manual (HSM), published by the American Association of State Highway and Transportation Officials (AASHTO). The HSM relates traffic volumes and roadway character to crash expectancy. Changes in volumes would then cause an increase or decrease in the crash expectancy. It is anticipated that the additional truck traffic would result in an increase of 6 crashes total on an annual basis along the entirety of the haul route, as follows:

- Net increase of 2 Severe (Fatal or Injury) Crashes per year
- Net increase of 4 PDO (Property Damage Only) Cashes per year

Additional environmental costs would also be incurred as a result of the hauling operation.[1] In total, transportation safety and environmental costs are estimated to be approximately $490 million to $611 million over the duration of the hauling operation. These costs would not be borne directly by Ameren but instead would be incurred by the general population.

Pavement

The additional truck volume would depreciate the pavement design life and accelerate pavement deterioration along the selected route. To compensate for the increased wear, pavement mill and overlay were assumed at 5-year increments along all segments of the route, with the exception of Interstate 55 (which as an interstate should be build to withstand truck traffic) and the upgraded access route to the Rush Island site (which would be reconstructed with heavy duty concrete).

[1] According to the Environmental Protection Agency's (EPA) publication on National Average In-Use Emissions from Heavy-Duty Trucks, semi-tractor trailer rigs are responsible for emitting 12.5 grams of pollutants per mile into the air. The economic cost attributable to truck emissions using EPA's methodology was estimated to be $434M. This accounts for increased healthcare costs, lost productivity, welfare costs, environmental remediation, etc.

Conclusion

Lochmueller Group completed the preceding planning-level assessment of the methods and impacts associated with extracting, stabilizing, and transporting CCR from the existing Rush Island Power Generation Center. The purpose of this assessment was to determine the impacts and quantify the order-of-magnitude costs associate with completely removing all CCR from the Rush Island site and transporting it to a private landfill for permanent storage. The information contained herein is provided at a planning-level.

This study assumed that 12,725,000 cubic yards of coal combustion residuals would ultimately need to be removed from the Rush Island site. This would equate to approximately 21,650,000 tons of material to transport. This transport weight was calculated by multiplying the in place cubic yards by a swell factor to account for the uncompacted volume after excavation. The weight of the uncompacted unit volume was established from geotechnical testing data that provided the pounds per cubic foot and the percent moisture content. Based on a range of operating days per calendar year, it would take from 28 to 34 years to extract all material from the site.

Restoration of the site would include backfilling and stabilization with vegetative and structural practices. Restoration costs could be significant in that the resulting 70 – 100 foot depression may need to be backfilled via a dredging operation within the Mississippi River.

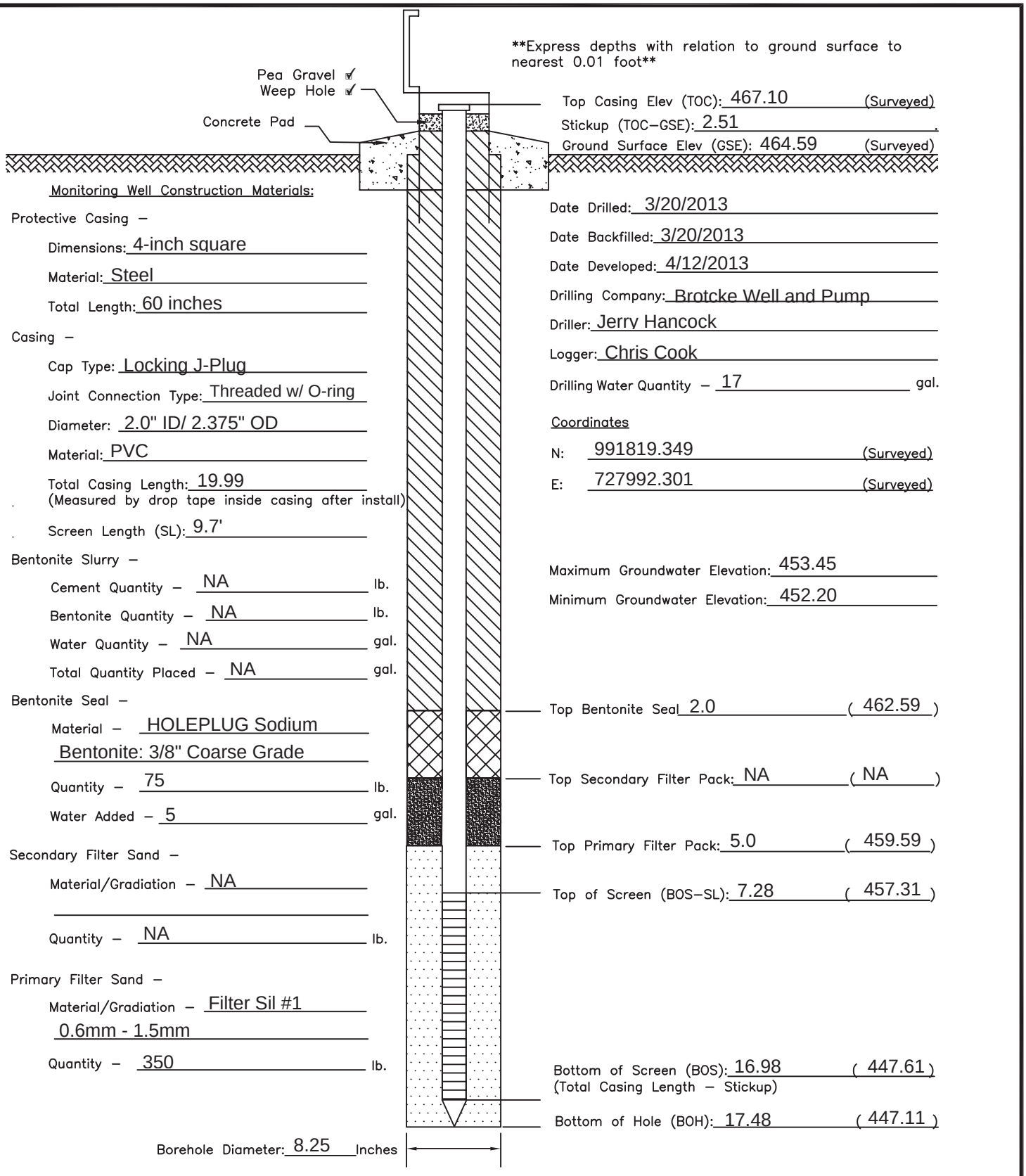
The total cost to extract, stabilize, transport, and dispose of the CCR material is summarized below in 2019 dollars. The total cost to Ameren could range from $1.9 to $2.1 Billion, depending upon the total period of removal operations. This includes transportation infrastructure upgrades both internal and external to the Rush Island site as discussed.

Extraction of CCR and Transport to Offsite Landfill	
Ameren Project Costs	
Extraction, Stabilization, Loading, and Restoration	$773-891 Million
Hauling	$372-375 Million
Landfill Placement Costs	$691-757 Million
Transportation Infrastructure (on and off-site)	$66-77 Million
Project Cost Total	**$1.9-$2.1 Billion**

Costs in 2019 Dollars

APPENDIX B

Well Construction Diagrams



PERMANENT MONITORING WELL CONSTRUCTION DIAGRAM

AMEREN MISSOURI

LABADIE ENERGY CENTER

Reitz & Jens, Inc.

CONSULTING ENGINEERS

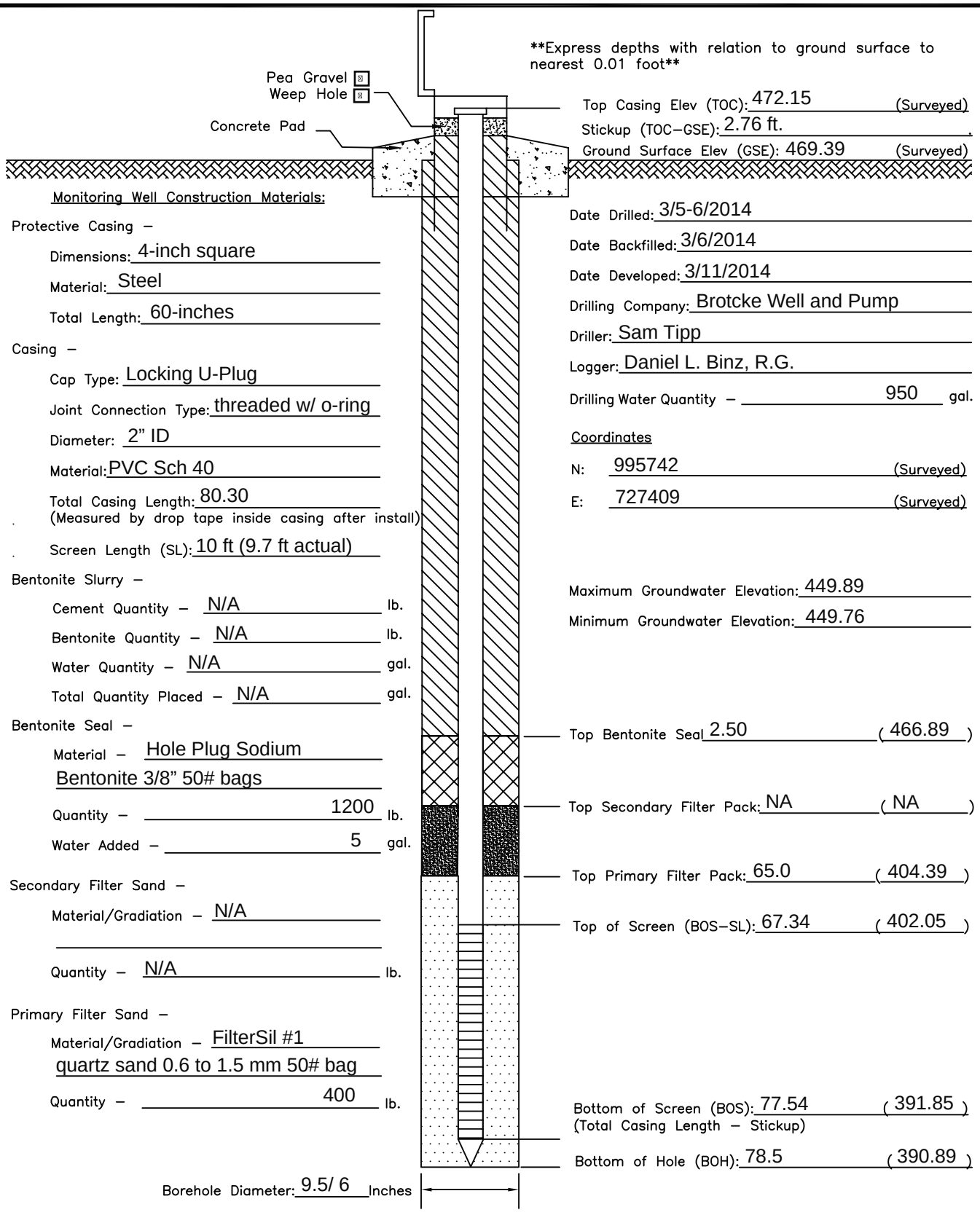
1055 Corporate Square Drive
Saint Louis, Missouri 63132

Telephone: (314) 993-4132
Fax: (314) 993-4177

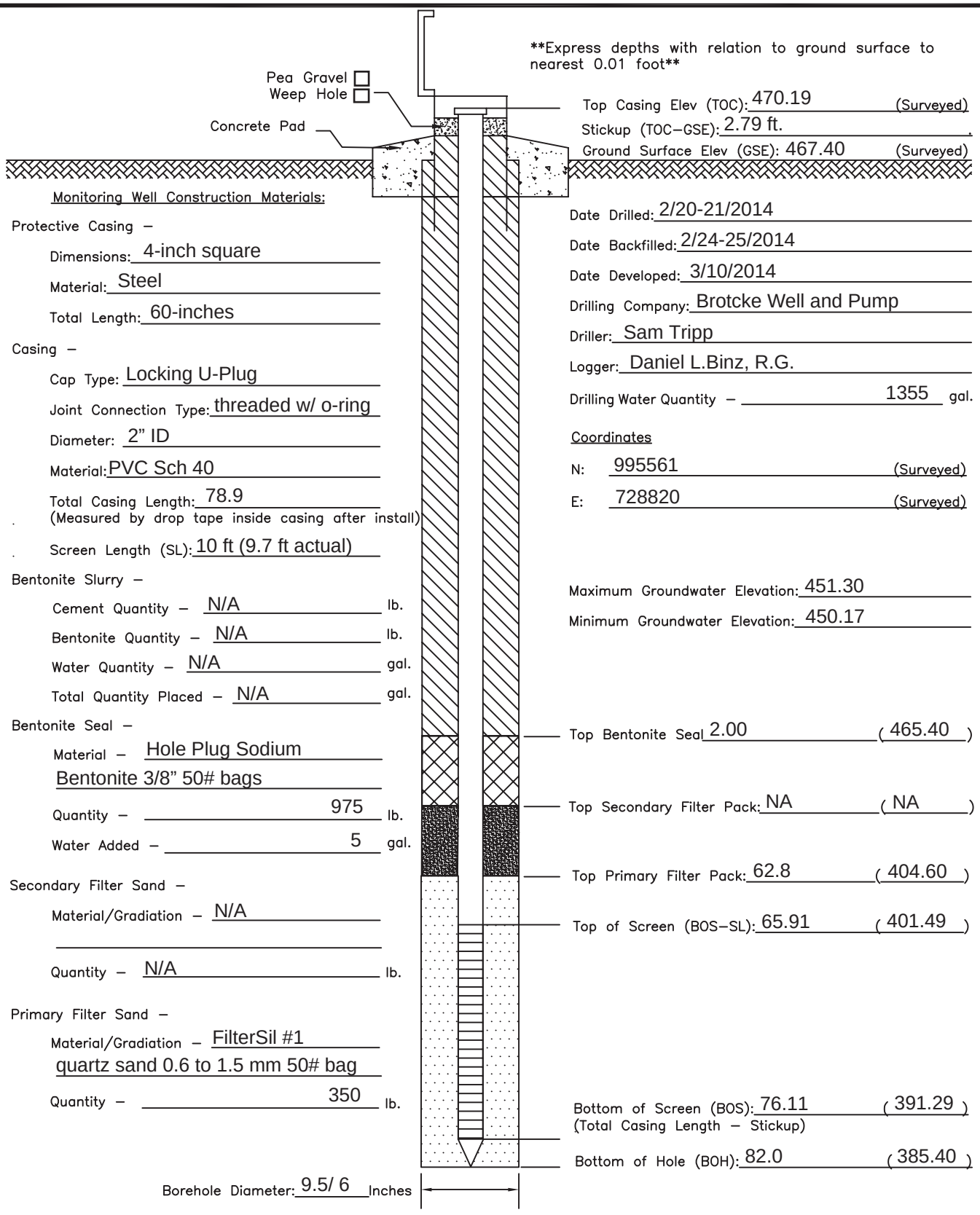
Well Number:

MW-24

DATE	SCALE	DRAWN BY:	APPROVED BY:
3/2013	N.T.S.	CWC	CWC



PERMANENT MONITORING WELL CONSTRUCTION DIAGRAM	**Reitz & Jens, Inc.** CONSULTING ENGINEERS				Well Number: **MW-33D**
AMEREN MISSOURI	1055 Corporate Square Drive Saint Louis, Missouri 63132		Telephone: (314) 993-4132 Fax: (314) 993-4177		
LABADIE ENERGY CENTER	DATE 3/2014	SCALE N.T.S.	DRAWN BY: DLB	APPROVED BY: JLF	



PERMANENT MONITORING WELL CONSTRUCTION DIAGRAM

AMEREN MISSOURI

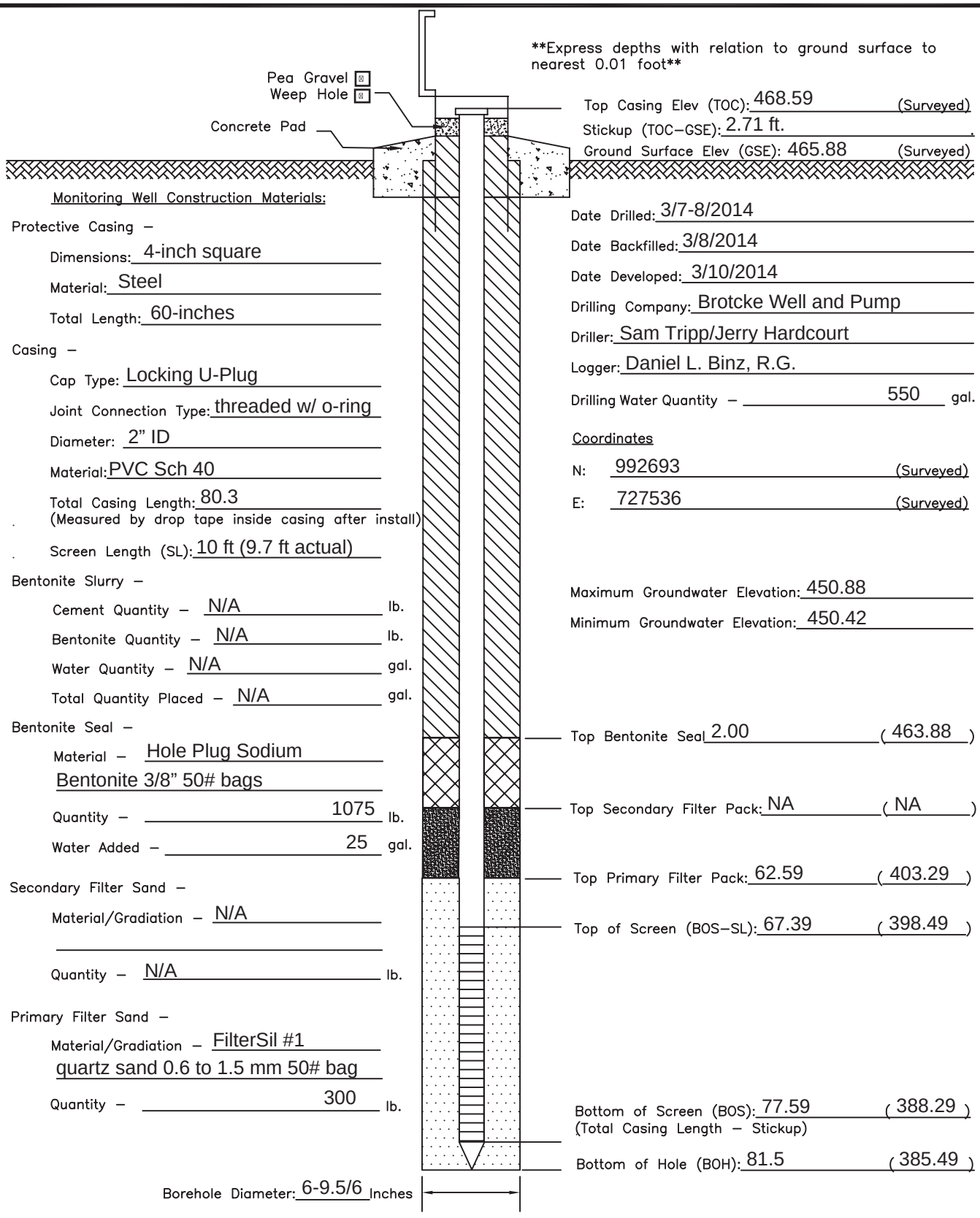
LABADIE ENERGY CENTER

Reitz & Jens, Inc.
CONSULTING ENGINEERS
1055 Corporate Square Drive
Saint Louis, Missouri 63132
Telephone: (314) 993-4132
Fax: (314) 993-4177

Well Number:

MW-34D

DATE	SCALE	DRAWN BY:	APPROVED BY:
3/2014	N.T.S.	DLB	JLF



PERMANENT MONITORING WELL CONSTRUCTION DIAGRAM

AMEREN MISSOURI

LABADIE ENERGY CENTER

Reitz & Jens, Inc.

CONSULTING ENGINEERS

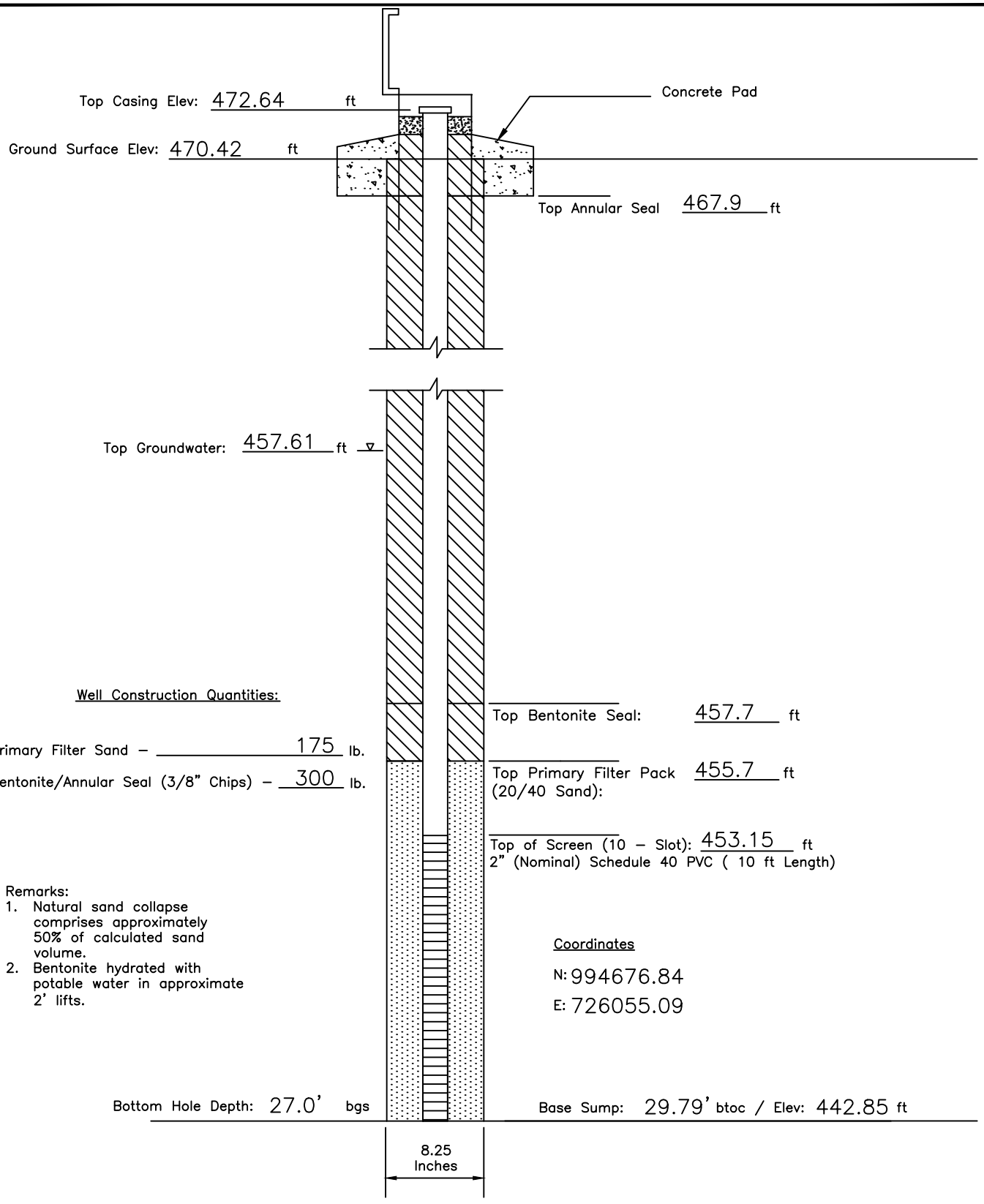
1055 Corporate Square Drive
Saint Louis, Missouri 63132

Telephone: (314) 993-4132
Fax: (314) 993-4177

Well Number:

MW-35D

DATE	SCALE	DRAWN BY:	APPROVED BY:
3/2014	N.T.S.	DLB	JLF



Well Construction Quantities:

1. Primary Filter Sand – 175 lb.
2. Bentonite/Annular Seal (3/8" Chips) – 300 lb.

Remarks:
1. Natural sand collapse comprises approximately 50% of calculated sand volume.
2. Bentonite hydrated with potable water in approximate 2' lifts.

Coordinates

N: 994676.84

E: 726055.09

S-1	WELL CONSTRUCTION DIAGRAM	GREDELL Engineering Resources, Inc. ENVIRONMENTAL ENGINEERING LAND AIR WATER			
Date Well Completed: 4-5-17	Ameren Labadie Energy Center	1505 East High Street Jefferson City, Missouri 65101			Telephone: (573) 659-9078 Facsimile: (573) 659-9079
	Sentry Well Installation	DATE 9/2017	SCALE N.T.S.	DRAWN BY: AJK	APPROVED BY: KAE

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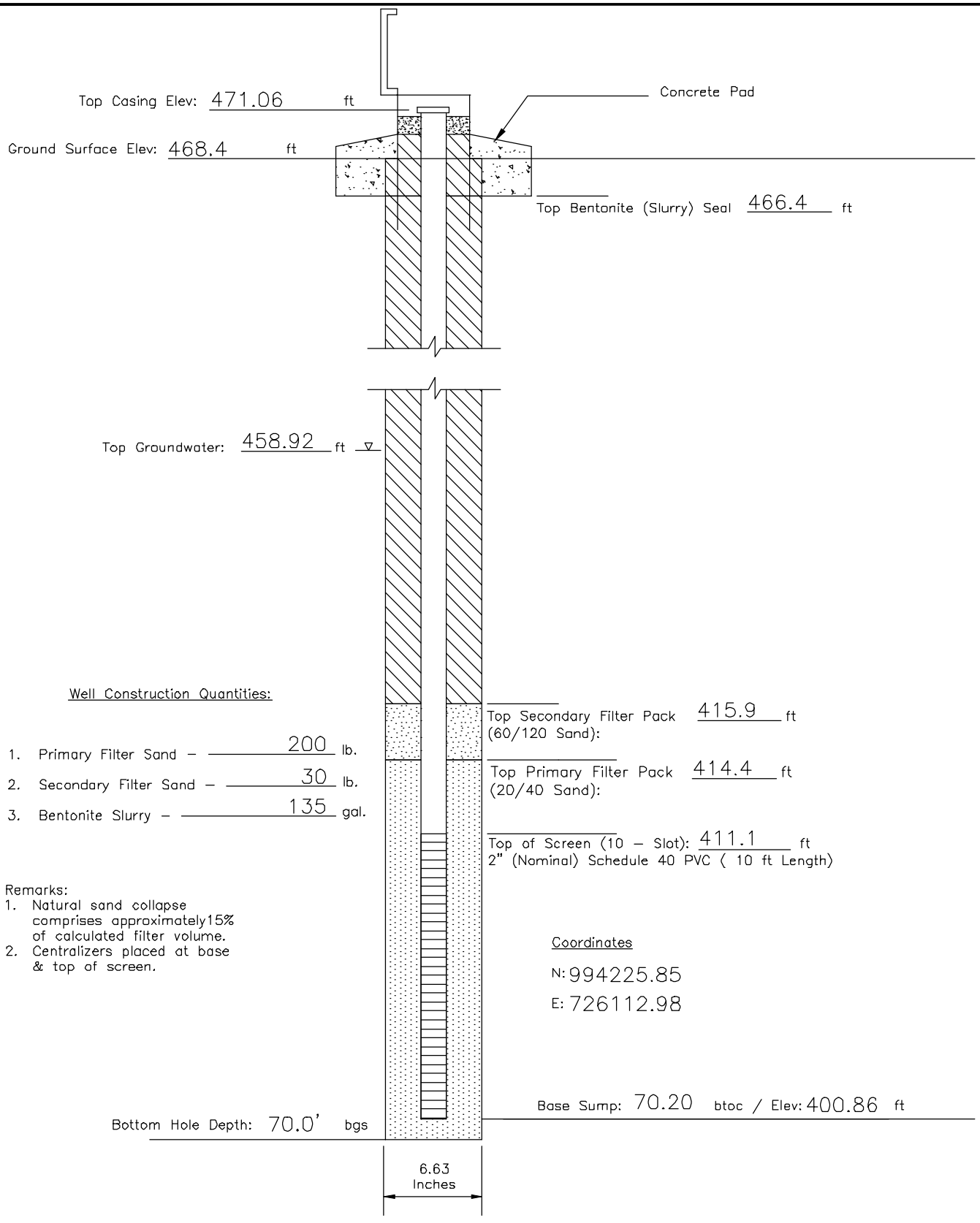

Well Construction Quantities:

1. Primary Filter Sand – 200 lb.
2. Secondary Filter Sand – 30 lb.
3. Bentonite Slurry – 135 gal.

Remarks:
1. Natural sand collapse comprises approximately15% of calculated filter volume.
2. Centralizers placed at base & top of screen.

Coordinates

N: 994225.85

E: 726112.98

AMW-8	**MONITORING WELL CONSTRUCTION DIAGRAM**	**GREDELL Engineering Resources, Inc.** ENVIRONMENTAL ENGINEERING				
Date Well Installed: 6-13-18	Ameren Labadie Energy Center	LAND AIR WATER 1505 East High Street Jefferson City, Missouri 65101		Telephone: (573) 659-9078		
	ASH POND NPDES MONITORING	DATE 7/2018	SCALE N.T.S.	DRAWN BY: CP	CHECKED BY: KE	APPROVED BY: MCC

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APPENDIX C

Laboratory Analytical Data

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

December 28, 2018

Mark Haddock
Golder Associates
820 S. Main St
Suite 100
Saint Charles, MO 63301

RE: Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on November 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

cc: Ryan Feldmann, Golder
Jeffrey Ingram, Golder Associates
Eric Schneider, Golder Associates

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

CERTIFICATIONS

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Arkansas Drinking Water
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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

SAMPLE SUMMARY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60286215026	**L-AM-1S**	Water	11/09/18 11:40	11/10/18 06:25
60286215027	**L-AM-1D**	Water	11/09/18 12:45	11/10/18 06:25

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286215026	**L-AM-1S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286215027	**L-AM-1D**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	ZMH	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Sample: L-AM-1S **Lab ID: 60286215026** Collected: 11/09/18 11:40 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**539**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:01	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 18:00	11/27/18 14:01	7440-41-7	
Boron	**494**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 14:01	7440-42-8	
Calcium	**157000**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 14:01	7440-70-2	
Cobalt	**5.6**	ug/L	5.0	0.87	1	11/26/18 18:00	11/27/18 14:01	7440-48-4	
Iron	**5600**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 14:01	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 18:00	11/27/18 14:01	7439-92-1	
Lithium	**37.0**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:01	7439-93-2	
Magnesium	**34600**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 14:01	7439-95-4	
Manganese	**1840**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 14:01	7439-96-5	
Molybdenum	**3.6J**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:01	7439-98-7	
Potassium	**6700**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 14:01	7440-09-7	
Sodium	**59700**	ug/L	500	157	1	11/26/18 18:00	11/27/18 14:01	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 15:05	11/27/18 11:04	7440-36-0	
Arsenic	**4.5**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:12	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 15:05	11/26/18 16:12	7440-43-9	
Chromium	**0.43J**	ug/L	1.0	0.078	1	11/23/18 15:05	11/26/18 16:12	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 15:05	11/26/18 16:12	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 15:05	11/26/18 16:12	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/30/18 15:30	12/03/18 11:23	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**449**	mg/L	20.0	4.9	1		11/20/18 11:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**725**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**2.7**	mg/L	0.050		1		11/30/18 15:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**2.9**	mg/L	0.20	0.012	1		11/10/18 13:51		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**157**	mg/L	20.0	5.8	20		11/27/18 00:54	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	0.19	1		11/27/18 00:38	16984-48-8	
Sulfate	**18.7**	mg/L	1.0	0.24	1		11/27/18 00:38	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.14**	mg/L	0.10	0.050	1		11/15/18 11:20	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Sample: L-AM-1D **Lab ID: 60286215027** Collected: 11/09/18 12:45 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**76.4**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:04	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 18:00	11/27/18 14:04	7440-41-7	
Boron	**7410**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 14:04	7440-42-8	
Calcium	**79300**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 14:04	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 18:00	11/27/18 14:04	7440-48-4	
Iron	**4210**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 14:04	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 18:00	11/27/18 14:04	7439-92-1	
Lithium	**32.5**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:04	7439-93-2	
Magnesium	**11600**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 14:04	7439-95-4	
Manganese	**210**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 14:04	7439-96-5	
Molybdenum	**375**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:04	7439-98-7	
Potassium	**7120**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 14:04	7440-09-7	
Sodium	**113000**	ug/L	500	157	1	11/26/18 18:00	11/27/18 14:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 15:05	11/27/18 11:05	7440-36-0	
Arsenic	**2.7**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:14	7440-38-2	
Cadmium	**0.14J**	ug/L	0.50	0.033	1	11/23/18 15:05	11/26/18 16:14	7440-43-9	
Chromium	**0.36J**	ug/L	1.0	0.078	1	11/23/18 15:05	11/26/18 16:14	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 15:05	11/26/18 16:14	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 15:05	11/26/18 16:14	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/30/18 15:30	12/03/18 11:25	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**138**	mg/L	20.0	4.9	1		11/20/18 11:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**700**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**3.9**	mg/L	0.050	0.012	1		12/03/18 14:32	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.31**	mg/L	0.20	0.012	1		11/10/18 13:52		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**33.6**	mg/L	5.0	1.4	5		11/27/18 01:26	16887-00-6	
Fluoride	**0.41**	mg/L	0.20	0.19	1		11/27/18 01:10	16984-48-8	
Sulfate	**336**	mg/L	50.0	12.0	50		11/27/18 02:14	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.34**	mg/L	0.10	0.050	1		11/15/18 11:21	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 557799 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2288401 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	12/03/18 11:00	

LABORATORY CONTROL SAMPLE: 2288402

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2288403 2288404

Parameter	Units	60285459024 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.090	5	5	4.9	4.9	97	98	75-125	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 556876
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2284987
Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/27/18 13:48	
Beryllium	ug/L	<0.16	1.0	0.16	11/27/18 13:48	
Boron	ug/L	<12.5	100	12.5	11/27/18 13:48	
Calcium	ug/L	<53.5	200	53.5	11/27/18 13:48	
Cobalt	ug/L	<0.87	5.0	0.87	11/27/18 13:48	
Iron	ug/L	<6.1	50.0	6.1	11/27/18 13:48	
Lead	ug/L	<3.0	10.0	3.0	11/27/18 13:48	
Lithium	ug/L	<4.6	10.0	4.6	11/27/18 13:48	
Magnesium	ug/L	<14.0	50.0	14.0	11/27/18 13:48	
Manganese	ug/L	0.80J	5.0	0.73	11/27/18 13:48	
Molybdenum	ug/L	<0.90	20.0	0.90	11/27/18 13:48	
Potassium	ug/L	<79.3	500	79.3	11/27/18 13:48	
Sodium	ug/L	<157	500	157	11/27/18 13:48	

LABORATORY CONTROL SAMPLE: 2284988

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Beryllium	ug/L	1000	987	99	85-115	
Boron	ug/L	1000	979	98	85-115	
Calcium	ug/L	10000	9940	99	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Iron	ug/L	10000	10000	100	85-115	
Lead	ug/L	1000	984	98	85-115	
Lithium	ug/L	1000	989	99	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Molybdenum	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE SAMPLE: 2284989

Parameter	Units	60286215023 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	82.2	1000	1060	98	70-130	
Beryllium	ug/L	<0.16	1000	999	100	70-130	
Boron	ug/L	9300	1000	10400	112	70-130	
Calcium	ug/L	84400	10000	94400	100	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

MATRIX SPIKE SAMPLE: 2284989

Parameter	Units	60286215023 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	<0.87	1000	1010	101	70-130	
Iron	ug/L	64.8	10000	10100	101	70-130	
Lead	ug/L	<3.0	1000	975	97	70-130	
Lithium	ug/L	13.4	1000	987	97	70-130	
Magnesium	ug/L	5160	10000	15000	98	70-130	
Manganese	ug/L	113	1000	1100	99	70-130	
Molybdenum	ug/L	206	1000	1220	101	70-130	
Potassium	ug/L	9650	10000	19700	100	70-130	
Sodium	ug/L	75600	10000	85100	96	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284990 2284991

Parameter	Units	60286372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	375	1000	1000	1360	1360	99	98	70-130	0	20	
Beryllium	ug/L	<0.16	1000	1000	1000	1000	100	100	70-130	0	20	
Boron	ug/L	124	1000	1000	1140	1140	101	102	70-130	0	20	
Calcium	ug/L	162000	10000	10000	174000	173000	118	107	70-130	1	20	
Cobalt	ug/L	4.2J	1000	1000	1000	1000	100	100	70-130	0	20	
Iron	ug/L	368	10000	10000	10400	10300	100	100	70-130	0	20	
Lead	ug/L	3.2J	1000	1000	973	968	97	96	70-130	1	20	
Lithium	ug/L	40.3	1000	1000	1040	1030	100	99	70-130	0	20	
Magnesium	ug/L	44100	10000	10000	54700	54300	106	102	70-130	1	20	
Manganese	ug/L	4550	1000	1000	5620	5590	106	104	70-130	0	20	
Molybdenum	ug/L	<0.90	1000	1000	1020	1020	102	102	70-130	0	20	
Potassium	ug/L	5880	10000	10000	16100	16000	102	102	70-130	0	20	
Sodium	ug/L	11500	10000	10000	21900	21800	104	103	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 556679 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2283974 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/27/18 10:58	
Arsenic	ug/L	<0.065	1.0	0.065	11/26/18 16:00	
Cadmium	ug/L	<0.033	0.50	0.033	11/26/18 16:00	
Chromium	ug/L	0.22J	1.0	0.078	11/26/18 16:00	
Selenium	ug/L	<0.085	1.0	0.085	11/26/18 16:00	
Thallium	ug/L	<0.099	1.0	0.099	11/26/18 16:00	

LABORATORY CONTROL SAMPLE: 2283975

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.4	96	85-115	
Arsenic	ug/L	40	39.4	98	85-115	
Cadmium	ug/L	40	39.3	98	85-115	
Chromium	ug/L	40	40.9	102	85-115	
Selenium	ug/L	40	37.7	94	85-115	
Thallium	ug/L	40	38.4	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2283976 2283977

Parameter	Units	60286215023 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.078J	40	40	39.0	39.3	97	98	70-130	1	20	
Arsenic	ug/L	1.7	40	40	41.3	41.2	99	99	70-130	0	20	
Cadmium	ug/L	0.079J	40	40	38.7	38.9	97	97	70-130	0	20	
Chromium	ug/L	0.46J	40	40	39.6	39.4	98	97	70-130	1	20	
Selenium	ug/L	0.20J	40	40	36.4	36.0	90	89	70-130	1	20	
Thallium	ug/L	<0.099	40	40	38.7	38.7	97	97	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 556192 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2282069 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/20/18 10:40	

LABORATORY CONTROL SAMPLE: 2282070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	513	103	90-110	

SAMPLE DUPLICATE: 2282071

Parameter	Units	60286215025 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	58.8	64.8	10	10	

SAMPLE DUPLICATE: 2282072

Parameter	Units	60286372001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	534	545	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 555353 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2278151 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/15/18 14:12	

LABORATORY CONTROL SAMPLE: 2278152

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

SAMPLE DUPLICATE: 2278153

Parameter	Units	60286488009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	697	710	2	10	

SAMPLE DUPLICATE: 2278161

Parameter	Units	60286668008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	620	601	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.

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 554544 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2274532 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 13:31	H6

LABORATORY CONTROL SAMPLE: 2274533

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	100	90-110	H6

SAMPLE DUPLICATE: 2274535

Parameter	Units	60286215010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

SAMPLE DUPLICATE: 2274537

Parameter	Units	60286372001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 556826 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2284823 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/26/18 17:58	
Fluoride	mg/L	<0.19	0.20	0.19	11/26/18 17:58	
Sulfate	mg/L	<0.24	1.0	0.24	11/26/18 17:58	

LABORATORY CONTROL SAMPLE: 2284824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284825 2284826

Parameter	Units	60286358005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.7	5	5	9.7	9.7	99	100	90-110	1	15	
Fluoride	mg/L	0.22	2.5	2.5	2.9	2.9	106	109	90-110	2	15	
Sulfate	mg/L	10.1	5	5	15.3	15.3	103	105	90-110	1	15	

MATRIX SPIKE SAMPLE: 2284827

Parameter	Units	60286372001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.7	5	5.7	38	90-110	M1
Fluoride	mg/L	0.29	2.5	1.3	40	90-110	M1
Sulfate	mg/L	96.8	50	115	37	90-110	M1

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 554983 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 2276689 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/15/18 10:53	

LABORATORY CONTROL SAMPLE: 2276690

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	97	90-110	

MATRIX SPIKE SAMPLE: 2276691

Parameter	Units	60286318014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	<0.050	2	1.9	96	90-110	

MATRIX SPIKE SAMPLE: 2276693

Parameter	Units	60286270003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.9	2	4.8	91	90-110	

SAMPLE DUPLICATE: 2276692

Parameter	Units	60286214007 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L		0.36	3	10	

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REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Sample: L-AM-1S **Lab ID: 60286215026** Collected: 11/09/18 11:40 Received: 11/10/18 06:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.694 ± 0.508 (0.568) C:NA T:92%**	pCi/L	12/12/18 10:16	13982-63-3	
Radium-228	EPA 904.0	**0.374 ± 0.346 (0.706) C:77% T:90%**	pCi/L	12/06/18 11:05	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Sample: L-AM-1D **Lab ID: 60286215027** Collected: 11/09/18 12:45 Received: 11/10/18 06:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.287 ± 0.622 (1.15) C:NA T:80%**	pCi/L	12/12/18 10:16	13982-63-3	
Radium-228	EPA 904.0	**0.917 ± 0.444 (0.769) C:72% T:87%**	pCi/L	12/06/18 11:05	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 321152 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples:

METHOD BLANK: 1566304 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.396 (0.801) C:80% T:65%	pCi/L	12/06/18 12:32	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 321153 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 1566305 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.196 ± 0.321 (0.697) C:82% T:78%	pCi/L	12/06/18 11:04	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 321138 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples:

METHOD BLANK: 1566284 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.119 ± 0.271 (0.437) C:NA T:88%	pCi/L	12/06/18 20:58	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 321140 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60286215026, 60286215027

METHOD BLANK: 1566289 Matrix: Water
Associated Lab Samples: 60286215026, 60286215027

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.323 ± 0.449 (0.749) C:NA T:95%	pCi/L	12/12/18 10:00	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

QC Batch: 321154 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples:

METHOD BLANK: 1566306 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.125 ± 0.292 (0.652) C:80% T:79%	pCi/L	12/07/18 11:19	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA / LEC N&E
Pace Project No.: 60290639

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286215026	**L-AM-1S**	EPA 200.7	556876	EPA 200.7	556951
60286215027	**L-AM-1D**	EPA 200.7	556876	EPA 200.7	556951
60286215026	**L-AM-1S**	EPA 200.8	556679	EPA 200.8	556837
60286215027	**L-AM-1D**	EPA 200.8	556679	EPA 200.8	556837
60286215026	**L-AM-1S**	EPA 7470	557799	EPA 7470	557857
60286215027	**L-AM-1D**	EPA 7470	557799	EPA 7470	557857
60286215026	**L-AM-1S**	EPA 903.1	321140		
60286215027	**L-AM-1D**	EPA 903.1	321140		
60286215026	**L-AM-1S**	EPA 904.0	321153		
60286215027	**L-AM-1D**	EPA 904.0	321153		
60286215026	**L-AM-1S**	SM 2320B	556192		
60286215027	**L-AM-1D**	SM 2320B	556192		
60286215026	**L-AM-1S**	SM 2540C	555353		
60286215027	**L-AM-1D**	SM 2540C	555353		
60286215026	**L-AM-1S**	SM 3500-Fe B#4	557770		
60286215027	**L-AM-1D**	SM 3500-Fe B#4	558081		
60286215026	**L-AM-1S**	SM 3500-Fe B#4	554544		
60286215027	**L-AM-1D**	SM 3500-Fe B#4	554544		
60286215026	**L-AM-1S**	EPA 300.0	556826		
60286215027	**L-AM-1D**	EPA 300.0	556826		
60286215026	**L-AM-1S**	EPA 365.4	554983		
60286215027	**L-AM-1D**	EPA 365.4	554983		

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Sample Condition Upon Receipt

WO# : 60286215

60286215

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 3.0 4.2 3.8 **Corr. Factor** +0.0 **Corrected** 3.0 4.2 3.8

Date and initials of person examining contents: JB 11/6

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	Fe2+
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jann Church 11/12/18

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

Section A
Required Client Information:

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

Section B
Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA N&E
Project Number:	153-1406.0001D (COC #1)

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Section D
Required Client Information

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

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

Requested Analysis Filtered (Y/N): N N N N N

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G																						
2	L-UMW-2D	WT	G																						
3	L-UMW-3D	WT	G	11/9/18	1130	11/9/18	1215		6	2	1	3							✓	✓	✓	✓	✓		(2) BA24 BA3N BA35 (2) BA1N 023
4	L-UMW-4D	WT	G	11/9/18	0930	11/9/18	0915		6	2	1	3							✓	✓	✓	✓	✓		↓ 024
5	L-UMW-5D	WT	G																						
6	L-UMW-6D	WT	G	11/9/18	1005	11/9/18	1035		6	2	1	3							✓	✓	✓	✓	✓		↓ 025
7	L-UMW-7D	WT	G																						
8	L-UMW-8D	WT	G																						
9	L-UMW-9D	WT	G																						
10	L-BMW-1D	WT	G																						
11	L-BMW-2D	WT	G																						
12	L-AM-1S	WT	G	11/9/18		11/9/18	1140		6	2	1	3							✓	✓	✓	✓	✓		↓ 026

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As	[signature]	11/9/18	1430	[signature] / PACE	11/9/18	1430				
	[signature] / PACE	11/9/18	1700	[signature]	11/10/18	0625	3.0	Y	Y	Y
							4.2	Y	Y	Y
							3.8	Y	Y	Y

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tony [signature]
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM/DD/YY): 11/9/18

*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

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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Page: of

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA
Project Number:	153-1406.0001D (COC #1)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER ———

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		
1	L-AM-1D	WT	G			11/9/18	1245		6	2	1	3							✓	✓	✓	✓	✓		
2	L-UMW-DUP-1	WT	G																						
3	L-UMW-DUP-2	WT	G																						
4	L-UMW-FB-1	WT	G																						
5	L-UMW-FB-2	WT	G																						
6		WT	G																						
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As	Tommy Goodwin / Golder	11/9/18	1430		11/9/18	1430				
		11/9/18	1700		11/10	0825	3.0	Y	Y	Y
							4.2	Y	Y	Y
							3.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Goodwin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/9/18

*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

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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Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LEC N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001I (COC #2)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER ———

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information (SAMPLE ID)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N										
1	L-AM-1D	WT	G			11/9/18	1245		6	2	1	3							✓	✓	✓	✓	✓	✓										
2	L-UMW-DUP-1	WT	G																														
3	L-UMW-DUP-2	WT	G																														
4	L-UMW-FB-1	WT	G																														
5	L-UMW-FB-2	WT	G																														
6		WT	G																														
7		WT	G																														
8		WT	G																														
9		WT	G																														
10		WT	G																														
11		WT	G																														
12		WT	G																														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Fe, Mg, Mn, K, Na		11/9/18	1430		11/9/18	1430	
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl		11/9/18	1700		11/10	0830	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

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

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: of

Section A — **Required** Client Information:

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

Section B — **Required** Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LEC N&E
Project Number:	153-1406.0001I (COC #2)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER ———

Site Location — **STATE:** MO

Section D — **Required** Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	Section D SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N →	N	N	N	N	N	N		
1	L-UMW-1D	WT	G																							
2	L-UMW-2D	WT	G																							
3	L-UMW-3D	WT	G			11/9/18	1215		6	2	1	3							✓		✓	✓	✓	✓		
4	L-UMW-4D	WT	G			11/9/18	0915		6	2	1	3							✓		✓	✓	✓	✓		
5	L-UMW-5D	WT	G																							
6	L-UMW-6D	WT	G			11/9/18	1035		6	2	1	3							✓		✓	✓	✓	✓		
7	L-UMW-7D	WT	G																							
8	L-UMW-8D	WT	G																							
9	L-UMW-9D	WT	G																							
10	L-BMW-1D	WT	G																							
11	L-BMW-2D	WT	G																							
12	L-AM-1S	WT	G			11/9/18	1140		6	2	1	3							✓	✓	✓	✓	✓	✓		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Fe, Mg, Mn, K, Na	Tommy Goodwin / Golder	11/9/18	1430	[illegible] / PACE	11/9/18	1430	
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl	[illegible] / PACE	11/9/18	1700		11/10/18	0820	

SAMPLER NAME AND SIGNATURE Tommy Goodwin

PRINT Name of SAMPLER: Tommy Goodwin

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

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: of

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	Ballwin, MO 63021
Email To:	maddock@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA
Project Number:	153-1406.0001D (COC #1)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER ———

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
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OIL	OL
	WP
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Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		
1	L-AM-1D	WT	G			11/9/18	1245		6	2	1	3							✓	✓	✓	✓	✓		
2	L-UMW-DUP-1	WT	G																						
3	L-UMW-DUP-2	WT	G																						
4	L-UMW-FB-1	WT	G																						
5	L-UMW-FB-2	WT	G																						
6		WT	G																						
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As	Tommy Goodwin / Golder	11/9/18	1430	[illegible] / FACS	11/9/18	1430	
	[illegible] / FACS	11/9/18	1700				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Goodwin

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 11/9/18

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

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

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

MEMORANDUM

DATE January 7, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – NOVEMBER 2018 – N&E – DATA PACKAGE 60290639

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

- Analysis of Ferrous Iron for all samples was initiated outside of the 15-minute EPA required holding time, the detections in samples were qualified as estimates (J).
- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - LEC-LCPA-NTE
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406
Validation Date: 1/7/19

Laboratory: Pace Analytical
SDG #: 60290639
Analytical Method (type and no.): Metals(200.7+200.8), Hg(7470), Ra(903.1+904.0), Alk(2320), TDS(2540C), $Fe^{2+/3+}$(3500), Anions(300.0), P(365.4)
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____
Sample Names L-AM-1S, L-AM-1D

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	11/9/18
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies: _____

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☐	☐	☒	
b) Were hold times met for sample analysis?	☐	☒	☐	Fe^{2+}
c) Were the correct preservatives used?	☒	☐	☐	
d) Was the correct method used?	☒	☐	☐	
e) Were appropriate reporting limits achieved?	☒	☐	☐	
f) Were any sample dilutions noted?	☒	☐	☐	
g) Were any matrix problems noted?	☐	☒	☐	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☑	☐	☐	Mn (0.80), Cr (0.22),
b) Were analytes detected in the field blank(s)?	☐	☐	☑	
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ NA
	☑ (1)	☒	☐	FB-1@ NA
b) Were field dup. precision criteria met (note RPD)?	☐	☐	☒	
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☑	☐	Cl^-, SO_4^{2-}, F^-
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☑	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☑	☐	☐	

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-AM-1S	Ferrous Iron (Fe^{2+})	2.9	J	Analyzed Outside EPA hold time
〃	Chromium, total (Cr,t)	1.0	U	Detected in Method Blank; MDL<Result<PQL
L-AM-1D	〃	1.0	U	〃 〃
〃	Fe^{2+}	0.31	J	Hold Time

Signature: Tommy A Good Jr Date: 1/9/19

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

December 27, 2018

Mark Haddock
Golder Associates
820 S. Main St
Suite 100
Saint Charles, MO 63301

RE: Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory between November 08, 2018 and November 09, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

REV-1, 12/27/18: Metals list trimmed.

REV-2, 12/27/18: Arsenic, Barium, Lithium, Molybdenum only reported.

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

Sincerely,

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

Enclosures

cc: Ryan Feldmann, Golder
Jeffrey Ingram, Golder Associates
Eric Schneider, Golder Associates

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

CERTIFICATIONS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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

SAMPLE SUMMARY

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60286214001	**L-LMW-1S**	Water	11/07/18 13:10	11/08/18 04:02
60286214002	**L-LMW-3S**	Water	11/07/18 15:30	11/08/18 04:02
60286214003	**L-BMW-1S**	Water	11/07/18 10:00	11/08/18 04:02
60286214004	**L-BMW-2S**	Water	11/07/18 12:25	11/08/18 04:02
60286214005	**L-LMW-FB-1**	Water	11/07/18 15:25	11/08/18 04:02
60286214007	**L-LMW-4S**	Water	11/08/18 15:15	11/09/18 03:12
60286214008	**L-LMW-5S**	Water	11/08/18 13:35	11/09/18 03:12
60286214009	**L-LMW-6S**	Water	11/08/18 12:25	11/09/18 03:12
60286214010	**L-LMW-7S**	Water	11/08/18 10:55	11/09/18 03:12
60286214011	**L-LMW-8S**	Water	11/08/18 09:15	11/09/18 03:12
60286214017	**L-LMW-DUP-1**	Water	11/08/18 08:00	11/09/18 03:12
60286214018	**L- LMW-2S**	Water	11/08/18 14:45	11/09/18 03:12

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286214001	**L-LMW-1S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214002	**L-LMW-3S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214003	**L-BMW-1S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214004	**L-BMW-2S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214005	**L-LMW-FB-1**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214007	**L-LMW-4S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214008	**L-LMW-5S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214009	**L-LMW-6S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214010	**L-LMW-7S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214011	**L-LMW-8S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214017	**L-LMW-DUP-1**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214018	**L- LMW-2S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-1S **Lab ID: 60286214001** Collected: 11/07/18 13:10 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**180**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:02	7440-39-3	
Lithium	**31.0**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:02	7439-93-2	
Molybdenum	**6.1J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:02	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**26.4**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:20	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-3S **Lab ID: 60286214002** Collected: 11/07/18 15:30 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**67.4**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:09	7440-39-3	
Lithium	**19.6**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:09	7439-93-2	
Molybdenum	**145**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:09	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.8**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:26	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-BMW-1S **Lab ID: 60286214003** Collected: 11/07/18 10:00 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**323**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:11	7440-39-3	
Lithium	**17.3**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:11	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:11	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**38.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:33	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-BMW-2S **Lab ID: 60286214004** Collected: 11/07/18 12:25 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**287**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:13	7440-39-3	
Lithium	**18.4**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:13	7439-93-2	
Molybdenum	**1.9J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:13	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.44J**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:35	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-FB-1 **Lab ID: 60286214005** Collected: 11/07/18 15:25 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.5**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:16	7440-39-3	
Lithium	**<4.6**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:16	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:16	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:37	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-4S **Lab ID: 60286214007** Collected: 11/08/18 15:15 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**150**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:50	7440-39-3	
Lithium	**39.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:50	7439-93-2	
Molybdenum	**83.2**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:50	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**18.8**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:35	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-5S **Lab ID: 60286214008** Collected: 11/08/18 13:35 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**349**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:53	7440-39-3	
Lithium	**9.6J**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:53	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:53	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.58J**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:36	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-6S **Lab ID: 60286214009** Collected: 11/08/18 12:25 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**387**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:55	7440-39-3	
Lithium	**43.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:55	7439-93-2	
Molybdenum	**25.6**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:55	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**25.8**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:37	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-7S **Lab ID: 60286214010** Collected: 11/08/18 10:55 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**287**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:57	7440-39-3	
Lithium	**37.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:57	7439-93-2	
Molybdenum	**111**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:57	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**20.7**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:38	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-8S **Lab ID: 60286214011** Collected: 11/08/18 09:15 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**222**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 12:08	7440-39-3	
Lithium	**30.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 12:08	7439-93-2	
Molybdenum	**157**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 12:08	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**9.3**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:39	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L-LMW-DUP-1 **Lab ID: 60286214017** Collected: 11/08/18 08:00 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**222**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 12:11	7440-39-3	
Lithium	**24.3**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 12:11	7439-93-2	
Molybdenum	**156**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 12:11	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**9.2**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:40	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Sample: L- LMW-2S **Lab ID: 60286214018** Collected: 11/08/18 14:45 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**34.4**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 12:13	7440-39-3	
Lithium	**12.8**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 12:13	7439-93-2	
Molybdenum	**97.5**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 12:13	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**36.9**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:41	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

QC Batch: 554744 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286214001, 60286214002, 60286214003, 60286214004, 60286214005

METHOD BLANK: 2275800 Matrix: Water
Associated Lab Samples: 60286214001, 60286214002, 60286214003, 60286214004, 60286214005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/20/18 20:58	
Lithium	ug/L	<4.6	10.0	4.6	11/20/18 20:58	
Molybdenum	ug/L	<0.90	20.0	0.90	11/20/18 20:58	

LABORATORY CONTROL SAMPLE: 2275801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Lithium	ug/L	1000	951	95	85-115	
Molybdenum	ug/L	1000	980	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275802 2275803

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	180	1000	1000	1140	1140	96	96	70-130	1	20	
Lithium	ug/L	31.0	1000	1000	981	966	95	94	70-130	1	20	
Molybdenum	ug/L	6.1J	1000	1000	971	961	96	95	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275804 2275805

Parameter	Units	60286215003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	121	1000	1000	1100	1100	98	98	70-130	0	20	
Lithium	ug/L	25.0	1000	1000	977	980	95	96	70-130	0	20	
Molybdenum	ug/L	231	1000	1000	1220	1210	98	98	70-130	0	20	

MATRIX SPIKE SAMPLE: 2275806

Parameter	Units	60286215005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	500	1000	1460	96	70-130	
Lithium	ug/L	16.4	1000	973	96	70-130	
Molybdenum	ug/L	<0.90	1000	972	97	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

QC Batch: 556667 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286214007, 60286214008, 60286214009, 60286214010, 60286214011, 60286214017, 60286214018

METHOD BLANK: 2283926 Matrix: Water
Associated Lab Samples: 60286214007, 60286214008, 60286214009, 60286214010, 60286214011, 60286214017, 60286214018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/27/18 11:10	
Lithium	ug/L	<4.6	10.0	4.6	11/27/18 11:10	
Molybdenum	ug/L	<0.90	20.0	0.90	11/27/18 11:10	

LABORATORY CONTROL SAMPLE: 2283927

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	984	98	85-115	
Lithium	ug/L	1000	993	99	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	

SAMPLE DUPLICATE: 2285840

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Barium	ug/L	83.7	83.7	0	20	
Lithium	ug/L	37.0	27.2	30	20	D6
Molybdenum	ug/L	547	520	5	20	

SAMPLE DUPLICATE: 2285841

Parameter	Units	60286318009 Result	Dup Result	RPD	Max RPD	Qualifiers
Barium	ug/L	431	425	2	20	
Lithium	ug/L	30.5	25.8	17	20	
Molybdenum	ug/L	1.8J	2.0J		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

QC Batch: 554584 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286214001, 60286214002, 60286214003, 60286214004, 60286214005

METHOD BLANK: 2275036 Matrix: Water
Associated Lab Samples: 60286214001, 60286214002, 60286214003, 60286214004, 60286214005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/14/18 16:42	

LABORATORY CONTROL SAMPLE: 2275037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	40.2	101	85-115	

MATRIX SPIKE SAMPLE: 2275038

Parameter	Units	60285994001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.4	40	38.6	93	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275039 2275040

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	26.4	40	40	58.4	57.3	80	77	70-130	2	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

QC Batch: 555794 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286214007, 60286214008, 60286214009, 60286214010, 60286214011, 60286214017, 60286214018

METHOD BLANK: 2280347 Matrix: Water
Associated Lab Samples: 60286214007, 60286214008, 60286214009, 60286214010, 60286214011, 60286214017, 60286214018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/20/18 15:33	

LABORATORY CONTROL SAMPLE: 2280348

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	40.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2280349 2280350

Parameter	Units	60286372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.8	40	40	42.3	42.8	101	103	70-130	1	20	

MATRIX SPIKE SAMPLE: 2280351

Parameter	Units	60287127001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.4	40	42.6	103	70-130	

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QUALIFIERS

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPB / LCPA N&E
Pace Project No.: 60286214

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286214001	**L-LMW-1S**	EPA 200.7	554744	EPA 200.7	554814
60286214002	**L-LMW-3S**	EPA 200.7	554744	EPA 200.7	554814
60286214003	**L-BMW-1S**	EPA 200.7	554744	EPA 200.7	554814
60286214004	**L-BMW-2S**	EPA 200.7	554744	EPA 200.7	554814
60286214005	**L-LMW-FB-1**	EPA 200.7	554744	EPA 200.7	554814
60286214007	**L-LMW-4S**	EPA 200.7	556667	EPA 200.7	556947
60286214008	**L-LMW-5S**	EPA 200.7	556667	EPA 200.7	556947
60286214009	**L-LMW-6S**	EPA 200.7	556667	EPA 200.7	556947
60286214010	**L-LMW-7S**	EPA 200.7	556667	EPA 200.7	556947
60286214011	**L-LMW-8S**	EPA 200.7	556667	EPA 200.7	556947
60286214017	**L-LMW-DUP-1**	EPA 200.7	556667	EPA 200.7	556947
60286214018	**L- LMW-2S**	EPA 200.7	556667	EPA 200.7	556947
60286214001	**L-LMW-1S**	EPA 200.8	554584	EPA 200.8	554713
60286214002	**L-LMW-3S**	EPA 200.8	554584	EPA 200.8	554713
60286214003	**L-BMW-1S**	EPA 200.8	554584	EPA 200.8	554713
60286214004	**L-BMW-2S**	EPA 200.8	554584	EPA 200.8	554713
60286214005	**L-LMW-FB-1**	EPA 200.8	554584	EPA 200.8	554713
60286214007	**L-LMW-4S**	EPA 200.8	555794	EPA 200.8	556335
60286214008	**L-LMW-5S**	EPA 200.8	555794	EPA 200.8	556335
60286214009	**L-LMW-6S**	EPA 200.8	555794	EPA 200.8	556335
60286214010	**L-LMW-7S**	EPA 200.8	555794	EPA 200.8	556335
60286214011	**L-LMW-8S**	EPA 200.8	555794	EPA 200.8	556335
60286214017	**L-LMW-DUP-1**	EPA 200.8	555794	EPA 200.8	556335
60286214018	**L- LMW-2S**	EPA 200.8	555794	EPA 200.8	556335

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Sample Condition Upon Receipt

WO#: 60286214

60286214

Client Name: Golder

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

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

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐ x5

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ Zpic x5

Thermometer Used: T-299 Type of Ice: Wet ☑ Blue None x5

Cooler Temperature (°C): As-read 0.9/2.2 Corr. Factor +0.1 Corrected 1.0/2.3

Date and initials of person examining contents: 11-8-18 HF dlb

Temperature should be above freezing to 6°C 0.4/0.5/2.3 0.5/0.6/2.4

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Chunk 11/9/18 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPB
Project Number:	153-1406.0001E (COC #4)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES (GROUND WATER) DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		60286214
																		Analysis Test	Metals*	Chloride/Fluoride/Sulfate	TDS		
1	L-LMW-1S	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓	2BP2U BP3S BP3N	001
2	L-LMW-2S	WT	G																				
3	L-LMW-3S	WT	G			11/7/18	1530		4	2	1	1							✓	✓	✓	2BP2U BP3S BP3N	002
4	L-LMW-4S	WT	G																				
5	L-LMW-5S	WT	G																				
6	L-LMW-6S	WT	G																				
7	~~L-LMW-7S~~ L-MS-1	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓	2BP2U BP3S BP3N	
8	~~L-LMW-8S~~ L-MSD-1	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓	↓ ↓ ↓	
9	L-BMW-1S	WT	G			11/7/18	1000		4	2	1	1							✓	✓	✓		003
10	L-BMW-2S	WT	G			11/7/18	1225		4	2	1	1							✓	✓	✓	↓ ↓ ↓	004
11	L-LMW-DUP-1	WT	G																				
12	L-LMW-FB-1	WT	G			11/7/18	1525		4	2	1	1							✓	✓	✓	2BP2U BP3S BP3N	005

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, ~~MS/MSD-1~~	Eric Schedler / Golder	11/7/18	1735	Holly Fowler DASI	11.8.18	0402	1.0 Y Y Y
							2.3
							0.5
							0.6
							2.4

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schedler

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/07/18

*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

COC #2

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Sample Condition Upon Receipt

WO# : 60286214

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 2.7,2.9 **Corr. Factor** +0.0 **Corrected** 2.7,2.9

Date and initials of person examining contents: AC 11/9

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jana Church Date: 11/9/18

11/8/18

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPA N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001I (COC #5)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES; GROUND WATER; DRINKING WATER; UST; RCRA; OTHER

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS																Y/N	N	N	N	N	N									
1	L-LMW-1S	WT	G																												
2	L-LMW-2S	WT	G			11/8/18	1445		4	2	1	1																		BP3S -006	
3	L-LMW-3S	WT	G				1515																								
4	L-LMW-4S	WT	G			11/8/18	~~1335~~ (2)		4	2	1	1																		BP3S -007	
5	L-LMW-5S	WT	G				~~1345~~ (2)																								-008
6	L-LMW-6S	WT	G				1055 (3)																								-009
7	L-LMW-7S	WT	G				1055																								-010
8	L-LMW-8S	WT	G				0915																								-011
9	L-BMW-1S	WT	G																												
10	L-BMW-2S	WT	G																												
11	L-LMW-DUP-1	WT	G			11/8/18	—		4	2	1	1																		BP3S -017	
12	L-LMW-FB-1	WT	G																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: Ba, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: As	[signature] / Golder	11/8/18	1735	[signature] via cat post	11/9/18	03:12	2.7	4	4	4
							2.9	4	4	4

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

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11/8/18

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPB	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001E (COC #4)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		
1	L-LMW-1S	WT	G																				
2	L-LMW-2S	WT	G			11/8/18	1445		4	2	1	1											-006
3	L-LMW-3S	WT	G																				
4	L-LMW-4S	WT	G			11/8/18	1515		4	2	1	1											-007
5	L-LMW-5S	WT	G			11/8/18	1335																-008
6	L-LMW-6S	WT	G			11/8/18	1225																-009
7	L-LMW-7S	WT	G			11/8/18	1055																-010
8	L-LMW-8S	WT	G			11/8/18	0915																-011
9	L-BMW-1S	WT	G																				
10	L-BMW-2S	WT	G																				
11	L-LMW-DUP-1	WT	G			11/8/18	—		4	2	1	1											-017
12	L-LMW-FB-1	WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca	[signature] / Golder	11/8/18	1735				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: | DATE Signed (MM/DD/YY):

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

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

11/7/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPA N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001! (COC #5)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES (GROUND WATER) DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Valid Matrix Codes: DRINKING WATER (DW), WATER (WT), WASTE WATER (WW), PRODUCT (P), SOIL/SOLID (SL), OIL (OL), WIPE (WP), AIR (AR), TISSUE (TS), OTHER (OT)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																		N	N	N	N	N		
1	L-LMW-1S	WT	G			11/7/18	1310		4	2	1	1							/	/	/	/	/		-012
2	L-LMW-2S	WT	G																						
3	L-LMW-3S	WT	G			11/7/18	1530		4	2	1	1							/	/	/	/	/		-013
4	L-LMW-4S	WT	G																						
5	L-LMW-5S	WT	G																						
6	L-LMW-6S	WT	G																						
7	~~L-LMW-7S~~ LMW-MS-1	WT	G			11/7/18	1310		4	2	1	1							/	/	/	/	/		-012
8	~~L-LMW-8S~~ LMW-MSD-1	WT	G				1310																		-014
9	L-BMW-1S	WT	G				1000																		-015
10	L-BMW-2S	WT	G			"	1225		"	"	"	"							"	"	"	"	"		
11	L-LMW-DUP-1	WT	G																						
12	L-LMW-FB-1	WT	G			11/7/18	1535		4	2	1	1							/	/	/	/	/		-016

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Ba, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: As	Golder	11/8/18	1735				

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

MEMORANDUM

DATE January 3, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – NOVEMBER 2018 - DATA PACKAGE 60286214R2

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a field duplicate RPD was not met, associated samples were qualified as estimates (J).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren-Labadie-LMW-Nov 2018
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406.0001B
Validation Date: 1/3/18

Laboratory: Pace Analytical
SDG #: 60286214 r2
Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐
Sample Names L-LMW1S, L-LMW-2S, L-LMW-3S, L-LMW-4S, L-LMW-5S, L-LMW-6S, L-LMW-7S, L-LMW-8S, L-BMW-1S, L-BMW-2S
L-LMW-DUP-1, L-LMW-FB-1, L-LMW-1S MS, L-LMW-1S MSD

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

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

Note Deficiencies:

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	☒	☐	☐	
b) Was the COC signed by both field and laboratory personnel?	☒	☐	☐	
c) Were samples received in good condition?	☑	☐	☐	0.4/0.5/2.3/2.7/2.9

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ BS
	☑	☐	☐	FB-1@ 3S
b) Were field dup. precision criteria met (note RPD)?	☐	☑	☐	Li (23.9)
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☑	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☑	☐	Li (30)

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LMW-8S	Lithium (Li)	30.9	J	RPD exceeded limits; Result > MDL
L-LMW-DUP-1	"	24.3	J	" "

Signature: [signature]

Date: 1/3/19

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December 28, 2018

Mark Haddock
Golder Associates
820 S. Main St
Suite 100
Saint Charles, MO 63301

RE: Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory between November 08, 2018 and November 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

REV-1, 12/28/18: L-BMW-1S and L-BMW-2S added. Metals list trimmed.

REV-2, 12/28/18: Reported trimmed to only report As, Ba, Li, Mo.

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

Sincerely,

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

Enclosures

cc: Ryan Feldmann, Golder
Jeffrey Ingram, Golder Associates
Eric Schneider, Golder Associates

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60286372001	**L-TMW-1**	Water	11/09/18 09:00	11/10/18 06:25
60286372002	**L-TMW-2**	Water	11/09/18 10:05	11/10/18 06:25
60286372003	**L-TMW-3**	Water	11/09/18 11:40	11/10/18 06:25
60286372004	**L-MW-26**	Water	11/09/18 12:45	11/10/18 06:25
60286372005	**L-UWL-DUP-1**	Water	11/09/18 09:00	11/10/18 06:25
60286372006	**L-UWL-FB-1**	Water	11/09/18 11:27	11/10/18 06:25
60286214003	**L-BMW-1S**	Water	11/07/18 10:00	11/08/18 04:02
60286214004	**L-BMW-2S**	Water	11/07/18 12:25	11/08/18 04:02

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286372001	**L-TMW-1**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286372002	**L-TMW-2**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286372003	**L-TMW-3**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286372004	**L-MW-26**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286372005	**L-UWL-DUP-1**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286372006	**L-UWL-FB-1**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214003	**L-BMW-1S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K
60286214004	**L-BMW-2S**	EPA 200.7	JGP	3	PASI-K
		EPA 200.8	JDH	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-TMW-1 **Lab ID: 60286372001** Collected: 11/09/18 09:00 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**375**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:17	7440-39-3	
Lithium	**40.3**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:17	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:17	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.8**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:42	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-TMW-2 **Lab ID: 60286372002** Collected: 11/09/18 10:05 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**203**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:23	7440-39-3	
Lithium	**43.7**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:23	7439-93-2	
Molybdenum	**1.1J**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:23	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.0**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:47	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-TMW-3 **Lab ID: 60286372003** Collected: 11/09/18 11:40 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**313**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:26	7440-39-3	
Lithium	**52.0**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:26	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:26	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**16.1**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:48	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-MW-26 **Lab ID: 60286372004** Collected: 11/09/18 12:45 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**186**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:28	7440-39-3	
Lithium	**29.1**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:28	7439-93-2	
Molybdenum	**1.1J**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:28	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.52J**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:49	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-UWL-DUP-1 **Lab ID: 60286372005** Collected: 11/09/18 09:00 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**206**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:30	7440-39-3	
Lithium	**45.4**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:30	7439-93-2	
Molybdenum	**1.1J**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:30	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.2**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:50	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-UWL-FB-1 **Lab ID: 60286372006** Collected: 11/09/18 11:27 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.5**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:32	7440-39-3	
Lithium	**<4.6**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:32	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:32	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/20/18 10:02	11/20/18 15:51	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-BMW-1S **Lab ID: 60286214003** Collected: 11/07/18 10:00 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**323**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:11	7440-39-3	
Lithium	**17.3**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:11	7439-93-2	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:11	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**38.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:33	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Sample: L-BMW-2S **Lab ID: 60286214004** Collected: 11/07/18 12:25 Received: 11/08/18 04:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**287**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:13	7440-39-3	
Lithium	**18.4**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:13	7439-93-2	
Molybdenum	**1.9J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:13	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.44J**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:35	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

QC Batch: 554744
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286214003, 60286214004

METHOD BLANK: 2275800 Matrix: Water
Associated Lab Samples: 60286214003, 60286214004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/20/18 20:58	
Lithium	ug/L	<4.6	10.0	4.6	11/20/18 20:58	
Molybdenum	ug/L	<0.90	20.0	0.90	11/20/18 20:58	

LABORATORY CONTROL SAMPLE: 2275801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Lithium	ug/L	1000	951	95	85-115	
Molybdenum	ug/L	1000	980	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275802 2275803

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	180	1000	1000	1140	1140	96	96	70-130	1	20	
Lithium	ug/L	31.0	1000	1000	981	966	95	94	70-130	1	20	
Molybdenum	ug/L	6.1J	1000	1000	971	961	96	95	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275804 2275805

Parameter	Units	60286215003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	121	1000	1000	1100	1100	98	98	70-130	0	20	
Lithium	ug/L	25.0	1000	1000	977	980	95	96	70-130	0	20	
Molybdenum	ug/L	231	1000	1000	1220	1210	98	98	70-130	0	20	

MATRIX SPIKE SAMPLE: 2275806

Parameter	Units	60286215005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	500	1000	1460	96	70-130	
Lithium	ug/L	16.4	1000	973	96	70-130	
Molybdenum	ug/L	<0.90	1000	972	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

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

QC Batch: 556876 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286372001, 60286372002, 60286372003, 60286372004, 60286372005, 60286372006

METHOD BLANK: 2284987 Matrix: Water
Associated Lab Samples: 60286372001, 60286372002, 60286372003, 60286372004, 60286372005, 60286372006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/27/18 13:48	
Lithium	ug/L	<4.6	10.0	4.6	11/27/18 13:48	
Molybdenum	ug/L	<0.90	20.0	0.90	11/27/18 13:48	

LABORATORY CONTROL SAMPLE: 2284988

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Lithium	ug/L	1000	989	99	85-115	
Molybdenum	ug/L	1000	1000	100	85-115	

MATRIX SPIKE SAMPLE: 2284989

Parameter	Units	60286215023 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	82.2	1000	1060	98	70-130	
Lithium	ug/L	13.4	1000	987	97	70-130	
Molybdenum	ug/L	206	1000	1220	101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284990 2284991

Parameter	Units	60286372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	375	1000	1000	1360	1360	99	98	70-130	0	20	
Lithium	ug/L	40.3	1000	1000	1040	1030	100	99	70-130	0	20	
Molybdenum	ug/L	<0.90	1000	1000	1020	1020	102	102	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.

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

QC Batch: 554584 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286214003, 60286214004

METHOD BLANK: 2275036 Matrix: Water
Associated Lab Samples: 60286214003, 60286214004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/14/18 16:42	

LABORATORY CONTROL SAMPLE: 2275037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	40.2	101	85-115	

MATRIX SPIKE SAMPLE: 2275038

Parameter	Units	60285994001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.4	40	38.6	93	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275039 2275040

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	26.4	40	40	58.4	57.3	80	77	70-130	2	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

QC Batch: 555794 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286372001, 60286372002, 60286372003, 60286372004, 60286372005, 60286372006

METHOD BLANK: 2280347 Matrix: Water
Associated Lab Samples: 60286372001, 60286372002, 60286372003, 60286372004, 60286372005, 60286372006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/20/18 15:33	

LABORATORY CONTROL SAMPLE: 2280348

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	40.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2280349 2280350

Parameter	Units	60286372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.8	40	40	42.3	42.8	101	103	70-130	1	20	

MATRIX SPIKE SAMPLE: 2280351

Parameter	Units	60287127001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.4	40	42.6	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

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

QUALIFIERS

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCL1 / LCPA N&E
Pace Project No.: 60286372

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286214003	**L-BMW-1S**	EPA 200.7	554744	EPA 200.7	554814
60286214004	**L-BMW-2S**	EPA 200.7	554744	EPA 200.7	554814
60286372001	**L-TMW-1**	EPA 200.7	556876	EPA 200.7	556951
60286372002	**L-TMW-2**	EPA 200.7	556876	EPA 200.7	556951
60286372003	**L-TMW-3**	EPA 200.7	556876	EPA 200.7	556951
60286372004	**L-MW-26**	EPA 200.7	556876	EPA 200.7	556951
60286372005	**L-UWL-DUP-1**	EPA 200.7	556876	EPA 200.7	556951
60286372006	**L-UWL-FB-1**	EPA 200.7	556876	EPA 200.7	556951
60286214003	**L-BMW-1S**	EPA 200.8	554584	EPA 200.8	554713
60286214004	**L-BMW-2S**	EPA 200.8	554584	EPA 200.8	554713
60286372001	**L-TMW-1**	EPA 200.8	555794	EPA 200.8	556335
60286372002	**L-TMW-2**	EPA 200.8	555794	EPA 200.8	556335
60286372003	**L-TMW-3**	EPA 200.8	555794	EPA 200.8	556335
60286372004	**L-MW-26**	EPA 200.8	555794	EPA 200.8	556335
60286372005	**L-UWL-DUP-1**	EPA 200.8	555794	EPA 200.8	556335
60286372006	**L-UWL-FB-1**	EPA 200.8	555794	EPA 200.8	556335

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Sample Condition Upon Receipt

WO# : 60286372

60286372

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 3.0 4.2 **Corr. Factor** +0.0 **Corrected** 3.0 4.2

JLS

Date and initials of person examining contents: JB 11/12

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	Fe24
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Chunk Date: 11/12/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — Required Client Information:

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

Section B — Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA N&E
Project Number:	153-1406.0001I (COC #7)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES — GROUND WATER — DRINKING WATER

UST — RCRA — OTHER

Site Location STATE: MO

Pace Project No./ Lab I.D.: 60286372

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-TMW-1	WT	G			11/9/18	0900		12	6	3	3						N	/	/	/	/	/		001
2	L-TMW-2	WT	G				1005		4	2	1	1						N	/	/	/	/	/		002
3	L-TMW-3	WT	G				1140		4	2	1	1						N	/	/	/	/	/		003
4	L-MW-26	WT	G				1245		4	2	1	1						N	/	/	/	/	/		004
5	L-UWL-DUP-1	WT	G				—		4	2	1	1						N	/	/	/	/	/		005
6	L-UWL-FB-1	WT	G				1127		4	2	1	1						N	/	/	/	/	/		006
7	L-BMW-1S	WT	G																						
8	L-BMW-2S	WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: Ba, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: As	Golder	11/9/18	1430	PACE	11/9/18	1430
		11/9/18	1700		11/10	0625

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Golden

SIGNATURE of SAMPLER: Tommy Golden

DATE Signed (MM/DD/YY): 11/9/18

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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Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCL1	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001F (COC #6)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES / GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		
1	L-TMW-1	WT	G			11/9/18	0700		12	6	3	3							/	/	/		
2	L-TMW-2	WT	G				0805		4	2	1	1											
3	L-TMW-3	WT	G				1140		4														
4	L-MW-26	WT	G				1245		4														
5	L-UWL-DUP-1	WT	G				—		4														
6	L-UWL-FB-1	WT	G				1127		4														
7	L-BMW-1S	WT	G																				
8	L-BMW-2S	WT	G																				
9		WT	G																				
10		WT	G																				
11		WT	G																				
12		WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca	Tommy Golder	11/9/18	1430	PACE	11/9/18	1430				
	PACE	11/9/18	1700		11/10/18	0825	3.0	Y	Y	Y
							4.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Golder

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/9/18

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Sample Condition Upon Receipt

WO#: 60286214

60286214

Client Name: Golder

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

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

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐ x5

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ Zpic x5

Thermometer Used: T-299 Type of Ice: Wet Blue None x5

Cooler Temperature (°C): As-read 0.9/2.2 Corr. Factor +0.1 Corrected 1.0/2.3

Date and initials of person examining contents: 11-8-18 HF dlb

Temperature should be above freezing to 6°C 0.4/0.5/2.3 0.5/0.6/2.4

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Chunk 11/9/18 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPB
Project Number:	153-1406.0001E (COC #4)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		
1	L-LMW-1S	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓		60286214 001
2	L-LMW-2S	WT	G																				
3	L-LMW-3S	WT	G			11/7/18	1530		4	2	1	1							✓	✓	✓		002
4	L-LMW-4S	WT	G																				
5	L-LMW-5S	WT	G																				
6	L-LMW-6S	WT	G																				
7	~~L-LMW-7S~~ L-MS-1	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓		
8	~~L-LMW-8S~~ L-MSD-1	WT	G			11/7/18	1310		4	2	1	1							✓	✓	✓		
9	L-BMW-1S	WT	G			11/7/18	1000		4	2	1	1							✓	✓	✓		003
10	L-BMW-2S	WT	G			11/7/18	1225		4	2	1	1							✓	✓	✓		004
11	L-LMW-DUP-1	WT	G																				
12	L-LMW-FB-1	WT	G			11/7/18	1525		4	2	1	1							✓	✓	✓		005

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, ~~MS/MSD-1~~	Eric Schedler	11/7/18	1735	Holly Fowler DASI	11.8.18	0402	1.0 / 2.3 / 0.5 / 0.6 / 2.4

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schedler

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/07/18

*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

COC #2

WO# : 60286214

60286214

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www.pacelabs.com

Sample Condition Upon Receipt

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 2.7,2.9 **Corr. Factor** +0.0 **Corrected** 2.7,2.9

Date and initials of person examining contents: AC 11/9

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jana Church Date: 11/9/18

11/8/18

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPA N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001 (COC #5)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES (GROUND WATER) DRINKING WATER; UST RCRA OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS																Y/N	N	N	N	N	N								
1	L-LMW-1S	WT	G																											
2	L-LMW-2S	WT	G			11/8/18	1445		4	2	1	1																	BP3S -006
3	L-LMW-3S	WT	G				1515																							
4	L-LMW-4S	WT	G			11/8/18	~~1335~~ (2)		4	2	1	1																	BP3S -007
5	L-LMW-5S	WT	G				~~1345~~ (2)																							-008
6	L-LMW-6S	WT	G				~~1210~~ 1055 (2)																							-009
7	L-LMW-7S	WT	G				1055																							-010
8	L-LMW-8S	WT	G				0915																							-011
9	L-BMW-1S	WT	G																											
10	L-BMW-2S	WT	G																											
11	L-LMW-DUP-1	WT	G			11/8/18	—		4	2	1	1																	BP3S -017
12	L-LMW-FB-1	WT	G																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: Ba, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: As	[signature] / Golder	11/8/18	1735	[signature] via cat post	11/9/18	03:12	2.7	4	4	4
							2.9	4	4	4

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

Pace Analytical
www.pacelabs.com

11/8/18

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPB	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001E (COC #4)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		
1	L-LMW-1S	WT	G																				
2	L-LMW-2S	WT	G			11/8/18	1445		4	2	1	1											-006
3	L-LMW-3S	WT	G																				
4	L-LMW-4S	WT	G			11/8/18	1515		4	2	1	1											-007
5	L-LMW-5S	WT	G			11/8/18	1335																-008
6	L-LMW-6S	WT	G			11/8/18	1225																-009
7	L-LMW-7S	WT	G			11/8/18	1055																-010
8	L-LMW-8S	WT	G			11/8/18	0915																-011
9	L-BMW-1S	WT	G																				
10	L-BMW-2S	WT	G																				
11	L-LMW-DUP-1	WT	G			11/8/18	—		4	2	1	1											-017
12	L-LMW-FB-1	WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca	[signature] / Golder	11/8/18	1735				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: | DATE Signed (MM/DD/YY):

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

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

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

11/7/18

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1

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	Ballwin, MO 63021			Address:	
Email To:	mhaddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie EC LCPA N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001! (COC #5)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES (GROUND WATER) DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																		N	N	N	N	N		
1	L-LMW-1S	WT	G			11/7/18	1310		4	2	1	1							/	/	/	/	/		-012
2	L-LMW-2S	WT	G																						
3	L-LMW-3S	WT	G			11/7/18	1530		4	2	1	1							/	/	/	/	/		-013
4	L-LMW-4S	WT	G																						
5	L-LMW-5S	WT	G																						
6	L-LMW-6S	WT	G																						
7	~~L-LMW-7S~~ LMW-MS-1	WT	G			11/7/18	1310		4	2	1	1							/	/	/	/	/		-012
8	~~L-LMW-8S~~ LMW-MSD-1	WT	G				1310																		-014
9	L-BMW-1S	WT	G				1000																		-015
10	L-BMW-2S	WT	G			⊥	1225		⊥	⊥	⊥	⊥							⊥	⊥	⊥	⊥	⊥		
11	L-LMW-DUP-1	WT	G																						
12	L-LMW-FB-1	WT	G			11/7/18	1535		4	2	1	1							/	/	/	/	/		-016

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Ba, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: As	Golder	11/8/18	1735				

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

MEMORANDUM

DATE January 7, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – NOVEMBER 2018 – CCR – DATA PACKAGE 60286372R2

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).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - LCLI ~~LCEC~~ N+E - Nov 2018
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406
Validation Date: 1/7/19

Laboratory: Pace Analytical
SDG #: 60286372, 2
Analytical Method (type and no.): Metals (200.7 + 200.8)
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, ~~L-DUP-1~~ L-MW-26, L-UWL-DUP-1, L-UWL-FB-1, L-BMW-1S L-BMW-2S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	11/7 + 11/9/18
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ L-TMW-2
	☒	☐	☐	FB-1@ L-TMW-3
b) Were field dup. precision criteria met (note RPD)?	☑	☐	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature: Tommy McGood Jr Date: 1/7/19

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

December 05, 2018

Mark Haddock
Golder Associates
820 S. Main St
Suite 100
Saint Charles, MO 63301

RE: Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory between November 09, 2018 and November 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

cc: Ryan Feldmann, Golder
Jeffrey Ingram, Golder Associates
John Suozzi, Golder Associates

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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

SAMPLE SUMMARY

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60286318001	**L-TP-1S**	Water	11/08/18 14:40	11/09/18 03:12
60286318002	**L-TP-1M**	Water	11/08/18 14:00	11/09/18 03:12
60286318003	**L-TP-1D**	Water	11/08/18 13:10	11/09/18 03:12
60286318004	**L-TP-3M**	Water	11/08/18 10:40	11/09/18 03:12
60286318005	**L-TP-3D**	Water	11/08/18 09:45	11/09/18 03:12
60286318006	**L-TP-4S**	Water	11/08/18 11:10	11/09/18 03:12
60286318007	**L-TP-4M**	Water	11/08/18 10:35	11/09/18 03:12
60286318008	**L-TP-4D**	Water	11/08/18 09:40	11/09/18 03:12
60286318009	**L-TP-5S**	Water	11/08/18 13:50	11/09/18 03:12
60286318010	**L-TP-5M**	Water	11/08/18 13:15	11/09/18 03:12
60286318011	**L-TP-5D**	Water	11/08/18 12:25	11/09/18 03:12
60286318012	**L-NE-DUP-1**	Water	11/08/18 08:00	11/09/18 03:12
60286318013	**L-NE-DUP-2**	Water	11/08/18 08:00	11/09/18 03:12
60286318014	**L-NE-FB-1**	Water	11/08/18 10:30	11/09/18 03:12
60286318015	**L-NE-FB-2**	Water	11/08/18 13:00	11/09/18 03:12
60286318016	**L-TP-3S**	Water	11/08/18 11:20	11/09/18 03:12
60286318017	**L-TP-2S**	Water	11/09/18 10:10	11/10/18 06:25
60286318018	**L-TP-2M**	Water	11/09/18 10:50	11/10/18 06:25
60286318019	**L-TP-2D**	Water	11/09/18 09:40	11/10/18 06:25

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286318001	**L-TP-1S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318002	**L-TP-1M**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318003	**L-TP-1D**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB, WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318004	**L-TP-3M**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318005	**L-TP-3D**	EPA 200.7	JGP	13	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318006	**L-TP-4S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318007	**L-TP-4M**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318008	**L-TP-4D**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286318009	**L-TP-5S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318010	**L-TP-5M**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318011	**L-TP-5D**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318012	**L-NE-DUP-1**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB, WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318013	**L-NE-DUP-2**	EPA 200.7	JGP	13	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB, WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318014	**L-NE-FB-1**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318015	**L-NE-FB-2**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318016	**L-TP-3S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	LDB, WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318017	**L-TP-2S**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318018	**L-TP-2M**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286318019	**L-TP-2D**	EPA 200.7	JGP	13	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	ZMH	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-1S **Lab ID: 60286318001** Collected: 11/08/18 14:40 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**355**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 22:00	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/12/18 18:25	11/20/18 22:00	7440-41-7	
Boron	**105**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 22:00	7440-42-8	
Calcium	**152000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 22:00	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/12/18 18:25	11/20/18 22:00	7440-48-4	
Iron	**24500**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 22:00	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/12/18 18:25	11/20/18 22:00	7439-92-1	
Lithium	**14.3**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 22:00	7439-93-2	
Magnesium	**30700**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 22:00	7439-95-4	
Manganese	**1710**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 22:00	7439-96-5	
Molybdenum	**4.5J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 22:00	7439-98-7	
Potassium	**4760**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 22:00	7440-09-7	
Sodium	**10100**	ug/L	500	157	1	11/12/18 18:25	11/20/18 22:00	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:51	7440-36-0	
Arsenic	**12.8**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 14:51	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/15/18 11:26	11/16/18 14:51	7440-43-9	
Chromium	**0.10J**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:51	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/15/18 11:26	11/16/18 14:51	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/15/18 11:26	11/16/18 14:51	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 16:44	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**511**	mg/L	20.0	4.9	1		11/16/18 21:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**556**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**22.3**	mg/L	0.050		1		11/26/18 10:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**2.2**	mg/L	0.20	0.012	1		11/10/18 15:45		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**4.3**	mg/L	1.0	0.29	1		11/24/18 20:16	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/24/18 20:16	16984-48-8	
Sulfate	**39.2**	mg/L	10.0	2.4	10		11/24/18 20:32	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.22**	mg/L	0.10	0.050	1		11/15/18 10:32	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-1M **Lab ID: 60286318002** Collected: 11/08/18 14:00 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**980**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 22:02	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/12/18 18:25	11/20/18 22:02	7440-41-7	
Boron	**69.4J**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 22:02	7440-42-8	
Calcium	**129000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 22:02	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/12/18 18:25	11/20/18 22:02	7440-48-4	
Iron	**8520**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 22:02	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/12/18 18:25	11/20/18 22:02	7439-92-1	
Lithium	**21.8**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 22:02	7439-93-2	
Magnesium	**34100**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 22:02	7439-95-4	
Manganese	**586**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 22:02	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 22:02	7439-98-7	
Potassium	**4020**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 22:02	7440-09-7	
Sodium	**8780**	ug/L	500	157	1	11/12/18 18:25	11/20/18 22:02	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:53	7440-36-0	
Arsenic	**0.18J**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 14:53	7440-38-2	B
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/15/18 11:26	11/16/18 14:53	7440-43-9	
Chromium	**0.081J**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:53	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/15/18 11:26	11/16/18 14:53	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/15/18 11:26	11/16/18 14:53	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 16:46	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**467**	mg/L	20.0	4.9	1		11/16/18 21:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**528**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**8.4**	mg/L	0.050		1		11/26/18 10:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.17J**	mg/L	0.20	0.012	1		11/10/18 15:45		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**3.5**	mg/L	1.0	0.29	1		11/24/18 20:48	16887-00-6	
Fluoride	**0.20J**	mg/L	0.20	0.19	1		11/24/18 20:48	16984-48-8	
Sulfate	**29.0**	mg/L	5.0	1.2	5		11/24/18 21:04	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.64**	mg/L	0.10	0.050	1		11/15/18 10:35	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-1D **Lab ID: 60286318003** Collected: 11/08/18 13:10 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**1420**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 22:04	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/12/18 18:25	11/20/18 22:04	7440-41-7	
Boron	**69.6J**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 22:04	7440-42-8	
Calcium	**136000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 22:04	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/12/18 18:25	11/20/18 22:04	7440-48-4	
Iron	**8090**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 22:04	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/12/18 18:25	11/20/18 22:04	7439-92-1	
Lithium	**26.4**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 22:04	7439-93-2	
Magnesium	**35000**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 22:04	7439-95-4	
Manganese	**230**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 22:04	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 22:04	7439-98-7	
Potassium	**4230**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 22:04	7440-09-7	
Sodium	**11400**	ug/L	500	157	1	11/12/18 18:25	11/20/18 22:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:59	7440-36-0	
Arsenic	**0.66J**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 14:59	7440-38-2	B
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/15/18 11:26	11/16/18 14:59	7440-43-9	
Chromium	**0.26J**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 14:59	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/15/18 11:26	11/16/18 14:59	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/15/18 11:26	11/16/18 14:59	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 16:53	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**489**	mg/L	20.0	4.9	1		11/16/18 21:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**520**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**8.1**	mg/L	0.050		1		11/26/18 10:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.21**	mg/L	0.20	0.012	1		11/10/18 15:42		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**4.9**	mg/L	1.0	0.29	1		11/24/18 21:20	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/24/18 21:20	16984-48-8	
Sulfate	**25.7**	mg/L	2.0	0.48	2		11/26/18 20:23	14808-79-8	M1
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.47**	mg/L	0.10	0.050	1		11/15/18 10:36	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-3M **Lab ID: 60286318004** Collected: 11/08/18 10:40 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**238**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:15	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:15	7440-41-7	
Boron	**6210**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:15	7440-42-8	
Calcium	**101000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:15	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:15	7440-48-4	
Iron	**7500**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:15	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:15	7439-92-1	
Lithium	**26.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:15	7439-93-2	
Magnesium	**22300**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:15	7439-95-4	
Manganese	**1070**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:15	7439-96-5	
Molybdenum	**355**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:15	7439-98-7	
Potassium	**5320**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:15	7440-09-7	
Sodium	**60300**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:15	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 15:01	7440-36-0	
Arsenic	**0.27J**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 15:01	7440-38-2	B
Cadmium	**0.096J**	ug/L	0.50	0.033	1	11/15/18 11:26	11/16/18 15:01	7440-43-9	B
Chromium	**<0.078**	ug/L	1.0	0.078	1	11/15/18 11:26	11/16/18 15:01	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/15/18 11:26	11/16/18 15:01	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/15/18 11:26	11/16/18 15:01	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 16:55	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**250**	mg/L	20.0	4.9	1		11/16/18 21:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**585**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**6.5**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.95**	mg/L	0.20	0.012	1		11/10/18 15:36		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.4**	mg/L	1.0	0.29	1		11/24/18 21:36	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.19	1		11/24/18 21:36	16984-48-8	
Sulfate	**205**	mg/L	20.0	4.8	20		11/24/18 21:52	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.30**	mg/L	0.10	0.050	1		11/15/18 10:37	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-3D **Lab ID: 60286318005** Collected: 11/08/18 09:45 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**83.7**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:17	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:17	7440-41-7	
Boron	**10600**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:17	7440-42-8	
Calcium	**99600**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:17	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:17	7440-48-4	
Iron	**5620**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:17	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:17	7439-92-1	
Lithium	**37.0**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:17	7439-93-2	D6
Magnesium	**22500**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:17	7439-95-4	
Manganese	**195**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:17	7439-96-5	
Molybdenum	**547**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:17	7439-98-7	
Potassium	**6760**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:17	7440-09-7	
Sodium	**117000**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:17	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.10J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 10:57	7440-36-0	
Arsenic	**1.8**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 10:57	7440-38-2	
Cadmium	**0.20J**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 10:57	7440-43-9	B
Chromium	**0.37J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 10:57	7440-47-3	B
Selenium	**0.14J**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 10:57	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 10:57	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 16:58	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**115**	mg/L	20.0	4.9	1		11/17/18 19:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**858**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**26.8**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.19J**	mg/L	0.20	0.012	1		11/10/18 15:34		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**24.4**	mg/L	5.0	1.4	5		11/24/18 23:12	16887-00-6	M1
Fluoride	**0.27**	mg/L	0.20	0.19	1		11/24/18 22:40	16984-48-8	M1
Sulfate	**441**	mg/L	50.0	12.0	50		11/24/18 23:44	14808-79-8	M1
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.19**	mg/L	0.10	0.050	1		11/15/18 10:38	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-4S **Lab ID: 60286318006** Collected: 11/08/18 11:10 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**302**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:24	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:24	7440-41-7	
Boron	**131**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:24	7440-42-8	
Calcium	**110000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:24	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:24	7440-48-4	
Iron	**12200**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:24	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:24	7439-92-1	
Lithium	**18.2**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:24	7439-93-2	
Magnesium	**23100**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:24	7439-95-4	
Manganese	**1160**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:24	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:24	7439-98-7	
Potassium	**5420**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:24	7440-09-7	
Sodium	**23500**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:24	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.12J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:02	7440-36-0	
Arsenic	**24.2**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:02	7440-38-2	
Cadmium	**0.057J**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:02	7440-43-9	B
Chromium	**0.37J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:02	7440-47-3	B
Selenium	**0.19J**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:02	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:02	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:04	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**393**	mg/L	20.0	4.9	1		11/17/18 19:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**456**	mg/L	5.0	5.0	1		11/14/18 13:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**11.8**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.40**	mg/L	0.20	0.012	1		11/10/18 15:38		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.7**	mg/L	1.0	0.29	1		11/25/18 00:16	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.19	1		11/25/18 00:16	16984-48-8	
Sulfate	**23.8**	mg/L	5.0	1.2	5		11/25/18 00:32	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.58**	mg/L	0.10	0.050	1		11/15/18 10:42	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-4M **Lab ID: 60286318007** Collected: 11/08/18 10:35 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**374**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:26	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:26	7440-41-7	
Boron	**659**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:26	7440-42-8	
Calcium	**109000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:26	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:26	7440-48-4	
Iron	**7700**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:26	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:26	7439-92-1	
Lithium	**12.5**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:26	7439-93-2	
Magnesium	**21600**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:26	7439-95-4	
Manganese	**897**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:26	7439-96-5	
Molybdenum	**2.2J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:26	7439-98-7	
Potassium	**4650**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:26	7440-09-7	
Sodium	**23000**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:26	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.084J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:04	7440-36-0	
Arsenic	**4.5**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:04	7440-38-2	
Cadmium	**0.035J**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:04	7440-43-9	B
Chromium	**0.38J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:04	7440-47-3	B
Selenium	**0.11J**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:04	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:07	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**344**	mg/L	20.0	4.9	1		11/17/18 19:31		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**454**	mg/L	5.0	5.0	1		11/14/18 13:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**7.6**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.080J**	mg/L	0.20	0.012	1		11/10/18 15:35		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.5**	mg/L	1.0	0.29	1		11/25/18 00:48	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.19	1		11/25/18 00:48	16984-48-8	
Sulfate	**45.0**	mg/L	5.0	1.2	5		11/25/18 01:04	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.32**	mg/L	0.10	0.050	1		11/15/18 10:43	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-4D **Lab ID: 60286318008** Collected: 11/08/18 09:40 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**418**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:28	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:28	7440-41-7	
Boron	**4380**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:28	7440-42-8	
Calcium	**122000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:28	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:28	7440-48-4	
Iron	**5760**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:28	7439-89-6	
Lead	**3.6J**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:28	7439-92-1	
Lithium	**26.1**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:28	7439-93-2	
Magnesium	**32800**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:28	7439-95-4	
Manganese	**336**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:28	7439-96-5	
Molybdenum	**1.8J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:28	7439-98-7	
Potassium	**4770**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:28	7440-09-7	
Sodium	**24800**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:28	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.097J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:05	7440-36-0	
Arsenic	**5.2**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:05	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:05	7440-43-9	
Chromium	**0.40J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:05	7440-47-3	B
Selenium	**0.091J**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:05	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:09	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**301**	mg/L	20.0	4.9	1		11/17/18 19:36		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**566**	mg/L	5.0	5.0	1		11/14/18 13:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**5.5**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.23**	mg/L	0.20	0.012	1		11/10/18 15:33		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.5**	mg/L	1.0	0.29	1		11/25/18 01:52	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 01:52	16984-48-8	
Sulfate	**169**	mg/L	20.0	4.8	20		11/25/18 02:08	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.20**	mg/L	0.10	0.050	1		11/15/18 10:44	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-5S **Lab ID: 60286318009** Collected: 11/08/18 13:50 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**431**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:30	7440-39-3	M1
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:30	7440-41-7	M1
Boron	**128**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:30	7440-42-8	M1
Calcium	**157000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:30	7440-70-2	M1
Cobalt	**1.4J**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:30	7440-48-4	M1
Iron	**14500**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:30	7439-89-6	M1
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:30	7439-92-1	M1
Lithium	**30.5**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:30	7439-93-2	M1
Magnesium	**37400**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:30	7439-95-4	M1
Manganese	**2610**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:30	7439-96-5	M1
Molybdenum	**1.8J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:30	7439-98-7	M1
Potassium	**5540**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:30	7440-09-7	M1
Sodium	**12000**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:30	7440-23-5	M1
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:07	7440-36-0	
Arsenic	**11.9**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:07	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:07	7440-43-9	
Chromium	**0.49J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:07	7440-47-3	B
Selenium	**0.15J**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:07	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:07	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:11	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**570**	mg/L	20.0	4.9	1		11/17/18 19:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**564**	mg/L	5.0	5.0	1		11/14/18 13:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**13.6**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.90**	mg/L	0.20	0.012	1		11/10/18 15:45		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**1.6**	mg/L	1.0	0.29	1		11/25/18 02:24	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 02:24	16984-48-8	
Sulfate	**8.0**	mg/L	1.0	0.24	1		11/25/18 02:24	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.12**	mg/L	0.10	0.050	1		11/15/18 10:45	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-5M **Lab ID: 60286318010** Collected: 11/08/18 13:15 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**888**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:39	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:39	7440-41-7	
Boron	**612**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:39	7440-42-8	
Calcium	**160000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:39	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:39	7440-48-4	
Iron	**10900**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:39	7439-89-6	
Lead	**3.4J**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:39	7439-92-1	
Lithium	**26.5**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:39	7439-93-2	
Magnesium	**36700**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:39	7439-95-4	
Manganese	**673**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:39	7439-96-5	
Molybdenum	**0.98J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:39	7439-98-7	
Potassium	**4940**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:39	7440-09-7	
Sodium	**13200**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:39	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:08	7440-36-0	M1
Arsenic	**0.72J**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:08	7440-38-2	M1
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:08	7440-43-9	M1
Chromium	**0.43J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:08	7440-47-3	B,M1
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:08	7782-49-2	M1
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:08	7440-28-0	M1
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:14	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**550**	mg/L	20.0	4.9	1		11/17/18 19:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**582**	mg/L	5.0	5.0	1		11/14/18 13:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**10.5**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.44**	mg/L	0.20	0.012	1		11/10/18 15:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**2.7**	mg/L	1.0	0.29	1		11/25/18 02:56	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 02:56	16984-48-8	
Sulfate	**33.3**	mg/L	10.0	2.4	10		11/25/18 03:12	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.32**	mg/L	0.10	0.050	1		11/15/18 10:48	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-5D **Lab ID: 60286318011** Collected: 11/08/18 12:25 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**534**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:41	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:41	7440-41-7	
Boron	**4590**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:41	7440-42-8	
Calcium	**140000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:41	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:41	7440-48-4	
Iron	**7230**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:41	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:41	7439-92-1	
Lithium	**23.9**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:41	7439-93-2	
Magnesium	**34600**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:41	7439-95-4	
Manganese	**227**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:41	7439-96-5	
Molybdenum	**1.4J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:41	7439-98-7	
Potassium	**4810**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:41	7440-09-7	
Sodium	**27400**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:41	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:15	7440-36-0	
Arsenic	**11.8**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:15	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:15	7440-43-9	
Chromium	**0.35J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:15	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:15	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:15	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:20	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**377**	mg/L	20.0	4.9	1		11/17/18 19:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**631**	mg/L	5.0	5.0	1		11/15/18 14:58		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**7.2**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/10/18 15:40		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.2**	mg/L	1.0	0.29	1		11/25/18 03:28	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 03:28	16984-48-8	
Sulfate	**156**	mg/L	20.0	4.8	20		11/25/18 03:44	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.22**	mg/L	0.10	0.050	1		11/15/18 10:50	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-NE-DUP-1 **Lab ID: 60286318012** Collected: 11/08/18 08:00 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**251**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:44	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:44	7440-41-7	
Boron	**91.0J**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:44	7440-42-8	
Calcium	**132000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:44	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:44	7440-48-4	
Iron	**7.3J**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:44	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:44	7439-92-1	
Lithium	**21.1**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:44	7439-93-2	
Magnesium	**22000**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:44	7439-95-4	
Manganese	**268**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:44	7439-96-5	
Molybdenum	**7.5J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:44	7439-98-7	
Potassium	**4390**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:44	7440-09-7	
Sodium	**4540**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.21J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:16	7440-36-0	
Arsenic	**0.29J**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:16	7440-38-2	
Cadmium	**0.085J**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:16	7440-43-9	B
Chromium	**0.36J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:16	7440-47-3	B
Selenium	**3.6**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:16	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:16	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:23	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**374**	mg/L	20.0	4.9	1		11/17/18 20:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**465**	mg/L	5.0	5.0	1		11/15/18 14:11		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.066J**	mg/L	0.20	0.012	1		11/10/18 13:36		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**7.3**	mg/L	1.0	0.29	1		11/25/18 04:00	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 04:00	16984-48-8	
Sulfate	**21.6**	mg/L	2.0	0.48	2		11/26/18 21:06	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/15/18 10:51	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-NE-DUP-2 **Lab ID: 60286318013** Collected: 11/08/18 08:00 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**537**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:46	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:46	7440-41-7	
Boron	**4590**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:46	7440-42-8	
Calcium	**141000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:46	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:46	7440-48-4	
Iron	**7320**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:46	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:46	7439-92-1	
Lithium	**19.8**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:46	7439-93-2	
Magnesium	**34600**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:46	7439-95-4	
Manganese	**226**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:46	7439-96-5	
Molybdenum	**1.9J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:46	7439-98-7	
Potassium	**4810**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:46	7440-09-7	
Sodium	**27500**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:46	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:18	7440-36-0	
Arsenic	**11.9**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:18	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:18	7440-43-9	
Chromium	**0.39J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:18	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:18	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:18	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:25	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**375**	mg/L	20.0	4.9	1		11/17/18 20:14		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**653**	mg/L	5.0	5.0	1		11/15/18 14:11		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**6.8**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.56**	mg/L	0.20	0.012	1		11/10/18 15:31		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.2**	mg/L	1.0	0.29	1		11/25/18 09:53	16887-00-6	M1
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 09:53	16984-48-8	
Sulfate	**159**	mg/L	20.0	4.8	20		11/26/18 21:20	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.21**	mg/L	0.10	0.050	1		11/15/18 10:52	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-NE-FB-1 **Lab ID: 60286318014** Collected: 11/08/18 10:30 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.5**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 12:04	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 12:04	7440-41-7	
Boron	**<12.5**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 12:04	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 12:04	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 12:04	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 12:04	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 12:04	7439-92-1	
Lithium	**<4.6**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 12:04	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 12:04	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 12:04	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 12:04	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 12:04	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	11/26/18 16:15	11/27/18 12:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:20	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:20	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:20	7440-43-9	
Chromium	**0.36J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:20	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:20	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:27	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/17/18 20:24		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		11/15/18 14:11		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/10/18 15:34		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.29**	mg/L	1.0	0.29	1		11/25/18 10:41	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 10:41	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		11/25/18 10:41	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/15/18 10:55	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-NE-FB-2 **Lab ID: 60286318015** Collected: 11/08/18 13:00 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.5**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 12:06	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 12:06	7440-41-7	
Boron	**<12.5**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 12:06	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 12:06	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 12:06	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 12:06	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 12:06	7439-92-1	
Lithium	**<4.6**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 12:06	7439-93-2	
Magnesium	**36.2J**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 12:06	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 12:06	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 12:06	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 12:06	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	11/26/18 16:15	11/27/18 12:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:21	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:21	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:21	7440-43-9	
Chromium	**0.24J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:21	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:21	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:21	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:30	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/17/18 20:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**6.0**	mg/L	5.0	5.0	1		11/15/18 14:11		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/10/18 15:42		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.29**	mg/L	1.0	0.29	1		11/25/18 10:57	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 10:57	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		11/25/18 10:57	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/15/18 10:57	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-3S **Lab ID: 60286318016** Collected: 11/08/18 11:20 Received: 11/09/18 03:12 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**246**	ug/L	5.0	1.5	1	11/26/18 16:15	11/27/18 11:48	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 16:15	11/27/18 11:48	7440-41-7	
Boron	**88.8J**	ug/L	100	12.5	1	11/26/18 16:15	11/27/18 11:48	7440-42-8	
Calcium	**130000**	ug/L	200	53.5	1	11/26/18 16:15	11/27/18 11:48	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 16:15	11/27/18 11:48	7440-48-4	
Iron	**10.1J**	ug/L	50.0	6.1	1	11/26/18 16:15	11/27/18 11:48	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 16:15	11/27/18 11:48	7439-92-1	
Lithium	**22.3**	ug/L	10.0	4.6	1	11/26/18 16:15	11/27/18 11:48	7439-93-2	
Magnesium	**21600**	ug/L	50.0	14.0	1	11/26/18 16:15	11/27/18 11:48	7439-95-4	
Manganese	**276**	ug/L	5.0	0.73	1	11/26/18 16:15	11/27/18 11:48	7439-96-5	
Molybdenum	**7.3J**	ug/L	20.0	0.90	1	11/26/18 16:15	11/27/18 11:48	7439-98-7	
Potassium	**4300**	ug/L	500	79.3	1	11/26/18 16:15	11/27/18 11:48	7440-09-7	
Sodium	**4770**	ug/L	500	157	1	11/26/18 16:15	11/27/18 11:48	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.18J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:23	7440-36-0	
Arsenic	**0.27J**	ug/L	1.0	0.065	1	11/23/18 16:00	11/26/18 11:23	7440-38-2	
Cadmium	**0.064J**	ug/L	0.50	0.033	1	11/23/18 16:00	11/26/18 11:23	7440-43-9	B
Chromium	**0.35J**	ug/L	1.0	0.078	1	11/23/18 16:00	11/26/18 11:23	7440-47-3	B
Selenium	**3.5**	ug/L	1.0	0.085	1	11/23/18 16:00	11/26/18 11:23	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 16:00	11/26/18 11:23	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/26/18 18:30	11/27/18 17:32	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**367**	mg/L	20.0	4.9	1		11/17/18 20:32		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**480**	mg/L	5.0	5.0	1		11/15/18 14:11		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.010J**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/10/18 15:38		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**7.4**	mg/L	1.0	0.29	1		11/25/18 11:13	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/25/18 11:13	16984-48-8	
Sulfate	**21.1**	mg/L	2.0	0.48	2		11/26/18 21:34	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/15/18 10:59	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-2S **Lab ID: 60286318017** Collected: 11/09/18 10:10 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**315**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:06	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 18:00	11/27/18 14:06	7440-41-7	
Boron	**679**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 14:06	7440-42-8	
Calcium	**141000**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 14:06	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 18:00	11/27/18 14:06	7440-48-4	
Iron	**16800**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 14:06	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 18:00	11/27/18 14:06	7439-92-1	
Lithium	**39.7**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:06	7439-93-2	
Magnesium	**29400**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 14:06	7439-95-4	
Manganese	**1330**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 14:06	7439-96-5	
Molybdenum	**43.0**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:06	7439-98-7	
Potassium	**7120**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 14:06	7440-09-7	
Sodium	**72600**	ug/L	500	157	1	11/26/18 18:00	11/27/18 14:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 15:05	11/27/18 11:07	7440-36-0	
Arsenic	**11.0**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:16	7440-38-2	
Cadmium	**0.080J**	ug/L	0.50	0.033	1	11/23/18 15:05	11/26/18 16:16	7440-43-9	
Chromium	**0.39J**	ug/L	1.0	0.078	1	11/23/18 15:05	11/26/18 16:16	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 15:05	11/26/18 16:16	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 15:05	11/26/18 16:16	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/27/18 17:50	11/28/18 09:53	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**408**	mg/L	20.0	4.9	1		11/20/18 11:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**720**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**15.1**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**1.7**	mg/L	0.20	0.012	1		11/10/18 13:47		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**67.6**	mg/L	10.0	2.9	10		11/27/18 02:46	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.19	1		11/27/18 02:30	16984-48-8	
Sulfate	**141**	mg/L	10.0	2.4	10		11/27/18 02:46	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.15**	mg/L	0.10	0.050	1		11/15/18 11:22	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-2M **Lab ID: 60286318018** Collected: 11/09/18 10:50 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**115**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:08	7440-39-3	
Beryllium	**0.18J**	ug/L	1.0	0.16	1	11/26/18 18:00	11/27/18 14:08	7440-41-7	
Boron	**3560**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 14:08	7440-42-8	
Calcium	**95100**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 14:08	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 18:00	11/27/18 14:08	7440-48-4	
Iron	**3690**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 14:08	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	11/26/18 18:00	11/27/18 14:08	7439-92-1	
Lithium	**34.3**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:08	7439-93-2	
Magnesium	**14300**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 14:08	7439-95-4	
Manganese	**436**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 14:08	7439-96-5	
Molybdenum	**117**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:08	7439-98-7	
Potassium	**6300**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 14:08	7440-09-7	
Sodium	**61900**	ug/L	500	157	1	11/26/18 18:00	11/27/18 14:08	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 15:05	11/27/18 11:08	7440-36-0	
Arsenic	**0.26J**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:22	7440-38-2	
Cadmium	**0.057J**	ug/L	0.50	0.033	1	11/23/18 15:05	11/26/18 16:22	7440-43-9	
Chromium	**0.39J**	ug/L	1.0	0.078	1	11/23/18 15:05	11/26/18 16:22	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 15:05	11/26/18 16:22	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 15:05	11/26/18 16:22	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/27/18 17:50	11/28/18 10:00	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**256**	mg/L	20.0	4.9	1		11/20/18 11:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**534**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**3.6**	mg/L	0.050		1		11/27/18 17:33	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.088J**	mg/L	0.20	0.012	1		11/10/18 13:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**22.3**	mg/L	2.0	0.58	2		11/27/18 03:18	16887-00-6	
Fluoride	**0.47**	mg/L	0.20	0.19	1		11/27/18 03:02	16984-48-8	
Sulfate	**154**	mg/L	20.0	4.8	20		11/27/18 03:34	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.35**	mg/L	0.10	0.050	1		11/15/18 11:23	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-2D **Lab ID: 60286318019** Collected: 11/09/18 09:40 Received: 11/10/18 06:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**112**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 14:15	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	11/26/18 18:00	11/27/18 14:15	7440-41-7	
Boron	**1930**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 14:15	7440-42-8	
Calcium	**88600**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 14:15	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	11/26/18 18:00	11/27/18 14:15	7440-48-4	
Iron	**4480**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 14:15	7439-89-6	
Lead	**3.2J**	ug/L	10.0	3.0	1	11/26/18 18:00	11/27/18 14:15	7439-92-1	
Lithium	**42.7**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 14:15	7439-93-2	
Magnesium	**16000**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 14:15	7439-95-4	
Manganese	**316**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 14:15	7439-96-5	
Molybdenum	**125**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 14:15	7439-98-7	
Potassium	**5510**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 14:15	7440-09-7	
Sodium	**58300**	ug/L	500	157	1	11/26/18 18:00	11/27/18 14:15	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	11/23/18 15:05	11/27/18 11:09	7440-36-0	
Arsenic	**5.9**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:23	7440-38-2	
Cadmium	**0.057J**	ug/L	0.50	0.033	1	11/23/18 15:05	11/26/18 16:23	7440-43-9	
Chromium	**0.26J**	ug/L	1.0	0.078	1	11/23/18 15:05	11/26/18 16:23	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	11/23/18 15:05	11/26/18 16:23	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	11/23/18 15:05	11/26/18 16:23	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	11/27/18 17:50	11/28/18 10:03	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**231**	mg/L	20.0	4.9	1		11/20/18 11:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**523**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**4.4**	mg/L	0.050	0.012	1		12/03/18 14:44	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.11J**	mg/L	0.20	0.012	1		11/10/18 13:46		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**22.6**	mg/L	2.0	0.58	2		11/27/18 04:06	16887-00-6	
Fluoride	**0.43**	mg/L	0.20	0.19	1		11/27/18 03:50	16984-48-8	
Sulfate	**156**	mg/L	10.0	2.4	10		11/27/18 06:32	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.18**	mg/L	0.10	0.050	1		11/15/18 11:30	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556888 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2285036 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	11/27/18 16:39	

LABORATORY CONTROL SAMPLE: 2285037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2285038 2285039

Parameter	Units	60286318005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.090	5	5	4.8	4.9	96	99	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 557103 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2285743 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	11/28/18 09:49	

LABORATORY CONTROL SAMPLE: 2285744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2285745 2285746

Parameter	Units	60286318017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.090	5	5	5.2	5.1	105	101	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554744 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286318001, 60286318002, 60286318003

METHOD BLANK: 2275800 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/20/18 20:58	
Beryllium	ug/L	<0.16	1.0	0.16	11/20/18 20:58	
Boron	ug/L	<12.5	100	12.5	11/20/18 20:58	
Calcium	ug/L	<53.5	200	53.5	11/20/18 20:58	
Cobalt	ug/L	<0.87	5.0	0.87	11/20/18 20:58	
Iron	ug/L	<6.1	50.0	6.1	11/20/18 20:58	
Lead	ug/L	<3.0	10.0	3.0	11/20/18 20:58	
Lithium	ug/L	<4.6	10.0	4.6	11/20/18 20:58	
Magnesium	ug/L	<14.0	50.0	14.0	11/20/18 20:58	
Manganese	ug/L	1.8J	5.0	0.73	11/20/18 20:58	
Molybdenum	ug/L	<0.90	20.0	0.90	11/20/18 20:58	
Potassium	ug/L	<79.3	500	79.3	11/20/18 20:58	
Sodium	ug/L	<157	500	157	11/20/18 20:58	

LABORATORY CONTROL SAMPLE: 2275801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Beryllium	ug/L	1000	988	99	85-115	
Boron	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	9880	99	85-115	
Cobalt	ug/L	1000	962	96	85-115	
Iron	ug/L	10000	9670	97	85-115	
Lead	ug/L	1000	976	98	85-115	
Lithium	ug/L	1000	951	95	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	975	98	85-115	
Molybdenum	ug/L	1000	980	98	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275802 2275803

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	180	1000	1000	1140	1140	96	96	70-130	1	20	
Beryllium	ug/L	<0.16	1000	1000	968	955	97	95	70-130	1	20	
Boron	ug/L	13900	1000	1000	15100	15200	125	139	70-130	1	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275802 2275803

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	301000	10000	10000	315000	316000	142	156	70-130	0	20	M1
Cobalt	ug/L	<0.87	1000	1000	893	886	89	89	70-130	1	20	
Iron	ug/L	25400	10000	10000	35100	35000	97	97	70-130	0	20	
Lead	ug/L	<3.0	1000	1000	918	911	92	91	70-130	1	20	
Lithium	ug/L	31.0	1000	1000	981	966	95	94	70-130	1	20	
Magnesium	ug/L	56500	10000	10000	66600	67000	101	105	70-130	1	20	
Manganese	ug/L	3040	1000	1000	4020	4040	98	100	70-130	0	20	
Molybdenum	ug/L	6.1J	1000	1000	971	961	96	95	70-130	1	20	
Potassium	ug/L	7730	10000	10000	17600	17700	99	100	70-130	1	20	
Sodium	ug/L	51500	10000	10000	62600	62800	111	113	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275804 2275805

Parameter	Units	60286215003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	121	1000	1000	1100	1100	98	98	70-130	0	20	
Beryllium	ug/L	0.55J	1000	1000	990	985	99	98	70-130	1	20	
Boron	ug/L	8310	1000	1000	9270	9180	96	87	70-130	1	20	
Calcium	ug/L	220000	10000	10000	231000	228000	113	81	70-130	1	20	
Cobalt	ug/L	<0.87	1000	1000	919	918	92	92	70-130	0	20	
Iron	ug/L	11900	10000	10000	21500	21300	96	94	70-130	1	20	
Lead	ug/L	<3.0	1000	1000	952	945	95	95	70-130	1	20	
Lithium	ug/L	25.0	1000	1000	977	980	95	96	70-130	0	20	
Magnesium	ug/L	28100	10000	10000	37600	37200	95	92	70-130	1	20	
Manganese	ug/L	2110	1000	1000	3060	3030	95	93	70-130	1	20	
Molybdenum	ug/L	231	1000	1000	1220	1210	98	98	70-130	0	20	
Potassium	ug/L	6910	10000	10000	17100	16900	102	100	70-130	1	20	
Sodium	ug/L	76500	10000	10000	87200	86600	107	100	70-130	1	20	

MATRIX SPIKE SAMPLE: 2275806

Parameter	Units	60286215005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	500	1000	1460	96	70-130	
Beryllium	ug/L	<0.16	1000	981	98	70-130	
Boron	ug/L	113	1000	1120	101	70-130	
Calcium	ug/L	114000	10000	124000	98	70-130	
Cobalt	ug/L	<0.87	1000	921	92	70-130	
Iron	ug/L	22700	10000	32300	96	70-130	
Lead	ug/L	<3.0	1000	944	94	70-130	
Lithium	ug/L	16.4	1000	973	96	70-130	
Magnesium	ug/L	31600	10000	41000	94	70-130	
Manganese	ug/L	349	1000	1290	94	70-130	
Molybdenum	ug/L	<0.90	1000	972	97	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

MATRIX SPIKE SAMPLE: 2275806

Parameter	Units	60286215005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Potassium	ug/L	4120	10000	13800	97	70-130	
Sodium	ug/L	13800	10000	23800	100	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556667 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2283926 Matrix: Water
Associated Lab Samples: 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/27/18 11:10	
Beryllium	ug/L	<0.16	1.0	0.16	11/27/18 11:10	
Boron	ug/L	<12.5	100	12.5	11/27/18 11:10	
Calcium	ug/L	<53.5	200	53.5	11/27/18 11:10	
Cobalt	ug/L	<0.87	5.0	0.87	11/27/18 11:10	
Iron	ug/L	<6.1	50.0	6.1	11/27/18 11:10	
Lead	ug/L	<3.0	10.0	3.0	11/27/18 11:10	
Lithium	ug/L	<4.6	10.0	4.6	11/27/18 11:10	
Magnesium	ug/L	<14.0	50.0	14.0	11/27/18 11:10	
Manganese	ug/L	2.0J	5.0	0.73	11/27/18 11:10	
Molybdenum	ug/L	<0.90	20.0	0.90	11/27/18 11:10	
Potassium	ug/L	<79.3	500	79.3	11/27/18 11:10	
Sodium	ug/L	<157	500	157	11/27/18 11:10	

LABORATORY CONTROL SAMPLE: 2283927

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	984	98	85-115	
Beryllium	ug/L	1000	996	100	85-115	
Boron	ug/L	1000	980	98	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Iron	ug/L	10000	10100	101	85-115	
Lead	ug/L	1000	997	100	85-115	
Lithium	ug/L	1000	993	99	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	10500	105	85-115	

SAMPLE DUPLICATE: 2285840

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Barium	ug/L	83.7	83.7	0	20	
Beryllium	ug/L	<0.16	<0.16		20	
Boron	ug/L	10600	10900	3	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

SAMPLE DUPLICATE: 2285840

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Calcium	ug/L	99600	103000	3	20	
Cobalt	ug/L	<0.87	<0.87		20	
Iron	ug/L	5620	5670	1	19	
Lead	ug/L	<3.0	<3.0		27	
Lithium	ug/L	37.0	27.2	30	20	D6
Magnesium	ug/L	22500	23400	4	20	
Manganese	ug/L	195	202	4	12	
Molybdenum	ug/L	547	520	5	20	
Potassium	ug/L	6760	6910	2	20	
Sodium	ug/L	117000	119000	1	20	

SAMPLE DUPLICATE: 2285841

Parameter	Units	60286318009 Result	Dup Result	RPD	Max RPD	Qualifiers
Barium	ug/L	431	425	2	20	
Beryllium	ug/L	<0.16	<0.16		20	
Boron	ug/L	128	112	14	20	
Calcium	ug/L	157000	155000	1	20	
Cobalt	ug/L	1.4J	1.0J		20	
Iron	ug/L	14500	14300	1	19	
Lead	ug/L	<3.0	<3.0		27	
Lithium	ug/L	30.5	25.8	17	20	
Magnesium	ug/L	37400	36700	2	20	
Manganese	ug/L	2610	2560	2	12	
Molybdenum	ug/L	1.8J	2.0J		20	
Potassium	ug/L	5540	5350	3	20	
Sodium	ug/L	12000	11800	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556876 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2284987 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	11/27/18 13:48	
Beryllium	ug/L	<0.16	1.0	0.16	11/27/18 13:48	
Boron	ug/L	<12.5	100	12.5	11/27/18 13:48	
Calcium	ug/L	<53.5	200	53.5	11/27/18 13:48	
Cobalt	ug/L	<0.87	5.0	0.87	11/27/18 13:48	
Iron	ug/L	<6.1	50.0	6.1	11/27/18 13:48	
Lead	ug/L	<3.0	10.0	3.0	11/27/18 13:48	
Lithium	ug/L	<4.6	10.0	4.6	11/27/18 13:48	
Magnesium	ug/L	<14.0	50.0	14.0	11/27/18 13:48	
Manganese	ug/L	0.80J	5.0	0.73	11/27/18 13:48	
Molybdenum	ug/L	<0.90	20.0	0.90	11/27/18 13:48	
Potassium	ug/L	<79.3	500	79.3	11/27/18 13:48	
Sodium	ug/L	<157	500	157	11/27/18 13:48	

LABORATORY CONTROL SAMPLE: 2284988

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Beryllium	ug/L	1000	987	99	85-115	
Boron	ug/L	1000	979	98	85-115	
Calcium	ug/L	10000	9940	99	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Iron	ug/L	10000	10000	100	85-115	
Lead	ug/L	1000	984	98	85-115	
Lithium	ug/L	1000	989	99	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Molybdenum	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE SAMPLE: 2284989

Parameter	Units	60286215023 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	82.2	1000	1060	98	70-130	
Beryllium	ug/L	<0.16	1000	999	100	70-130	
Boron	ug/L	9300	1000	10400	112	70-130	
Calcium	ug/L	84400	10000	94400	100	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

MATRIX SPIKE SAMPLE: 2284989

Parameter	Units	60286215023 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	<0.87	1000	1010	101	70-130	
Iron	ug/L	64.8	10000	10100	101	70-130	
Lead	ug/L	<3.0	1000	975	97	70-130	
Lithium	ug/L	13.4	1000	987	97	70-130	
Magnesium	ug/L	5160	10000	15000	98	70-130	
Manganese	ug/L	113	1000	1100	99	70-130	
Molybdenum	ug/L	206	1000	1220	101	70-130	
Potassium	ug/L	9650	10000	19700	100	70-130	
Sodium	ug/L	75600	10000	85100	96	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284990 2284991

Parameter	Units	60286372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	375	1000	1000	1360	1360	99	98	70-130	0	20	
Beryllium	ug/L	<0.16	1000	1000	1000	1000	100	100	70-130	0	20	
Boron	ug/L	124	1000	1000	1140	1140	101	102	70-130	0	20	
Calcium	ug/L	162000	10000	10000	174000	173000	118	107	70-130	1	20	
Cobalt	ug/L	4.2J	1000	1000	1000	1000	100	100	70-130	0	20	
Iron	ug/L	368	10000	10000	10400	10300	100	100	70-130	0	20	
Lead	ug/L	3.2J	1000	1000	973	968	97	96	70-130	1	20	
Lithium	ug/L	40.3	1000	1000	1040	1030	100	99	70-130	0	20	
Magnesium	ug/L	44100	10000	10000	54700	54300	106	102	70-130	1	20	
Manganese	ug/L	4550	1000	1000	5620	5590	106	104	70-130	0	20	
Molybdenum	ug/L	<0.90	1000	1000	1020	1020	102	102	70-130	0	20	
Potassium	ug/L	5880	10000	10000	16100	16000	102	102	70-130	0	20	
Sodium	ug/L	11500	10000	10000	21900	21800	104	103	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555338 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004

METHOD BLANK: 2278064 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.079J	1.0	0.078	11/16/18 14:08	
Arsenic	ug/L	0.072J	1.0	0.065	11/16/18 14:08	
Cadmium	ug/L	0.040J	0.50	0.033	11/16/18 14:08	
Chromium	ug/L	<0.078	1.0	0.078	11/16/18 14:08	
Selenium	ug/L	<0.085	1.0	0.085	11/16/18 14:08	
Thallium	ug/L	<0.099	1.0	0.099	11/16/18 14:08	

LABORATORY CONTROL SAMPLE: 2278065

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.2	101	85-115	
Arsenic	ug/L	40	40.1	100	85-115	
Cadmium	ug/L	40	39.6	99	85-115	
Chromium	ug/L	40	40.4	101	85-115	
Selenium	ug/L	40	39.4	99	85-115	
Thallium	ug/L	40	38.1	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2278066 2278067

Parameter	Units	60285081007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.29J	40	40	34.2	34.4	85	85	70-130	0	20	
Arsenic	ug/L	3.9	40	40	41.1	41.1	93	93	70-130	0	20	
Cadmium	ug/L	0.13J	40	40	38.2	38.5	95	96	70-130	1	20	
Chromium	ug/L	3.8	40	40	43.5	43.6	99	100	70-130	0	20	
Selenium	ug/L	1.7	40	40	35.8	36.4	85	87	70-130	2	20	
Thallium	ug/L	<0.099	40	40	36.4	36.6	91	91	70-130	0	20	

MATRIX SPIKE SAMPLE: 2278068

Parameter	Units	60286261004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	ND	40	39.8	99	70-130	
Arsenic	ug/L	0.59	40	40.8	100	70-130	
Cadmium	ug/L	ND	40	36.9	92	70-130	
Chromium	ug/L	1.3	40	40.0	97	70-130	
Selenium	ug/L	1.2	40	26.0	62	70-130	M1
Thallium	ug/L	ND	40	35.0	88	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556674 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2283950 Matrix: Water
Associated Lab Samples: 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/26/18 10:54	
Arsenic	ug/L	<0.065	1.0	0.065	11/26/18 10:54	
Cadmium	ug/L	0.082J	0.50	0.033	11/26/18 10:54	
Chromium	ug/L	0.30J	1.0	0.078	11/26/18 10:54	
Selenium	ug/L	<0.085	1.0	0.085	11/26/18 10:54	
Thallium	ug/L	<0.099	1.0	0.099	11/26/18 10:54	

LABORATORY CONTROL SAMPLE: 2283951

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	98	85-115	
Arsenic	ug/L	40	39.5	99	85-115	
Cadmium	ug/L	40	39.3	98	85-115	
Chromium	ug/L	40	40.4	101	85-115	
Selenium	ug/L	40	38.3	96	85-115	
Thallium	ug/L	40	38.0	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2283952 2283953

Parameter	Units	60286318005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.10J	40	40	39.9	40.2	100	100	70-130	1	20	
Arsenic	ug/L	1.8	40	40	41.9	42.1	100	101	70-130	0	20	
Cadmium	ug/L	0.20J	40	40	38.8	38.9	97	97	70-130	0	20	
Chromium	ug/L	0.37J	40	40	42.1	42.0	104	104	70-130	0	20	
Selenium	ug/L	0.14J	40	40	36.4	36.5	91	91	70-130	0	20	
Thallium	ug/L	<0.099	40	40	39.3	39.1	98	98	70-130	0	20	

SAMPLE DUPLICATE: 2284999

Parameter	Units	60286318010 Result	Dup Result	RPD	Max RPD	Qualifiers
Antimony	ug/L	<0.078	0.085J		20	
Arsenic	ug/L	0.72J	0.75J		20	
Cadmium	ug/L	<0.033	<0.033		20	
Chromium	ug/L	0.43J	0.44J		20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

SAMPLE DUPLICATE: 2284999

Parameter	Units	60286318010 Result	Dup Result	RPD	Max RPD	Qualifiers
Selenium	ug/L	<0.085	0.096J		20	
Thallium	ug/L	<0.099	<0.099		20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556679 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2283974 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/27/18 10:58	
Arsenic	ug/L	<0.065	1.0	0.065	11/26/18 16:00	
Cadmium	ug/L	<0.033	0.50	0.033	11/26/18 16:00	
Chromium	ug/L	0.22J	1.0	0.078	11/26/18 16:00	
Selenium	ug/L	<0.085	1.0	0.085	11/26/18 16:00	
Thallium	ug/L	<0.099	1.0	0.099	11/26/18 16:00	

LABORATORY CONTROL SAMPLE: 2283975

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.4	96	85-115	
Arsenic	ug/L	40	39.4	98	85-115	
Cadmium	ug/L	40	39.3	98	85-115	
Chromium	ug/L	40	40.9	102	85-115	
Selenium	ug/L	40	37.7	94	85-115	
Thallium	ug/L	40	38.4	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2283976 2283977

Parameter	Units	60286215023 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.078J	40	40	39.0	39.3	97	98	70-130	1	20	
Arsenic	ug/L	1.7	40	40	41.3	41.2	99	99	70-130	0	20	
Cadmium	ug/L	0.079J	40	40	38.7	38.9	97	97	70-130	0	20	
Chromium	ug/L	0.46J	40	40	39.6	39.4	98	97	70-130	1	20	
Selenium	ug/L	0.20J	40	40	36.4	36.0	90	89	70-130	1	20	
Thallium	ug/L	<0.099	40	40	38.7	38.7	97	97	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555761 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004

METHOD BLANK: 2280113 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/16/18 19:07	

LABORATORY CONTROL SAMPLE: 2280114

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

SAMPLE DUPLICATE: 2280115

Parameter	Units	60286215003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	358	362	1	10	

SAMPLE DUPLICATE: 2280116

Parameter	Units	60286471001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	488	495	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555811 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2280687 Matrix: Water
Associated Lab Samples: 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/17/18 19:13	

LABORATORY CONTROL SAMPLE: 2280688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	513	103	90-110	

SAMPLE DUPLICATE: 2280689

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	115	120	4	10	

SAMPLE DUPLICATE: 2280690

Parameter	Units	60286318013 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	375	397	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556192 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2282069 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/20/18 10:40	

LABORATORY CONTROL SAMPLE: 2282070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	513	103	90-110	

SAMPLE DUPLICATE: 2282071

Parameter	Units	60286215025 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	58.8	64.8	10	10	

SAMPLE DUPLICATE: 2282072

Parameter	Units	60286372001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	534	545	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555031 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010

METHOD BLANK: 2276914 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/14/18 13:57	

LABORATORY CONTROL SAMPLE: 2276915

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

SAMPLE DUPLICATE: 2276916

Parameter	Units	60286404006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	606	610	1	10	

SAMPLE DUPLICATE: 2276918

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	858	858	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555352 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2278146 Matrix: Water
Associated Lab Samples: 60286318011, 60286318012, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/15/18 14:58	

LABORATORY CONTROL SAMPLE: 2278147

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

SAMPLE DUPLICATE: 2278148

Parameter	Units	60286318011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	631	644	2	10	

SAMPLE DUPLICATE: 2278150

Parameter	Units	60286488003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	484	488	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 555353 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2278151 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/15/18 14:12	

LABORATORY CONTROL SAMPLE: 2278152

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

SAMPLE DUPLICATE: 2278153

Parameter	Units	60286488009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	697	710	2	10	

SAMPLE DUPLICATE: 2278161

Parameter	Units	60286668008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	620	601	3	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554544 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286318012, 60286318017, 60286318018, 60286318019

METHOD BLANK: 2274532 Matrix: Water
Associated Lab Samples: 60286318012, 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 13:31	H6

LABORATORY CONTROL SAMPLE: 2274533

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	100	90-110	H6

SAMPLE DUPLICATE: 2274535

Parameter	Units	60286215010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

SAMPLE DUPLICATE: 2274537

Parameter	Units	60286372001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554557 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318011, 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2274664 Matrix: Water
Associated Lab Samples: 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318011, 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 15:30	H6

LABORATORY CONTROL SAMPLE: 2274665

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.1	103	90-110	H6

SAMPLE DUPLICATE: 2274667

Parameter	Units	60286318013 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.56	0.56	0	20	H6

SAMPLE DUPLICATE: 2274668

Parameter	Units	60286318005 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.19J	0.21		20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554558 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286318001, 60286318002, 60286318009, 60286318010

METHOD BLANK: 2274674 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318009, 60286318010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 15:43	H6

LABORATORY CONTROL SAMPLE: 2274675

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	102	90-110	H6

SAMPLE DUPLICATE: 2274676

Parameter	Units	60286318010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.44	0.44	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556691 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012

METHOD BLANK: 2284087 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/24/18 10:56	
Fluoride	mg/L	<0.19	0.20	0.19	11/24/18 10:56	
Sulfate	mg/L	<0.24	1.0	0.24	11/24/18 10:56	

LABORATORY CONTROL SAMPLE: 2284088

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284089 2284090

Parameter	Units	60286762001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2080	1000	1000	3440	3450	136	137	90-110	0	15	M1
Fluoride	mg/L	60.2	500	500	646	640	117	116	90-110	1	15	M1
Sulfate	mg/L	ND	1000	1000	1310	1290	121	119	90-110	2	15	M1

MATRIX SPIKE SAMPLE: 2284091

Parameter	Units	60286318005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	24.4	25	56.9	130	90-110	M1
Fluoride	mg/L	0.27	2.5	3.4	124	90-110	M1
Sulfate	mg/L	441	250	752	124	90-110	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556692 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286318013, 60286318014, 60286318015, 60286318016

METHOD BLANK: 2284092 Matrix: Water
Associated Lab Samples: 60286318013, 60286318014, 60286318015, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/25/18 04:16	
Fluoride	mg/L	<0.19	0.20	0.19	11/25/18 04:16	
Sulfate	mg/L	<0.24	1.0	0.24	11/25/18 04:16	

LABORATORY CONTROL SAMPLE: 2284093

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284094 2284095

Parameter	Units	60286318013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.2	5	5	18.9	18.8	114	112	90-110	0	15	M1
Fluoride	mg/L	<0.19	2.5	2.5	2.6	2.6	100	100	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556824 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286318003, 60286318012, 60286318013, 60286318016

METHOD BLANK: 2284818 Matrix: Water
Associated Lab Samples: 60286318003, 60286318012, 60286318013, 60286318016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	11/26/18 19:27	

LABORATORY CONTROL SAMPLE: 2284819

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284820 2284821

Parameter	Units	60286318003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	25.7	10	10	36.8	36.8	111	110	90-110	0	15	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 556826 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286318017, 60286318018, 60286318019

METHOD BLANK: 2284823 Matrix: Water
Associated Lab Samples: 60286318017, 60286318018, 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/26/18 17:58	
Fluoride	mg/L	<0.19	0.20	0.19	11/26/18 17:58	
Sulfate	mg/L	<0.24	1.0	0.24	11/26/18 17:58	

LABORATORY CONTROL SAMPLE: 2284824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284825 2284826

Parameter	Units	60286358005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.7	5	5	9.7	9.7	99	100	90-110	1	15	
Fluoride	mg/L	0.22	2.5	2.5	2.9	2.9	106	109	90-110	2	15	
Sulfate	mg/L	10.1	5	5	15.3	15.3	103	105	90-110	1	15	

MATRIX SPIKE SAMPLE: 2284827

Parameter	Units	60286372001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.7	5	5.7	38	90-110	M1
Fluoride	mg/L	0.29	2.5	1.3	40	90-110	M1
Sulfate	mg/L	96.8	50	115	37	90-110	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554982 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013

METHOD BLANK: 2276684 Matrix: Water
Associated Lab Samples: 60286318001, 60286318002, 60286318003, 60286318004, 60286318005, 60286318006, 60286318007, 60286318008, 60286318009, 60286318010, 60286318011, 60286318012, 60286318013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/15/18 10:17	

LABORATORY CONTROL SAMPLE: 2276685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	2.0	101	90-110	

MATRIX SPIKE SAMPLE: 2276686

Parameter	Units	60286529001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	12.2	2	13.8	83	90-110	M1

MATRIX SPIKE SAMPLE: 2276688

Parameter	Units	60286318005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.19	2	2.1	96	90-110	

SAMPLE DUPLICATE: 2276687

Parameter	Units	60286215011 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	0.068J	0.056J		10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554983 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286318014, 60286318015, 60286318016, 60286318017, 60286318018

METHOD BLANK: 2276689 Matrix: Water
Associated Lab Samples: 60286318014, 60286318015, 60286318016, 60286318017, 60286318018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/15/18 10:53	

LABORATORY CONTROL SAMPLE: 2276690

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	97	90-110	

MATRIX SPIKE SAMPLE: 2276691

Parameter	Units	60286318014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	<0.050	2	1.9	96	90-110	

MATRIX SPIKE SAMPLE: 2276693

Parameter	Units	60286270003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.9	2	4.8	91	90-110	

SAMPLE DUPLICATE: 2276692

Parameter	Units	60286214007 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	0.37	0.36	3	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 554984 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286318019

METHOD BLANK: 2276694 Matrix: Water
Associated Lab Samples: 60286318019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/15/18 11:25	

LABORATORY CONTROL SAMPLE: 2276695

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	96	90-110	

MATRIX SPIKE SAMPLE: 2276696

Parameter	Units	60286318019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.18	2	2.1	98	90-110	

MATRIX SPIKE SAMPLE: 2276698

Parameter	Units	60286571003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.28	2	2.3	100	90-110	

SAMPLE DUPLICATE: 2276697

Parameter	Units	60286372001 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	<0.050	<0.050		10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Sample: L-TP-4M **Lab ID: 60286318007** Collected: 11/08/18 10:35 Received: 11/09/18 03:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.815 ± 0.605 (0.756) C:NA T:86%**	pCi/L	12/04/18 21:22	13982-63-3	
Radium-228	EPA 904.0	**0.535 ± 0.491 (1.00) C:80% T:85%**	pCi/L	12/04/18 18:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 320562 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60286318007

METHOD BLANK: 1563545 Matrix: Water
Associated Lab Samples: 60286318007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.257 ± 0.316 (0.668) C:82% T:82%	pCi/L	12/04/18 16:04	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

QC Batch: 321857 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60286318007

METHOD BLANK: 1569342 Matrix: Water
Associated Lab Samples: 60286318007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.262 ± 0.454 (0.810) C:NA T:82%	pCi/L	12/04/18 21:22	

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QUALIFIERS

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286318001	**L-TP-1S**	EPA 200.7	554744	EPA 200.7	554814
60286318002	**L-TP-1M**	EPA 200.7	554744	EPA 200.7	554814
60286318003	**L-TP-1D**	EPA 200.7	554744	EPA 200.7	554814
60286318004	**L-TP-3M**	EPA 200.7	556667	EPA 200.7	556947
60286318005	**L-TP-3D**	EPA 200.7	556667	EPA 200.7	556947
60286318006	**L-TP-4S**	EPA 200.7	556667	EPA 200.7	556947
60286318007	**L-TP-4M**	EPA 200.7	556667	EPA 200.7	556947
60286318008	**L-TP-4D**	EPA 200.7	556667	EPA 200.7	556947
60286318009	**L-TP-5S**	EPA 200.7	556667	EPA 200.7	556947
60286318010	**L-TP-5M**	EPA 200.7	556667	EPA 200.7	556947
60286318011	**L-TP-5D**	EPA 200.7	556667	EPA 200.7	556947
60286318012	**L-NE-DUP-1**	EPA 200.7	556667	EPA 200.7	556947
60286318013	**L-NE-DUP-2**	EPA 200.7	556667	EPA 200.7	556947
60286318014	**L-NE-FB-1**	EPA 200.7	556667	EPA 200.7	556947
60286318015	**L-NE-FB-2**	EPA 200.7	556667	EPA 200.7	556947
60286318016	**L-TP-3S**	EPA 200.7	556667	EPA 200.7	556947
60286318017	**L-TP-2S**	EPA 200.7	556876	EPA 200.7	556951
60286318018	**L-TP-2M**	EPA 200.7	556876	EPA 200.7	556951
60286318019	**L-TP-2D**	EPA 200.7	556876	EPA 200.7	556951
60286318001	**L-TP-1S**	EPA 200.8	555338	EPA 200.8	555405
60286318002	**L-TP-1M**	EPA 200.8	555338	EPA 200.8	555405
60286318003	**L-TP-1D**	EPA 200.8	555338	EPA 200.8	555405
60286318004	**L-TP-3M**	EPA 200.8	555338	EPA 200.8	555405
60286318005	**L-TP-3D**	EPA 200.8	556674	EPA 200.8	556761
60286318006	**L-TP-4S**	EPA 200.8	556674	EPA 200.8	556761
60286318007	**L-TP-4M**	EPA 200.8	556674	EPA 200.8	556761
60286318008	**L-TP-4D**	EPA 200.8	556674	EPA 200.8	556761
60286318009	**L-TP-5S**	EPA 200.8	556674	EPA 200.8	556761
60286318010	**L-TP-5M**	EPA 200.8	556674	EPA 200.8	556761
60286318011	**L-TP-5D**	EPA 200.8	556674	EPA 200.8	556761
60286318012	**L-NE-DUP-1**	EPA 200.8	556674	EPA 200.8	556761
60286318013	**L-NE-DUP-2**	EPA 200.8	556674	EPA 200.8	556761
60286318014	**L-NE-FB-1**	EPA 200.8	556674	EPA 200.8	556761
60286318015	**L-NE-FB-2**	EPA 200.8	556674	EPA 200.8	556761
60286318016	**L-TP-3S**	EPA 200.8	556674	EPA 200.8	556761
60286318017	**L-TP-2S**	EPA 200.8	556679	EPA 200.8	556837
60286318018	**L-TP-2M**	EPA 200.8	556679	EPA 200.8	556837
60286318019	**L-TP-2D**	EPA 200.8	556679	EPA 200.8	556837
60286318001	**L-TP-1S**	EPA 7470	556888	EPA 7470	556949
60286318002	**L-TP-1M**	EPA 7470	556888	EPA 7470	556949
60286318003	**L-TP-1D**	EPA 7470	556888	EPA 7470	556949
60286318004	**L-TP-3M**	EPA 7470	556888	EPA 7470	556949
60286318005	**L-TP-3D**	EPA 7470	556888	EPA 7470	556949
60286318006	**L-TP-4S**	EPA 7470	556888	EPA 7470	556949
60286318007	**L-TP-4M**	EPA 7470	556888	EPA 7470	556949
60286318008	**L-TP-4D**	EPA 7470	556888	EPA 7470	556949

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286318009	L-TP-5S	EPA 7470	556888	EPA 7470	556949
60286318010	L-TP-5M	EPA 7470	556888	EPA 7470	556949
60286318011	L-TP-5D	EPA 7470	556888	EPA 7470	556949
60286318012	L-NE-DUP-1	EPA 7470	556888	EPA 7470	556949
60286318013	L-NE-DUP-2	EPA 7470	556888	EPA 7470	556949
60286318014	L-NE-FB-1	EPA 7470	556888	EPA 7470	556949
60286318015	L-NE-FB-2	EPA 7470	556888	EPA 7470	556949
60286318016	L-TP-3S	EPA 7470	556888	EPA 7470	556949
60286318017	L-TP-2S	EPA 7470	557103	EPA 7470	557207
60286318018	L-TP-2M	EPA 7470	557103	EPA 7470	557207
60286318019	L-TP-2D	EPA 7470	557103	EPA 7470	557207
60286318007	L-TP-4M	EPA 903.1	321857		
60286318007	L-TP-4M	EPA 904.0	320562		
60286318001	L-TP-1S	SM 2320B	555761		
60286318002	L-TP-1M	SM 2320B	555761		
60286318003	L-TP-1D	SM 2320B	555761		
60286318004	L-TP-3M	SM 2320B	555761		
60286318005	L-TP-3D	SM 2320B	555811		
60286318006	L-TP-4S	SM 2320B	555811		
60286318007	L-TP-4M	SM 2320B	555811		
60286318008	L-TP-4D	SM 2320B	555811		
60286318009	L-TP-5S	SM 2320B	555811		
60286318010	L-TP-5M	SM 2320B	555811		
60286318011	L-TP-5D	SM 2320B	555811		
60286318012	L-NE-DUP-1	SM 2320B	555811		
60286318013	L-NE-DUP-2	SM 2320B	555811		
60286318014	L-NE-FB-1	SM 2320B	555811		
60286318015	L-NE-FB-2	SM 2320B	555811		
60286318016	L-TP-3S	SM 2320B	555811		
60286318017	L-TP-2S	SM 2320B	556192		
60286318018	L-TP-2M	SM 2320B	556192		
60286318019	L-TP-2D	SM 2320B	556192		
60286318001	L-TP-1S	SM 2540C	555031		
60286318002	L-TP-1M	SM 2540C	555031		
60286318003	L-TP-1D	SM 2540C	555031		
60286318004	L-TP-3M	SM 2540C	555031		
60286318005	L-TP-3D	SM 2540C	555031		
60286318006	L-TP-4S	SM 2540C	555031		
60286318007	L-TP-4M	SM 2540C	555031		
60286318008	L-TP-4D	SM 2540C	555031		
60286318009	L-TP-5S	SM 2540C	555031		
60286318010	L-TP-5M	SM 2540C	555031		
60286318011	L-TP-5D	SM 2540C	555352		
60286318012	L-NE-DUP-1	SM 2540C	555352		
60286318013	L-NE-DUP-2	SM 2540C	555352		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286318014	**L-NE-FB-1**	SM 2540C	555352		
60286318015	**L-NE-FB-2**	SM 2540C	555352		
60286318016	**L-TP-3S**	SM 2540C	555352		
60286318017	**L-TP-2S**	SM 2540C	555353		
60286318018	**L-TP-2M**	SM 2540C	555353		
60286318019	**L-TP-2D**	SM 2540C	555353		
60286318001	**L-TP-1S**	SM 3500-Fe B#4	556806		
60286318002	**L-TP-1M**	SM 3500-Fe B#4	556806		
60286318003	**L-TP-1D**	SM 3500-Fe B#4	556806		
60286318004	**L-TP-3M**	SM 3500-Fe B#4	557168		
60286318005	**L-TP-3D**	SM 3500-Fe B#4	557168		
60286318006	**L-TP-4S**	SM 3500-Fe B#4	557168		
60286318007	**L-TP-4M**	SM 3500-Fe B#4	557168		
60286318008	**L-TP-4D**	SM 3500-Fe B#4	557168		
60286318009	**L-TP-5S**	SM 3500-Fe B#4	557168		
60286318010	**L-TP-5M**	SM 3500-Fe B#4	557168		
60286318011	**L-TP-5D**	SM 3500-Fe B#4	557168		
60286318012	**L-NE-DUP-1**	SM 3500-Fe B#4	557168		
60286318013	**L-NE-DUP-2**	SM 3500-Fe B#4	557168		
60286318014	**L-NE-FB-1**	SM 3500-Fe B#4	557168		
60286318015	**L-NE-FB-2**	SM 3500-Fe B#4	557168		
60286318016	**L-TP-3S**	SM 3500-Fe B#4	557168		
60286318017	**L-TP-2S**	SM 3500-Fe B#4	557168		
60286318018	**L-TP-2M**	SM 3500-Fe B#4	557168		
60286318019	**L-TP-2D**	SM 3500-Fe B#4	558082		
60286318001	**L-TP-1S**	SM 3500-Fe B#4	554558		
60286318002	**L-TP-1M**	SM 3500-Fe B#4	554558		
60286318003	**L-TP-1D**	SM 3500-Fe B#4	554557		
60286318004	**L-TP-3M**	SM 3500-Fe B#4	554557		
60286318005	**L-TP-3D**	SM 3500-Fe B#4	554557		
60286318006	**L-TP-4S**	SM 3500-Fe B#4	554557		
60286318007	**L-TP-4M**	SM 3500-Fe B#4	554557		
60286318008	**L-TP-4D**	SM 3500-Fe B#4	554557		
60286318009	**L-TP-5S**	SM 3500-Fe B#4	554558		
60286318010	**L-TP-5M**	SM 3500-Fe B#4	554558		
60286318011	**L-TP-5D**	SM 3500-Fe B#4	554557		
60286318012	**L-NE-DUP-1**	SM 3500-Fe B#4	554544		
60286318013	**L-NE-DUP-2**	SM 3500-Fe B#4	554557		
60286318014	**L-NE-FB-1**	SM 3500-Fe B#4	554557		
60286318015	**L-NE-FB-2**	SM 3500-Fe B#4	554557		
60286318016	**L-TP-3S**	SM 3500-Fe B#4	554557		
60286318017	**L-TP-2S**	SM 3500-Fe B#4	554544		
60286318018	**L-TP-2M**	SM 3500-Fe B#4	554544		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286318019	L-TP-2D	SM 3500-Fe B#4	554544		
60286318001	L-TP-1S	EPA 300.0	556691		
60286318002	L-TP-1M	EPA 300.0	556691		
60286318003	L-TP-1D	EPA 300.0	556691		
60286318003	L-TP-1D	EPA 300.0	556824		
60286318004	L-TP-3M	EPA 300.0	556691		
60286318005	L-TP-3D	EPA 300.0	556691		
60286318006	L-TP-4S	EPA 300.0	556691		
60286318007	L-TP-4M	EPA 300.0	556691		
60286318008	L-TP-4D	EPA 300.0	556691		
60286318009	L-TP-5S	EPA 300.0	556691		
60286318010	L-TP-5M	EPA 300.0	556691		
60286318011	L-TP-5D	EPA 300.0	556691		
60286318012	L-NE-DUP-1	EPA 300.0	556691		
60286318012	L-NE-DUP-1	EPA 300.0	556824		
60286318013	L-NE-DUP-2	EPA 300.0	556692		
60286318013	L-NE-DUP-2	EPA 300.0	556824		
60286318014	L-NE-FB-1	EPA 300.0	556692		
60286318015	L-NE-FB-2	EPA 300.0	556692		
60286318016	L-TP-3S	EPA 300.0	556692		
60286318016	L-TP-3S	EPA 300.0	556824		
60286318017	L-TP-2S	EPA 300.0	556826		
60286318018	L-TP-2M	EPA 300.0	556826		
60286318019	L-TP-2D	EPA 300.0	556826		
60286318001	L-TP-1S	EPA 365.4	554982		
60286318002	L-TP-1M	EPA 365.4	554982		
60286318003	L-TP-1D	EPA 365.4	554982		
60286318004	L-TP-3M	EPA 365.4	554982		
60286318005	L-TP-3D	EPA 365.4	554982		
60286318006	L-TP-4S	EPA 365.4	554982		
60286318007	L-TP-4M	EPA 365.4	554982		
60286318008	L-TP-4D	EPA 365.4	554982		
60286318009	L-TP-5S	EPA 365.4	554982		
60286318010	L-TP-5M	EPA 365.4	554982		
60286318011	L-TP-5D	EPA 365.4	554982		
60286318012	L-NE-DUP-1	EPA 365.4	554982		
60286318013	L-NE-DUP-2	EPA 365.4	554982		
60286318014	L-NE-FB-1	EPA 365.4	554983		
60286318015	L-NE-FB-2	EPA 365.4	554983		
60286318016	L-TP-3S	EPA 365.4	554983		
60286318017	L-TP-2S	EPA 365.4	554983		
60286318018	L-TP-2M	EPA 365.4	554983		
60286318019	L-TP-2D	EPA 365.4	554984		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA N&E
Pace Project No.: 60286318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60286318

60286318

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): As-read 3.1, 2.7 Corr. Factor +0.0 Corrected 3.1, 2.7

Date and initials of person examining contents: AC 11/9

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Church Date: 11/9/18

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA N&E
Project Number:	153-1406.00011 (COC #3)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N	N	N	60286318
1	L-TP-1S	WT	G			11/8/18	1440		4	2	1	1							/	/	/	/	/	/	/		2BP2U	BP3N	BP3S	-001
2	L-TP-1M	WT	G				1400		1	1	1	1							1	1	1	1	1	1	1					-002
3	L-TP-1D	WT	G				1310		1	1	1	1							1	1	1	1	1	1	1					-003
4	L-TP-2S	WT	G																											
5	L-TP-2M	WT	G																											
6	L-TP-2D	WT	G																											
7	L-TP-3S	WT	G			11/8/18	1120		4	2	1	1							/	/	/	/	/	/	/		2BP2U	BP3N	BP3S	-010
8	L-TP-3M	WT	G				1040		1	1	1	1							1	1	1	1	1	1	1					-004
9	L-TP-3D	WT	G				0945		1	1	1	1							1	1	1	1	1	1	1					-005
10	L-TP-4S	WT	G				1140		1	1	1	1							1	1	1	1	1	1	1					-006
11	L-TP-4M	WT	G				1035		6	2	3	1							/	/	/	/	/	/	/		2BP1N			-007
12	L-TP-4D	WT	G				0940		4	2	1	1							1	1	1	1	1	1	1					-008

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Golder	11/8/18	1735	Lydia Cf pest	11/9/18	03:12	3.1	4	4	4
							2.7	4	4	4

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

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

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical
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Section A — Required Client Information:

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

Section B — Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA N&E
Project Number:	153-1406.0001 (COC #3)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES X GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: MO

Section D — Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-TP-5S	WT	G			11/8/18	1350		4	2	1				2				/	/	/	/	/	/	/	/			28P2U BP3N BP3S -009
2	L-TP-5M	WT	G				1315		1	1	1	1																	-010
3	L-TP-5D	WT	G				1275																						-011
4	L-NE-DUP-1	WT	G				—																						-012
5	L-NE-DUP-2	WT	G				—																						-013
6	L-NE-FB-1	WT	G				1030																						-014
7	L-NE-FB-2	WT	G				1300																						-015
8	L-NE-MS-1	WT	G				0945																						-005
9	L-NE-MSD-1	WT	G				0945																						
10		WT	G																										
11		WT	G																										
12		WT	G																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	/ Golder	11/8/18	1735	P2SI	11/9/18	03:12	3.1 2.7	4 4	4 4	4 4

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

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60286318

60286318

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 3.0 **Corr. Factor** +0.0 **Corrected** 3.0

Date and initials of person examining contents: JLS 11/6

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jana Chunk 11/12/18 Date:

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EC LCPA N&E
Project Number:	153-1406.0001I (COC #3)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

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

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./Lab I.D.
1	L-TP-1S	WT	G																										
2	L-TP-1M	WT	G																										
3	L-TP-1D	WT	G																										
4	L-TP-2S	WT	G			11/5/18	1010		4	2	1	1						/	/	/	/	/	/	/	/				(2)BP2U BP3S BP3N 017
5	L-TP-2M	WT	G			1	1050		1	1	1	1						1	1	1	1	1	1	1	1				018
6	L-TP-2D	WT	G				0940																						019
7	L-TP-3S	WT	G																										
8	L-TP-3M	WT	G																										
9	L-TP-3D	WT	G																										
10	L-TP-4S	WT	G			11/9/18																							
11	L-TP-4M	WT	G																										
12	L-TP-4D	WT	G																										

Pace Project No.: 60286318

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	[signature] / Golder	11/5/18	1130	[signature] / PACE	11/7/18	1430				
	[signature] / PACE	11/9/18	1700	[signature]	11/10	0625	3.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Goodwin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/9/18

*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

MEMORANDUM

DATE January 10, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – NATURE & EXTENT – DATA PACKAGE 60286318

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

- Analysis of Ferrous Iron for all samples was initiated outside of the 15-minute EPA required holding time, the detections in samples were qualified as estimates (J) or non-detect and estimates (UJ).
- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).
- When a sample or field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - LCPA - NAE - Nov 2018
Reviewer: T Goodwin

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

Laboratory: Pace Analytical
SDG #: 60286318

Analytical Method (type and no.): Metals (200.7&200.8), Hg (7470), Alk (SM 2320B), TDS (SM 2540C), Fe (SM 3500-Fe B#4), Anions (300.0), P (365.4), ~~Ra (9015/9804.0)~~ Ra (903.1/904.0) ok TL

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐

Sample Names L-TP-1S, L-TP-1M, L-TP-1D, L-TP-3M, L-TP-3D, L-TP-4S, L-TP-4M, L-TP-4D, L-TP-5S, L-TP-5M, L-TP-5D, L-NE-DUP-1, L-NE-DUP-2, L-NE-FB-1, L-NE-FB-2, L-TP-3S, L-TP-2S, L-TP-2M, L-TP-2D

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

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

Note Deficiencies:

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☐	☐	☒	
b) Were hold times met for sample analysis?	☐	☑	☐	Fe^{2+}
c) Were the correct preservatives used?	☒	☐	☐	
d) Was the correct method used?	☒	☐	☐	
e) Were appropriate reporting limits achieved?	☒	☐	☐	
f) Were any sample dilutions noted?	☐	☐	☐	
g) Were any matrix problems noted?	☐	☐	☐	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☑	☐	☐	See Notes
b) Were analytes detected in the field blank(s)?	☑	☐	☐	FB-1: Cr(0.36)
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	FB-2: Mg(36.2), Cr(0.24), TDS(6.0),
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☑	☐	☐	Dup-1@L-TP-3S DUP-2 @ L-TP-5D FB-1@L-TP-3M FB-2 @ L-TP-5M
b) Were field dup. precision criteria met (note RPD)?	☐	☑	☐	DUP-1: Fe(32), Cl(28), Fe^{3+}(200), Fe^{2+}/200)
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	DUP-2: Mo(30), Fe^{2+}(200), ~~Cl⁻(200), F^-(200), SO_4^{2-}(200), P(200)~~ T6 ~~Alk(200), TDS(500), Fe^{3+}(200), Fe^{2+}~~ T6
d) Were lab dup. precision criteria met (note RPD)?	☐	☑	☐	[DOS] Li:(30)

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☑	☐	Ba, Se, Anions, P
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☑	☐	B, Ca, Anions
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☑	☐	☐	

Comments/Notes:

MB:
[8001-03]: Mn(1.8)
[8004-16]: Mn(2.0), {Cd(0.082), Cr(0.30) Not[04]}
[8017-18]: Mn(0.8), Cr(0.22),
[8001-04]: Sb(0.079), As(0.072), Cd(0.040)

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
All Samples	Ferrous Iron (Fe^{2+})	—	J/UJ	Analyzed outside EPA hold time
L-TP-1M	Arsenic (As)	1.0	U	Method Blank (MB); MDL < Result < PQL
L-TP-1D	↓	1.0	U	↓
L-TP-3M	↓	1.0	U	↓
↓	Cadmium (Cd)	0.50	U	↓
L-TP-3D	↓	0.50	U	↓
↓	Chromium (Cr)	1.0	U	↓
↓	Lithium (Li)	37.0	J	Sample Duplicate (SD) exceeded limits; Result > MDL
L-TP-4S	Cd	0.50	U	MB; MDL < Result < PQL
↓	Cr	1.0	U	↓
L-TP-4M	Cd	0.50	U	↓
↓	Cr	1.0	U	↓
L-TP-4D	↓	1.0	U	↓
L-TP-5S	↓	1.0	U	↓
L-TP-5M	↓	1.0	U	↓
L-TP-5D	↓	1.0	U	↓
↓	Molybdenum (Mo)	1.4	J	RPD exceeded limits; Result > MDL
↓	Ferrous Iron (Fe^{2+})	0.012	UJ	↓ Result < MDL
L-NE-DUP-2	Mo	1.9	J	↓ Result > MDL
↓	Fe^{2+}	0.56	J	↓
↓	Cr	1.0	U	MB; MDL < Result < PQL
L-NE-DUP-1	↓	1.0	U	↓
↓	Cd	0.50	U	↓
↓	Iron (Fe)	7.3	J	RPD exceeded limits; Result > MDL
↓	Fe^{2+}	0.066	J	↓
↓	Ferric Iron (Fe^{3+})	0.0	UJ	↓ Result ≤ MDL
L-TP-3S	Fe	10.1	J	↓ Result > MDL
↓	Fe^{3+}	0.010	J	↓
↓	Fe^{2+}	0.010	UJ	↓ Result < MDL
↓	Cd	0.50	U	MB; MDL < Result < PQL
↓	Cr	1.0	U	↓

Continue on Next Page

Signature: Tommy McGoodwin Jr. Date: 1/10/19

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-NE-FB-1	Cr	1.0	U	MB; MDL < Result < PQL
L-NE-FB-2	"	1.0	U	"
L-TP-2S	"	1.0	U	"
L-TP-2M	"	1.0	U	"
L-TP-2D	"	1.0	U	"

Signature: Tommy J. Gordon Date: 1/10/19

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

January 09, 2019

Mark Haddock
Golder Associates
820 S. Main St
Suite 100
Saint Charles, MO 63301

RE: Project: LCPA AMEREN GW
Pace Project No.: 60291119

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

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

Sincerely,

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

Enclosures

cc: Ryan Feldmann, Golder
Jeffrey Ingram, Golder Associates
Eric Schneider, Golder Associates

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

CERTIFICATIONS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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

SAMPLE SUMMARY

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291119001	**L-UMW-1D**	Water	01/02/19 09:24	01/04/19 03:25
60291119002	**L-UMW-8D**	Water	01/02/19 10:57	01/04/19 03:25
60291119003	**L-UMW-5D**	Water	01/03/19 10:25	01/04/19 03:25
60291119004	**L-LCPA-DUP-1**	Water	01/03/19 10:25	01/04/19 03:25
60291119005	**L-LCPA-FB-1**	Water	01/03/19 10:35	01/04/19 03:25
60291119006	**L-UMW-3D**	Water	01/03/19 12:43	01/04/19 03:25
60291119007	**L-UMW-4D**	Water	01/03/19 13:43	01/04/19 03:25

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

SAMPLE ANALYTE COUNT

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291119001	**L-UMW-1D**	EPA 200.7	CTR	1	PASI-K
60291119002	**L-UMW-8D**	SM 2540C	AJS	1	PASI-K
60291119003	**L-UMW-5D**	EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291119004	**L-LCPA-DUP-1**	EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291119005	**L-LCPA-FB-1**	EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291119006	**L-UMW-3D**	EPA 300.0	MGS	1	PASI-K
60291119007	**L-UMW-4D**	SM 2540C	AJS	1	PASI-K

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

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-UMW-1D **Lab ID: 60291119001** Collected: 01/02/19 09:24 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Calcium	**168000**	ug/L	200	53.5	1	01/08/19 09:37	01/09/19 10:40	7440-70-2	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-UMW-8D **Lab ID: 60291119002** Collected: 01/02/19 10:57 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**576**	mg/L	5.0	5.0	1		01/08/19 08:39		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-UMW-5D **Lab ID: 60291119003** Collected: 01/03/19 10:25 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**5890**	ug/L	100	12.5	1	01/08/19 09:37	01/09/19 10:42	7440-42-8	
Calcium	**72200**	ug/L	200	53.5	1	01/08/19 09:37	01/09/19 10:42	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**531**	mg/L	5.0	5.0	1		01/08/19 08:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.0**	mg/L	1.0	0.29	1		01/08/19 18:40	16887-00-6	M1,R1
Fluoride	**<0.19**	mg/L	0.20	0.19	1		01/08/19 18:40	16984-48-8	
Sulfate	**278**	mg/L	20.0	4.8	20		01/08/19 19:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-LCPA-DUP-1 **Lab ID: 60291119004** Collected: 01/03/19 10:25 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**5860**	ug/L	100	12.5	1	01/08/19 09:37	01/09/19 10:47	7440-42-8	
Calcium	**72100**	ug/L	200	53.5	1	01/08/19 09:37	01/09/19 10:47	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**536**	mg/L	5.0	5.0	1		01/08/19 08:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.0**	mg/L	1.0	0.29	1		01/08/19 20:16	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		01/08/19 20:16	16984-48-8	
Sulfate	**269**	mg/L	20.0	4.8	20		01/09/19 12:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-LCPA-FB-1 **Lab ID: 60291119005** Collected: 01/03/19 10:35 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**26.5J**	ug/L	100	12.5	1	01/08/19 09:37	01/09/19 10:49	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	01/08/19 09:37	01/09/19 10:49	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		01/08/19 08:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.29**	mg/L	1.0	0.29	1		01/08/19 20:49	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		01/08/19 20:49	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		01/08/19 20:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-UMW-3D **Lab ID: 60291119006** Collected: 01/03/19 12:43 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**17.7**	mg/L	1.0	0.29	1		01/08/19 21:53	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Sample: L-UMW-4D **Lab ID: 60291119007** Collected: 01/03/19 13:43 Received: 01/04/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**625**	mg/L	5.0	5.0	1		01/08/19 08:39		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: LCPA AMEREN GW
Pace Project No.: 60291119

QC Batch: 563580 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60291119001, 60291119003, 60291119004, 60291119005

METHOD BLANK: 2312313 Matrix: Water
Associated Lab Samples: 60291119001, 60291119003, 60291119004, 60291119005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	01/09/19 10:36	
Calcium	ug/L	<53.5	200	53.5	01/09/19 10:36	

LABORATORY CONTROL SAMPLE: 2312314

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2312315 2312316

Parameter	Units	60291121002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	117	1000	1000	1150	1140	103	102	70-130	1	20	
Calcium	ug/L	169000	10000	10000	178000	180000	95	109	70-130	1	20	

MATRIX SPIKE SAMPLE: 2312351

Parameter	Units	60291119003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	5890	1000	6950	106	70-130	
Calcium	ug/L	72200	10000	82800	106	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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QUALITY CONTROL DATA

Project: LCPA AMEREN GW
Pace Project No.: 60291119

QC Batch: 563588 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60291119002, 60291119003, 60291119004, 60291119005, 60291119007

METHOD BLANK: 2312355 Matrix: Water
Associated Lab Samples: 60291119002, 60291119003, 60291119004, 60291119005, 60291119007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/08/19 08:39	

LABORATORY CONTROL SAMPLE: 2312356

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

SAMPLE DUPLICATE: 2312358

Parameter	Units	60291119003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	531	528	1	10	

SAMPLE DUPLICATE: 2312359

Parameter	Units	60291121002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	670	669	0	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LCPA AMEREN GW
Pace Project No.: 60291119

QC Batch: 563695 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60291119003, 60291119004, 60291119005, 60291119006

METHOD BLANK: 2312684 Matrix: Water
Associated Lab Samples: 60291119003, 60291119004, 60291119005, 60291119006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	01/08/19 17:20	
Fluoride	mg/L	<0.19	0.20	0.19	01/08/19 17:20	
Sulfate	mg/L	<0.24	1.0	0.24	01/08/19 17:20	

LABORATORY CONTROL SAMPLE: 2312685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2312686 2312687

Parameter	Units	60291119003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.0	5	5	24.4	25.0	109	119	90-110	2	15	E,M1, R1
Fluoride	mg/L	<0.19	2.5	2.5	2.6	2.7	97	102	90-110	5	15	
Sulfate	mg/L	278	100	100	382	386	104	109	90-110	1	15	

MATRIX SPIKE SAMPLE: 2312688

Parameter	Units	60291121002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.6	5	8.9	106	90-110	
Fluoride	mg/L	0.23	2.5	2.9	105	90-110	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LCPA AMEREN GW
Pace Project No.: 60291119

QC Batch: 563846
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60291119004

METHOD BLANK: 2313290 Matrix: Water
Associated Lab Samples: 60291119004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	01/09/19 11:19	

LABORATORY CONTROL SAMPLE: 2313291

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2313292 2313293

Parameter	Units	60291121002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	98.6	50	50	152	152	108	107	90-110	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

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QUALIFIERS

Project: LCPA AMEREN GW
Pace Project No.: 60291119

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LCPA AMEREN GW
Pace Project No.: 60291119

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291119001	**L-UMW-1D**	EPA 200.7	563580	EPA 200.7	563633
60291119003	**L-UMW-5D**	EPA 200.7	563580	EPA 200.7	563633
60291119004	**L-LCPA-DUP-1**	EPA 200.7	563580	EPA 200.7	563633
60291119005	**L-LCPA-FB-1**	EPA 200.7	563580	EPA 200.7	563633
60291119002	**L-UMW-8D**	SM 2540C	563588		
60291119003	**L-UMW-5D**	SM 2540C	563588		
60291119004	**L-LCPA-DUP-1**	SM 2540C	563588		
60291119005	**L-LCPA-FB-1**	SM 2540C	563588		
60291119007	**L-UMW-4D**	SM 2540C	563588		
60291119003	**L-UMW-5D**	EPA 300.0	563695		
60291119004	**L-LCPA-DUP-1**	EPA 300.0	563695		
60291119004	**L-LCPA-DUP-1**	EPA 300.0	563846		
60291119005	**L-LCPA-FB-1**	EPA 300.0	563695		
60291119006	**L-UMW-3D**	EPA 300.0	563695		

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Sample Condition Upon Receipt

Jamie

WO#: 60291119

60291119

Client Name: Golder Associates

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

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

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

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

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

Cooler Temperature (°C): As-read 1.4, 0.5 Corr. Factor 0.0 Corrected 1.4, 0.5

Date and initials of person examining contents: 1/4/19 AK

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No ☐N/A	recieve sample L-Dup-1LL1 (BP2U, BP3N) instead of sample L-2CPA-Dup-1.
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added. Dup is L-Dup-1
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☑No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☑No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Church 1/7/19 Date:

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	820 South Main Street, Suite 100	Copy To:	Jeffrey Ingram	Company Name:	
	St Charles, MO 63301			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	LCPA / Ameren GW	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153140.0001	Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS							Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N	N						
1	L-UMW-1D	WT	G			1/2/19	0924		2	1		1								✓				BP2U, BP3N					001
2	L-UMW-8D	WT	G			1	1057		1	1		1												✓	↓		↓			002
3	L-UMW-5D	WT	G			1/3/19	1025		6	3		3								✓	✓	✓	✓	✓	✓	BP2U(3)		BP3N(3)		003
4	L-LCPA-DUP-1	WT	G				—		2	1		1								↓	↓	↓	↓	↓	↓	BP2U,		BP3N		004
5	L-LCPA-FB-1	WT	G				1035		1	1		1								↓	↓	↓	↓	↓	↓		↓			005
6	L-UMW-3D	WT	G				1243		1	1		1										✓								006
7	L-UMW-4D	WT	G				1343		1	1		1													✓	↓		↓		007
8		WT	G																											
9		WT	G																											
10		WT	G																											
11		WT	G																											
12		WT	G																											

60291119

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / Golder	1/3/19	1710	EBrackett / Pace	1/4/19	0325	1.4	✓	✓	✓

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 01/03/19

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

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

MEMORANDUM

DATE January 14, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – VERIFICATION SAMPLING – DATA PACKAGE 60291119

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

- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

Project Manager: J Ingram
Project Number: 1531406
Validation Date: 1/14/19

Laboratory: Pace Analytical (12) (11) (12) SDG #: 60291119 (12)
Analytical Method (type and no.): Metals (200.7&200.8), Hg (7470), Alk (SM 2320B), TDS (SM 2540C), Fe (SM 3500-Fe B#4), Anions (300.0), R (365.4), Ra (903.1&904.0) (12)
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____
Sample Names L-UMW-1D, L-UMW-8D, L-UMW-5D, L-LCPA-DUP-1, L-LCPA-FB-1, L-UMW-3D, L-UMW-4D

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	1/3/19
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Q, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☑	☐	
b) Were analytes detected in the field blank(s)?	☑	☐	☐	FB-1: B(26.5)
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ UMW-5D
	☑	☐	☐	FB-1@ UMW-5D
b) Were field dup. precision criteria met (note RPD)?	☑	☑ (N)	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature: Tommy A Goodwin Date: 1/14/19

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

May 31, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory between May 02, 2019 and May 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Florida: Cert E871149 SEKS WET
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60301548001	**L-UMW-1D**	Water	04/30/19 09:30	05/02/19 04:13
60301548002	**L-UMW-2D**	Water	05/01/19 12:10	05/02/19 04:13
60301548003	**L-UMW-3D**	Water	04/30/19 16:50	05/02/19 04:13
60301548004	**L-UMW-4D**	Water	04/30/19 15:05	05/02/19 04:13
60301548005	**L-UMW-5D**	Water	04/30/19 12:00	05/02/19 04:13
60301548006	**L-UMW-6D**	Water	04/30/19 10:35	05/02/19 04:13
60301548007	**L-UMW-8D**	Water	04/30/19 11:25	05/02/19 04:13
60301548008	**L-UMW-9D**	Water	04/30/19 16:20	05/02/19 04:13
60301548009	**L-BMW-1D**	Water	05/01/19 12:20	05/02/19 04:13
60301548010	**L-BMW-2D**	Water	05/01/19 10:15	05/02/19 04:13
60301548011	**L-UMW-DUP-1**	Water	04/30/19 09:30	05/02/19 04:13
60301548012	**L-UMW-FB-1**	Water	04/30/19 16:45	05/02/19 04:13
60301548013	**L-UMW-FB-2**	Water	05/01/19 11:57	05/02/19 04:13
60301548014	**L-UMW-1D MS**	Water	04/30/19 09:30	05/02/19 04:13
60301548015	**L-UMW-1D MSD**	Water	04/30/19 09:30	05/02/19 04:13
60301805001	**L-UMW-7D**	Water	05/02/19 09:55	05/04/19 04:35
60301805002	**L-UMW-DUP-2**	Water	05/02/19 09:55	05/04/19 04:35

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60301548001	**L-UMW-1D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548002	**L-UMW-2D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548003	**L-UMW-3D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548004	**L-UMW-4D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548005	**L-UMW-5D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548006	**L-UMW-6D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548007	**L-UMW-8D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548008	**L-UMW-9D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548009	**L-BMW-1D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548010	**L-BMW-2D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548011	**L-UMW-DUP-1**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548012	**L-UMW-FB-1**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548013	**L-UMW-FB-2**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60301548014	**L-UMW-1D MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60301548015	**L-UMW-1D MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60301805001	**L-UMW-7D**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60301805002	**L-UMW-DUP-2**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-1D **Lab ID: 60301548001** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**421**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 17:31	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 17:31	7440-41-7	
Boron	**555**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 17:31	7440-42-8	
Calcium	**127000**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 17:31	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 17:31	7440-48-4	
Iron	**12300**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 17:31	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 17:31	7439-92-1	
Lithium	**24.8**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 17:31	7439-93-2	
Magnesium	**34300**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 17:31	7439-95-4	
Manganese	**314**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 17:31	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 17:31	7439-98-7	
Potassium	**6160**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 17:31	7440-09-7	
Sodium	**25000**	ug/L	500	144	1	05/18/19 17:20	05/20/19 17:31	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.082J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:41	7440-36-0	
Arsenic	**34.7**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:41	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:41	7440-43-9	
Chromium	**0.19J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:41	7440-47-3	B
Selenium	**0.11J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:41	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:41	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:03	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**510**	mg/L	20.0	6.5	1		05/09/19 11:13		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**559**	mg/L	10.0	10.0	1		05/07/19 09:57		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.6**	mg/L	1.0	0.22	1		05/21/19 15:46	16887-00-6	
Fluoride	**0.18J**	mg/L	0.20	0.085	1		05/21/19 15:46	16984-48-8	
Sulfate	**7.3**	mg/L	1.0	0.23	1		05/21/19 15:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-2D **Lab ID: 60301548002** Collected: 05/01/19 12:10 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**95.5**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:44	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:44	7440-41-7	
Boron	**1210**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:44	7440-42-8	
Calcium	**83400**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:44	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:44	7440-48-4	
Iron	**2360**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:44	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:44	7439-92-1	
Lithium	**22.8**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:44	7439-93-2	
Magnesium	**16600**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:44	7439-95-4	
Manganese	**269**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:44	7439-96-5	
Molybdenum	**43.4**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:44	7439-98-7	
Potassium	**6620**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:44	7440-09-7	
Sodium	**63600**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:46	7440-36-0	
Arsenic	**1.8**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:46	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:46	7440-43-9	
Chromium	**0.15J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:46	7440-47-3	B
Selenium	**0.11J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:46	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:46	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:10	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**204**	mg/L	20.0	6.5	1		05/13/19 13:56		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**547**	mg/L	10.0	10.0	1		05/07/19 10:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**22.1**	mg/L	2.0	0.44	2		05/21/19 18:07	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	0.085	1		05/21/19 17:51	16984-48-8	
Sulfate	**206**	mg/L	50.0	11.5	50		05/21/19 18:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-3D **Lab ID: 60301548003** Collected: 04/30/19 16:50 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**68.1**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:22	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:22	7440-41-7	
Boron	**9590**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:22	7440-42-8	M1
Calcium	**84000**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:22	7440-70-2	M1
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:22	7440-48-4	
Iron	**114**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:22	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:22	7439-92-1	
Lithium	**18.0**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:22	7439-93-2	
Magnesium	**5040**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:22	7439-95-4	M1
Manganese	**124**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:22	7439-96-5	
Molybdenum	**202**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:22	7439-98-7	
Potassium	**9480**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:22	7440-09-7	
Sodium	**64000**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:22	7440-23-5	M1
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:48	7440-36-0	
Arsenic	**4.6**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:48	7440-38-2	
Cadmium	**0.10J**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:48	7440-43-9	
Chromium	**0.099J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:48	7440-47-3	B
Selenium	**0.16J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:48	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:48	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:12	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**46.2**	mg/L	20.0	6.5	1		05/09/19 11:23		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**579**	mg/L	10.0	10.0	1		05/07/19 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.8**	mg/L	2.0	0.44	2		05/22/19 15:53	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.085	1		05/21/19 18:38	16984-48-8	
Sulfate	**350**	mg/L	50.0	11.5	50		05/21/19 18:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-4D **Lab ID: 60301548004** Collected: 04/30/19 15:05 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**88.6**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:46	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:46	7440-41-7	
Boron	**3680**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:46	7440-42-8	
Calcium	**67700**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:46	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:46	7440-48-4	
Iron	**282**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:46	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:46	7439-92-1	
Lithium	**33.3**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:46	7439-93-2	
Magnesium	**8620**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:46	7439-95-4	
Manganese	**291**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:46	7439-96-5	
Molybdenum	**83.4**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:46	7439-98-7	
Potassium	**8650**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:46	7440-09-7	
Sodium	**114000**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:46	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:50	7440-36-0	
Arsenic	**0.13J**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:50	7440-38-2	
Cadmium	**0.050J**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:50	7440-43-9	
Chromium	**0.27J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:50	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:50	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:50	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:14	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**52.2**	mg/L	20.0	6.5	1		05/09/19 11:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**657**	mg/L	10.0	10.0	1		05/07/19 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**24.3**	mg/L	2.0	0.44	2		05/21/19 20:12	16887-00-6	
Fluoride	**0.29**	mg/L	0.20	0.085	1		05/21/19 19:25	16984-48-8	
Sulfate	**386**	mg/L	50.0	11.5	50		05/21/19 20:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-5D **Lab ID: 60301548005** Collected: 04/30/19 12:00 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**64.0**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:48	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:48	7440-41-7	
Boron	**5400**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:48	7440-42-8	
Calcium	**68000**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:48	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:48	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:48	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:48	7439-92-1	
Lithium	**16.7**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:48	7439-93-2	
Magnesium	**90.3**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:48	7439-95-4	
Manganese	**8.8**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:48	7439-96-5	
Molybdenum	**157**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:48	7439-98-7	
Potassium	**12900**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:48	7440-09-7	
Sodium	**70000**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:48	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:52	7440-36-0	
Arsenic	**16.7**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:52	7440-38-2	
Cadmium	**0.078J**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:52	7440-43-9	
Chromium	**0.091J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:52	7440-47-3	B
Selenium	**0.14J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:52	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:52	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:16	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**57.0**	mg/L	20.0	6.5	1		05/09/19 11:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**503**	mg/L	10.0	10.0	1		05/07/19 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.8**	mg/L	2.0	0.44	2		05/21/19 20:58	16887-00-6	
Fluoride	**0.095J**	mg/L	0.20	0.085	1		05/21/19 20:43	16984-48-8	
Sulfate	**264**	mg/L	20.0	4.6	20		05/21/19 21:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-6D **Lab ID: 60301548006** Collected: 04/30/19 10:35 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**115**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 17:46	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 17:46	7440-41-7	
Boron	**15600**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 17:46	7440-42-8	
Calcium	**103000**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 17:46	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 17:46	7440-48-4	
Iron	**604**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 17:46	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 17:46	7439-92-1	
Lithium	**9.2J**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 17:46	7439-93-2	
Magnesium	**5280**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 17:46	7439-95-4	
Manganese	**426**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 17:46	7439-96-5	
Molybdenum	**593**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 17:46	7439-98-7	
Potassium	**20700**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 17:46	7440-09-7	
Sodium	**89300**	ug/L	500	144	1	05/18/19 17:20	05/20/19 17:46	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:54	7440-36-0	
Arsenic	**17.3**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 11:54	7440-38-2	
Cadmium	**0.27J**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 11:54	7440-43-9	
Chromium	**0.21J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 11:54	7440-47-3	B
Selenium	**0.24J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 11:54	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 11:54	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:19	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**61.8**	mg/L	20.0	6.5	1		05/09/19 11:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**758**	mg/L	10.0	10.0	1		05/07/19 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.8**	mg/L	2.0	0.44	2		05/21/19 21:45	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/21/19 21:30	16984-48-8	
Sulfate	**426**	mg/L	50.0	11.5	50		05/21/19 22:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-8D **Lab ID: 60301548007** Collected: 04/30/19 11:25 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**438**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 17:52	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 17:52	7440-41-7	
Boron	**532**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 17:52	7440-42-8	
Calcium	**135000**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 17:52	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 17:52	7440-48-4	
Iron	**21200**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 17:52	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 17:52	7439-92-1	
Lithium	**32.8**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 17:52	7439-93-2	
Magnesium	**34300**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 17:52	7439-95-4	
Manganese	**896**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 17:52	7439-96-5	
Molybdenum	**16.7J**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 17:52	7439-98-7	
Potassium	**5050**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 17:52	7440-09-7	
Sodium	**18800**	ug/L	500	144	1	05/18/19 17:20	05/20/19 17:52	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:04	7440-36-0	
Arsenic	**27.5**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:04	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:04	7440-43-9	
Chromium	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:04	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:04	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:26	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**512**	mg/L	20.0	6.5	1		05/09/19 11:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**531**	mg/L	10.0	10.0	1		05/07/19 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.9**	mg/L	1.0	0.22	1		05/21/19 22:17	16887-00-6	
Fluoride	**0.16J**	mg/L	0.20	0.085	1		05/21/19 22:17	16984-48-8	
Sulfate	**13.3**	mg/L	1.0	0.23	1		05/21/19 22:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-9D **Lab ID: 60301548008** Collected: 04/30/19 16:20 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**479**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 17:55	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 17:55	7440-41-7	
Boron	**97.3J**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 17:55	7440-42-8	
Calcium	**116000**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 17:55	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 17:55	7440-48-4	
Iron	**22800**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 17:55	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 17:55	7439-92-1	
Lithium	**15.9**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 17:55	7439-93-2	
Magnesium	**32600**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 17:55	7439-95-4	
Manganese	**349**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 17:55	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 17:55	7439-98-7	
Potassium	**3840**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 17:55	7440-09-7	
Sodium	**13800**	ug/L	500	144	1	05/18/19 17:20	05/20/19 17:55	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:06	7440-36-0	
Arsenic	**32.2**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:06	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:06	7440-43-9	
Chromium	**0.098J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:06	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:06	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:06	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:28	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**533**	mg/L	20.0	6.5	1		05/13/19 12:29		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**473**	mg/L	10.0	10.0	1		05/07/19 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**23.0**	mg/L	2.0	0.44	2		05/21/19 23:35	16887-00-6	
Fluoride	**0.14J**	mg/L	0.20	0.085	1		05/21/19 23:19	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		05/21/19 23:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-BMW-1D **Lab ID: 60301548009** Collected: 05/01/19 12:20 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**941**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 17:57	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 17:57	7440-41-7	
Boron	**82.0J**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 17:57	7440-42-8	
Calcium	**120000**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 17:57	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 17:57	7440-48-4	
Iron	**9710**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 17:57	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 17:57	7439-92-1	
Lithium	**26.6**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 17:57	7439-93-2	
Magnesium	**28200**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 17:57	7439-95-4	
Manganese	**601**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 17:57	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 17:57	7439-98-7	
Potassium	**3930**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 17:57	7440-09-7	
Sodium	**8680**	ug/L	500	144	1	05/18/19 17:20	05/20/19 17:57	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:08	7440-36-0	
Arsenic	**0.94J**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:08	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:08	7440-43-9	
Chromium	**0.13J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:08	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:08	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:30	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**402**	mg/L	20.0	6.5	1		05/13/19 14:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**492**	mg/L	10.0	10.0	1		05/07/19 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.3**	mg/L	1.0	0.22	1		05/21/19 23:50	16887-00-6	
Fluoride	**0.18J**	mg/L	0.20	0.085	1		05/21/19 23:50	16984-48-8	
Sulfate	**32.1**	mg/L	5.0	1.2	5		05/22/19 00:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-BMW-2D **Lab ID: 60301548010** Collected: 05/01/19 10:15 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**353**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:51	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:51	7440-41-7	
Boron	**81.8J**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:51	7440-42-8	
Calcium	**137000**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:51	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:51	7440-48-4	
Iron	**7740**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:51	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:51	7439-92-1	
Lithium	**40.6**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:51	7439-93-2	
Magnesium	**28500**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:51	7439-95-4	
Manganese	**287**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:51	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:51	7439-98-7	
Potassium	**4080**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:51	7440-09-7	
Sodium	**6520**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:51	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:10	7440-36-0	
Arsenic	**29.8**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:10	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:10	7440-43-9	
Chromium	**0.13J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:10	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:10	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:10	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:32	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**436**	mg/L	20.0	6.5	1		05/13/19 14:08		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**506**	mg/L	10.0	10.0	1		05/07/19 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.4**	mg/L	1.0	0.22	1		05/22/19 00:21	16887-00-6	
Fluoride	**0.17J**	mg/L	0.20	0.085	1		05/22/19 00:21	16984-48-8	
Sulfate	**34.5**	mg/L	5.0	1.2	5		05/22/19 00:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-DUP-1 **Lab ID: 60301548011** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**66.8**	ug/L	5.0	1.4	1	05/21/19 13:20	05/22/19 11:53	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/21/19 13:20	05/22/19 11:53	7440-41-7	
Boron	**5460**	ug/L	100	10.7	1	05/21/19 13:20	05/22/19 11:53	7440-42-8	
Calcium	**68900**	ug/L	200	50.0	1	05/21/19 13:20	05/22/19 11:53	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/21/19 13:20	05/22/19 11:53	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/21/19 13:20	05/22/19 11:53	7439-89-6	
Lead	**3.8J**	ug/L	10.0	3.4	1	05/21/19 13:20	05/22/19 11:53	7439-92-1	
Lithium	**18.0**	ug/L	10.0	5.9	1	05/21/19 13:20	05/22/19 11:53	7439-93-2	
Magnesium	**64.0**	ug/L	50.0	13.0	1	05/21/19 13:20	05/22/19 11:53	7439-95-4	
Manganese	**6.9**	ug/L	5.0	2.1	1	05/21/19 13:20	05/22/19 11:53	7439-96-5	
Molybdenum	**159**	ug/L	20.0	2.6	1	05/21/19 13:20	05/22/19 11:53	7439-98-7	
Potassium	**13000**	ug/L	500	79.0	1	05/21/19 13:20	05/22/19 11:53	7440-09-7	
Sodium	**71700**	ug/L	500	144	1	05/21/19 13:20	05/22/19 11:53	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:12	7440-36-0	
Arsenic	**16.2**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:12	7440-38-2	
Cadmium	**0.082J**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:12	7440-43-9	
Chromium	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:12	7440-47-3	
Selenium	**0.14J**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:12	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:12	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:35	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**77.0**	mg/L	20.0	6.5	1		05/13/19 12:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**507**	mg/L	10.0	10.0	1		05/07/19 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.5**	mg/L	2.0	0.44	2		05/22/19 01:39	16887-00-6	
Fluoride	**0.11J**	mg/L	0.20	0.085	1		05/22/19 01:24	16984-48-8	
Sulfate	**250**	mg/L	20.0	4.6	20		05/22/19 16:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-FB-1 **Lab ID: 60301548012** Collected: 04/30/19 16:45 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**2.6J**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 18:05	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 18:05	7440-41-7	
Boron	**14.6J**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 18:05	7440-42-8	
Calcium	**70.2J**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 18:05	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 18:05	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 18:05	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 18:05	7439-92-1	
Lithium	**<5.9**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 18:05	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 18:05	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 18:05	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 18:05	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 18:05	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	05/18/19 17:20	05/20/19 18:05	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:00	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:00	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:00	7440-43-9	
Chromium	**0.081J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:00	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:00	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:00	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:37	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		05/13/19 12:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		05/07/19 10:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.23J**	mg/L	1.0	0.22	1		05/22/19 02:42	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/22/19 02:42	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		05/22/19 02:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-FB-2 **Lab ID: 60301548013** Collected: 05/01/19 11:57 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	05/18/19 17:20	05/20/19 18:07	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/18/19 17:20	05/20/19 18:07	7440-41-7	
Boron	**<10.7**	ug/L	100	10.7	1	05/18/19 17:20	05/20/19 18:07	7440-42-8	
Calcium	**<50.0**	ug/L	200	50.0	1	05/18/19 17:20	05/20/19 18:07	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/18/19 17:20	05/20/19 18:07	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/18/19 17:20	05/20/19 18:07	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/18/19 17:20	05/20/19 18:07	7439-92-1	
Lithium	**<5.9**	ug/L	10.0	5.9	1	05/18/19 17:20	05/20/19 18:07	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	05/18/19 17:20	05/20/19 18:07	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	05/18/19 17:20	05/20/19 18:07	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/18/19 17:20	05/20/19 18:07	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	05/18/19 17:20	05/20/19 18:07	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	05/18/19 17:20	05/20/19 18:07	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:02	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	05/20/19 09:15	05/22/19 12:02	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/20/19 09:15	05/22/19 12:02	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.078	1	05/20/19 09:15	05/22/19 12:02	7440-47-3	B
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/20/19 09:15	05/22/19 12:02	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/20/19 09:15	05/22/19 12:02	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/21/19 18:52	05/22/19 13:39	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		05/13/19 14:12		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		05/07/19 11:30		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.22**	mg/L	1.0	0.22	1		05/22/19 02:58	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/22/19 02:58	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		05/22/19 02:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-7D **Lab ID: 60301805001** Collected: 05/02/19 09:55 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**126**	ug/L	5.0	1.4	1	05/15/19 08:55	05/15/19 17:42	7440-39-3	
Beryllium	**0.37J**	ug/L	1.0	0.25	1	05/15/19 08:55	05/15/19 17:42	7440-41-7	
Boron	**7030**	ug/L	100	10.7	1	05/15/19 08:55	05/15/19 17:42	7440-42-8	
Calcium	**213000**	ug/L	200	50.0	1	05/15/19 08:55	05/15/19 17:42	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/15/19 08:55	05/15/19 17:42	7440-48-4	
Iron	**11600**	ug/L	50.0	14.0	1	05/15/19 08:55	05/15/19 17:42	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/15/19 08:55	05/15/19 17:42	7439-92-1	
Lithium	**20.8**	ug/L	10.0	5.9	1	05/15/19 08:55	05/15/19 17:42	7439-93-2	
Magnesium	**27800**	ug/L	50.0	13.0	1	05/15/19 08:55	05/15/19 17:42	7439-95-4	
Manganese	**2080**	ug/L	5.0	2.1	1	05/15/19 08:55	05/15/19 17:42	7439-96-5	
Molybdenum	**208**	ug/L	20.0	2.6	1	05/15/19 08:55	05/15/19 17:42	7439-98-7	
Potassium	**6890**	ug/L	500	79.0	1	05/15/19 08:55	05/15/19 17:42	7440-09-7	
Sodium	**69600**	ug/L	500	144	1	05/15/19 08:55	05/15/19 17:42	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/14/19 15:30	05/15/19 14:34	7440-36-0	
Arsenic	**20.3**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 14:34	7440-38-2	
Cadmium	**0.082J**	ug/L	0.50	0.033	1	05/14/19 15:30	05/15/19 14:34	7440-43-9	
Chromium	**0.28J**	ug/L	1.0	0.078	1	05/14/19 15:30	05/15/19 14:34	7440-47-3	
Selenium	**0.089J**	ug/L	1.0	0.085	1	05/14/19 15:30	05/15/19 14:34	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/14/19 15:30	05/15/19 14:34	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/16/19 15:10	05/17/19 13:25	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**365**	mg/L	20.0	6.5	1		05/16/19 11:26		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1030**	mg/L	13.3	13.3	1		05/09/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.9**	mg/L	1.0	0.22	1		05/17/19 02:57	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.085	1		05/17/19 02:57	16984-48-8	
Sulfate	**422**	mg/L	50.0	11.5	50		05/17/19 16:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-DUP-2 **Lab ID: 60301805002** Collected: 05/02/19 09:55 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**126**	ug/L	5.0	1.4	1	05/15/19 08:55	05/15/19 17:44	7440-39-3	
Beryllium	**0.39J**	ug/L	1.0	0.25	1	05/15/19 08:55	05/15/19 17:44	7440-41-7	
Boron	**7000**	ug/L	100	10.7	1	05/15/19 08:55	05/15/19 17:44	7440-42-8	
Calcium	**214000**	ug/L	200	50.0	1	05/15/19 08:55	05/15/19 17:44	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/15/19 08:55	05/15/19 17:44	7440-48-4	
Iron	**11700**	ug/L	50.0	14.0	1	05/15/19 08:55	05/15/19 17:44	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/15/19 08:55	05/15/19 17:44	7439-92-1	
Lithium	**20.0**	ug/L	10.0	5.9	1	05/15/19 08:55	05/15/19 17:44	7439-93-2	
Magnesium	**27800**	ug/L	50.0	13.0	1	05/15/19 08:55	05/15/19 17:44	7439-95-4	
Manganese	**2080**	ug/L	5.0	2.1	1	05/15/19 08:55	05/15/19 17:44	7439-96-5	
Molybdenum	**210**	ug/L	20.0	2.6	1	05/15/19 08:55	05/15/19 17:44	7439-98-7	
Potassium	**6970**	ug/L	500	79.0	1	05/15/19 08:55	05/15/19 17:44	7440-09-7	
Sodium	**69800**	ug/L	500	144	1	05/15/19 08:55	05/15/19 17:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/14/19 15:30	05/15/19 14:36	7440-36-0	
Arsenic	**20.1**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 14:36	7440-38-2	
Cadmium	**0.075J**	ug/L	0.50	0.033	1	05/14/19 15:30	05/15/19 14:36	7440-43-9	
Chromium	**0.10J**	ug/L	1.0	0.078	1	05/14/19 15:30	05/15/19 14:36	7440-47-3	
Selenium	**0.093J**	ug/L	1.0	0.085	1	05/14/19 15:30	05/15/19 14:36	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/14/19 15:30	05/15/19 14:36	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/16/19 15:10	05/17/19 13:32	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**354**	mg/L	20.0	6.5	1		05/16/19 11:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1040**	mg/L	13.3	13.3	1		05/09/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.9**	mg/L	1.0	0.22	1		05/17/19 03:48	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.085	1		05/17/19 03:48	16984-48-8	
Sulfate	**440**	mg/L	50.0	11.5	50		05/17/19 16:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585045 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2400652 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	05/17/19 13:16	

LABORATORY CONTROL SAMPLE: 2400654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400655 2400656

Parameter	Units	60301805001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	4.9	4.9	98	98	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 586038 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

METHOD BLANK: 2404529 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	05/22/19 12:58	

LABORATORY CONTROL SAMPLE: 2404530

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2404531 2404532

Parameter	Units	60301548001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	5.2	5.2	104	104	75-125	0	20	

MATRIX SPIKE SAMPLE: 2404533

Parameter	Units	60302398001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	<0.000037 mg/L	5	5.2	104	75-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 584623 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2398909 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/16/19 11:33	
Beryllium	ug/L	<0.25	1.0	0.25	05/16/19 11:33	
Boron	ug/L	<10.7	100	10.7	05/16/19 11:33	
Calcium	ug/L	<50.0	200	50.0	05/16/19 11:33	
Cobalt	ug/L	<0.84	5.0	0.84	05/16/19 11:33	
Iron	ug/L	<14.0	50.0	14.0	05/16/19 11:33	
Lead	ug/L	<3.4	10.0	3.4	05/16/19 11:33	
Lithium	ug/L	<5.9	10.0	5.9	05/16/19 11:33	
Magnesium	ug/L	15.8J	50.0	13.0	05/16/19 11:33	
Manganese	ug/L	<2.1	5.0	2.1	05/16/19 11:33	
Molybdenum	ug/L	<2.6	20.0	2.6	05/16/19 11:33	
Potassium	ug/L	<79.0	500	79.0	05/16/19 11:33	
Sodium	ug/L	<144	500	144	05/16/19 11:33	

LABORATORY CONTROL SAMPLE: 2398910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Beryllium	ug/L	1000	983	98	85-115	
Boron	ug/L	1000	974	97	85-115	
Calcium	ug/L	10000	9980	100	85-115	
Cobalt	ug/L	1000	991	99	85-115	
Iron	ug/L	10000	9790	98	85-115	
Lead	ug/L	1000	1000	100	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Magnesium	ug/L	10000	9900	99	85-115	
Manganese	ug/L	1000	980	98	85-115	
Molybdenum	ug/L	1000	916	92	85-115	
Potassium	ug/L	10000	9900	99	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398911 2398912

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	360	1000	1000	1370	1360	101	100	70-130	1	20	
Beryllium	ug/L	<0.25	1000	1000	1010	1000	101	100	70-130	1	20	
Boron	ug/L	109	1000	1000	1120	1120	101	101	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398911 2398912

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	164000	10000	10000	178000	177000	140	134	70-130	0	20	M1
Cobalt	ug/L	3.7J	1000	1000	985	980	98	98	70-130	0	20	
Iron	ug/L	286	10000	10000	10200	10100	99	98	70-130	1	20	
Lead	ug/L	<3.4	1000	1000	981	979	98	98	70-130	0	20	
Lithium	ug/L	43.3	1000	1000	1070	1060	102	101	70-130	1	20	
Magnesium	ug/L	44200	10000	10000	55200	55100	110	108	70-130	0	20	
Manganese	ug/L	4600	1000	1000	5710	5680	112	108	70-130	1	20	
Molybdenum	ug/L	<2.6	1000	1000	935	932	94	93	70-130	0	20	
Potassium	ug/L	5510	10000	10000	15800	15700	103	102	70-130	1	20	
Sodium	ug/L	11200	10000	10000	21700	21700	105	104	70-130	0	20	

MATRIX SPIKE SAMPLE: 2398913

Parameter	Units	60301923002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	45.3	1000	986	94	70-130	
Beryllium	ug/L	ND	1000	952	95	70-130	
Boron	ug/L	ND	1000	1010	96	70-130	
Calcium	ug/L	26300	10000	34600	83	70-130	
Cobalt	ug/L	ND	1000	946	95	70-130	
Iron	ug/L	150	10000	9420	93	70-130	
Lead	ug/L	ND	1000	945	94	70-130	
Lithium	ug/L	ND	1000	972	97	70-130	
Magnesium	ug/L	7480	10000	16700	92	70-130	
Manganese	ug/L	13.1	1000	956	94	70-130	
Molybdenum	ug/L	ND	1000	893	89	70-130	
Potassium	ug/L	2990	10000	12600	96	70-130	
Sodium	ug/L	54000	10000	60800	68	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585455 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301548001, 60301548006, 60301548007, 60301548008, 60301548009, 60301548012, 60301548013

METHOD BLANK: 2402489 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/20/19 17:27	
Beryllium	ug/L	<0.25	1.0	0.25	05/20/19 17:27	
Boron	ug/L	<10.7	100	10.7	05/20/19 17:27	
Calcium	ug/L	<50.0	200	50.0	05/20/19 17:27	
Cobalt	ug/L	<0.84	5.0	0.84	05/20/19 17:27	
Iron	ug/L	<14.0	50.0	14.0	05/20/19 17:27	
Lead	ug/L	<3.4	10.0	3.4	05/20/19 17:27	
Lithium	ug/L	<5.9	10.0	5.9	05/20/19 17:27	
Magnesium	ug/L	<13.0	50.0	13.0	05/20/19 17:27	
Molybdenum	ug/L	<2.6	20.0	2.6	05/20/19 17:27	
Potassium	ug/L	<79.0	500	79.0	05/20/19 17:27	
Sodium	ug/L	185J	500	144	05/20/19 17:27	

LABORATORY CONTROL SAMPLE: 2402490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	934	93	85-115	
Beryllium	ug/L	1000	957	96	85-115	
Boron	ug/L	1000	939	94	85-115	
Calcium	ug/L	10000	9930	99	85-115	
Cobalt	ug/L	1000	1030	103	85-115	
Iron	ug/L	10000	9750	98	85-115	
Lead	ug/L	1000	1000	100	85-115	
Lithium	ug/L	1000	978	98	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	975	97	85-115	
Molybdenum	ug/L	1000	979	98	85-115	
Potassium	ug/L	10000	9480	95	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2402491 2402492

Parameter	Units	60301548001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	421	1000	1000	1360	1350	94	93	70-130	1	20	
Beryllium	ug/L	<0.25	1000	1000	972	964	97	96	70-130	1	20	
Boron	ug/L	555	1000	1000	1520	1510	96	96	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2402491 2402492

Parameter	Units	60301548001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	127000	10000	10000	137000	136000	98	90	70-130	1	20	
Cobalt	ug/L	<0.84	1000	1000	1020	1010	102	101	70-130	0	20	
Iron	ug/L	12300	10000	10000	22000	21800	98	96	70-130	1	20	
Lead	ug/L	<3.4	1000	1000	985	985	98	98	70-130	0	20	
Lithium	ug/L	24.8	1000	1000	1040	1030	101	101	70-130	1	20	
Magnesium	ug/L	34300	10000	10000	44500	44400	102	101	70-130	0	20	
Manganese	ug/L	314	1000	1000	1280	1270	96	96	70-130	1	20	
Molybdenum	ug/L	<2.6	1000	1000	997	996	99	99	70-130	0	20	
Potassium	ug/L	6160	10000	10000	16000	16000	99	99	70-130	0	20	
Sodium	ug/L	25000	10000	10000	35100	35000	102	101	70-130	0	20	

MATRIX SPIKE SAMPLE: 2402493

Parameter	Units	60301548010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	353		1270			
Beryllium	ug/L	<0.25		975			
Boron	ug/L	81.8J		1050			
Calcium	ug/L	137000		144000			
Cobalt	ug/L	<0.84		1020			
Iron	ug/L	7740		17200			
Lead	ug/L	<3.4		992			
Lithium	ug/L	40.6		1060			
Magnesium	ug/L	28500		39300			
Manganese	ug/L	287		1270			
Molybdenum	ug/L	<2.6		1000			
Potassium	ug/L	4080		13600			
Sodium	ug/L	6520		16800			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585940 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301548002, 60301548003, 60301548004, 60301548005, 60301548010, 60301548011

METHOD BLANK: 2404182 Matrix: Water
Associated Lab Samples: 60301548002, 60301548003, 60301548004, 60301548005, 60301548010, 60301548011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/22/19 11:10	
Beryllium	ug/L	<0.25	1.0	0.25	05/22/19 11:10	
Boron	ug/L	<10.7	100	10.7	05/22/19 11:10	
Calcium	ug/L	<50.0	200	50.0	05/22/19 11:10	
Cobalt	ug/L	<0.84	5.0	0.84	05/22/19 11:10	
Iron	ug/L	<14.0	50.0	14.0	05/22/19 11:10	
Lead	ug/L	<3.4	10.0	3.4	05/22/19 11:10	
Lithium	ug/L	<5.9	10.0	5.9	05/22/19 11:10	
Magnesium	ug/L	<13.0	50.0	13.0	05/22/19 11:10	
Manganese	ug/L	<2.1	5.0	2.1	05/22/19 11:10	
Molybdenum	ug/L	<2.6	20.0	2.6	05/22/19 11:10	
Potassium	ug/L	<79.0	500	79.0	05/22/19 11:10	
Sodium	ug/L	<144	500	144	05/22/19 11:10	

LABORATORY CONTROL SAMPLE: 2404183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Beryllium	ug/L	1000	1010	101	85-115	
Boron	ug/L	1000	983	98	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Cobalt	ug/L	1000	1040	104	85-115	
Iron	ug/L	10000	10100	101	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	999	100	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Molybdenum	ug/L	1000	948	95	85-115	
Potassium	ug/L	10000	9960	100	85-115	
Sodium	ug/L	10000	9970	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2404184 2404185

Parameter	Units	60302669001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	130	1000	1000	1130	1120	100	99	70-130	1	20	
Beryllium	ug/L	ND	1000	1000	979	957	98	96	70-130	2	20	
Boron	ug/L	363	1000	1000	1350	1340	99	98	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2404184 2404185

Parameter	Units	60302669001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	933000	10000	10000	920000	923000	-127	-92	70-130	0	20	M1
Cobalt	ug/L	ND	1000	1000	909	898	91	90	70-130	1	20	
Iron	ug/L	ND	10000	10000	9590	9390	96	94	70-130	2	20	
Lead	ug/L	ND	1000	1000	882	871	88	87	70-130	1	20	
Lithium	ug/L	321	1000	1000	1400	1390	108	107	70-130	1	20	
Magnesium	ug/L	568000	10000	10000	556000	558000	-116	-97	70-130	0	20	M1
Manganese	ug/L	ND	1000	1000	928	911	93	91	70-130	2	20	
Molybdenum	ug/L	ND	1000	1000	922	911	91	90	70-130	1	20	
Potassium	ug/L	55900	10000	10000	66300	66700	104	108	70-130	1	20	
Sodium	ug/L	1170000	10000	10000	1150000	1160000	-240	-145	70-130	1	20	M1

MATRIX SPIKE SAMPLE: 2404186

Parameter	Units	60301548003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	68.1	1000	1110	104	70-130	
Beryllium	ug/L	<0.25	1000	1010	101	70-130	
Boron	ug/L	9590	1000	1180	-841	70-130	M1
Calcium	ug/L	84000	10000	98600	146	70-130	M1
Cobalt	ug/L	<0.84	1000	998	100	70-130	
Iron	ug/L	114	10000	10100	100	70-130	
Lead	ug/L	<3.4	1000	976	97	70-130	
Lithium	ug/L	18.0	1000	1040	102	70-130	
Magnesium	ug/L	5040	10000	25300	202	70-130	M1
Manganese	ug/L	124	1000	1060	93	70-130	
Molybdenum	ug/L	202	1000	945	74	70-130	
Potassium	ug/L	9480	10000	20600	111	70-130	
Sodium	ug/L	64000	10000	168000	1040	70-130	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 584464 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2398379 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	05/15/19 13:18	
Arsenic	ug/L	<0.065	1.0	0.065	05/15/19 13:18	
Cadmium	ug/L	<0.033	0.50	0.033	05/15/19 13:18	
Chromium	ug/L	<0.078	1.0	0.078	05/15/19 13:18	
Selenium	ug/L	<0.085	1.0	0.085	05/15/19 13:18	
Thallium	ug/L	<0.099	1.0	0.099	05/15/19 13:18	

LABORATORY CONTROL SAMPLE: 2398380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	98	85-115	
Arsenic	ug/L	40	39.7	99	85-115	
Cadmium	ug/L	40	40.0	100	85-115	
Chromium	ug/L	40	41.0	103	85-115	
Selenium	ug/L	40	40.2	100	85-115	
Thallium	ug/L	40	37.4	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398381 2398382

Parameter	Units	60301568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.078	40	40	39.1	39.6	98	99	70-130	1	20	
Arsenic	ug/L	19.0	40	40	59.6	60.2	101	103	70-130	1	20	
Cadmium	ug/L	0.081J	40	40	37.5	37.9	94	95	70-130	1	20	
Chromium	ug/L	<0.078	40	40	47.0	47.3	117	118	70-130	1	20	
Selenium	ug/L	0.10J	40	40	39.1	39.2	98	98	70-130	0	20	
Thallium	ug/L	<0.099	40	40	40.0	40.1	100	100	70-130	0	20	

MATRIX SPIKE SAMPLE: 2398383

Parameter	Units	60301622003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	ND	40	39.9	99	70-130	
Arsenic	ug/L	1.2	40	41.3	100	70-130	
Cadmium	ug/L	ND	40	38.9	97	70-130	
Chromium	ug/L	ND	40	42.3	105	70-130	
Selenium	ug/L	ND	40	39.9	99	70-130	
Thallium	ug/L	ND	40	38.7	97	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585530 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

METHOD BLANK: 2402827 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	05/22/19 11:37	
Arsenic	ug/L	<0.065	1.0	0.065	05/22/19 11:37	
Cadmium	ug/L	<0.033	0.50	0.033	05/22/19 11:37	
Chromium	ug/L	0.12J	1.0	0.078	05/22/19 11:37	
Selenium	ug/L	<0.085	1.0	0.085	05/22/19 11:37	
Thallium	ug/L	<0.099	1.0	0.099	05/22/19 11:37	

LABORATORY CONTROL SAMPLE: 2402828

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.0	98	85-115	
Arsenic	ug/L	40	36.8	92	85-115	
Cadmium	ug/L	40	38.6	97	85-115	
Chromium	ug/L	40	39.3	98	85-115	
Selenium	ug/L	40	37.6	94	85-115	
Thallium	ug/L	40	36.8	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2402829 2402830

Parameter	Units	60301548001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.082J	40	40	39.3	39.1	98	98	70-130	1	20	
Arsenic	ug/L	34.7	40	40	71.3	70.1	92	89	70-130	2	20	
Cadmium	ug/L	<0.033	40	40	37.9	37.5	95	94	70-130	1	20	
Chromium	ug/L	0.19J	40	40	38.6	38.1	96	95	70-130	1	20	
Selenium	ug/L	0.11J	40	40	35.8	35.1	89	87	70-130	2	20	
Thallium	ug/L	<0.099	40	40	34.9	35.0	87	87	70-130	0	20	

MATRIX SPIKE SAMPLE: 2402831

Parameter	Units	60302236001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	ND	40	37.5	93	70-130	
Arsenic	ug/L	4.6	40	37.4	82	70-130	
Cadmium	ug/L	ND	40	37.4	93	70-130	
Chromium	ug/L	4.1	40	41.1	93	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

MATRIX SPIKE SAMPLE: 2402831

Parameter	Units	60302236001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	7.6	40	39.0	79	70-130	
Thallium	ug/L	ND	40	34.3	86	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 583511 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60301548001, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007

METHOD BLANK: 2394346 Matrix: Water
Associated Lab Samples: 60301548001, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/09/19 09:43	

LABORATORY CONTROL SAMPLE: 2394347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	512	102	90-110	

SAMPLE DUPLICATE: 2394348

Parameter	Units	60301846004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	258	264	3	10	

SAMPLE DUPLICATE: 2394349

Parameter	Units	60301548001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	510	516	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 584102 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60301548002, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

METHOD BLANK: 2397396 Matrix: Water
Associated Lab Samples: 60301548002, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/13/19 12:18	

LABORATORY CONTROL SAMPLE: 2397397

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	497	99	90-110	

SAMPLE DUPLICATE: 2397398

Parameter	Units	60301568001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	427	429	0	10	

SAMPLE DUPLICATE: 2397399

Parameter	Units	60301568005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	392	402	3	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 584515 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2398572 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/16/19 10:35	

LABORATORY CONTROL SAMPLE: 2398573

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	519	104	90-110	

SAMPLE DUPLICATE: 2398574

Parameter	Units	60301804001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	543	549	1	10	

SAMPLE DUPLICATE: 2398575

Parameter	Units	60302254001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	611	617	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 582881 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012

METHOD BLANK: 2392180 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/07/19 09:57	

LABORATORY CONTROL SAMPLE: 2392181

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

SAMPLE DUPLICATE: 2392182

Parameter	Units	60301548001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	559	550	2	10	

SAMPLE DUPLICATE: 2392183

Parameter	Units	60301568002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	395	397	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 583021 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60301548013

METHOD BLANK: 2392610 Matrix: Water
Associated Lab Samples: 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/07/19 11:29	

LABORATORY CONTROL SAMPLE: 2392611

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

SAMPLE DUPLICATE: 2392612

Parameter	Units	60301568001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1130	1120	1	10	

SAMPLE DUPLICATE: 2392613

Parameter	Units	60301618006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2610	2660	2	10	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 583514 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2394354 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/09/19 13:57	

LABORATORY CONTROL SAMPLE: 2394355

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

SAMPLE DUPLICATE: 2394356

Parameter	Units	60301670001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	314	308	2	10	

SAMPLE DUPLICATE: 2394357

Parameter	Units	60301786007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4230	4720	11	10	D6

SAMPLE DUPLICATE: 2394358

Parameter	Units	60301804001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	664	670	1	10	

SAMPLE DUPLICATE: 2394359

Parameter	Units	60301827001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2220	2260	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585101 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2400812 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.46J	1.0	0.22	05/16/19 18:31	
Fluoride	mg/L	<0.085	0.20	0.085	05/16/19 18:31	

LABORATORY CONTROL SAMPLE: 2400813

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400814 2400815

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.7	5	5	8.4	8.4	94	95	80-120	0	15	
Fluoride	mg/L	0.24	2.5	2.5	2.5	2.6	92	93	80-120	1	15	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585251 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 2401454 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.23	1.0	0.23	05/17/19 15:27	

LABORATORY CONTROL SAMPLE: 2401455

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401456 2401457

Parameter	Units	60301805001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	422	250	250	682	693	104	109	80-120	2	15	

MATRIX SPIKE SAMPLE: 2401458

Parameter	Units	60302344001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	657	250	949	117	80-120	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 585937 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

METHOD BLANK: 2404160 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	05/21/19 15:16	
Fluoride	mg/L	<0.085	0.20	0.085	05/21/19 15:16	
Sulfate	mg/L	<0.23	1.0	0.23	05/21/19 15:16	

LABORATORY CONTROL SAMPLE: 2404161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2404162 2404163

Parameter	Units	60301548001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	12.6	5	5	17.2	17.1	92	91	80-120	0	15	
Fluoride	mg/L	0.18J	2.5	2.5	3.0	3.0	115	114	80-120	1	15	
Sulfate	mg/L	7.3	5	5	12.6	12.5	106	104	80-120	1	15	

MATRIX SPIKE SAMPLE: 2404164

Parameter	Units	60301548010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10.4	5	14.7	85	80-120	
Fluoride	mg/L	0.17J	2.5	2.9	109	80-120	
Sulfate	mg/L	34.5	25	60.4	104	80-120	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 586198 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60301548003, 60301548011

METHOD BLANK: 2405133 Matrix: Water
Associated Lab Samples: 60301548003, 60301548011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	05/22/19 12:16	
Sulfate	mg/L	<0.23	1.0	0.23	05/22/19 12:16	

LABORATORY CONTROL SAMPLE: 2405134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405135 2405136

Parameter	Units	60301548003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.8	10	10	28.6	28.5	98	97	80-120	0	15	

MATRIX SPIKE SAMPLE: 2405137

Parameter	Units	60302408005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	65.1	250	311	98	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-1D **Lab ID: 60301548001** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.463 ± 0.339 (0.379) C:NA T:94%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**1.41 ± 0.510 (0.764) C:77% T:86%**	pCi/L	05/16/19 14:18	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-2D **Lab ID: 60301548002** Collected: 05/01/19 12:10 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.02 ± 0.622 (0.764) C:NA T:81%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**0.573 ± 0.404 (0.784) C:80% T:80%**	pCi/L	05/16/19 14:18	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-3D **Lab ID: 60301548003** Collected: 04/30/19 16:50 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.563 ± 0.447 (0.581) C:NA T:80%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**-0.0517 ± 0.324 (0.762) C:81% T:82%**	pCi/L	05/16/19 14:18	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-4D **Lab ID: 60301548004** Collected: 04/30/19 15:05 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.787 ± 0.551 (0.727) C:NA T:82%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**0.799 ± 0.531 (1.04) C:79% T:75%**	pCi/L	05/16/19 14:18	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-5D **Lab ID: 60301548005** Collected: 04/30/19 12:00 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.226 ± 0.314 (0.525) C:NA T:90%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**0.373 ± 0.368 (0.758) C:83% T:79%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-6D **Lab ID: 60301548006** Collected: 04/30/19 10:35 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.440 ± 0.434 (0.661) C:NA T:89%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**0.430 ± 0.382 (0.776) C:81% T:74%**	pCi/L	05/16/19 14:19	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-8D **Lab ID: 60301548007** Collected: 04/30/19 11:25 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.02 ± 0.580 (0.705) C:NA T:89%**	pCi/L	05/23/19 12:16	13982-63-3	
Radium-228	EPA 904.0	**1.67 ± 0.558 (0.779) C:76% T:84%**	pCi/L	05/16/19 14:19	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-9D **Lab ID: 60301548008** Collected: 04/30/19 16:20 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.410 ± 0.351 (0.476) C:NA T:98%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**0.554 ± 0.362 (0.691) C:79% T:87%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-BMW-1D **Lab ID: 60301548009** Collected: 05/01/19 12:20 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.65 ± 0.648 (0.495) C:NA T:95%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**1.73 ± 0.602 (0.864) C:83% T:67%**	pCi/L	05/20/19 13:05	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-BMW-2D **Lab ID: 60301548010** Collected: 05/01/19 10:15 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.446 ± 0.350 (0.411) C:NA T:94%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**0.469 ± 0.374 (0.749) C:79% T:88%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-DUP-1 **Lab ID: 60301548011** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.418 ± 0.355 (0.440) C:NA T:82%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**0.252 ± 0.362 (0.779) C:74% T:79%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-FB-1 **Lab ID: 60301548012** Collected: 04/30/19 16:45 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.701 ± 0.493 (0.629) C:NA T:93%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**0.189 ± 0.434 (0.960) C:80% T:74%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-FB-2 **Lab ID: 60301548013** Collected: 05/01/19 11:57 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.513 ± 0.453 (0.672) C:NA T:96%**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**-0.133 ± 0.365 (0.876) C:80% T:71%**	pCi/L	05/16/19 14:19	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-1D MS **Lab ID: 60301548014** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**93.87 %REC ± NA (NA) C:NA T:NA**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**121.50 %REC ± NA (NA) C:NA T:NA**	pCi/L	05/16/19 14:20	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-1D MSD **Lab ID: 60301548015** Collected: 04/30/19 09:30 Received: 05/02/19 04:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**107.89 %REC 13.90 RPD ± NA (NA) C:NA T:NA**	pCi/L	05/23/19 12:29	13982-63-3	
Radium-228	EPA 904.0	**119.20 %REC 1.91 RPD ± NA (NA) C:NA T:NA**	pCi/L	05/16/19 14:20	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-7D **Lab ID: 60301805001** Collected: 05/02/19 09:55 Received: 05/04/19 04:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.582 ± 0.527 (0.777) C:NA T:83%**	pCi/L	05/23/19 11:46	13982-63-3	
Radium-228	EPA 904.0	**0.434 ± 0.420 (0.864) C:75% T:81%**	pCi/L	05/17/19 12:28	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Sample: L-UMW-DUP-2 **Lab ID: 60301805002** Collected: 05/02/19 09:55 Received: 05/04/19 04:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.299 ± 0.312 (0.440) C:NA T:85%**	pCi/L	05/23/19 11:46	13982-63-3	
Radium-228	EPA 904.0	**0.635 ± 0.403 (0.755) C:79% T:80%**	pCi/L	05/17/19 12:28	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 341988 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 1664626 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.345 ± 0.393 (0.825) C:83% T:75%	pCi/L	05/17/19 12:26	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 341975 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013, 60301548014, 60301548015

METHOD BLANK: 1664594 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013, 60301548014, 60301548015

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.338 ± 0.334 (0.508) C:NA T:87%	pCi/L	05/23/19 12:16	

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 341976 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013, 60301548014, 60301548015

METHOD BLANK: 1664595 Matrix: Water
Associated Lab Samples: 60301548001, 60301548002, 60301548003, 60301548004, 60301548005, 60301548006, 60301548007, 60301548008, 60301548009, 60301548010, 60301548011, 60301548012, 60301548013, 60301548014, 60301548015

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0902 ± 0.366 (0.828) C:82% T:70%	pCi/L	05/16/19 14:18	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

QC Batch: 341987 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60301805001, 60301805002

METHOD BLANK: 1664625 Matrix: Water
Associated Lab Samples: 60301805001, 60301805002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.397 ± 0.433 (0.681) C:NA T:72%	pCi/L	05/23/19 11:03	

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 LABADIE ENERGY CTR #1
Pace Project No.: 60301548

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301548001	**L-UMW-1D**	EPA 200.7	585455	EPA 200.7	585478
60301548002	**L-UMW-2D**	EPA 200.7	585940	EPA 200.7	585970
60301548003	**L-UMW-3D**	EPA 200.7	585940	EPA 200.7	585970
60301548004	**L-UMW-4D**	EPA 200.7	585940	EPA 200.7	585970
60301548005	**L-UMW-5D**	EPA 200.7	585940	EPA 200.7	585970
60301548006	**L-UMW-6D**	EPA 200.7	585455	EPA 200.7	585478
60301548007	**L-UMW-8D**	EPA 200.7	585455	EPA 200.7	585478
60301548008	**L-UMW-9D**	EPA 200.7	585455	EPA 200.7	585478
60301548009	**L-BMW-1D**	EPA 200.7	585455	EPA 200.7	585478
60301548010	**L-BMW-2D**	EPA 200.7	585940	EPA 200.7	585970
60301548011	**L-UMW-DUP-1**	EPA 200.7	585940	EPA 200.7	585970
60301548012	**L-UMW-FB-1**	EPA 200.7	585455	EPA 200.7	585478
60301548013	**L-UMW-FB-2**	EPA 200.7	585455	EPA 200.7	585478
60301805001	**L-UMW-7D**	EPA 200.7	584623	EPA 200.7	584665
60301805002	**L-UMW-DUP-2**	EPA 200.7	584623	EPA 200.7	584665
60301548001	**L-UMW-1D**	EPA 200.8	585530	EPA 200.8	585558
60301548002	**L-UMW-2D**	EPA 200.8	585530	EPA 200.8	585558
60301548003	**L-UMW-3D**	EPA 200.8	585530	EPA 200.8	585558
60301548004	**L-UMW-4D**	EPA 200.8	585530	EPA 200.8	585558
60301548005	**L-UMW-5D**	EPA 200.8	585530	EPA 200.8	585558
60301548006	**L-UMW-6D**	EPA 200.8	585530	EPA 200.8	585558
60301548007	**L-UMW-8D**	EPA 200.8	585530	EPA 200.8	585558
60301548008	**L-UMW-9D**	EPA 200.8	585530	EPA 200.8	585558
60301548009	**L-BMW-1D**	EPA 200.8	585530	EPA 200.8	585558
60301548010	**L-BMW-2D**	EPA 200.8	585530	EPA 200.8	585558
60301548011	**L-UMW-DUP-1**	EPA 200.8	585530	EPA 200.8	585558
60301548012	**L-UMW-FB-1**	EPA 200.8	585530	EPA 200.8	585558
60301548013	**L-UMW-FB-2**	EPA 200.8	585530	EPA 200.8	585558
60301805001	**L-UMW-7D**	EPA 200.8	584464	EPA 200.8	584518
60301805002	**L-UMW-DUP-2**	EPA 200.8	584464	EPA 200.8	584518
60301548001	**L-UMW-1D**	EPA 7470	586038	EPA 7470	586191
60301548002	**L-UMW-2D**	EPA 7470	586038	EPA 7470	586191
60301548003	**L-UMW-3D**	EPA 7470	586038	EPA 7470	586191
60301548004	**L-UMW-4D**	EPA 7470	586038	EPA 7470	586191
60301548005	**L-UMW-5D**	EPA 7470	586038	EPA 7470	586191
60301548006	**L-UMW-6D**	EPA 7470	586038	EPA 7470	586191
60301548007	**L-UMW-8D**	EPA 7470	586038	EPA 7470	586191
60301548008	**L-UMW-9D**	EPA 7470	586038	EPA 7470	586191
60301548009	**L-BMW-1D**	EPA 7470	586038	EPA 7470	586191
60301548010	**L-BMW-2D**	EPA 7470	586038	EPA 7470	586191
60301548011	**L-UMW-DUP-1**	EPA 7470	586038	EPA 7470	586191
60301548012	**L-UMW-FB-1**	EPA 7470	586038	EPA 7470	586191
60301548013	**L-UMW-FB-2**	EPA 7470	586038	EPA 7470	586191
60301805001	**L-UMW-7D**	EPA 7470	585045	EPA 7470	585233

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301805002	L-UMW-DUP-2	EPA 7470	585045	EPA 7470	585233
60301548001	L-UMW-1D	EPA 903.1	341975		
60301548002	L-UMW-2D	EPA 903.1	341975		
60301548003	L-UMW-3D	EPA 903.1	341975		
60301548004	L-UMW-4D	EPA 903.1	341975		
60301548005	L-UMW-5D	EPA 903.1	341975		
60301548006	L-UMW-6D	EPA 903.1	341975		
60301548007	L-UMW-8D	EPA 903.1	341975		
60301548008	L-UMW-9D	EPA 903.1	341975		
60301548009	L-BMW-1D	EPA 903.1	341975		
60301548010	L-BMW-2D	EPA 903.1	341975		
60301548011	L-UMW-DUP-1	EPA 903.1	341975		
60301548012	L-UMW-FB-1	EPA 903.1	341975		
60301548013	L-UMW-FB-2	EPA 903.1	341975		
60301548014	L-UMW-1D MS	EPA 903.1	341975		
60301548015	L-UMW-1D MSD	EPA 903.1	341975		
60301805001	L-UMW-7D	EPA 903.1	341987		
60301805002	L-UMW-DUP-2	EPA 903.1	341987		
60301548001	L-UMW-1D	EPA 904.0	341976		
60301548002	L-UMW-2D	EPA 904.0	341976		
60301548003	L-UMW-3D	EPA 904.0	341976		
60301548004	L-UMW-4D	EPA 904.0	341976		
60301548005	L-UMW-5D	EPA 904.0	341976		
60301548006	L-UMW-6D	EPA 904.0	341976		
60301548007	L-UMW-8D	EPA 904.0	341976		
60301548008	L-UMW-9D	EPA 904.0	341976		
60301548009	L-BMW-1D	EPA 904.0	341976		
60301548010	L-BMW-2D	EPA 904.0	341976		
60301548011	L-UMW-DUP-1	EPA 904.0	341976		
60301548012	L-UMW-FB-1	EPA 904.0	341976		
60301548013	L-UMW-FB-2	EPA 904.0	341976		
60301548014	L-UMW-1D MS	EPA 904.0	341976		
60301548015	L-UMW-1D MSD	EPA 904.0	341976		
60301805001	L-UMW-7D	EPA 904.0	341988		
60301805002	L-UMW-DUP-2	EPA 904.0	341988		
60301548001	L-UMW-1D	SM 2320B	583511		
60301548002	L-UMW-2D	SM 2320B	584102		
60301548003	L-UMW-3D	SM 2320B	583511		
60301548004	L-UMW-4D	SM 2320B	583511		
60301548005	L-UMW-5D	SM 2320B	583511		
60301548006	L-UMW-6D	SM 2320B	583511		
60301548007	L-UMW-8D	SM 2320B	583511		
60301548008	L-UMW-9D	SM 2320B	584102		
60301548009	L-BMW-1D	SM 2320B	584102		
60301548010	L-BMW-2D	SM 2320B	584102		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR #1
Pace Project No.: 60301548

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301548011	**L-UMW-DUP-1**	SM 2320B	584102		
60301548012	**L-UMW-FB-1**	SM 2320B	584102		
60301548013	**L-UMW-FB-2**	SM 2320B	584102		
60301805001	**L-UMW-7D**	SM 2320B	584515		
60301805002	**L-UMW-DUP-2**	SM 2320B	584515		
60301548001	**L-UMW-1D**	SM 2540C	582881		
60301548002	**L-UMW-2D**	SM 2540C	582881		
60301548003	**L-UMW-3D**	SM 2540C	582881		
60301548004	**L-UMW-4D**	SM 2540C	582881		
60301548005	**L-UMW-5D**	SM 2540C	582881		
60301548006	**L-UMW-6D**	SM 2540C	582881		
60301548007	**L-UMW-8D**	SM 2540C	582881		
60301548008	**L-UMW-9D**	SM 2540C	582881		
60301548009	**L-BMW-1D**	SM 2540C	582881		
60301548010	**L-BMW-2D**	SM 2540C	582881		
60301548011	**L-UMW-DUP-1**	SM 2540C	582881		
60301548012	**L-UMW-FB-1**	SM 2540C	582881		
60301548013	**L-UMW-FB-2**	SM 2540C	583021		
60301805001	**L-UMW-7D**	SM 2540C	583514		
60301805002	**L-UMW-DUP-2**	SM 2540C	583514		
60301548001	**L-UMW-1D**	EPA 300.0	585937		
60301548002	**L-UMW-2D**	EPA 300.0	585937		
60301548003	**L-UMW-3D**	EPA 300.0	585937		
60301548003	**L-UMW-3D**	EPA 300.0	586198		
60301548004	**L-UMW-4D**	EPA 300.0	585937		
60301548005	**L-UMW-5D**	EPA 300.0	585937		
60301548006	**L-UMW-6D**	EPA 300.0	585937		
60301548007	**L-UMW-8D**	EPA 300.0	585937		
60301548008	**L-UMW-9D**	EPA 300.0	585937		
60301548009	**L-BMW-1D**	EPA 300.0	585937		
60301548010	**L-BMW-2D**	EPA 300.0	585937		
60301548011	**L-UMW-DUP-1**	EPA 300.0	585937		
60301548011	**L-UMW-DUP-1**	EPA 300.0	586198		
60301548012	**L-UMW-FB-1**	EPA 300.0	585937		
60301548013	**L-UMW-FB-2**	EPA 300.0	585937		
60301805001	**L-UMW-7D**	EPA 300.0	585101		
60301805001	**L-UMW-7D**	EPA 300.0	585251		
60301805002	**L-UMW-DUP-2**	EPA 300.0	585101		
60301805002	**L-UMW-DUP-2**	EPA 300.0	585251		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60301548

60301548

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): As-read 2.1, 3.4 2.8 Corr. Factor -1.0 Corrected 1.1, 2.4 1.8

Date and initials of person examining contents: 5/2/19 DF

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	Sample 2-BMW-ID is labeled as 2-BMW-18.
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: Sft	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church 5/4/19 Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical
www.pacelabs.com

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey.ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-01.0001A (COC #1)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER

Site Location STATE: MO

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

ITEM #	Section D Required Client Information / SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G			4/30/19	0930		15	6		9						N	X	X	X	X	X		X	X		60301548 001
2	L-UMW-2D	WT	G			5/1/19	1210		5	2		3						N	X	X	X	X	X		X	X		002
3	L-UMW-3D	WT	G			4/30/19	1650		5	2		3						N	X	X	X	X	X		X	X		003
4	L-UMW-4D	WT	G				1505		5	2		3						N	X	X	X	X	X		X	X		004
5	L-UMW-5D	WT	G				1200		5	2		3						N	X	X	X	X	X		X	X		005
6	L-UMW-6D	WT	G				1035		5	2		3						N	X	X	X	X	X		X	X		006
7	L-UMW-7D	WT	G			[redacted]																						
8	L-UMW-8D	WT	G			4/30/19	1125		5	2		3						N	X	X	X	X	X		X	X		007
9	L-UMW-9D	WT	G				1620		5	2		3						N	X	X	X	X	X		X	X		008
10	L-BMW-1D	WT	G			5/1/19	1220		5	2		3						N	X	X	X	X	X		X	X		009
11	L-BMW-2D	WT	G			5/1/19	1015		5	2		3						N	X	X	X	X	X		X	X		010
12	L-UMW-DUP-1	WT	G			4/30/19	—		5	2		3						N	X	X	X	X	X		X	X		011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	[signature]	5/1/19	1800	[signature]	5/2/19	0813	2.1 3.4 2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/1/19

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001A (COC #1)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference	
Pace Project Manager	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Radium 226	Radium 228					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N						GW 301548
1	L-UMW-DUP-2	WT	G																											
2	L-UMW-FB-1	WT	G			4/30/19	1645		5	2		3							X	X	X	X	X		X	X					012
3	L-UMW-FB-2	WT	G			5/1/19	1157		5	2		3				↓			X	X	X	X	X		X	X					013
4		WT	G																											
5		WT	G																											
6		WT	G																											
7		WT	G																											
8		WT	G																											
9		WT	G																											
10		WT	G																											
11		WT	G																											
12		WT	G																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Golder	5/1/19	1600		5/2/19	0823	2.1 3.2 2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 5/1/19

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

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Sample Condition Upon Receipt

WO#: 60301805

60301805

Client Name: Golder

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

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

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

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

Thermometer Used: T-294 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.8 Corr. Factor -1.0 Corrected 0.8

Date and initials of person examining contents: 5/4/19

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 2

Section A Required Client Information:

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Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001A (COC #1)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER (circled) | DRINKING WATER
UST | RCRA | OTHER ______

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

Requested Analysis Filtered (Y/N): Metals* N, Mercury N, Chloride/Fluoride/Sulfate N, TDS N, Alkalinity N, Total Phosphorus N, Radium 226 N, Radium 228 N

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G																								
2	L-UMW-2D	WT	G																								
3	L-UMW-3D	WT	G																								
4	L-UMW-4D	WT	G																								
5	L-UMW-5D	WT	G																								
6	L-UMW-6D	WT	G																								
7	L-UMW-7D	WT	G			5/2/19	0955		5	2		3						X	X	X	X	X		X	X		3P [illegible] (2), [illegible]
8	L-UMW-8D	WT	G																								
9	L-UMW-9D	WT	G																								
10	L-BMW-1D	WT	G																								
11	L-BMW-2D	WT	G																								
12	L-UMW-DUP-1	WT	G																								

Pace Project No./Lab I.D.: 60301805

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	[signature] / Golder	5/3/19	1025	[signature] / PACE	5/3/19	1025				
	[signature] / PACE	5/3/19	1700	[signature]	5/4/19	0935	1.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 05/03/19

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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Phone: 636-724-9191	Fax: 636-724-9323
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Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001A (COC #1)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Radium 226	Radium 228					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N					
1	L-UMW-DUP-2	WT	G			5/2/19	—		5	2		3							X	X	X	X	X		X	X					60301805
2	L-UMW-FB-1	WT	G																												
3	L-UMW-FB-2	WT	G																												
4		WT	G																												
5		WT	G																												
6		WT	G																												
7		WT	G																												
8		WT	G																												
9		WT	G																												
10		WT	G																												
11		WT	G																												
12		WT	G																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Golder	5/3/19	1025	PACE	5/3/19	1025				
	PACE	5/3/19	1700		5/3/19	0735	2.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 05/03/19

MEMORANDUM

DATE 8/15/2019 **Project No.** 1531406-01

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – LABADIE ENERGY CENTER – ASSESSMENT MONITORING - DATA PACKAGE 60301548

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

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

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Amesen - Labadie
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 15314601
Validation Date: 8/15/19

Laboratory: Pace Analytical - KS/PA
SDG #: 60301548
Analytical Method (type and no.): EPA 200.7 & 200.8 {Metals}, 7470 {Hg}, 2320B {Alk}, 2540C {TDS}, 300.0 {Anions}, 905.1 + 904.0 {Rads}
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____
Sample Names L-UMW-1D, L-UMW-2D, L-UMW-3D, L-UMW-4D, L-UMW-5D, L-UMW-6D, L-UMW-7D, L-UMW-8D, L-UMW-9D, L-BMW-1D, L-BMW-2D, L-UMW-DUP-1, L-UMW-DUP-2, L-UMW-FB-1, L-UMW-FB-2, L-UMW-MSD, L-UMW-MS

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☑	☐	☐	4/30 - 5/2/19
b) Sampling team indicated?	☑	☐	☐	
c) Sample location noted?	☑	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☑	
e) Sample type indicated (grab/composite)?	☑	☐	☐	
f) Field QC noted?	☑	☐	☐	
g) Field parameters collected (note types)?	☑	☐	☐	pH, DO, Turb, Cond, ORP
h) Field Calibration within control limits?	☑	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☑	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☑	

Note Deficiencies: _____

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☑	☐	☐	
b) Were hold times met for sample analysis?	☑	☐	☐	
c) Were the correct preservatives used?	☑	☐	☐	
d) Was the correct method used?	☑	☐	☐	
e) Were appropriate reporting limits achieved?	☑	☐	☐	
f) Were any sample dilutions noted?	☑	☑ (2)	☐	See Notes
g) Were any matrix problems noted?	☐	☑	☐	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☑	☐	☐	DUP-1 @ L-UMW-5D; FB-1 @ L-UMW-3D DUP-2 @ L-UMW-7D; FB-2 @ L-UMW-2D
b) Were field dup. precision criteria met (note RPD)?	☐	☑	☐	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	☑	☐	☐	L-UMW-1D (Alk, TDS)
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	Max Lab DUP RPD: 2% (Limit 10%)

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☑	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☑	
b) Was MSD accuracy criteria met?	☑	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☑	
c) Were MS/MSD precision criteria met?	☑	☐	☐	MS/MSD @ L-UMW-1D

Comments/Notes:

MB

01,02: Mg (15.8)

01-13: Na (185)

01-13: Cr (0.12)

05001-02: Cl⁻ (0.46)

MS/MSD

3: B(-), Ca(+), Mg(+), Na(+)

DUPs

DUP-1: Pb(200), Mg(34), Mn(24), Cr(200), Alk(24)

DUP-2: Cr(94)

FB

FB-1: 226 (0.701 ± 0.493 [0.629])

FB-1: Ba(2.6), B(11.6), Ca(70.2), Cr(0.081), Cl⁻(0.25)

FB-2: Cr(0.11)

Dilutions: Chloride + Sulfate were diluted in several samples; no qualification is necessary

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-UMW-1D	Chromium (Cr)	1.0	U	Detected in Method Blank (MB); PQL > Result > MDL
2D	↓	↓	↓	↓
3D	↓	↓	↓	↓
4D	↓	↓	↓	↓
5D	↓	↓	↓	↓
6D	↓	↓	↓	↓
9D	↓	↓	↓	↓
L-BMW-1D	↓	↓	↓	↓
↓ 2D	↓	↓	↓	↓
L-UMW-3D	Boron (B)	9590	J	MS/MSD exceeded criteria
↓	Calcium (Ca)	84000	↓	↓
↓	Magnesium (Mg)	5040	↓	↓
↓	Sodium (Na)	64000	↓	↓
L-UMW-FB-1	Cr	1.0	U	Detected in MB; PQL > Result > MDL
L-UMW-FB-2	↓	↓	↓	↓

Signature: Tommy McGood Jr. Date: 8/15/2019

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

August 15, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory between May 02, 2019 and May 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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

SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60301568001	**L-LMW-1S**	Water	05/01/19 15:05	05/02/19 04:13
60301568002	**L-LMW-2S**	Water	04/30/19 15:25	05/02/19 04:13
60301568003	**L-LMW-5S**	Water	05/01/19 14:05	05/02/19 04:13
60301568004	**L-BMW-1S**	Water	05/01/19 11:35	05/02/19 04:13
60301568005	**L-BMW-2S**	Water	05/01/19 10:50	05/02/19 04:13
60301568006	**L-LMW-DUP-1**	Water	04/30/19 15:25	05/02/19 04:13
60301568007	**L-LMW-4S**	Water	05/01/19 16:00	05/02/19 04:13
60301803001	**L-LMW-3S**	Water	05/02/19 10:05	05/04/19 04:35
60301803002	**L-LMW-8S**	Water	05/02/19 14:05	05/04/19 04:35
60301803003	**L-LMW-FB-1**	Water	05/02/19 10:35	05/04/19 04:35
60302537001	**L-LMW-6S**	Water	05/08/19 12:35	05/10/19 03:45
60302537002	**L-LMW-7S**	Water	05/08/19 14:05	05/10/19 03:45

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60301568001	**L-LMW-1S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568002	**L-LMW-2S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568003	**L-LMW-5S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568004	**L-BMW-1S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568005	**L-BMW-2S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568006	**L-LMW-DUP-1**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568007	**L-LMW-4S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301803001	**L-LMW-3S**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301803002	**L-LMW-8S**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301803003	**L-LMW-FB-1**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60302537001	**L-LMW-6S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60302537002	**L-LMW-7S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-1S **Lab ID: 60301568001** Collected: 05/01/19 15:05 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**114**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:28	7440-39-3	
Lithium	**26.4**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:28	7439-93-2	
Molybdenum	**4.7J**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:28	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**19.0**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:24	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-2S **Lab ID: 60301568002** Collected: 04/30/19 15:25 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**33.1**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:50	7440-39-3	
Lithium	**10.6**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:50	7439-93-2	
Molybdenum	**112**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:50	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**41.1**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:32	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-5S **Lab ID: 60301568003** Collected: 05/01/19 14:05 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**291**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:52	7440-39-3	
Lithium	**9.6J**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:52	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:52	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.47J**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:34	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-BMW-1S **Lab ID: 60301568004** Collected: 05/01/19 11:35 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**288**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:54	7440-39-3	
Lithium	**17.6**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:54	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:54	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**35.1**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:44	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-BMW-2S **Lab ID: 60301568005** Collected: 05/01/19 10:50 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**266**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:57	7440-39-3	
Lithium	**20.2**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:57	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:57	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.52J**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:46	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-DUP-1 **Lab ID: 60301568006** Collected: 04/30/19 15:25 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**33.9**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:59	7440-39-3	
Lithium	**9.7J**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:59	7439-93-2	
Molybdenum	**111**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:59	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**41.3**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:48	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-4S **Lab ID: 60301568007** Collected: 05/01/19 16:00 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**116**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 13:01	7440-39-3	
Lithium	**35.8**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 13:01	7439-93-2	
Molybdenum	**151**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 13:01	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**21.0**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:50	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-3S **Lab ID: 60301803001** Collected: 05/02/19 10:05 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**69.7**	ug/L	5.0	1.4	1	05/15/19 08:55	05/16/19 11:37	7440-39-3	
Lithium	**23.2**	ug/L	10.0	5.9	1	05/15/19 08:55	05/16/19 11:37	7439-93-2	
Molybdenum	**157**	ug/L	20.0	2.6	1	05/15/19 08:55	05/16/19 11:37	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**3.6**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:16	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-8S **Lab ID: 60301803002** Collected: 05/02/19 14:05 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**298**	ug/L	5.0	1.4	1	05/15/19 08:55	05/16/19 11:39	7440-39-3	
Lithium	**21.4**	ug/L	10.0	5.9	1	05/15/19 08:55	05/16/19 11:39	7439-93-2	
Molybdenum	**244**	ug/L	20.0	2.6	1	05/15/19 08:55	05/16/19 11:39	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**22.0**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:18	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-FB-1 **Lab ID: 60301803003** Collected: 05/02/19 10:35 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	05/15/19 08:55	05/16/19 11:41	7440-39-3	
Lithium	**<5.9**	ug/L	10.0	5.9	1	05/15/19 08:55	05/16/19 11:41	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/15/19 08:55	05/16/19 11:41	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:34	7440-38-2	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-6S **Lab ID: 60302537001** Collected: 05/08/19 12:35 Received: 05/10/19 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**323**	ug/L	5.0	1.4	1	05/20/19 14:55	05/21/19 12:22	7440-39-3	
Lithium	**34.6**	ug/L	10.0	5.9	1	05/20/19 14:55	05/21/19 12:22	7439-93-2	
Molybdenum	**26.2**	ug/L	20.0	2.6	1	05/20/19 14:55	05/21/19 12:22	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**3.1**	ug/L	1.0	0.065	1	05/20/19 10:53	05/22/19 11:17	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Sample: L-LMW-7S **Lab ID: 60302537002** Collected: 05/08/19 14:05 Received: 05/10/19 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**296**	ug/L	5.0	1.4	1	05/20/19 14:55	05/21/19 12:24	7440-39-3	
Lithium	**35.7**	ug/L	10.0	5.9	1	05/20/19 14:55	05/21/19 12:24	7439-93-2	
Molybdenum	**118**	ug/L	20.0	2.6	1	05/20/19 14:55	05/21/19 12:24	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**17.2**	ug/L	1.0	0.065	1	05/20/19 10:53	05/22/19 11:19	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 583885 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301568001, 60301568002, 60301568003, 60301568004, 60301568005, 60301568006, 60301568007

METHOD BLANK: 2395795 Matrix: Water
Associated Lab Samples: 60301568001, 60301568002, 60301568003, 60301568004, 60301568005, 60301568006, 60301568007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/13/19 12:26	
Lithium	ug/L	<5.9	10.0	5.9	05/13/19 12:26	
Molybdenum	ug/L	<2.6	20.0	2.6	05/13/19 12:26	

LABORATORY CONTROL SAMPLE: 2395796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	972	97	85-115	
Lithium	ug/L	1000	973	97	85-115	
Molybdenum	ug/L	1000	948	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395797 2395798

Parameter	Units	60301568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	114	1000	1000	1090	1090	98	98	70-130	0	20	
Lithium	ug/L	26.4	1000	1000	1050	1050	102	102	70-130	0	20	
Molybdenum	ug/L	4.7J	1000	1000	956	964	95	96	70-130	1	20	

MATRIX SPIKE SAMPLE: 2395799

Parameter	Units	60301646001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	23.5	1000	966	94	70-130	
Lithium	ug/L	16.1	1000	1030	101	70-130	
Molybdenum	ug/L	22.6	1000	945	92	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 584623 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301803001, 60301803002, 60301803003

METHOD BLANK: 2398909 Matrix: Water
Associated Lab Samples: 60301803001, 60301803002, 60301803003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/16/19 11:33	
Lithium	ug/L	<5.9	10.0	5.9	05/16/19 11:33	
Molybdenum	ug/L	<2.6	20.0	2.6	05/16/19 11:33	

LABORATORY CONTROL SAMPLE: 2398910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	916	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398911 2398912

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	360	1000	1000	1370	1360	101	100	70-130	1	20	
Lithium	ug/L	43.3	1000	1000	1070	1060	102	101	70-130	1	20	
Molybdenum	ug/L	<2.6	1000	1000	935	932	94	93	70-130	0	20	

MATRIX SPIKE SAMPLE: 2398913

Parameter	Units	60301923002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	45.3	1000	986	94	70-130	
Lithium	ug/L	ND	1000	972	97	70-130	
Molybdenum	ug/L	ND	1000	893	89	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 585659 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60302537001, 60302537002

METHOD BLANK: 2403215 Matrix: Water
Associated Lab Samples: 60302537001, 60302537002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/21/19 12:05	
Lithium	ug/L	<5.9	10.0	5.9	05/21/19 12:05	
Molybdenum	ug/L	<2.6	20.0	2.6	05/21/19 12:05	

LABORATORY CONTROL SAMPLE: 2403216

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	1050	105	85-115	
Molybdenum	ug/L	1000	931	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2403217 2403218

Parameter	Units	60302656002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	20.8	1000	1000	1040	1050	102	103	70-130	1	20	
Lithium	ug/L	48.7	1000	1000	1100	1110	105	106	70-130	1	20	
Molybdenum	ug/L	ND	1000	1000	906	904	90	90	70-130	0	20	

MATRIX SPIKE SAMPLE: 2403219

Parameter	Units	60302658002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	186	1000	1210	103	70-130	
Lithium	ug/L	15.3	1000	1060	104	70-130	
Molybdenum	ug/L	ND	1000	902	89	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 584464 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301568001, 60301568002, 60301568003, 60301568004, 60301568005, 60301568006, 60301568007

METHOD BLANK: 2398379 Matrix: Water
Associated Lab Samples: 60301568001, 60301568002, 60301568003, 60301568004, 60301568005, 60301568006, 60301568007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/15/19 13:18	

LABORATORY CONTROL SAMPLE: 2398380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.7	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398381 2398382

Parameter	Units	60301568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	19.0	40	40	59.6	60.2	101	103	70-130	1	20	

MATRIX SPIKE SAMPLE: 2398383

Parameter	Units	60301622003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.2	40	41.3	100	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 584536 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301803001, 60301803002, 60301803003

METHOD BLANK: 2398606 Matrix: Water
Associated Lab Samples: 60301803001, 60301803002, 60301803003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/16/19 14:13	

LABORATORY CONTROL SAMPLE: 2398607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.7	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398608 2398609

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.6	40	40	41.3	40.4	99	97	70-130	2	20	

MATRIX SPIKE SAMPLE: 2398610

Parameter	Units	60302480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.6	40	41.6	100	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

QC Batch: 585573 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60302537001, 60302537002

METHOD BLANK: 2402959 Matrix: Water
Associated Lab Samples: 60302537001, 60302537002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/22/19 10:51	

LABORATORY CONTROL SAMPLE: 2402960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	37.1	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2402961 2402962

Parameter	Units	60302498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	40	40	35.6	35.7	87	88	70-130	0	20	

MATRIX SPIKE SAMPLE: 2402963

Parameter	Units	60303232001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	0.24J	40	36.7	91	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

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

QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301568

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301568001	**L-LMW-1S**	EPA 200.7	583885	EPA 200.7	584051
60301568002	**L-LMW-2S**	EPA 200.7	583885	EPA 200.7	584051
60301568003	**L-LMW-5S**	EPA 200.7	583885	EPA 200.7	584051
60301568004	**L-BMW-1S**	EPA 200.7	583885	EPA 200.7	584051
60301568005	**L-BMW-2S**	EPA 200.7	583885	EPA 200.7	584051
60301568006	**L-LMW-DUP-1**	EPA 200.7	583885	EPA 200.7	584051
60301568007	**L-LMW-4S**	EPA 200.7	583885	EPA 200.7	584051
60301803001	**L-LMW-3S**	EPA 200.7	584623	EPA 200.7	584665
60301803002	**L-LMW-8S**	EPA 200.7	584623	EPA 200.7	584665
60301803003	**L-LMW-FB-1**	EPA 200.7	584623	EPA 200.7	584665
60302537001	**L-LMW-6S**	EPA 200.7	585659	EPA 200.7	585727
60302537002	**L-LMW-7S**	EPA 200.7	585659	EPA 200.7	585727
60301568001	**L-LMW-1S**	EPA 200.8	584464	EPA 200.8	584518
60301568002	**L-LMW-2S**	EPA 200.8	584464	EPA 200.8	584518
60301568003	**L-LMW-5S**	EPA 200.8	584464	EPA 200.8	584518
60301568004	**L-BMW-1S**	EPA 200.8	584464	EPA 200.8	584518
60301568005	**L-BMW-2S**	EPA 200.8	584464	EPA 200.8	584518
60301568006	**L-LMW-DUP-1**	EPA 200.8	584464	EPA 200.8	584518
60301568007	**L-LMW-4S**	EPA 200.8	584464	EPA 200.8	584518
60301803001	**L-LMW-3S**	EPA 200.8	584536	EPA 200.8	584573
60301803002	**L-LMW-8S**	EPA 200.8	584536	EPA 200.8	584573
60301803003	**L-LMW-FB-1**	EPA 200.8	584536	EPA 200.8	584573
60302537001	**L-LMW-6S**	EPA 200.8	585573	EPA 200.8	585611
60302537002	**L-LMW-7S**	EPA 200.8	585573	EPA 200.8	585611

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Sample Condition Upon Receipt

WO# : 60301568

60301568

Client Name: Golder

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

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

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

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

Thermometer Used: T-298 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 3.0, 3.2 Corr. Factor -1.0 Corrected 2.0, 2.2

Date and initials of person examining contents: 5/2/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	Sent extra samples. 2-2mw-215
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	time + date 5/1/19 @ 1400 (BP24, BP3N,
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	BP3W)
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: Per Eric, analyze extra sample L-LMW-4S for all parameters.

Project Manager Review: Jessi Church Date: 5/4/19

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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Page: 1 of 1

Section A — Required Client Information:

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

Section B — Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001B (COC #2)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES — GROUND WATER (circled) — DRINKING WATER

UST — RCRA — OTHER ______

Site Location STATE: MO

Section D — Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

Requested Analysis Filtered (Y/N): Metals* N; Chloride/Fluoride/Sulfate N; TDS N; Alkalinity N; Total Phosphorus N

Pace Project No./ Lab I.D.: 60301568

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-LMW-1S	WT	G			5/1/19	1505		4	6		3						X	BP2U(3), BP3U(3), BP3N(3)					001
2	L-LMW-2S	WT	G			4/30/19	1535		3	2		1						X	BP2U, BP3U, BP3N					002
3	L-LMW-5S	WT	G			5/1/19	1405		3	2		1						X	↓		↓		↓	003
4	L-BMW-1S	WT	G			5/1/19	1135		3	2		1						X	↓		↓		↓	004
5	L-BMW-2S	WT	G			5/1/19	1050		3	2		1						X	↓		↓		↓	005
6	L-LMW-DUP-1	WT	G			4/30/19	—		3	2		1						X	↓		↓		↓	006
7		WT	G																					007 EXTRA SAMPLE
8		WT	G																					
9		WT	G																					
10		WT	G																					
11		WT	G																					
12		WT	G																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
~~[illegible]~~ As, Ba, Li, Mo (only sample these parameters for these metals)	[signature] / Golder	5/1/19	1800	[signature]	5/2/19	0813	3.0 / 3.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5/1/19

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Sample Condition Upon Receipt

WO# : 60302537

60302537

Client Name: Cooler Assa.

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

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

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

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

Thermometer Used: 7200 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 0.4 Corr. Factor +0.4 Corrected 0.8

Date and initials of person examining contents: 5-10-19 JL

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church 5/13/19

Date:

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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Page: 2 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-01.0001B (COC#2)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES | GROUND WATER | DRINKING WATER | UST | RCRA | OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information / SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		
1	L-LMW-65	WT	G			5/8/19	1405		3	2		1							X						
2	L-LMW-75	WT	G			1	1235		1	1		1							1						
3		WT	G																						
4		WT	G																						
5		WT	G																						
6		WT	G																						
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	[signature] / Golder	5/9/19	1738	UPS / Fedex	5/10/19	0845	08	Y	Y	Y
Sample only for Metals: Ba, Li, Mo, As										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Atkins

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/09/19

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

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Sample Condition Upon Receipt

WO# : 60301803

60301803

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 1.5 **Corr. Factor** -1.0 **Corrected** 0.5

Date and initials of person examining contents: 5/7/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	COC 2/2 same Sample #s COC
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	1/2
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	Sample 2-2mw-45 doesn't have labels on them.
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church 5/6/19 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-01.0001B (COC #2)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N): Y/N	Analysis Test: Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-LMW-35	WT	G			5/2/19	1005		3	2		1						N	X						60301803
2	L-LMW-85	WT	G			1	1405		1	1								N	X						
3	L-LMW-FB-1	WT	G			1	1035		1	1		1						N	X						
4		WT	G															N							
5		WT	G															N							
6		WT	G															N							
7		WT	G															N							
8		WT	G															N							
9		WT	G															N							
10		WT	G															N							
11		WT	G															N							
12		WT	G															N							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na Analysis Sample For the following Metals only Ba, Li, Mo, As	Golder	5/3/19	1025	PACE	5/3/19	1025	
	PACE	5/3/19	1200				

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Eric Schneider	DATE Signed (MM/DD/YY):	05/03/19	Temp in °C	Received on Ice (Y/N)
SIGNATURE of SAMPLER:				Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

MEMORANDUM

DATE August 16, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCPB – NATURE AND EXTENT - DATA PACKAGE 60301568

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).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - Labadie - LCPB ~~Eastern~~ - NAE
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 153140601
Validation Date: 8/16/19

Laboratory: Pace Analytical - KS
SDG #: 60301568
Analytical Method (type and no.): EPA 200.7 + 200.8 (Metals)
Matrix: ☐ Air ☐ Soil/Sed. ☑ Water ☐ Waste ☐
Sample Names L-LMW-1S, L-LMW-2S, L-LMW-3S, L-LMW-4S, L-LMW-5S, L-LMW-6S, L-LMW-7S, L-LMW-8S L-BMW-1S, L-BMW-2S, L-LMW-DUP-1, L-LMW-FB-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☑	☐	☐	4/30 - 5/8/19
b) Sampling team indicated?	☑	☐	☐	
c) Sample location noted?	☑	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☑	
e) Sample type indicated (~~grab~~/composite)?	☑	☐	☐	
f) Field QC noted?	☑	☐	☐	
g) Field parameters collected (note types)?	☑	☐	☐	
h) Field Calibration within control limits?	☑	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☑	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☑ (1)	☑	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				L-LMW-25 @ DUP-1
	☑	☐	☐	FB-1 @ L-LMW-35
b) Were field dup. precision criteria met (note RPD)?	☑	☐	☐	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☑ (B)	☑	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☐	☑	

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

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

Comments/Notes:

Max Field Duplicate RPD: 8.9% (Limit 20%)

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature: Tommy J Hood Jr. Date: 8/16/19

Pace Analytical Services, LLC
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August 15, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory between May 02, 2019 and May 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60301804001	**L-TMW-1**	Water	05/02/19 13:55	05/04/19 04:35
60301804002	**L-TMW-2**	Water	05/02/19 12:10	05/04/19 04:35
60301804003	**L-UWL-DUP-1**	Water	05/02/19 12:10	05/04/19 04:35
60302536001	**L-TMW-3**	Water	05/08/19 12:00	05/10/19 03:45
60302536002	**L-MW-26**	Water	05/08/19 10:50	05/10/19 03:45
60302536003	**L-UWL-FB-1**	Water	05/08/19 10:55	05/10/19 03:45
60301568004	**L-BMW-1S**	Water	05/01/19 11:35	05/02/19 04:13
60301568005	**L-BMW-2S**	Water	05/01/19 10:50	05/02/19 04:13

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60301804001	**L-TMW-1**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301804002	**L-TMW-2**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301804003	**L-UWL-DUP-1**	EPA 200.7	HKC	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60302536001	**L-TMW-3**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60302536002	**L-MW-26**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60302536003	**L-UWL-FB-1**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568004	**L-BMW-1S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K
60301568005	**L-BMW-2S**	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-TMW-1 **Lab ID: 60301804001** Collected: 05/02/19 13:55 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**360**	ug/L	5.0	1.4	1	05/15/19 08:55	05/16/19 11:43	7440-39-3	
Lithium	**43.3**	ug/L	10.0	5.9	1	05/15/19 08:55	05/16/19 11:43	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/15/19 08:55	05/16/19 11:43	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.6**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:20	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-TMW-2 **Lab ID: 60301804002** Collected: 05/02/19 12:10 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**194**	ug/L	5.0	1.4	1	05/15/19 08:55	05/15/19 17:38	7440-39-3	
Lithium	**45.2**	ug/L	10.0	5.9	1	05/15/19 08:55	05/15/19 17:38	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/15/19 08:55	05/15/19 17:38	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.1**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:25	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-UWL-DUP-1 **Lab ID: 60301804003** Collected: 05/02/19 12:10 Received: 05/04/19 04:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**195**	ug/L	5.0	1.4	1	05/15/19 08:55	05/15/19 17:40	7440-39-3	
Lithium	**44.0**	ug/L	10.0	5.9	1	05/15/19 08:55	05/15/19 17:40	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/15/19 08:55	05/15/19 17:40	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.0**	ug/L	1.0	0.065	1	05/14/19 17:45	05/16/19 14:27	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-TMW-3 **Lab ID: 60302536001** Collected: 05/08/19 12:00 Received: 05/10/19 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**386**	ug/L	5.0	1.4	1	05/20/19 14:55	05/21/19 12:09	7440-39-3	
Lithium	**41.2**	ug/L	10.0	5.9	1	05/20/19 14:55	05/21/19 12:09	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/20/19 14:55	05/21/19 12:09	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.5**	ug/L	1.0	0.065	1	05/20/19 10:53	05/22/19 11:07	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-MW-26 **Lab ID: 60302536002** Collected: 05/08/19 10:50 Received: 05/10/19 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**210**	ug/L	5.0	1.4	1	05/20/19 14:55	05/21/19 12:11	7440-39-3	
Lithium	**37.0**	ug/L	10.0	5.9	1	05/20/19 14:55	05/21/19 12:11	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/20/19 14:55	05/21/19 12:11	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.0**	ug/L	1.0	0.065	1	05/20/19 10:53	05/22/19 11:13	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-UWL-FB-1 **Lab ID: 60302536003** Collected: 05/08/19 10:55 Received: 05/10/19 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**208**	ug/L	5.0	1.4	1	05/20/19 14:55	05/21/19 12:14	7440-39-3	
Lithium	**35.0**	ug/L	10.0	5.9	1	05/20/19 14:55	05/21/19 12:14	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/20/19 14:55	05/21/19 12:14	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.99J**	ug/L	1.0	0.065	1	05/20/19 10:53	05/22/19 11:15	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-BMW-1S **Lab ID: 60301568004** Collected: 05/01/19 11:35 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**288**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:54	7440-39-3	
Lithium	**17.6**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:54	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:54	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**35.1**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:44	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Sample: L-BMW-2S **Lab ID: 60301568005** Collected: 05/01/19 10:50 Received: 05/02/19 04:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**266**	ug/L	5.0	1.4	1	05/10/19 15:30	05/13/19 12:57	7440-39-3	
Lithium	**20.2**	ug/L	10.0	5.9	1	05/10/19 15:30	05/13/19 12:57	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/10/19 15:30	05/13/19 12:57	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.52J**	ug/L	1.0	0.065	1	05/14/19 15:30	05/15/19 13:46	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 583885 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301568004, 60301568005

METHOD BLANK: 2395795 Matrix: Water
Associated Lab Samples: 60301568004, 60301568005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/13/19 12:26	
Lithium	ug/L	<5.9	10.0	5.9	05/13/19 12:26	
Molybdenum	ug/L	<2.6	20.0	2.6	05/13/19 12:26	

LABORATORY CONTROL SAMPLE: 2395796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	972	97	85-115	
Lithium	ug/L	1000	973	97	85-115	
Molybdenum	ug/L	1000	948	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395797 2395798

Parameter	Units	60301568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	114	1000	1000	1090	1090	98	98	70-130	0	20	
Lithium	ug/L	26.4	1000	1000	1050	1050	102	102	70-130	0	20	
Molybdenum	ug/L	4.7J	1000	1000	956	964	95	96	70-130	1	20	

MATRIX SPIKE SAMPLE: 2395799

Parameter	Units	60301646001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	23.5	1000	966	94	70-130	
Lithium	ug/L	16.1	1000	1030	101	70-130	
Molybdenum	ug/L	22.6	1000	945	92	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

Pace Analytical Services, LLC
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Lenexa, KS 66219
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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 584623 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60301804001, 60301804002, 60301804003

METHOD BLANK: 2398909 Matrix: Water
Associated Lab Samples: 60301804001, 60301804002, 60301804003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/16/19 11:33	
Lithium	ug/L	<5.9	10.0	5.9	05/16/19 11:33	
Molybdenum	ug/L	<2.6	20.0	2.6	05/16/19 11:33	

LABORATORY CONTROL SAMPLE: 2398910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	980	98	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	916	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398911 2398912

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	360	1000	1000	1370	1360	101	100	70-130	1	20	
Lithium	ug/L	43.3	1000	1000	1070	1060	102	101	70-130	1	20	
Molybdenum	ug/L	<2.6	1000	1000	935	932	94	93	70-130	0	20	

MATRIX SPIKE SAMPLE: 2398913

Parameter	Units	60301923002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	45.3	1000	986	94	70-130	
Lithium	ug/L	ND	1000	972	97	70-130	
Molybdenum	ug/L	ND	1000	893	89	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 585659 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60302536001, 60302536002, 60302536003

METHOD BLANK: 2403215 Matrix: Water
Associated Lab Samples: 60302536001, 60302536002, 60302536003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/21/19 12:05	
Lithium	ug/L	<5.9	10.0	5.9	05/21/19 12:05	
Molybdenum	ug/L	<2.6	20.0	2.6	05/21/19 12:05	

LABORATORY CONTROL SAMPLE: 2403216

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	1050	105	85-115	
Molybdenum	ug/L	1000	931	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2403217 2403218

Parameter	Units	60302656002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	20.8	1000	1000	1040	1050	102	103	70-130	1	20	
Lithium	ug/L	48.7	1000	1000	1100	1110	105	106	70-130	1	20	
Molybdenum	ug/L	ND	1000	1000	906	904	90	90	70-130	0	20	

MATRIX SPIKE SAMPLE: 2403219

Parameter	Units	60302658002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	186	1000	1210	103	70-130	
Lithium	ug/L	15.3	1000	1060	104	70-130	
Molybdenum	ug/L	ND	1000	902	89	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 584464 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301568004, 60301568005

METHOD BLANK: 2398379 Matrix: Water
Associated Lab Samples: 60301568004, 60301568005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/15/19 13:18	

LABORATORY CONTROL SAMPLE: 2398380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.7	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398381 2398382

Parameter	Units	60301568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	19.0	40	40	59.6	60.2	101	103	70-130	1	20	

MATRIX SPIKE SAMPLE: 2398383

Parameter	Units	60301622003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.2	40	41.3	100	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 584536 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60301804001, 60301804002, 60301804003

METHOD BLANK: 2398606 Matrix: Water
Associated Lab Samples: 60301804001, 60301804002, 60301804003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/16/19 14:13	

LABORATORY CONTROL SAMPLE: 2398607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.7	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398608 2398609

Parameter	Units	60301804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.6	40	40	41.3	40.4	99	97	70-130	2	20	

MATRIX SPIKE SAMPLE: 2398610

Parameter	Units	60302480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.6	40	41.6	100	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

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

QC Batch: 585573 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60302536001, 60302536002, 60302536003

METHOD BLANK: 2402959 Matrix: Water
Associated Lab Samples: 60302536001, 60302536002, 60302536003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	05/22/19 10:51	

LABORATORY CONTROL SAMPLE: 2402960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	37.1	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2402961 2402962

Parameter	Units	60302498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	40	40	35.6	35.7	87	88	70-130	0	20	

MATRIX SPIKE SAMPLE: 2402963

Parameter	Units	60303232001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	0.24J	40	36.7	91	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

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

QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60301804

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301568004	**L-BMW-1S**	EPA 200.7	583885	EPA 200.7	584051
60301568005	**L-BMW-2S**	EPA 200.7	583885	EPA 200.7	584051
60301804001	**L-TMW-1**	EPA 200.7	584623	EPA 200.7	584665
60301804002	**L-TMW-2**	EPA 200.7	584623	EPA 200.7	584665
60301804003	**L-UWL-DUP-1**	EPA 200.7	584623	EPA 200.7	584665
60302536001	**L-TMW-3**	EPA 200.7	585659	EPA 200.7	585727
60302536002	**L-MW-26**	EPA 200.7	585659	EPA 200.7	585727
60302536003	**L-UWL-FB-1**	EPA 200.7	585659	EPA 200.7	585727
60301568004	**L-BMW-1S**	EPA 200.8	584464	EPA 200.8	584518
60301568005	**L-BMW-2S**	EPA 200.8	584464	EPA 200.8	584518
60301804001	**L-TMW-1**	EPA 200.8	584536	EPA 200.8	584573
60301804002	**L-TMW-2**	EPA 200.8	584536	EPA 200.8	584573
60301804003	**L-UWL-DUP-1**	EPA 200.8	584536	EPA 200.8	584573
60302536001	**L-TMW-3**	EPA 200.8	585573	EPA 200.8	585611
60302536002	**L-MW-26**	EPA 200.8	585573	EPA 200.8	585611
60302536003	**L-UWL-FB-1**	EPA 200.8	585573	EPA 200.8	585611

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Sample Condition Upon Receipt

WO# : 60301804

60301804

Client Name: Golder

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

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

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

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

Thermometer Used: T-294 **Type of Ice:** Wet Blue None

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

Date and initials of person examining contents: 5/4/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	L-TMW-1 samples are the same samples for both chains. / Also L-TMW-2 / DUP
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church 5/6/19 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001C (COC #3)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-TMW-1	WT	G			5/2/19	1355		9	6		3						X							40301804
2	L-TMW-2	WT	G			↓	1210		3	2		1						X							
3	L-UWL-DUP-1	WT	G			↓	—		1	1		1						X							
4		WT	G																						
5		WT	G																						
6		WT	G																						
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
~~EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na~~		5/3/19	1025		5/3/19	1025	
Analysis for the following metals only: Ba, Li, Mo, As	PACE	5/3/19	1700		5/3/19	0235	2.2 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: _____ DATE Signed (MM/DD/YY): 05/03/19

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

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Sample Condition Upon Receipt

WO# : 60302536

60302536

Client Name: Coolers Assoc.

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

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

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

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

Thermometer Used: T200 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.4 **Corr. Factor** +0.4 **Corrected** 0.8

Date and initials of person examining contents: 5-10-19 AZ

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	There are 2 COC for the
Containers intact:	☒Yes ☐No ☐N/A	same set of samples
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

5/10/19

Project Manager Review: Jami Church Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-01.0001B (COC #5	Pace Profile #:	9285

REGULATORY AGENCY: NPDES | GROUND WATER | DRINKING WATER | UST | RCRA | OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N Analysis Test: Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y	N	N	N	N	N	
1	L-TMW-3	WT	G			5/8/19	1200		3	2		1						X						004
2	L-TMW-26	WT	G			1	1050		1	1		1						1						005
3	L-UWL-FB-1	WT	G			1	1055		1	1		1						1						006
4		WT	G																					
5		WT	G																					
6		WT	G																					
7		WT	G																					
8		WT	G																					
9		WT	G																					
10		WT	G																					
11		WT	G																					
12		WT	G																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	[signature]/Golder	5/9/19	1738	Accept Pace	5/10/19	0345	0.8	Y	Y	Y
Sample only for Metals: Ba, Li, Mo, As										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adams

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/09/19

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www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60301568

60301568

Client Name: Golder

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

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

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

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

Thermometer Used: T-298 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 3.0, 3.2 Corr. Factor -1.0 Corrected 2.0, 2.2

Date and initials of person examining contents: 5/2/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No ☐N/A	Sent extra samples. 2-2mw-215
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	time + date 5/1/19 @ 1400 (BP24, BP3N,
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	BP3W)
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: Per Eric, analyze extra sample L-LMW-4S for all parameters.

Project Manager Review: Jason Clark Date: 5/4/19

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical — www.pacelabs.com

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

Page: 1 of 1

Section A — Required Client Information:

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

Section B — Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001B (COC #2)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY: NPDES / GROUND WATER (circled) / DRINKING WATER / UST / RCRA / OTHER

Site Location STATE: MO

Section D — Required Client Information

Valid Matrix Codes: DRINKING WATER DW, WATER WT, WASTE WATER WW, PRODUCT P, SOIL/SOLID SL, OIL OL, WP, AR, OT, TS

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

Requested Analysis Filtered (Y/N): Metals* N, Chloride/Fluoride/Sulfate N, TDS N, Alkalinity N, Total Phosphorus N

Pace Project No./ Lab I.D.: 60301568

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-LMW-1S	WT	G			5/1/19	1505		9	6		3							X	BP2U(3), BP3U(3), BP3N(3)					001
2	L-LMW-2S	WT	G			4/30/19	1525		3	2		1							X	BP2U, BP3U, BP3N					002
3	L-LMW-5S	WT	G			5/1/19	1405		3	2		1							X	↓					003
4	L-BMW-1S	WT	G			5/1/19	1135		3	2		1							X	↓					004
5	L-BMW-2S	WT	G			5/1/19	1050		3	2		1							X	↓					005
6	L-LMW-Dup-1	WT	G			4/30/19	—		3	2		1							X	↓					006
7		WT	G																						007 Extra Sample
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
~~EPA 200.7/8: Ca, Fe, Mg, Mn, K, Na~~ [illegible], As, [illegible], Ba, Li, Mo (only sample these Parameters for these metals)	[signature] / Golder	5/1/19	1800	[signature]	5/2/19	0913	3.0 3.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5/1/19

MEMORANDUM

DATE August 16, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – NATURE AND EXTENT - DATA PACKAGE 60301804

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).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder
Project Name: Amaren - Labadie - LCLI - N+E
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 153140601
Validation Date: 8/16/19

Laboratory: Pace Analytical - KS
SDG #: 60301804
Analytical Method (type and no.): EPA 200.7 + 200.8 (Metals)
Matrix: ☐ Air ☐ Soil/Sed. ☑ Water ☐ Waste ☐
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-MW-2C, L-UWL-FB-1, L-BMW-1S, L-BMW-2S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☑	☐	☐	5/1 - 5/8/19
b) Sampling team indicated?	☑	☐	☐	
c) Sample location noted?	☑	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☑	
e) Sample type indicated (grab/composite)?	☑	☐	☐	
f) Field QC noted?	☑	☐	☐	
g) Field parameters collected (note types)?	☑	☐	☐	
h) Field Calibration within control limits?	☑	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☑	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☑	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				DUP-1 @ L-TMW-2
	☑	☐	☐	FB-1 @ L-MW-26
b) Were field dup. precision criteria met (note RPD)?	☑	☐	☐	Max Field DUP RPD: 9.5% (Limit 20%)
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☐	☑	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☐	☑	

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

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

Comments/Notes:

FB

FB-1: EPA 200.7 Metals were incorrect sample results and therefore not validated. ~~As (200.8)~~ TL

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature: Tommy J Good Jr Date: 8/16/2019

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

October 15, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory between May 10, 2019 and August 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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(913)599-5665

SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60302527001	**L-TP-1S**	Water	05/08/19 17:20	05/10/19 03:25
60302527002	**L-TP-1M**	Water	05/08/19 16:50	05/10/19 03:25
60302527003	**L-TP-1D**	Water	05/08/19 15:50	05/10/19 03:25
60302527004	**L-TP-3S**	Water	05/09/19 10:30	05/10/19 03:25
60302527005	**L-TP-3M**	Water	05/09/19 10:25	05/10/19 03:25
60302527006	**L-TP-3D**	Water	05/09/19 11:10	05/10/19 03:25
60302527007	**L-TP-5S**	Water	05/09/19 13:30	05/10/19 03:25
60302527008	**L-TP-5M**	Water	05/09/19 13:30	05/10/19 03:25
60302527009	**L-TP-5D**	Water	05/09/19 13:30	05/10/19 03:25
60302527010	**L-UMW-10S (AMW-1S)**	Water	05/08/19 14:50	05/10/19 03:25
60302527011	**L-UMW-10D (AMW-1D)**	Water	05/08/19 16:00	05/10/19 03:25
60302527012	**L-NE-DUP-1**	Water	05/08/19 16:00	05/10/19 03:25
60302527013	**L-NE-DUP-2**	Water	05/08/19 16:00	05/10/19 03:25
60302527014	**L-NE-FB-1**	Water	05/08/19 17:25	05/10/19 03:25
60302527015	**L-NE-FB-2**	Water	05/08/19 14:30	05/10/19 03:25
60302527016	**L-TP-1D MS**	Water	05/08/19 15:50	05/10/19 03:25
60302527017	**L-TP-1D MSD**	Water	05/08/19 15:50	05/10/19 03:25
60302527018	**L-UMW-10S (AMW-1S) MS**	Water	05/08/19 14:50	05/10/19 03:25
60302527019	**L-UMW-10S (AMW-1S) MSD**	Water	05/08/19 14:50	05/10/19 03:25
60302527020	**L-TP-2S**	Water	08/20/19 10:15	08/22/19 02:55
60302527021	**L-TP-2M**	Water	08/20/19 11:00	08/22/19 02:55
60302527022	**L-TP-2D**	Water	08/20/19 11:55	08/22/19 02:55
60302527023	**L-TP-4S**	Water	08/20/19 15:30	08/22/19 02:55
60302527024	**L-TP-4M**	Water	08/20/19 16:15	08/22/19 02:55
60302527025	**L-TP-4D**	Water	08/20/19 12:55	08/22/19 02:55

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60302527001	**L-TP-1S**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527002	**L-TP-1M**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527003	**L-TP-1D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60302527004	**L-TP-3S**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527005	**L-TP-3M**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527006	**L-TP-3D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527007	**L-TP-5S**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527008	**L-TP-5M**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527009	**L-TP-5D**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527010	**L-UMW-10S (AMW-1S)**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS	2	PASI-K
60302527011	**L-UMW-10D (AMW-1D)**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60302527012	**L-NE-DUP-1**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60302527013	**L-NE-DUP-2**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60302527014	**L-NE-FB-1**	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	LDF	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	JDS	3	PASI-K
60302527015	L-NE-FB-2	EPA 200.7	EMR	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	LRS	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	JES	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60302527016	L-TP-1D MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60302527017	L-TP-1D MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60302527018	L-UMW-10S (AMW-1S) MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60302527019	L-UMW-10S (AMW-1S) MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60302527020	L-TP-2S	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60302527021	L-TP-2M	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60302527022	L-TP-2D	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60302527023	**L-TP-4S**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60302527024	**L-TP-4M**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60302527025	**L-TP-4D**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JLH	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1S **Lab ID: 60302527001** Collected: 05/08/19 17:20 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**322**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:00	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:00	7440-41-7	
Boron	**77.4J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:00	7440-42-8	
Calcium	**147000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:00	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:00	7440-48-4	
Iron	**22600**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:00	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:00	7439-92-1	
Lithium	**19.0**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:00	7439-93-2	
Magnesium	**28500**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:00	7439-95-4	
Manganese	**1300**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:00	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:00	7439-98-7	
Potassium	**4050**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:00	7440-09-7	
Sodium	**9030**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:00	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:40	7440-36-0	
Arsenic	**28.7**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 14:59	7440-38-2	
Cadmium	**0.055J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 14:59	7440-43-9	
Chromium	**0.16J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 14:59	7440-47-3	
Selenium	**0.14J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 14:59	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 14:59	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/22/19 14:10	05/23/19 17:41	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**490**	mg/L	20.0	6.5	1		05/16/19 18:29		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**565**	mg/L	10.0	10.0	1		05/15/19 16:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**3.3**	mg/L	1.0	0.22	1		05/30/19 14:36	16887-00-6	
Fluoride	**0.099J**	mg/L	0.20	0.085	1		05/30/19 14:36	16984-48-8	
Sulfate	**36.3**	mg/L	10.0	2.3	10		05/30/19 15:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1M **Lab ID: 60302527002** Collected: 05/08/19 16:50 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**947**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:02	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:02	7440-41-7	
Boron	**60.6J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:02	7440-42-8	
Calcium	**133000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:02	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:02	7440-48-4	
Iron	**9570**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:02	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:02	7439-92-1	
Lithium	**24.0**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:02	7439-93-2	
Magnesium	**36400**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:02	7439-95-4	
Manganese	**754**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:02	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:02	7439-98-7	
Potassium	**4170**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:02	7440-09-7	
Sodium	**9980**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:02	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.094J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:42	7440-36-0	
Arsenic	**0.50J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:03	7440-38-2	
Cadmium	**0.21J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:03	7440-43-9	
Chromium	**0.40J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:03	7440-47-3	
Selenium	**0.31J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:03	7782-49-2	
Thallium	**0.24J**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/22/19 14:10	05/23/19 17:43	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**486**	mg/L	20.0	6.5	1		05/16/19 18:36		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**548**	mg/L	10.0	10.0	1		05/15/19 16:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**5.4**	mg/L	1.0	0.22	1		05/30/19 15:23	16887-00-6	
Fluoride	**0.16J**	mg/L	0.20	0.085	1		05/30/19 15:23	16984-48-8	
Sulfate	**29.9**	mg/L	5.0	1.2	5		05/30/19 15:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1D **Lab ID: 60302527003** Collected: 05/08/19 15:50 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**1410**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:04	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:04	7440-41-7	
Boron	**56.6J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:04	7440-42-8	
Calcium	**132000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:04	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:04	7440-48-4	
Iron	**8120**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:04	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:04	7439-92-1	
Lithium	**23.8**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:04	7439-93-2	
Magnesium	**35000**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:04	7439-95-4	
Manganese	**226**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:04	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:04	7439-98-7	
Potassium	**4170**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:04	7440-09-7	
Sodium	**11000**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.77J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:43	7440-36-0	
Arsenic	**0.65J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:04	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:04	7440-43-9	
Chromium	**0.26J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:04	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:04	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/22/19 14:10	05/23/19 17:46	7439-97-6	M1
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**471**	mg/L	20.0	6.5	1		05/16/19 18:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**581**	mg/L	10.0	10.0	1		05/15/19 16:10		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**4.1**	mg/L	1.0	0.22	1		05/31/19 12:36	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.085	1		05/31/19 12:36	16984-48-8	
Sulfate	**24.7**	mg/L	2.0	0.46	2		05/30/19 17:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3S **Lab ID: 60302527004** Collected: 05/09/19 10:30 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**243**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:10	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:10	7440-41-7	
Boron	**67.2J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:10	7440-42-8	
Calcium	**132000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:10	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:10	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:10	7439-89-6	
Lead	**3.9J**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:10	7439-92-1	
Lithium	**21.1**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:10	7439-93-2	
Magnesium	**21600**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:10	7439-95-4	
Manganese	**36.0**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:10	7439-96-5	
Molybdenum	**3.3J**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:10	7439-98-7	
Potassium	**4040**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:10	7440-09-7	
Sodium	**5100**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:10	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.16J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:44	7440-36-0	
Arsenic	**0.26J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:06	7440-38-2	
Cadmium	**0.038J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:06	7440-43-9	
Chromium	**0.84J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:06	7440-47-3	
Selenium	**2.2**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:06	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:06	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/28/19 14:38	05/29/19 12:47	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**390**	mg/L	20.0	6.5	1		05/17/19 15:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**457**	mg/L	10.0	10.0	1		05/16/19 14:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.7**	mg/L	1.0	0.22	1		05/30/19 17:59	16887-00-6	
Fluoride	**0.17J**	mg/L	0.20	0.085	1		05/30/19 17:59	16984-48-8	
Sulfate	**21.2**	mg/L	2.0	0.46	2		05/30/19 18:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3M **Lab ID: 60302527005** Collected: 05/09/19 10:25 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**257**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:12	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:12	7440-41-7	
Boron	**4880**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:12	7440-42-8	
Calcium	**105000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:12	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:12	7440-48-4	
Iron	**8650**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:12	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:12	7439-92-1	
Lithium	**33.8**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:12	7439-93-2	
Magnesium	**23900**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:12	7439-95-4	
Manganese	**1310**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:12	7439-96-5	
Molybdenum	**247**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:12	7439-98-7	
Potassium	**5130**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:12	7440-09-7	
Sodium	**48000**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:12	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.23J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:45	7440-36-0	
Arsenic	**0.58J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:08	7440-38-2	
Cadmium	**0.17J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:08	7440-43-9	
Chromium	**0.22J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:08	7440-47-3	
Selenium	**0.16J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:08	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/28/19 14:38	05/29/19 12:54	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**292**	mg/L	20.0	6.5	1		05/17/19 16:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**607**	mg/L	10.0	10.0	1		05/16/19 14:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**16.8**	mg/L	1.0	0.22	1		05/30/19 18:30	16887-00-6	
Fluoride	**0.20J**	mg/L	0.20	0.085	1		05/30/19 18:30	16984-48-8	
Sulfate	**168**	mg/L	20.0	4.6	20		05/30/19 19:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3D **Lab ID: 60302527006** Collected: 05/09/19 11:10 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**77.2**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:14	7440-41-7	
Boron	**10000**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:14	7440-42-8	
Calcium	**85400**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:14	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:14	7440-48-4	
Iron	**5580**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:14	7439-89-6	
Lead	**3.9J**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:14	7439-92-1	
Lithium	**29.8**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:14	7439-93-2	
Magnesium	**19900**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:14	7439-95-4	
Manganese	**172**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:14	7439-96-5	
Molybdenum	**766**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:14	7439-98-7	
Potassium	**6390**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:14	7440-09-7	
Sodium	**114000**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:14	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.085J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:46	7440-36-0	
Arsenic	**4.7**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:10	7440-38-2	
Cadmium	**0.26J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:10	7440-43-9	
Chromium	**0.13J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:10	7440-47-3	
Selenium	**0.11J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:10	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:10	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/28/19 14:38	05/29/19 12:56	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**113**	mg/L	20.0	6.5	1		05/17/19 16:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**825**	mg/L	10.0	10.0	1		05/16/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**27.1**	mg/L	5.0	1.1	5		05/30/19 20:04	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	0.085	1		05/30/19 19:48	16984-48-8	
Sulfate	**387**	mg/L	100	23.0	100		05/30/19 20:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5S **Lab ID: 60302527007** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**378**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:17	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:17	7440-41-7	
Boron	**119**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:17	7440-42-8	
Calcium	**145000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:17	7440-70-2	
Cobalt	**2.4J**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:17	7440-48-4	
Iron	**1330**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:17	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:17	7439-92-1	
Lithium	**23.2**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:17	7439-93-2	
Magnesium	**36000**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:17	7439-95-4	
Manganese	**2100**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:17	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:17	7439-98-7	
Potassium	**4990**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:17	7440-09-7	
Sodium	**9480**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:17	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:47	7440-36-0	
Arsenic	**0.96J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:11	7440-38-2	
Cadmium	**0.035J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:11	7440-43-9	
Chromium	**0.10J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:11	7440-47-3	
Selenium	**0.54J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:11	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:11	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/28/19 14:38	05/29/19 12:59	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**552**	mg/L	20.0	6.5	1		05/17/19 16:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**575**	mg/L	10.0	10.0	1		05/16/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**1.5**	mg/L	1.0	0.22	1		05/30/19 20:35	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/30/19 20:35	16984-48-8	
Sulfate	**19.6**	mg/L	1.0	0.23	1		05/30/19 20:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5M **Lab ID: 60302527008** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**831**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:19	7440-41-7	
Boron	**828**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:19	7440-42-8	
Calcium	**150000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:19	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:19	7440-48-4	
Iron	**10200**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:19	7439-89-6	
Lead	**3.6J**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:19	7439-92-1	
Lithium	**22.3**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:19	7439-93-2	
Magnesium	**36100**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:19	7439-95-4	
Manganese	**739**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:19	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:19	7439-98-7	
Potassium	**4540**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:19	7440-09-7	
Sodium	**12700**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:19	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:50	7440-36-0	
Arsenic	**0.92J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:17	7440-38-2	
Cadmium	**0.044J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:17	7440-43-9	
Chromium	**0.18J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:17	7440-47-3	
Selenium	**0.14J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:17	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:17	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/28/19 14:38	05/29/19 13:01	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**519**	mg/L	20.0	6.5	1		05/17/19 16:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**618**	mg/L	10.0	10.0	1		05/16/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**4.1**	mg/L	1.0	0.22	1		05/30/19 21:06	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/30/19 21:06	16984-48-8	
Sulfate	**48.8**	mg/L	10.0	2.3	10		05/30/19 21:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5D **Lab ID: 60302527009** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water
Comments: • Sample collection time on containers does not match COC; client was notified.

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								
Barium	**572**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:25	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:25	7440-41-7	
Boron	**4510**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:25	7440-42-8	
Calcium	**133000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:25	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:25	7440-48-4	
Iron	**6640**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:25	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:25	7439-92-1	
Lithium	**22.4**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:25	7439-93-2	
Magnesium	**34600**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:25	7439-95-4	
Manganese	**222**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:25	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:25	7439-98-7	
Potassium	**4490**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:25	7440-09-7	
Sodium	**25900**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:25	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:51	7440-36-0	
Arsenic	**13.9**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:18	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:18	7440-43-9	
Chromium	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:18	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:18	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:18	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:19	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**380**	mg/L	20.0	6.5	1		05/17/19 16:59		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**693**	mg/L	10.0	10.0	1		05/16/19 14:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.0**	mg/L	1.0	0.22	1		05/30/19 21:38	16887-00-6	
Fluoride	**0.088J**	mg/L	0.20	0.085	1		05/30/19 21:38	16984-48-8	
Sulfate	**151**	mg/L	20.0	4.6	20		05/30/19 21:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10S (AMW-1S) **Lab ID: 60302527010** Collected: 05/08/19 14:50 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**551**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:27	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:27	7440-41-7	
Boron	**374**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:27	7440-42-8	
Calcium	**172000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:27	7440-70-2	M1
Cobalt	**4.5J**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:27	7440-48-4	
Iron	**4840**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:27	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:27	7439-92-1	
Lithium	**33.8**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:27	7439-93-2	
Magnesium	**38100**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:27	7439-95-4	
Manganese	**1590**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:27	7439-96-5	
Molybdenum	**2.9J**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:27	7439-98-7	
Potassium	**6750**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:27	7440-09-7	
Sodium	**61200**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:27	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:52	7440-36-0	
Arsenic	**2.9**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:20	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:20	7440-43-9	
Chromium	**0.091J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:20	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:20	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:21	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**474**	mg/L	20.0	6.5	1		05/16/19 19:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**931**	mg/L	10.0	10.0	1		05/15/19 16:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.13J**	mg/L	0.20	0.085	1		05/30/19 22:09	16984-48-8	
Sulfate	**17.6**	mg/L	1.0	0.23	1		05/30/19 22:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10D (AMW-1D) **Lab ID: 60302527011** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**63.6**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:31	7440-39-3	
Beryllium	**0.26J**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:31	7440-41-7	
Boron	**6900**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:31	7440-42-8	
Calcium	**83700**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:31	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:31	7440-48-4	
Iron	**4320**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:31	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:31	7439-92-1	
Lithium	**36.1**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:31	7439-93-2	
Magnesium	**11700**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:31	7439-95-4	
Manganese	**215**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:31	7439-96-5	
Molybdenum	**370**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:31	7439-98-7	
Potassium	**7520**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:31	7440-09-7	
Sodium	**112000**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:31	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:55	7440-36-0	
Arsenic	**2.7**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:25	7440-38-2	
Cadmium	**0.16J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:25	7440-43-9	
Chromium	**0.19J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:25	7440-47-3	
Selenium	**0.13J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:25	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:25	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:33	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**144**	mg/L	20.0	6.5	1		05/16/19 19:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**752**	mg/L	10.0	10.0	1		05/15/19 16:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**37.7**	mg/L	2.0	0.44	2		05/31/19 01:16	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	0.085	1		05/31/19 01:00	16984-48-8	
Sulfate	**332**	mg/L	20.0	4.6	20		05/31/19 14:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-DUP-1 **Lab ID: 60302527012** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**64.2**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:34	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:34	7440-41-7	
Boron	**6930**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:34	7440-42-8	
Calcium	**84100**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:34	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:34	7440-48-4	
Iron	**4320**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:34	7439-89-6	
Lead	**4.3J**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:34	7439-92-1	
Lithium	**34.4**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:34	7439-93-2	
Magnesium	**11800**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:34	7439-95-4	
Manganese	**216**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:34	7439-96-5	
Molybdenum	**369**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:34	7439-98-7	
Potassium	**7540**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:34	7440-09-7	
Sodium	**112000**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:34	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:56	7440-36-0	
Arsenic	**2.7**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:27	7440-38-2	
Cadmium	**0.15J**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:27	7440-43-9	
Chromium	**0.28J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:27	7440-47-3	
Selenium	**0.13J**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:27	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:35	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**148**	mg/L	20.0	6.5	1		05/16/19 19:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**800**	mg/L	10.0	10.0	1		05/15/19 16:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**37.1**	mg/L	2.0	0.44	2		05/31/19 02:34	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	0.085	1		05/31/19 02:18	16984-48-8	
Sulfate	**335**	mg/L	20.0	4.6	20		05/31/19 15:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-DUP-2 **Lab ID: 60302527013** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**952**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:36	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:36	7440-41-7	
Boron	**83.5J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:36	7440-42-8	
Calcium	**134000**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:36	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:36	7440-48-4	
Iron	**9640**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:36	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:36	7439-92-1	
Lithium	**24.2**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:36	7439-93-2	
Magnesium	**36600**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:36	7439-95-4	
Manganese	**760**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:36	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:36	7439-98-7	
Potassium	**4250**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:36	7440-09-7	
Sodium	**10100**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:36	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:57	7440-36-0	
Arsenic	**0.13J**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:29	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:29	7440-43-9	
Chromium	**0.14J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:29	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:29	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:29	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:37	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**498**	mg/L	20.0	6.5	1		05/17/19 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**560**	mg/L	10.0	10.0	1		05/15/19 16:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**5.3**	mg/L	1.0	0.22	1		05/31/19 02:50	16887-00-6	
Fluoride	**0.12J**	mg/L	0.20	0.085	1		05/31/19 02:50	16984-48-8	
Sulfate	**29.3**	mg/L	5.0	1.2	5		05/31/19 15:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-FB-1 **Lab ID: 60302527014** Collected: 05/08/19 17:25 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:38	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:38	7440-41-7	
Boron	**11.3J**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:38	7440-42-8	
Calcium	**61.7J**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:38	7440-70-2	B
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:38	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:38	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:38	7439-92-1	
Lithium	**<5.9**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:38	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:38	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:38	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:38	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:38	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:38	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:58	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:31	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:31	7440-43-9	
Chromium	**0.088J**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:31	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:31	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:31	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:39	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		05/17/19 12:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**6.5**	mg/L	5.0	5.0	1		05/15/19 16:12		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.22**	mg/L	1.0	0.22	1		05/31/19 03:21	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/31/19 03:21	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		05/31/19 03:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-FB-2 **Lab ID: 60302527015** Collected: 05/08/19 14:30 Received: 05/10/19 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	05/24/19 09:48	05/24/19 18:40	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	05/24/19 09:48	05/24/19 18:40	7440-41-7	
Boron	**<10.7**	ug/L	100	10.7	1	05/24/19 09:48	05/24/19 18:40	7440-42-8	
Calcium	**<50.0**	ug/L	200	50.0	1	05/24/19 09:48	05/24/19 18:40	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	05/24/19 09:48	05/24/19 18:40	7440-48-4	
Iron	**<14.0**	ug/L	50.0	14.0	1	05/24/19 09:48	05/24/19 18:40	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	05/24/19 09:48	05/24/19 18:40	7439-92-1	
Lithium	**<5.9**	ug/L	10.0	5.9	1	05/24/19 09:48	05/24/19 18:40	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	05/24/19 09:48	05/24/19 18:40	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	05/24/19 09:48	05/24/19 18:40	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	05/24/19 09:48	05/24/19 18:40	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	05/24/19 09:48	05/24/19 18:40	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	05/24/19 09:48	05/24/19 18:40	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 16:59	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	05/28/19 10:14	05/30/19 15:32	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	05/28/19 10:14	05/30/19 15:32	7440-43-9	
Chromium	**<0.078**	ug/L	1.0	0.078	1	05/28/19 10:14	05/30/19 15:32	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	05/28/19 10:14	05/30/19 15:32	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	05/28/19 10:14	05/30/19 15:32	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	05/29/19 16:56	05/30/19 11:42	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		05/17/19 12:54		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**11.8**	mg/L	10.8	10.8	1		05/22/19 17:00		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.22**	mg/L	1.0	0.22	1		05/31/19 03:36	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		05/31/19 03:36	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		05/31/19 03:36	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2S **Lab ID: 60302527020** Collected: 08/20/19 10:15 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**347**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 16:53	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 16:53	7440-41-7	
Boron	**221**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 16:53	7440-42-8	
Calcium	**143000**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 16:53	7440-70-2	M1
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 16:53	7440-48-4	
Iron	**18400**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 16:53	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 16:53	7439-92-1	
Lithium	**27.3**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 16:53	7439-93-2	
Magnesium	**23000**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 16:53	7439-95-4	
Manganese	**768**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 16:53	7439-96-5	
Molybdenum	**22.4**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 16:53	7439-98-7	
Potassium	**5720**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 16:53	7440-09-7	
Sodium	**93300**	ug/L	500	144	1	08/29/19 08:35	08/29/19 16:53	7440-23-5	M1
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.086J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:53	7440-36-0	
Arsenic	**5.5**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 11:53	7440-38-2	
Cadmium	**0.051J**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 11:53	7440-43-9	
Chromium	**0.27J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:53	7440-47-3	
Selenium	**0.14J**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 11:53	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 11:53	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:10	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**534**	mg/L	20.0	6.5	1		09/03/19 17:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**721**	mg/L	10.0	10.0	1		08/29/19 09:03		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**47.3**	mg/L	5.0	1.1	5		09/11/19 18:31	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.085	1		09/10/19 22:33	16984-48-8	
Sulfate	**63.3**	mg/L	5.0	1.2	5		09/11/19 18:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2M **Lab ID: 60302527021** Collected: 08/20/19 11:00 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**120**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 17:00	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 17:00	7440-41-7	
Boron	**1250**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 17:00	7440-42-8	
Calcium	**98100**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 17:00	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 17:00	7440-48-4	
Iron	**3300**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 17:00	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 17:00	7439-92-1	
Lithium	**32.6**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 17:00	7439-93-2	
Magnesium	**14100**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 17:00	7439-95-4	
Manganese	**440**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 17:00	7439-96-5	
Molybdenum	**64.0**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 17:00	7439-98-7	
Potassium	**6390**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 17:00	7440-09-7	
Sodium	**61900**	ug/L	500	144	1	08/29/19 08:35	08/29/19 17:00	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.090J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:54	7440-36-0	
Arsenic	**0.48J**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 11:54	7440-38-2	
Cadmium	**0.050J**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 11:54	7440-43-9	
Chromium	**0.14J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:54	7440-47-3	
Selenium	**0.091J**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 11:54	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 11:54	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:12	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**281**	mg/L	20.0	6.5	1		09/03/19 17:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**541**	mg/L	10.0	10.0	1		08/29/19 09:03		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.2**	mg/L	2.0	0.44	2		09/10/19 23:17	16887-00-6	
Fluoride	**0.43**	mg/L	0.20	0.085	1		09/10/19 23:03	16984-48-8	
Sulfate	**149**	mg/L	20.0	4.6	20		09/11/19 00:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2D **Lab ID: 60302527022** Collected: 08/20/19 11:55 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**107**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 17:07	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 17:07	7440-41-7	
Boron	**1650**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 17:07	7440-42-8	
Calcium	**92200**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 17:07	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 17:07	7440-48-4	
Iron	**3570**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 17:07	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 17:07	7439-92-1	
Lithium	**37.7**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 17:07	7439-93-2	
Magnesium	**15700**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 17:07	7439-95-4	
Manganese	**302**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 17:07	7439-96-5	
Molybdenum	**119**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 17:07	7439-98-7	
Potassium	**5510**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 17:07	7440-09-7	
Sodium	**57000**	ug/L	500	144	1	08/29/19 08:35	08/29/19 17:07	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:56	7440-36-0	
Arsenic	**11.7**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 11:56	7440-38-2	
Cadmium	**0.054J**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 11:56	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 11:56	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 11:56	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 11:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:24	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**232**	mg/L	20.0	6.5	1		09/03/19 17:54		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**539**	mg/L	10.0	10.0	1		08/29/19 09:04		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**22.5**	mg/L	2.0	0.44	2		09/11/19 00:32	16887-00-6	
Fluoride	**0.42**	mg/L	0.20	0.085	1		09/11/19 00:17	16984-48-8	
Sulfate	**164**	mg/L	10.0	2.3	10		09/11/19 00:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4S **Lab ID: 60302527023** Collected: 08/20/19 15:30 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**257**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 17:09	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 17:09	7440-41-7	
Boron	**83.5J**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 17:09	7440-42-8	
Calcium	**93500**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 17:09	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 17:09	7440-48-4	
Iron	**16600**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 17:09	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 17:09	7439-92-1	
Lithium	**10.9**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 17:09	7439-93-2	
Magnesium	**29400**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 17:09	7439-95-4	
Manganese	**375**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 17:09	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 17:09	7439-98-7	
Potassium	**5140**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 17:09	7440-09-7	
Sodium	**23300**	ug/L	500	144	1	08/29/19 08:35	08/29/19 17:09	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.085J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:01	7440-36-0	
Arsenic	**71.2**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 12:01	7440-38-2	
Cadmium	**0.050J**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 12:01	7440-43-9	
Chromium	**0.22J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:01	7440-47-3	
Selenium	**0.20J**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 12:01	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 12:01	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:26	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**400**	mg/L	20.0	6.5	1		09/03/19 18:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**433**	mg/L	10.0	10.0	1		08/29/19 09:04		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.4**	mg/L	1.0	0.22	1		09/11/19 01:01	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	0.085	1		09/11/19 01:01	16984-48-8	
Sulfate	**18.4**	mg/L	1.0	0.23	1		09/11/19 01:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4M **Lab ID: 60302527024** Collected: 08/20/19 16:15 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**379**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 17:12	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 17:12	7440-41-7	
Boron	**463**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 17:12	7440-42-8	
Calcium	**109000**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 17:12	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 17:12	7440-48-4	
Iron	**7330**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 17:12	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 17:12	7439-92-1	
Lithium	**12.1**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 17:12	7439-93-2	
Magnesium	**21000**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 17:12	7439-95-4	
Manganese	**929**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 17:12	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 17:12	7439-98-7	
Potassium	**4430**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 17:12	7440-09-7	
Sodium	**20400**	ug/L	500	144	1	08/29/19 08:35	08/29/19 17:12	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.078**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:03	7440-36-0	
Arsenic	**6.1**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 12:03	7440-38-2	
Cadmium	**0.033J**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 12:03	7440-43-9	
Chromium	**0.15J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:03	7440-47-3	
Selenium	**0.11J**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 12:03	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 12:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:28	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**354**	mg/L	20.0	6.5	1		09/03/19 18:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**450**	mg/L	10.0	10.0	1		08/29/19 09:04		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.7**	mg/L	1.0	0.22	1		09/11/19 01:31	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.085	1		09/11/19 01:31	16984-48-8	
Sulfate	**44.2**	mg/L	5.0	1.2	5		09/11/19 01:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4D **Lab ID: 60302527025** Collected: 08/20/19 12:55 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**434**	ug/L	5.0	1.4	1	08/29/19 08:35	08/29/19 17:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	08/29/19 08:35	08/29/19 17:14	7440-41-7	
Boron	**4610**	ug/L	100	10.7	1	08/29/19 08:35	08/29/19 17:14	7440-42-8	
Calcium	**121000**	ug/L	200	50.0	1	08/29/19 08:35	08/29/19 17:14	7440-70-2	
Cobalt	**<0.84**	ug/L	5.0	0.84	1	08/29/19 08:35	08/29/19 17:14	7440-48-4	
Iron	**5320**	ug/L	50.0	14.0	1	08/29/19 08:35	08/29/19 17:14	7439-89-6	
Lead	**<3.4**	ug/L	10.0	3.4	1	08/29/19 08:35	08/29/19 17:14	7439-92-1	
Lithium	**22.5**	ug/L	10.0	5.9	1	08/29/19 08:35	08/29/19 17:14	7439-93-2	
Magnesium	**31800**	ug/L	50.0	13.0	1	08/29/19 08:35	08/29/19 17:14	7439-95-4	
Manganese	**320**	ug/L	5.0	2.1	1	08/29/19 08:35	08/29/19 17:14	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	08/29/19 08:35	08/29/19 17:14	7439-98-7	
Potassium	**4700**	ug/L	500	79.0	1	08/29/19 08:35	08/29/19 17:14	7440-09-7	
Sodium	**25600**	ug/L	500	144	1	08/29/19 08:35	08/29/19 17:14	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.35J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:05	7440-36-0	
Arsenic	**7.5**	ug/L	1.0	0.065	1	08/29/19 14:26	09/04/19 12:05	7440-38-2	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	08/29/19 14:26	09/04/19 12:05	7440-43-9	
Chromium	**0.28J**	ug/L	1.0	0.078	1	08/29/19 14:26	09/04/19 12:05	7440-47-3	
Selenium	**<0.085**	ug/L	1.0	0.085	1	08/29/19 14:26	09/04/19 12:05	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	08/29/19 14:26	09/04/19 12:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.037**	ug/L	0.20	0.037	1	08/29/19 11:49	08/30/19 13:30	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**318**	mg/L	20.0	6.5	1		09/03/19 18:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**603**	mg/L	10.0	10.0	1		08/29/19 09:04		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.9**	mg/L	1.0	0.22	1		09/11/19 02:01	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.085	1		09/11/19 02:01	16984-48-8	
Sulfate	**154**	mg/L	20.0	4.6	20		09/11/19 02:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 586214 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60302527001, 60302527002, 60302527003

METHOD BLANK: 2405202 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	05/23/19 17:21	

LABORATORY CONTROL SAMPLE: 2405203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.2	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405204 2405205

Parameter	Units	60302527003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	3.7	3.5	75	70	75-125	7	20	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 587034 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60302527004, 60302527005, 60302527006, 60302527007, 60302527008

METHOD BLANK: 2408464 Matrix: Water
Associated Lab Samples: 60302527004, 60302527005, 60302527006, 60302527007, 60302527008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	05/29/19 12:43	

LABORATORY CONTROL SAMPLE: 2408465

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2408466 2408467

Parameter	Units	60302527004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	5.0	4.9	101	99	75-125	2	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 587325 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

METHOD BLANK: 2409353 Matrix: Water
Associated Lab Samples: 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	05/30/19 11:14	

LABORATORY CONTROL SAMPLE: 2409354

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409355 2409356

Parameter	Units	60302527010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	4.8	4.8	96	96	75-125	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 606407 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2478429 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	08/30/19 12:58	

LABORATORY CONTROL SAMPLE: 2478430

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2478431 2478432

Parameter	Units	60302527021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.037	5	5	5.0	4.9	101	98	75-125	3	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 586620 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

METHOD BLANK: 2406484 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	05/24/19 17:53	
Beryllium	ug/L	<0.25	1.0	0.25	05/24/19 17:53	
Boron	ug/L	<10.7	100	10.7	05/24/19 17:53	
Calcium	ug/L	50.7J	200	50.0	05/24/19 17:53	
Cobalt	ug/L	<0.84	5.0	0.84	05/24/19 17:53	
Iron	ug/L	15.2J	50.0	14.0	05/24/19 17:53	
Lead	ug/L	<3.4	10.0	3.4	05/24/19 17:53	
Lithium	ug/L	<5.9	10.0	5.9	05/24/19 17:53	
Magnesium	ug/L	20.3J	50.0	13.0	05/24/19 17:53	
Manganese	ug/L	<2.1	5.0	2.1	05/24/19 17:53	
Molybdenum	ug/L	<2.6	20.0	2.6	05/24/19 17:53	
Potassium	ug/L	<79.0	500	79.0	05/24/19 17:53	
Sodium	ug/L	<144	500	144	05/24/19 17:53	

LABORATORY CONTROL SAMPLE: 2406485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	983	98	85-115	
Beryllium	ug/L	1000	986	99	85-115	
Boron	ug/L	1000	968	97	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Cobalt	ug/L	1000	1010	101	85-115	
Iron	ug/L	10000	9900	99	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	996	100	85-115	
Magnesium	ug/L	10000	9910	99	85-115	
Manganese	ug/L	1000	981	98	85-115	
Molybdenum	ug/L	1000	938	94	85-115	
Potassium	ug/L	10000	9800	98	85-115	
Sodium	ug/L	10000	9940	99	85-115	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2406486 2406487

Parameter	Units	60302527003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	1410	1000	1000	2360	2340	95	94	70-130	1	20	
Beryllium	ug/L	<0.25	1000	1000	958	969	96	97	70-130	1	20	
Boron	ug/L	56.6J	1000	1000	1020	1050	97	100	70-130	3	20	
Calcium	ug/L	132000	10000	10000	142000	139000	97	71	70-130	2	20	
Cobalt	ug/L	<0.84	1000	1000	960	978	96	98	70-130	2	20	
Iron	ug/L	8120	10000	10000	17500	17400	94	93	70-130	0	20	
Lead	ug/L	<3.4	1000	1000	968	992	97	99	70-130	2	20	
Lithium	ug/L	23.8	1000	1000	1020	1040	99	101	70-130	2	20	
Magnesium	ug/L	35000	10000	10000	44500	44500	95	95	70-130	0	20	
Manganese	ug/L	226	1000	1000	1170	1190	94	97	70-130	2	20	
Molybdenum	ug/L	<2.6	1000	1000	924	942	92	94	70-130	2	20	
Potassium	ug/L	4170	10000	10000	14000	14100	98	99	70-130	1	20	
Sodium	ug/L	11000	10000	10000	20800	20900	98	99	70-130	0	20	

MATRIX SPIKE SAMPLE: 2406488

Parameter	Units	60302527010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	551	1000	1510	96	70-130	
Beryllium	ug/L	<0.25	1000	970	97	70-130	
Boron	ug/L	374	1000	1340	97	70-130	
Calcium	ug/L	172000	10000	178000	63	70-130	M1
Cobalt	ug/L	4.5J	1000	969	96	70-130	
Iron	ug/L	4840	10000	14300	94	70-130	
Lead	ug/L	<3.4	1000	969	97	70-130	
Lithium	ug/L	33.8	1000	1050	101	70-130	
Magnesium	ug/L	38100	10000	46900	88	70-130	
Manganese	ug/L	1590	1000	2520	92	70-130	
Molybdenum	ug/L	2.9J	1000	932	93	70-130	
Potassium	ug/L	6750	10000	16600	99	70-130	
Sodium	ug/L	61200	10000	70100	88	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 606334 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2478172 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	08/29/19 16:48	
Beryllium	ug/L	<0.25	1.0	0.25	08/29/19 16:48	
Boron	ug/L	<10.7	100	10.7	08/29/19 16:48	
Calcium	ug/L	<50.0	200	50.0	08/29/19 16:48	
Cobalt	ug/L	<0.84	5.0	0.84	08/29/19 16:48	
Iron	ug/L	14.0J	50.0	14.0	08/29/19 16:48	
Lead	ug/L	<3.4	10.0	3.4	08/29/19 16:48	
Lithium	ug/L	<5.9	10.0	5.9	08/29/19 16:48	
Magnesium	ug/L	22.3J	50.0	13.0	08/29/19 16:48	
Manganese	ug/L	<2.1	5.0	2.1	08/29/19 16:48	
Molybdenum	ug/L	<2.6	20.0	2.6	08/29/19 16:48	
Potassium	ug/L	<79.0	500	79.0	08/29/19 16:48	
Sodium	ug/L	<144	500	144	08/29/19 16:48	

LABORATORY CONTROL SAMPLE: 2478173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	981	98	85-115	
Beryllium	ug/L	1000	985	98	85-115	
Boron	ug/L	1000	961	96	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Cobalt	ug/L	1000	985	98	85-115	
Iron	ug/L	10000	9890	99	85-115	
Lead	ug/L	1000	1050	105	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Magnesium	ug/L	10000	9750	98	85-115	
Manganese	ug/L	1000	984	98	85-115	
Molybdenum	ug/L	1000	985	99	85-115	
Potassium	ug/L	10000	9940	99	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2478174 2478175

Parameter	Units	60302527020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	347	1000	1000	1300	1330	96	98	70-130	2	20	
Beryllium	ug/L	<0.25	1000	1000	975	993	98	99	70-130	2	20	
Boron	ug/L	221	1000	1000	1200	1210	98	99	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2478174 2478175

Parameter	Units	60302527020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	143000	10000	10000	156000	159000	125	153	70-130	2	20	M1
Cobalt	ug/L	<0.84	1000	1000	952	968	95	97	70-130	2	20	
Iron	ug/L	18400	10000	10000	28300	28700	99	104	70-130	2	20	
Lead	ug/L	<3.4	1000	1000	1010	1020	101	102	70-130	2	20	
Lithium	ug/L	27.3	1000	1000	986	1010	96	98	70-130	2	20	
Magnesium	ug/L	23000	10000	10000	33100	33500	101	106	70-130	1	20	
Manganese	ug/L	768	1000	1000	1760	1780	99	101	70-130	1	20	
Molybdenum	ug/L	22.4	1000	1000	1010	1020	98	100	70-130	2	20	
Potassium	ug/L	5720	10000	10000	15700	16100	100	104	70-130	2	20	
Sodium	ug/L	93300	10000	10000	105000	106000	115	132	70-130	2	20	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 587012 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

METHOD BLANK: 2408417 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	05/30/19 16:38	
Arsenic	ug/L	<0.065	1.0	0.065	05/30/19 14:56	
Cadmium	ug/L	<0.033	0.50	0.033	05/30/19 14:56	
Chromium	ug/L	<0.078	1.0	0.078	05/30/19 14:56	
Selenium	ug/L	<0.085	1.0	0.085	05/30/19 14:56	
Thallium	ug/L	<0.099	1.0	0.099	05/30/19 14:56	

LABORATORY CONTROL SAMPLE: 2408418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.5	101	85-115	
Arsenic	ug/L	40	39.6	99	85-115	
Cadmium	ug/L	40	39.9	100	85-115	
Chromium	ug/L	40	40.1	100	85-115	
Selenium	ug/L	40	41.0	102	85-115	
Thallium	ug/L	40	38.3	96	85-115	

MATRIX SPIKE SAMPLE: 2408419

Parameter	Units	60302527001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.078	40	39.7	99	70-130	
Arsenic	ug/L	28.7	40	67.1	96	70-130	
Cadmium	ug/L	0.055J	40	38.9	97	70-130	
Chromium	ug/L	0.16J	40	39.0	97	70-130	
Selenium	ug/L	0.14J	40	39.2	98	70-130	
Thallium	ug/L	<0.099	40	36.9	92	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2408420 2408421

Parameter	Units	60302527010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.078	40	40	40.8	40.4	102	101	70-130	1	20	
Arsenic	ug/L	2.9	40	40	42.4	42.2	99	98	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2408420 2408421

Parameter	Units	60302527010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	ug/L	<0.033	40	40	39.1	38.9	98	97	70-130	1	20	
Chromium	ug/L	0.091J	40	40	40.4	39.9	101	99	70-130	1	20	
Selenium	ug/L	<0.085	40	40	39.4	38.4	98	96	70-130	3	20	
Thallium	ug/L	<0.099	40	40	36.6	36.7	92	92	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 606449 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2478608 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	09/04/19 11:49	
Arsenic	ug/L	<0.065	1.0	0.065	09/04/19 11:49	
Cadmium	ug/L	<0.033	0.50	0.033	09/04/19 11:49	
Chromium	ug/L	<0.078	1.0	0.078	09/04/19 11:49	
Selenium	ug/L	<0.085	1.0	0.085	09/04/19 11:49	
Thallium	ug/L	<0.099	1.0	0.099	09/04/19 11:49	

LABORATORY CONTROL SAMPLE: 2478609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.5	94	85-115	
Arsenic	ug/L	40	39.5	99	85-115	
Cadmium	ug/L	40	39.6	99	85-115	
Chromium	ug/L	40	39.5	99	85-115	
Selenium	ug/L	40	40.1	100	85-115	
Thallium	ug/L	40	37.3	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2478610 2478611

Parameter	Units	60302527022 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.078	40	40	36.8	37.1	92	93	70-130	1	20	
Arsenic	ug/L	11.7	40	40	52.0	52.0	101	101	70-130	0	20	
Cadmium	ug/L	0.054J	40	40	37.5	37.8	94	94	70-130	1	20	
Chromium	ug/L	0.11J	40	40	41.9	42.1	104	105	70-130	1	20	
Selenium	ug/L	<0.085	40	40	38.0	38.1	95	95	70-130	0	20	
Thallium	ug/L	<0.099	40	40	38.5	38.8	96	97	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 584935 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527010, 60302527011, 60302527012

METHOD BLANK: 2400210 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527010, 60302527011, 60302527012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/16/19 16:59	

LABORATORY CONTROL SAMPLE: 2400211

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	494	99	90-110	

SAMPLE DUPLICATE: 2400212

Parameter	Units	60302527003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	471	486	3	10	

SAMPLE DUPLICATE: 2400213

Parameter	Units	60302527010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	474	472	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 585263 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60302527004, 60302527013, 60302527014, 60302527015

METHOD BLANK: 2401500 Matrix: Water
Associated Lab Samples: 60302527004, 60302527013, 60302527014, 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/17/19 12:29	

LABORATORY CONTROL SAMPLE: 2401501

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

SAMPLE DUPLICATE: 2401502

Parameter	Units	60302527013 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	498	495	1	10	

SAMPLE DUPLICATE: 2401503

Parameter	Units	60302446001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	202	197	3	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 585265 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60302527005, 60302527006, 60302527007, 60302527008, 60302527009

METHOD BLANK: 2401509 Matrix: Water
Associated Lab Samples: 60302527005, 60302527006, 60302527007, 60302527008, 60302527009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	05/17/19 16:24	

LABORATORY CONTROL SAMPLE: 2401510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	502	100	90-110	

SAMPLE DUPLICATE: 2401511

Parameter	Units	60302527005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	292	288	1	10	

SAMPLE DUPLICATE: 2401512

Parameter	Units	60302659006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	240	243	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 606955 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2480597 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	09/03/19 15:35	

LABORATORY CONTROL SAMPLE: 2480598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	489	98	90-110	

SAMPLE DUPLICATE: 2480599

Parameter	Units	60312724002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	654	671	3	10	

SAMPLE DUPLICATE: 2480600

Parameter	Units	60312565003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	<6.5		10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 584817 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014

METHOD BLANK: 2399588 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/15/19 16:02	

LABORATORY CONTROL SAMPLE: 2399589

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

SAMPLE DUPLICATE: 2399590

Parameter	Units	60302398001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	746	772	3	10	

SAMPLE DUPLICATE: 2399591

Parameter	Units	60302527003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	581	557	4	10	

SAMPLE DUPLICATE: 2399592

Parameter	Units	60302527010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	931	939	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 585009 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009

METHOD BLANK: 2400558 Matrix: Water
Associated Lab Samples: 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/16/19 14:01	

LABORATORY CONTROL SAMPLE: 2400559

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

SAMPLE DUPLICATE: 2400560

Parameter	Units	60302496003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	664	652	2	10	

SAMPLE DUPLICATE: 2400561

Parameter	Units	60302589004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	957	960	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 586350 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60302527015

METHOD BLANK: 2405574 Matrix: Water
Associated Lab Samples: 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/22/19 16:58	

LABORATORY CONTROL SAMPLE: 2405575

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

SAMPLE DUPLICATE: 2405576

Parameter	Units	60303029001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	531	97.0	138	10	D6

SAMPLE DUPLICATE: 2405577

Parameter	Units	60303174002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1380	1390	1	10	

SAMPLE DUPLICATE: 2405578

Parameter	Units	60303078003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	519	529	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 606319 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2478126 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/29/19 09:03	

LABORATORY CONTROL SAMPLE: 2478127

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

SAMPLE DUPLICATE: 2478128

Parameter	Units	60312794005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	346	346	0	10	

SAMPLE DUPLICATE: 2478129

Parameter	Units	60312794013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	312	318	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 587622 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

METHOD BLANK: 2410440 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	05/30/19 11:43	
Fluoride	mg/L	<0.085	0.20	0.085	05/30/19 11:43	
Sulfate	mg/L	<0.23	1.0	0.23	05/30/19 11:43	

LABORATORY CONTROL SAMPLE: 2410441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2410442 2410443

Parameter	Units	60302527003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	24.7	10	10	35.4	35.6	107	109	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2410444 2410445

Parameter	Units	60302527010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	<4.2	2.5	2.5	2.9	3.0	112	114	80-120	1	15	
Sulfate	mg/L	24.0J	25	25	42.2	42.5	98	99	80-120	1	15	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 587875 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60302527003, 60302527011, 60302527012, 60302527013

METHOD BLANK: 2411258 Matrix: Water
Associated Lab Samples: 60302527003, 60302527010, 60302527011, 60302527012, 60302527013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	05/31/19 10:08	
Fluoride	mg/L	<0.085	0.20	0.085	05/31/19 10:08	
Sulfate	mg/L	<0.23	1.0	0.23	05/31/19 10:08	

LABORATORY CONTROL SAMPLE: 2411259

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2411260 2411261

Parameter	Units	60302527003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.1	5	5	8.9	8.9	97	96	80-120	1	15	
Fluoride	mg/L	0.23	2.5	2.5	2.6	2.6	96	95	80-120	1	15	
Sulfate	mg/L	24.7	5	5	30.1	30.1	108	107	80-120	0	15	E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2411262 2411263

Parameter	Units	60302527010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	175	250	250	418	415	97	96	80-120	1	15	
Fluoride	mg/L	<4.2	125	125	124	123	99	98	80-120	1	15	
Sulfate	mg/L	24.0J	250	250	271	268	99	98	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2411265 2411266

Parameter	Units	60303293015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3080	2500	2500	6090	5880	120	112	80-120	4	15	
Fluoride	mg/L	ND	1250	1250	1180	1250	94	100	80-120	6	15	
Sulfate	mg/L	ND	2500	2500	2880	2910	99	100	80-120	1	15	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 608445 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 2485576 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.43J	1.0	0.22	09/10/19 10:44	
Fluoride	mg/L	<0.085	0.20	0.085	09/10/19 10:44	
Sulfate	mg/L	<0.23	1.0	0.23	09/10/19 10:44	

LABORATORY CONTROL SAMPLE: 2485577

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE SAMPLE: 2485578

Parameter	Units	60313886001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	610	500	1050	88	80-120	
Fluoride	mg/L	<20.0	250	261	104	80-120	
Sulfate	mg/L	1460	500	1910	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2485580 2485581

Parameter	Units	60313883001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	8.5	2.5	2.5	11.2	11.3	108	110	80-120	0	15	E

SAMPLE DUPLICATE: 2485623

Parameter	Units	60313885001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1070	1090	1	15	
Fluoride	mg/L	1.3	1.4	1	15	
Sulfate	mg/L	2290	2330	2	15	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 608637 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60302527020

METHOD BLANK: 2486357 Matrix: Water
Associated Lab Samples: 60302527020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.34J	1.0	0.22	09/11/19 10:28	
Sulfate	mg/L	<0.23	1.0	0.23	09/11/19 10:28	

LABORATORY CONTROL SAMPLE: 2486358

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2486359 2486360

Parameter	Units	60313341002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	194000	50000	50000	276000	276000	165	164	80-120	0	15	E,M1
Sulfate	mg/L	ND	50000	50000	75000	82500	143	158	80-120	9	15	M1

MATRIX SPIKE SAMPLE: 2486361

Parameter	Units	60313615004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.7	5	6.5	95	80-120	
Sulfate	mg/L	15.2	5	20.5	106	80-120	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.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1S **Lab ID: 60302527001** Collected: 05/08/19 17:20 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.436 ± 0.535 (0.879) C:NA T:85%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**0.378 ± 0.335 (0.678) C:78% T:93%**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1M **Lab ID: 60302527002** Collected: 05/08/19 16:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**2.04 ± 0.716 (0.158) C:NA T:92%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**1.25 ± 0.467 (0.679) C:80% T:82%**	pCi/L	05/30/19 16:07	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1D **Lab ID: 60302527003** Collected: 05/08/19 15:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**2.02 ± 0.777 (0.585) C:NA T:82%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**3.43 ± 0.839 (0.688) C:75% T:85%**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3S **Lab ID: 60302527004** Collected: 05/09/19 10:30 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.555 ± 0.350 (0.150) C:NA T:88%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**1.13 ± 0.423 (0.621) C:80% T:94%**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3M **Lab ID: 60302527005** Collected: 05/09/19 10:25 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.657 ± 0.409 (0.403) C:NA T:93%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**0.502 ± 0.596 (1.26) C:79% T:88%**	pCi/L	05/30/19 20:06	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-3D **Lab ID: 60302527006** Collected: 05/09/19 11:10 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.24 ± 0.550 (0.160) C:NA T:91%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**0.519 ± 0.532 (1.10) C:82% T:84%**	pCi/L	05/30/19 20:06	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5S **Lab ID: 60302527007** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.08 ± 0.684 (0.882) C:NA T:80%**	pCi/L	06/05/19 16:42	13982-63-3	
Radium-228	EPA 904.0	**0.659 ± 0.519 (1.03) C:79% T:88%**	pCi/L	05/30/19 18:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5M **Lab ID: 60302527008** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**2.19 ± 0.761 (0.165) C:NA T:92%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.745 ± 0.511 (0.978) C:77% T:89%**	pCi/L	05/30/19 18:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-5D **Lab ID: 60302527009** Collected: 05/09/19 13:30 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection time on containers does not match COC; client was notified.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.46 ± 0.674 (0.654) C:NA T:83%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.904 ± 0.511 (0.924) C:80% T:92%**	pCi/L	05/30/19 18:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10S (AMW-1S) **Lab ID: 60302527010** Collected: 05/08/19 14:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.792 ± 0.436 (0.388) C:NA T:94%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.668 ± 0.376 (0.660) C:73% T:84%**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10D (AMW-1D) **Lab ID: 60302527011** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.10 ± 0.540 (0.176) C:NA T:80%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**1.22 ± 0.684 (1.25) C:77% T:84%**	pCi/L	05/30/19 20:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-DUP-1 **Lab ID: 60302527012** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.434 ± 0.368 (0.456) C:NA T:87%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.679 ± 0.556 (1.11) C:78% T:90%**	pCi/L	05/30/19 20:09	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-DUP-2 **Lab ID: 60302527013** Collected: 05/08/19 16:00 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.77 ± 0.686 (0.434) C:NA T:91%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**1.19 ± 0.699 (1.30) C:77% T:87%**	pCi/L	05/30/19 20:10	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-FB-1 **Lab ID: 60302527014** Collected: 05/08/19 17:25 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.0658 ± 0.532 (1.10) C:NA T:85%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.0539 ± 0.542 (1.25) C:78% T:79%**	pCi/L	05/30/19 20:10	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-NE-FB-2 **Lab ID: 60302527015** Collected: 05/08/19 14:30 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.316 ± 0.512 (0.891) C:NA T:78%**	pCi/L	06/05/19 16:57	13982-63-3	
Radium-228	EPA 904.0	**0.706 ± 0.571 (1.13) C:80% T:79%**	pCi/L	05/30/19 20:10	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1D MS **Lab ID: 60302527016** Collected: 05/08/19 15:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**98.43 %REC ± NA (NA) C:NA T:NA**	pCi/L	06/05/19 17:09	13982-63-3	
Radium-228	EPA 904.0	**76.49 %REC ± NA (NA) C:NA T:NA**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-1D MSD **Lab ID: 60302527017** Collected: 05/08/19 15:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**72.20 %REC 30.74 RPD ± NA (NA) C:NA T:NA**	pCi/L	06/05/19 17:09	13982-63-3	
Radium-228	EPA 904.0	**85.89 %REC 11.58 RPD ± NA (NA) C:NA T:NA**	pCi/L	05/30/19 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10S (AMW-1S) MS **Lab ID: 60302527018** Collected: 05/08/19 14:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**112.84 % REC ± NA (NA) C:NA T:NA**	pCi/L	06/05/19 17:09	13982-63-3	
Radium-228	EPA 904.0	**98.75 %REC ± NA (NA) C:NA T:NA**	pCi/L	06/03/19 13:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-UMW-10S (AMW-1S) MSD **Lab ID: 60302527019** Collected: 05/08/19 14:50 Received: 05/10/19 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**127.59 % REC 12.27 RPD ± NA (NA) C:NA T:NA**	pCi/L	06/05/19 17:09	13982-63-3	
Radium-228	EPA 904.0	**91.06 %REC 8.11 RPD ± NA (NA) C:NA T:NA**	pCi/L	06/03/19 13:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2S **Lab ID: 60302527020** Collected: 08/20/19 10:15 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0607 ± 0.277 (0.563) C:NA T:97%**	pCi/L	09/04/19 13:49	13982-63-3	
Radium-228	EPA 904.0	**0.433 ± 0.430 (0.892) C:83% T:82%**	pCi/L	09/03/19 16:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2M **Lab ID: 60302527021** Collected: 08/20/19 11:00 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.42 ± 0.720 (0.693) C:NA T:84%**	pCi/L	09/04/19 13:49	13982-63-3	
Radium-228	EPA 904.0	**1.51 ± 0.505 (0.667) C:81% T:83%**	pCi/L	09/03/19 16:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-2D **Lab ID: 60302527022** Collected: 08/20/19 11:55 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.08 ± 0.684 (0.883) C:NA T:94%**	pCi/L	09/04/19 13:49	13982-63-3	
Radium-228	EPA 904.0	**0.524 ± 0.364 (0.700) C:81% T:89%**	pCi/L	09/03/19 16:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4S **Lab ID: 60302527023** Collected: 08/20/19 15:30 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.14 ± 0.569 (0.464) C:NA T:98%**	pCi/L	09/04/19 14:02	13982-63-3	
Radium-228	EPA 904.0	**0.0893 ± 0.325 (0.736) C:83% T:80%**	pCi/L	09/03/19 16:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4M **Lab ID: 60302527024** Collected: 08/20/19 16:15 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.416 ± 0.337 (0.188) C:NA T:99%**	pCi/L	09/04/19 14:02	13982-63-3	
Radium-228	EPA 904.0	**0.881 ± 0.448 (0.795) C:80% T:85%**	pCi/L	09/03/19 16:39	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Sample: L-TP-4D **Lab ID: 60302527025** Collected: 08/20/19 12:55 Received: 08/22/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.79 ± 0.877 (0.937) C:NA T:86%**	pCi/L	09/04/19 14:02	13982-63-3	
Radium-228	EPA 904.0	**1.11 ± 0.474 (0.771) C:80% T:86%**	pCi/L	09/03/19 16:38	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 358893 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 1742542 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.199 ± 0.332 (0.723) C:82% T:82%	pCi/L	09/03/19 16:38	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 342777 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015, 60302527016, 60302527017, 60302527018, 60302527019

METHOD BLANK: 1668423 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015, 60302527016, 60302527017, 60302527018, 60302527019

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.330 ± 0.292 (0.587) C:84% T:93%	pCi/L	05/30/19 16:07	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 342776 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015, 60302527016, 60302527017, 60302527018, 60302527019

METHOD BLANK: 1668422 Matrix: Water
Associated Lab Samples: 60302527001, 60302527002, 60302527003, 60302527004, 60302527005, 60302527006, 60302527007, 60302527008, 60302527009, 60302527010, 60302527011, 60302527012, 60302527013, 60302527014, 60302527015, 60302527016, 60302527017, 60302527018, 60302527019

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.522 ± 0.413 (0.562) C:NA T:83%	pCi/L	06/05/19 16:42	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

QC Batch: 358892 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

METHOD BLANK: 1742541 Matrix: Water
Associated Lab Samples: 60302527020, 60302527021, 60302527022, 60302527023, 60302527024, 60302527025

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.463 ± 0.368 (0.478) C:NA T:91%	pCi/L	09/04/19 13:36	

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 LABADIE ENERGY CTR
Pace Project No.: 60302527

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60302527001	L-TP-1S	EPA 200.7	586620	EPA 200.7	586751
60302527002	L-TP-1M	EPA 200.7	586620	EPA 200.7	586751
60302527003	L-TP-1D	EPA 200.7	586620	EPA 200.7	586751
60302527004	L-TP-3S	EPA 200.7	586620	EPA 200.7	586751
60302527005	L-TP-3M	EPA 200.7	586620	EPA 200.7	586751
60302527006	L-TP-3D	EPA 200.7	586620	EPA 200.7	586751
60302527007	L-TP-5S	EPA 200.7	586620	EPA 200.7	586751
60302527008	L-TP-5M	EPA 200.7	586620	EPA 200.7	586751
60302527009	L-TP-5D	EPA 200.7	586620	EPA 200.7	586751
60302527010	L-UMW-10S (AMW-1S)	EPA 200.7	586620	EPA 200.7	586751
60302527011	L-UMW-10D (AMW-1D)	EPA 200.7	586620	EPA 200.7	586751
60302527012	L-NE-DUP-1	EPA 200.7	586620	EPA 200.7	586751
60302527013	L-NE-DUP-2	EPA 200.7	586620	EPA 200.7	586751
60302527014	L-NE-FB-1	EPA 200.7	586620	EPA 200.7	586751
60302527015	L-NE-FB-2	EPA 200.7	586620	EPA 200.7	586751
60302527020	L-TP-2S	EPA 200.7	606334	EPA 200.7	606381
60302527021	L-TP-2M	EPA 200.7	606334	EPA 200.7	606381
60302527022	L-TP-2D	EPA 200.7	606334	EPA 200.7	606381
60302527023	L-TP-4S	EPA 200.7	606334	EPA 200.7	606381
60302527024	L-TP-4M	EPA 200.7	606334	EPA 200.7	606381
60302527025	L-TP-4D	EPA 200.7	606334	EPA 200.7	606381
60302527001	L-TP-1S	EPA 200.8	587012	EPA 200.8	587056
60302527002	L-TP-1M	EPA 200.8	587012	EPA 200.8	587056
60302527003	L-TP-1D	EPA 200.8	587012	EPA 200.8	587056
60302527004	L-TP-3S	EPA 200.8	587012	EPA 200.8	587056
60302527005	L-TP-3M	EPA 200.8	587012	EPA 200.8	587056
60302527006	L-TP-3D	EPA 200.8	587012	EPA 200.8	587056
60302527007	L-TP-5S	EPA 200.8	587012	EPA 200.8	587056
60302527008	L-TP-5M	EPA 200.8	587012	EPA 200.8	587056
60302527009	L-TP-5D	EPA 200.8	587012	EPA 200.8	587056
60302527010	L-UMW-10S (AMW-1S)	EPA 200.8	587012	EPA 200.8	587056
60302527011	L-UMW-10D (AMW-1D)	EPA 200.8	587012	EPA 200.8	587056
60302527012	L-NE-DUP-1	EPA 200.8	587012	EPA 200.8	587056
60302527013	L-NE-DUP-2	EPA 200.8	587012	EPA 200.8	587056
60302527014	L-NE-FB-1	EPA 200.8	587012	EPA 200.8	587056
60302527015	L-NE-FB-2	EPA 200.8	587012	EPA 200.8	587056
60302527020	L-TP-2S	EPA 200.8	606449	EPA 200.8	606513
60302527021	L-TP-2M	EPA 200.8	606449	EPA 200.8	606513
60302527022	L-TP-2D	EPA 200.8	606449	EPA 200.8	606513
60302527023	L-TP-4S	EPA 200.8	606449	EPA 200.8	606513
60302527024	L-TP-4M	EPA 200.8	606449	EPA 200.8	606513
60302527025	L-TP-4D	EPA 200.8	606449	EPA 200.8	606513
60302527001	L-TP-1S	EPA 7470	586214	EPA 7470	586383
60302527002	L-TP-1M	EPA 7470	586214	EPA 7470	586383
60302527003	L-TP-1D	EPA 7470	586214	EPA 7470	586383
60302527004	L-TP-3S	EPA 7470	587034	EPA 7470	587159

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60302527005	**L-TP-3M**	EPA 7470	587034	EPA 7470	587159
60302527006	**L-TP-3D**	EPA 7470	587034	EPA 7470	587159
60302527007	**L-TP-5S**	EPA 7470	587034	EPA 7470	587159
60302527008	**L-TP-5M**	EPA 7470	587034	EPA 7470	587159
60302527009	**L-TP-5D**	EPA 7470	587325	EPA 7470	587547
60302527010	**L-UMW-10S (AMW-1S)**	EPA 7470	587325	EPA 7470	587547
60302527011	**L-UMW-10D (AMW-1D)**	EPA 7470	587325	EPA 7470	587547
60302527012	**L-NE-DUP-1**	EPA 7470	587325	EPA 7470	587547
60302527013	**L-NE-DUP-2**	EPA 7470	587325	EPA 7470	587547
60302527014	**L-NE-FB-1**	EPA 7470	587325	EPA 7470	587547
60302527015	**L-NE-FB-2**	EPA 7470	587325	EPA 7470	587547
60302527020	**L-TP-2S**	EPA 7470	606407	EPA 7470	606463
60302527021	**L-TP-2M**	EPA 7470	606407	EPA 7470	606463
60302527022	**L-TP-2D**	EPA 7470	606407	EPA 7470	606463
60302527023	**L-TP-4S**	EPA 7470	606407	EPA 7470	606463
60302527024	**L-TP-4M**	EPA 7470	606407	EPA 7470	606463
60302527025	**L-TP-4D**	EPA 7470	606407	EPA 7470	606463
60302527001	**L-TP-1S**	EPA 903.1	342776		
60302527002	**L-TP-1M**	EPA 903.1	342776		
60302527003	**L-TP-1D**	EPA 903.1	342776		
60302527004	**L-TP-3S**	EPA 903.1	342776		
60302527005	**L-TP-3M**	EPA 903.1	342776		
60302527006	**L-TP-3D**	EPA 903.1	342776		
60302527007	**L-TP-5S**	EPA 903.1	342776		
60302527008	**L-TP-5M**	EPA 903.1	342776		
60302527009	**L-TP-5D**	EPA 903.1	342776		
60302527010	**L-UMW-10S (AMW-1S)**	EPA 903.1	342776		
60302527011	**L-UMW-10D (AMW-1D)**	EPA 903.1	342776		
60302527012	**L-NE-DUP-1**	EPA 903.1	342776		
60302527013	**L-NE-DUP-2**	EPA 903.1	342776		
60302527014	**L-NE-FB-1**	EPA 903.1	342776		
60302527015	**L-NE-FB-2**	EPA 903.1	342776		
60302527016	**L-TP-1D MS**	EPA 903.1	342776		
60302527017	**L-TP-1D MSD**	EPA 903.1	342776		
60302527018	**L-UMW-10S (AMW-1S) MS**	EPA 903.1	342776		
60302527019	**L-UMW-10S (AMW-1S) MSD**	EPA 903.1	342776		
60302527020	**L-TP-2S**	EPA 903.1	358892		
60302527021	**L-TP-2M**	EPA 903.1	358892		
60302527022	**L-TP-2D**	EPA 903.1	358892		
60302527023	**L-TP-4S**	EPA 903.1	358892		
60302527024	**L-TP-4M**	EPA 903.1	358892		
60302527025	**L-TP-4D**	EPA 903.1	358892		
60302527001	**L-TP-1S**	EPA 904.0	342777		
60302527002	**L-TP-1M**	EPA 904.0	342777		
60302527003	**L-TP-1D**	EPA 904.0	342777		
60302527004	**L-TP-3S**	EPA 904.0	342777		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60302527005	**L-TP-3M**	EPA 904.0	342777		
60302527006	**L-TP-3D**	EPA 904.0	342777		
60302527007	**L-TP-5S**	EPA 904.0	342777		
60302527008	**L-TP-5M**	EPA 904.0	342777		
60302527009	**L-TP-5D**	EPA 904.0	342777		
60302527010	**L-UMW-10S (AMW-1S)**	EPA 904.0	342777		
60302527011	**L-UMW-10D (AMW-1D)**	EPA 904.0	342777		
60302527012	**L-NE-DUP-1**	EPA 904.0	342777		
60302527013	**L-NE-DUP-2**	EPA 904.0	342777		
60302527014	**L-NE-FB-1**	EPA 904.0	342777		
60302527015	**L-NE-FB-2**	EPA 904.0	342777		
60302527016	**L-TP-1D MS**	EPA 904.0	342777		
60302527017	**L-TP-1D MSD**	EPA 904.0	342777		
60302527018	**L-UMW-10S (AMW-1S) MS**	EPA 904.0	342777		
60302527019	**L-UMW-10S (AMW-1S) MSD**	EPA 904.0	342777		
60302527020	**L-TP-2S**	EPA 904.0	358893		
60302527021	**L-TP-2M**	EPA 904.0	358893		
60302527022	**L-TP-2D**	EPA 904.0	358893		
60302527023	**L-TP-4S**	EPA 904.0	358893		
60302527024	**L-TP-4M**	EPA 904.0	358893		
60302527025	**L-TP-4D**	EPA 904.0	358893		
60302527001	**L-TP-1S**	SM 2320B	584935		
60302527002	**L-TP-1M**	SM 2320B	584935		
60302527003	**L-TP-1D**	SM 2320B	584935		
60302527004	**L-TP-3S**	SM 2320B	585263		
60302527005	**L-TP-3M**	SM 2320B	585265		
60302527006	**L-TP-3D**	SM 2320B	585265		
60302527007	**L-TP-5S**	SM 2320B	585265		
60302527008	**L-TP-5M**	SM 2320B	585265		
60302527009	**L-TP-5D**	SM 2320B	585265		
60302527010	**L-UMW-10S (AMW-1S)**	SM 2320B	584935		
60302527011	**L-UMW-10D (AMW-1D)**	SM 2320B	584935		
60302527012	**L-NE-DUP-1**	SM 2320B	584935		
60302527013	**L-NE-DUP-2**	SM 2320B	585263		
60302527014	**L-NE-FB-1**	SM 2320B	585263		
60302527015	**L-NE-FB-2**	SM 2320B	585263		
60302527020	**L-TP-2S**	SM 2320B	606955		
60302527021	**L-TP-2M**	SM 2320B	606955		
60302527022	**L-TP-2D**	SM 2320B	606955		
60302527023	**L-TP-4S**	SM 2320B	606955		
60302527024	**L-TP-4M**	SM 2320B	606955		
60302527025	**L-TP-4D**	SM 2320B	606955		
60302527001	**L-TP-1S**	SM 2540C	584817		
60302527002	**L-TP-1M**	SM 2540C	584817		
60302527003	**L-TP-1D**	SM 2540C	584817		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60302527004	**L-TP-3S**	SM 2540C	585009		
60302527005	**L-TP-3M**	SM 2540C	585009		
60302527006	**L-TP-3D**	SM 2540C	585009		
60302527007	**L-TP-5S**	SM 2540C	585009		
60302527008	**L-TP-5M**	SM 2540C	585009		
60302527009	**L-TP-5D**	SM 2540C	585009		
60302527010	**L-UMW-10S (AMW-1S)**	SM 2540C	584817		
60302527011	**L-UMW-10D (AMW-1D)**	SM 2540C	584817		
60302527012	**L-NE-DUP-1**	SM 2540C	584817		
60302527013	**L-NE-DUP-2**	SM 2540C	584817		
60302527014	**L-NE-FB-1**	SM 2540C	584817		
60302527015	**L-NE-FB-2**	SM 2540C	586350		
60302527020	**L-TP-2S**	SM 2540C	606319		
60302527021	**L-TP-2M**	SM 2540C	606319		
60302527022	**L-TP-2D**	SM 2540C	606319		
60302527023	**L-TP-4S**	SM 2540C	606319		
60302527024	**L-TP-4M**	SM 2540C	606319		
60302527025	**L-TP-4D**	SM 2540C	606319		
60302527001	**L-TP-1S**	EPA 300.0	587622		
60302527002	**L-TP-1M**	EPA 300.0	587622		
60302527003	**L-TP-1D**	EPA 300.0	587622		
60302527003	**L-TP-1D**	EPA 300.0	587875		
60302527004	**L-TP-3S**	EPA 300.0	587622		
60302527005	**L-TP-3M**	EPA 300.0	587622		
60302527006	**L-TP-3D**	EPA 300.0	587622		
60302527007	**L-TP-5S**	EPA 300.0	587622		
60302527008	**L-TP-5M**	EPA 300.0	587622		
60302527009	**L-TP-5D**	EPA 300.0	587622		
60302527010	**L-UMW-10S (AMW-1S)**	EPA 300.0	587622		
60302527011	**L-UMW-10D (AMW-1D)**	EPA 300.0	587622		
60302527011	**L-UMW-10D (AMW-1D)**	EPA 300.0	587875		
60302527012	**L-NE-DUP-1**	EPA 300.0	587622		
60302527012	**L-NE-DUP-1**	EPA 300.0	587875		
60302527013	**L-NE-DUP-2**	EPA 300.0	587622		
60302527013	**L-NE-DUP-2**	EPA 300.0	587875		
60302527014	**L-NE-FB-1**	EPA 300.0	587622		
60302527015	**L-NE-FB-2**	EPA 300.0	587622		
60302527020	**L-TP-2S**	EPA 300.0	608445		
60302527020	**L-TP-2S**	EPA 300.0	608637		
60302527021	**L-TP-2M**	EPA 300.0	608445		
60302527022	**L-TP-2D**	EPA 300.0	608445		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR
Pace Project No.: 60302527

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60302527023	**L-TP-4S**	EPA 300.0	608445		
60302527024	**L-TP-4M**	EPA 300.0	608445		
60302527025	**L-TP-4D**	EPA 300.0	608445		

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60302527

60302527

Client Name: Golder Assoc.

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

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

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

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

Thermometer Used: T200 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 14.8 **Corr. Factor** +0.4 **Corrected** 15.2

Date and initials of person examining contents: 5.10.19 WS

Temperature should be above freezing to 6°C 17.2, 17.7, 1.7, 0.4, 0.6 17.6, 18.1, 2.1, 0.8, 1.0

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church 5/10/19 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406-01.0001 (COC #10)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER (circled) | DRINKING WATER
UST | RCRA | OTHER ____

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes — MATRIX / CODE: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

Requested Analysis Filtered (Y/N): Metals* N, Mercury N, Chloride/Fluoride/Sulfate N, TDS N, Alkalinity N, Radium 226 N, Radium 228 N

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./Lab I.D. 60302527
1	L-TP-1S	WT	G			5/8/19	1720		5	2		3						X	X	X	X	X	X	X		2BP1N, BP2U, BP3N, BP3U 001
2	L-TP-1M	WT	G			5/8/19	1650		5	2		3						↓	↓	↓	↓	↓	↓	↓		↓ 002
3	L-TP-1D	WT	G			5/8/19	1550		15	6		9						↓	↓	↓	↓	↓	↓	↓		6BP1N, 3BP2U, 3BP3N, 3BP3U 003
4	L-TP-2S	WT	G																							
5	L-TP-2M	WT	G																							
6	L-TP-2D	WT	G																							
7	L-TP-3S	WT	G			5/9/19	1030		5	2		3						X	X	X	X	X	X	X		2BP1N, BP2U, BP3N, BP3U 004
8	L-TP-3M	WT	G				1025		5	2		3						↓	↓	↓	↓	↓	↓	↓		005
9	L-TP-3D	WT	G			↓	1110		5	2		3						↓	↓	↓	↓	↓	↓	↓		↓ 006
10	L-TP-4S	WT	G																							
11	L-TP-4M	WT	G																							
12	L-TP-4D	WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	[signature] / Golder	5/9/19	1738	[signature] / Pace	5-10-19	0325	

Sample Conditions:

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
15.2 / 17.6 / 18.1 / 2.1 / 0.8 / 1.0	N / N / Y / ↓	Y ↓	Y ↓

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/09/19

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-01.0001 (COC #10)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Mercury	Chloride/Fluoride/Sulfate	TDS	Alkalinity		Radium 226	Radium 228					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																		N	N	N	N	N		N	N				
1	L-TP-5S	WT	G			5/9/19	1330		5	2		3						X	X	X	X	X		X	X	2	BP1N			N	BP2U, BP3N, BP3U 006
2	L-TP-5M	WT	G				1330																								007
3	L-TP-5D	WT	G				1430																								008
4	L-UMW-10S (AMW-1S)	WT	G			5/8/19	1450		5	2		3						X	X	X	X	X		X	X	6	6BP1N			N	3BP2U, 3BP3N, 3BP3U 010
5	L-UMW-10D (AMW-1D)	WT	G			5/8/19	1600																			2	2BP1N			N	BP2U, BP3N, BP3U 011
6	L-NE-DUP-1	WT	G			5/8/19	—																								012
7	L-NE-DUP-2	WT	G			5/8/19	—																								013
8	L-NE-FB-1	WT	G			5/8/19	1725																								014
9	L-NE-FB-2	WT	G			5/9/19	1430																								015
10		WT	G																												
11		WT	G																												
12		WT	G																												

6030252 7

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Be, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na *EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Golder	5/9/19	1738		5/10/19	0825	15.2	N	Y	Y
							17.6			
							18.1			
							2.1			
							0.5			
							1.0			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Adkins

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 05/09/19

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60302527

60302527

Client Name: Golder

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

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

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

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

Thermometer Used: T295 **Type of Ice:** Wet Blue ☑ None

Cooler Temperature (°C): As-read 0.9/21.9 Corr. Factor -0.2 Corrected 0.7/21.7

Date and initials of person examining contents: 8/22/19 HF

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/,Resolution: _____

Jami Church 8/22/19

Project Manager Review: _____ Date:

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

2013252

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr. Ste 260, Ballwin MO 63021
Email To:	maddock@golder.com
Phone:	636-724-9191
Fax:	636-724-7323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock (Mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Labadie EL N+E
Project Number:	153140601.0001

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Metals*	Chloride/Fluoride/Sulfate	Alkalinity / TDS	Radium 226 & 228	Radium 228	Mercury	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-TP-2S					8/20/19	1015		5	2		3						/	/	/	/	/	/		60302527 2BP1N BP2U BP3N BP3U 021
2	L-TP-2M						1100																		022
3	L-TP-2D						1155																		023
4	L-TP-4S						1530																		024
5	L-TP-4M						1615																		
6	L-TP-4D						1255																		025
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
EPA 200.7 B, Ca, Fe, Mg, K, Na, Fe, Mg		8/21/19	1800	Valley Fowler pasi	8/22/19	0255	0.7	Y	Y	Y
EPA 200.8 Tl, Se, Mo, Li, Pb, Co, Cd, Be							21.7	N	N	Y
Ba, As, Sb										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/21/19

*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

DATE October 16, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – NATURE AND EXTENT - DATA PACKAGE 60302527

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

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

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J Ingram
Project Name: Ameren - Labadie - N&E
Project Number: 1531406
Reviewer: T Goodwin
Validation Date: 10/16/2019

Laboratory: Pace Analytical - KS
SDG #: 60302527
Analytical Method (type and no.): EPA 200.7/200.8 (Metals); EPA 7470 (Hg); EPA 903.1/904.0 (Rads); SM2320B (Alk); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-TP-1S, L-TP-1M, L-TP-1D, L-TP-3S, L-TP-3M, L-TP-3D, L-TP-5S, L-TP-5M, L-TP-5D, L-UMW-10S (AMW-1S), L-UMW-10D (AMW-1D), L-NE-DUP-1, L-NE-DUP-2, L-NE-FB-1, L-NE-FB-2, L-TP-1D MS, L-TP-1D MSD, L-UMW-10S (AMW-1S) MS, L-UMW-10S (AMW-1S) MSD, L-TP-2S, L-TP-2M, L-TP-2D, L-TP-4S, L-TP-4M, L-TP-4D

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	5/8-5/9/2019 and 8/20/209
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	[x]	[ ]	[ ]	DUP-1 @ AM-1D, DUP-2 @ TP-1M FB-1 @ TP-1S, FB-2 @ TP-5D
b) Were field dup. precision criteria met (note RPD)?	[ ]	[x]	[ ]	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	[x]	[ ]	[ ]	-27003,05,10,13: Alk, TDS
d) Were lab dup. precision criteria met (note RPD)?	[x]	[ ]	[ ]	Max Lab DUP RPD: 4% (Limit 10%)

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

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

Comments/Notes:

MB: -27001-15: Ca (50.7), Fe (15.2), Mg (20.3); -27020-25: Fe (14.0), Mg (22.3), Cl (0.43);

FB-1: B (11.3), Ca (61.7), Cr (0.088), TDS (6.5); FB-2: TDS (11.8)

DUP-1: Be (200), Pb (200), Cr (38), Ra-226 (200);

DUP-2: B (32), Sb (200), As (117), Cd (200), Cr (96), Se (200), Tl (200), F (29);

MS/MSD: -27003: Hg (MSDL), SO4 (4x); -27010: Ca (MSL); -27020: Ca (MSDH), Na (MSDH);

Hold Time: -015-025: TDS

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-TP-1S	Boron (B)	100	U	Detected in FB-1: PQL>Result>MDL
"	Chromium (Cr)	1.0	U	"
L-UMW-10S (AMW-1S)	Calcium (Ca)	-	J	MS %Rec Low; Result>MDL
L-UMW-10D (AMW-1D)	Radium-226 (Ra-226)	-	J	RPD Exceeded Limits: MDC>Result
L-NE-FB-1	Ca	200	U	Detected in Method Blank (MB); PQL>Result>MDL
L-NE-FB-2	Total Dissolved Solids (TDS)	-	J	Analyzed Outside of EPA Hold Time
L-TP-2S	"	-	J	"
"	Ca	-	J	MS %Rec High; Result>MDL
"	Sodium (Na)	-	J	"
L-TP-2M	TDS	-	J	Analyzed Outside of EPA Hold Time
L-TP-2D	"	-	J	"
L-TP-4S	"	-	J	"
L-TP-4M	"	-	J	"
L-TP-4D	"	-	J	"

Signature: Tommy J. Good Jr Date: 10/16/2019

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

September 03, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory on August 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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

SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60312684001	**L-UMW-3D**	Water	08/21/19 11:45	08/22/19 02:55

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60312684001	**L-UMW-3D**	EPA 300.0	MGS	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Sample: L-UMW-3D **Lab ID: 60312684001** Collected: 08/21/19 11:45 Received: 08/22/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.2**	mg/L	2.0	0.44	2		09/03/19 14:39	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

QC Batch: 606993
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60312684001

METHOD BLANK: 2480800 Matrix: Water
Associated Lab Samples: 60312684001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	09/03/19 11:07	

LABORATORY CONTROL SAMPLE: 2480801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480802 2480803

Parameter	Units	60312584001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1690			7800	7930				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

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QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60312684

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60312684001	**L-UMW-3D**	EPA 300.0	606993		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO#: 60312684

60312684

Client Name: Golder

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

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

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

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

Thermometer Used: T295 **Type of Ice:** Wet ☑ Blue None

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

Date and initials of person examining contents: 8/22/19 HF

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jasmi Church 8/23/19

Project Manager Review: _____ Date:

CHAIN-OF-CUSTODY / Analytical Request Document

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

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Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No:	Liquid LCPA	Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren ~~Sioux~~ EC ~~SCPC~~	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0002S ~~(OCC #17)~~	Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals	Chloride/Fluoride/Sulfate	TDS	Chloride								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N									40312684
1	S-UG-1A L-UMW-3D	WT	G			8/21/19	1145		1	1												1				BP2U			001
2	S-UG-2	WT	G																										
3	S-DG-1	WT	G																										
4	S-DG-2	WT	G																										
5	S-DG-3	WT	G																										
6	S-DG-4	WT	G																										
7	S-SCPC-DUP-1	WT	G																										
8	S-SCPC-FB-1	WT	G																										
9	S-BMW-1S	WT	G																										
10	S-BMW-3S	WT	G																										
11		WT	G																										
12		WT	G																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
~~EPA 200.7: B, Ca~~									
	Eric Schneider / Golder	8/21/19	1800	Holly Fowler, PSI	8/22/19	0255	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Eric Schneider					
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 08/21/19				

MEMORANDUM

DATE September 30, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCPA – VERIFICATION SAMPLING - DATA PACKAGE 60312684

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

- None.

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J Ingram
Project Name: Ameren - Labadie - LCPA
Project Number: 1531406
Reviewer: T Goodwin
Validation Date: 9/30/2019

Laboratory: Pace Analytical - KS
SDG #: 60312684
Analytical Method (type and no.): EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-UMW-3D

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			8/21/2019
b) Sampling team indicated?	x			
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			
f) Field QC noted?	x			
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

Comments/Notes:

MS/MSD for unrelated samples

Chloride analyzed at a dilution in L-UMW-3D

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature [signature] Date 9/30/19

Pace Analytical Services, LLC
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November 13, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory on October 19, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60318737001	**L-AM-1S**	Water	10/16/19 12:30	10/19/19 03:50
60318737002	**L-AM-1D**	Water	10/16/19 14:00	10/19/19 03:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60318737001	**L-AM-1S**	EPA 200.7	EMR	5	PASI-K
		EPA 200.8	EMR	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60318737002	**L-AM-1D**	EPA 200.7	EMR	5	PASI-K
		EPA 200.8	EMR	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MJK	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Sample: L-AM-1S **Lab ID: 60318737001** Collected: 10/16/19 12:30 Received: 10/19/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**537**	ug/L	5.0	1.4	1	10/23/19 08:55	10/24/19 15:19	7440-39-3	
Boron	**200**	ug/L	100	10.7	1	10/23/19 08:55	10/24/19 15:19	7440-42-8	
Calcium	**231000**	ug/L	200	50.0	1	10/23/19 08:55	10/24/19 15:19	7440-70-2	
Lithium	**23.4**	ug/L	10.0	5.9	1	10/23/19 08:55	10/24/19 15:19	7439-93-2	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	10/23/19 08:55	10/24/19 15:19	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**3.0**	ug/L	1.0	0.065	1	10/23/19 15:03	10/29/19 17:21	7440-38-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**783**	mg/L	13.3	13.3	1		10/23/19 13:22		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**7.8**	mg/L	1.0	0.22	1		11/12/19 00:12	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.085	1		11/12/19 00:12	16984-48-8	
Sulfate	**78.8**	mg/L	20.0	4.6	20		11/12/19 00:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Sample: L-AM-1D **Lab ID: 60318737002** Collected: 10/16/19 14:00 Received: 10/19/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**72.6**	ug/L	5.0	1.4	1	10/23/19 08:55	10/24/19 15:21	7440-39-3	
Boron	**6540**	ug/L	100	10.7	1	10/23/19 08:55	10/24/19 15:21	7440-42-8	
Calcium	**88800**	ug/L	200	50.0	1	10/23/19 08:55	10/24/19 15:21	7440-70-2	
Lithium	**37.0**	ug/L	10.0	5.9	1	10/23/19 08:55	10/24/19 15:21	7439-93-2	
Molybdenum	**345**	ug/L	20.0	2.6	1	10/23/19 08:55	10/24/19 15:21	7439-98-7	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.3**	ug/L	1.0	0.065	1	10/23/19 15:03	10/29/19 17:23	7440-38-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**684**	mg/L	10.0	10.0	1		10/23/19 13:22		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**35.8**	mg/L	5.0	1.1	5		11/12/19 01:03	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.085	1		11/12/19 00:46	16984-48-8	
Sulfate	**275**	mg/L	50.0	11.5	50		11/12/19 01:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 617629 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 2520187 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	10/24/19 14:50	
Boron	ug/L	<10.7	100	10.7	10/24/19 14:50	
Calcium	ug/L	<50.0	200	50.0	10/24/19 14:50	
Lithium	ug/L	<5.9	10.0	5.9	10/24/19 14:50	
Molybdenum	ug/L	<2.6	20.0	2.6	10/24/19 14:50	

LABORATORY CONTROL SAMPLE: 2520188

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	990	99	85-115	
Boron	ug/L	1000	962	96	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Lithium	ug/L	1000	979	98	85-115	
Molybdenum	ug/L	1000	1020	102	85-115	

MATRIX SPIKE SAMPLE: 2520189

Parameter	Units	60318736001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	155	1000	1130	97	70-130	
Boron	ug/L	9440	1000	10200	81	70-130	
Calcium	ug/L	87100	10000	96300	92	70-130	
Lithium	ug/L	28.8	1000	994	97	70-130	
Molybdenum	ug/L	292	1000	1290	100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2520190 2520191

Parameter	Units	60318735001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	14.2	1000	1000	998	996	98	98	70-130	0	20	
Boron	ug/L	5260	1000	1000	6480	6410	122	114	70-130	1	20	
Calcium	ug/L	7340	10000	10000	17700	17700	103	103	70-130	0	20	
Lithium	ug/L	12.3	1000	1000	989	985	98	97	70-130	0	20	
Molybdenum	ug/L	302	1000	1000	1320	1320	101	102	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 617826 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 2520917 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	10/29/19 16:55	

LABORATORY CONTROL SAMPLE: 2520918

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	35.9	90	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2520919 2520920

Parameter	Units	60318737002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	2.3	40	40	40.3	40.5	95	96	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 617499 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 2519915 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	10/23/19 13:19	

LABORATORY CONTROL SAMPLE: 2519916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	987	99	80-120	

SAMPLE DUPLICATE: 2519917

Parameter	Units	60318456001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1140	1120	2	10	

SAMPLE DUPLICATE: 2519918

Parameter	Units	60318595003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	523	537	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 621676 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 2535170 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	11/11/19 19:42	
Fluoride	mg/L	<0.085	0.20	0.085	11/11/19 19:42	
Sulfate	mg/L	<0.23	1.0	0.23	11/11/19 19:42	

METHOD BLANK: 2535876 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	11/12/19 21:35	
Fluoride	mg/L	<0.085	0.20	0.085	11/12/19 21:35	
Sulfate	mg/L	<0.23	1.0	0.23	11/12/19 21:35	

LABORATORY CONTROL SAMPLE: 2535171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

LABORATORY CONTROL SAMPLE: 2535877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.6	106	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2535172 2535173

Parameter	Units	60318734001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	76.3	100	100	176	168	100	92	80-120	5	15	
Fluoride	mg/L	0.29	2.5	2.5	2.7	2.6	96	94	80-120	2	15	
Sulfate	mg/L	198	100	100	319	290	121	92	80-120	9	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

MATRIX SPIKE SAMPLE: 2535174

Parameter	Units	60319962005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4.3	5	9.3	99	80-120	
Fluoride	mg/L	ND	2.5	2.9	116	80-120	
Sulfate	mg/L	17.9	5	23.5	111	80-120	E

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Sample: L-AM-1S **Lab ID: 60318737001** Collected: 10/16/19 12:30 Received: 10/19/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.116 ± 0.393 (0.759) C:NA T:92%**	pCi/L	11/11/19 13:45	13982-63-3	
Radium-228	EPA 904.0	**1.16 ± 0.516 (0.865) C:81% T:86%**	pCi/L	11/08/19 17:08	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Sample: L-AM-1D **Lab ID: 60318737002** Collected: 10/16/19 14:00 Received: 10/19/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.296 ± 0.387 (0.638) C:NA T:101%**	pCi/L	11/11/19 13:45	13982-63-3	
Radium-228	EPA 904.0	**0.698 ± 0.457 (0.876) C:80% T:85%**	pCi/L	11/08/19 17:08	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 368390 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 1787310 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.306 (0.647) C:NA T:87%	pCi/L	11/11/19 13:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

QC Batch: 368389 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60318737001, 60318737002

METHOD BLANK: 1787305 Matrix: Water
Associated Lab Samples: 60318737001, 60318737002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.274 ± 0.426 (0.922) C:70% T:83%	pCi/L	11/08/19 12:59	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60318737

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60318737001	**L-AM-1S**	EPA 200.7	617629	EPA 200.7	617750
60318737002	**L-AM-1D**	EPA 200.7	617629	EPA 200.7	617750
60318737001	**L-AM-1S**	EPA 200.8	617826	EPA 200.8	617909
60318737002	**L-AM-1D**	EPA 200.8	617826	EPA 200.8	617909
60318737001	**L-AM-1S**	EPA 903.1	368390		
60318737002	**L-AM-1D**	EPA 903.1	368390		
60318737001	**L-AM-1S**	EPA 904.0	368389		
60318737002	**L-AM-1D**	EPA 904.0	368389		
60318737001	**L-AM-1S**	SM 2540C	617499		
60318737002	**L-AM-1D**	SM 2540C	617499		
60318737001	**L-AM-1S**	EPA 300.0	621676		
60318737002	**L-AM-1D**	EPA 300.0	621676		

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Sample Condition Upon Receipt

WO#: 60318737

60318737

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): **As-read** 2.1,1.0 **Corr. Factor** 0.4 **Corrected** 2.5,1.4

Date and initials of person examining contents: 10/19/19 AF

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jami Church 10/21/19

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Suite 26	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	314-984-8800 Fax: 636-724-9323	Project Name:	Ameren Groundwater Sampling - LCPA	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406	Pace Profile #:	9285

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes MATRIX / CODE: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226 & 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																				Y/N	N	N	N	N		40374737
1	L-AM-1S		WT	G			10/16/19	1230		4	1		3								1	1	1	1		007
2	L-AM-1D		WT	G			10/16/19	1400		4	1		3								1	1	1	1		002
3			WT	G																						
4			WT	G																						
5			WT	G																						
6			WT	G																						
7			WT	G																						
8			WT	G																						
9			WT	G																						
10			WT	G																						
11			WT	G																						
12			WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Ba, B, Ca, Fe, Li, Mo EPA 200.8: As	Katherine Bartels/Golder	10/18/19	1135	[illegible] McMan	10/18	1136	
					10/18/19	2350	2.5 / 1.4 / Y / Y / Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katherine Bartels

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/18/19

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.5 / 1.4	Y	Y	Y

*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

DATE January 2, 2020 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCPA – DETECTION MONITORING - DATA PACKAGE 60318737

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

- None.

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13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J Ingram
Project Name: Ameren - Labadie - LCPA
Project Number: 1531406
Reviewer: T Goodwin
Validation Date: 1/2/2020

Laboratory: Pace Analytical - KS
SDG #: 60318737
Analytical Method (type and no.): EPA 200.7/200.8 (Metals); SM2540C (Total Dissolved Solids); EPA 300.0 (Anions); EPA 903.1/904.0 (Radium)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-AM-1S, L-AM-1D

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			10/16/2019
b) Sampling team indicated?	x			
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			
f) Field QC noted?	x			
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

Comments/Notes:

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature:

Date: 1/2/2020

Pace Analytical Services, LLC
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December 09, 2019

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

RE: Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Dear Jeffrey Ingram:
Enclosed are the analytical results for sample(s) received by the laboratory between November 07, 2019 and November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60320431001	**L-UMW-1D**	Water	11/06/19 10:00	11/07/19 03:50
60320431002	**L-UMW-7D**	Water	11/06/19 09:30	11/07/19 03:50
60320431003	**L-UMW-8D**	Water	11/05/19 14:45	11/07/19 03:50
60320431004	**L-UMW-9D**	Water	11/06/19 11:23	11/07/19 03:50
60320431005	**L-BMW-1D**	Water	11/05/19 10:00	11/07/19 03:50
60320431006	**L-BMW-2D**	Water	11/05/19 12:40	11/07/19 03:50
60320431007	**L-UMW-DUP-1**	Water	11/06/19 08:00	11/07/19 03:50
60320431008	**L-UMW-FB-1**	Water	11/06/19 11:46	11/07/19 03:50
60320431009	**L-UMW-7D MS**	Water	11/06/19 09:30	11/07/19 03:50
60320431010	**L-UMW-7D MSD**	Water	11/06/19 09:30	11/07/19 03:50
60320742001	**L-UMW-2D**	Water	11/07/19 12:30	11/09/19 02:55
60320742002	**L-UMW-3D**	Water	11/07/19 14:15	11/09/19 02:55
60320742003	**L-UMW-4D**	Water	11/07/19 09:25	11/09/19 02:55
60320742004	**L-UMW-5D**	Water	11/07/19 10:46	11/09/19 02:55
60320742005	**L-UMW-6D**	Water	11/07/19 12:48	11/09/19 02:55
60320742006	**L-AM-1S**	Water	11/07/19 14:05	11/09/19 02:55
60320742007	**L-AM-1D**	Water	11/07/19 15:25	11/09/19 02:55
60320742008	**L-UMW-DUP-2**	Water	11/07/19 08:00	11/09/19 02:55
60320742009	**L-UMW-FB-2**	Water	11/07/19 15:08	11/09/19 02:55

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60320431001	**L-UMW-1D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431002	**L-UMW-7D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60320431003	**L-UMW-8D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60320431004	**L-UMW-9D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431005	**L-BMW-1D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431006	**L-BMW-2D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431007	**L-UMW-DUP-1**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431008	**L-UMW-FB-1**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320431009	**L-UMW-7D MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60320431010	**L-UMW-7D MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60320742001	**L-UMW-2D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742002	**L-UMW-3D**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60320742003	L-UMW-4D	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742004	L-UMW-5D	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60320742005	L-UMW-6D	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742006	L-AM-1S	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742007	L-AM-1D	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742008	L-UMW-DUP-2	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60320742009	**L-UMW-FB-2**	EPA 200.7	HKC	10	PASI-K
		EPA 200.8	JGP	1	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MJK	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-1D **Lab ID: 60320431001** Collected: 11/06/19 10:00 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**502**	ug/L	5.0	1.4	1	11/21/19 15:17	11/22/19 20:26	7440-39-3	
Boron	**1340**	ug/L	100	10.7	1	11/21/19 15:17	11/22/19 20:26	7440-42-8	
Calcium	**130000**	ug/L	200	50.0	1	11/21/19 15:17	11/22/19 20:26	7440-70-2	M1
Iron	**14600**	ug/L	50.0	14.0	1	11/21/19 15:17	11/22/19 20:26	7439-89-6	
Lithium	**24.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/22/19 20:26	7439-93-2	
Magnesium	**35600**	ug/L	50.0	13.0	1	11/21/19 15:17	11/22/19 20:26	7439-95-4	
Manganese	**420**	ug/L	5.0	2.1	1	11/21/19 15:17	11/22/19 20:26	7439-96-5	
Molybdenum	**6.9J**	ug/L	20.0	2.6	1	11/21/19 15:17	11/22/19 20:26	7439-98-7	
Potassium	**6500**	ug/L	500	79.0	1	11/21/19 15:17	11/22/19 20:26	7440-09-7	
Sodium	**46000**	ug/L	500	144	1	11/21/19 15:17	11/22/19 20:26	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**49.7**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 15:59	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**530**	mg/L	20.0	6.5	1		11/12/19 15:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**634**	mg/L	10.0	10.0	1		11/12/19 09:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.1**	mg/L	1.0	0.22	1		11/26/19 19:28	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.085	1		11/26/19 19:28	16984-48-8	
Sulfate	**86.0**	mg/L	10.0	2.3	10		12/03/19 10:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-7D **Lab ID: 60320431002** Collected: 11/06/19 09:30 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**131**	ug/L	5.0	1.4	1	11/25/19 15:55	11/27/19 16:22	7440-39-3	
Boron	**11000**	ug/L	100	10.7	1	11/25/19 15:55	11/27/19 16:22	7440-42-8	
Calcium	**266000**	ug/L	200	50.0	1	11/25/19 15:55	11/27/19 16:22	7440-70-2	M1
Iron	**13500**	ug/L	50.0	14.0	1	11/25/19 15:55	11/27/19 16:22	7439-89-6	
Lithium	**18.8**	ug/L	10.0	5.9	1	11/25/19 15:55	11/27/19 16:22	7439-93-2	
Magnesium	**30700**	ug/L	50.0	13.0	1	11/25/19 15:55	11/27/19 16:22	7439-95-4	
Manganese	**2390**	ug/L	5.0	2.1	1	11/25/19 15:55	11/27/19 16:22	7439-96-5	
Molybdenum	**342**	ug/L	20.0	2.6	1	11/25/19 15:55	11/27/19 16:22	7439-98-7	
Potassium	**8160**	ug/L	500	79.0	1	11/25/19 15:55	11/27/19 16:22	7440-09-7	
Sodium	**161000**	ug/L	500	144	1	11/25/19 15:55	11/27/19 16:22	7440-23-5	M1
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**24.1**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:00	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**165**	mg/L	20.0	6.5	1		11/12/19 15:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1560**	mg/L	13.3	13.3	1		11/12/19 09:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**17.4**	mg/L	1.0	0.22	1		12/02/19 21:05	16887-00-6	
Fluoride	**0.16J**	mg/L	0.20	0.085	1		12/02/19 21:05	16984-48-8	
Sulfate	**992**	mg/L	50.0	11.5	50		11/26/19 20:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-8D **Lab ID: 60320431003** Collected: 11/05/19 14:45 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**431**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 13:56	7440-39-3	
Boron	**1680**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 13:56	7440-42-8	
Calcium	**143000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 13:56	7440-70-2	
Iron	**25000**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 13:56	7439-89-6	
Lithium	**34.4**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 13:56	7439-93-2	
Magnesium	**35100**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 13:56	7439-95-4	
Manganese	**1140**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 13:56	7439-96-5	
Molybdenum	**29.1**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 13:56	7439-98-7	
Potassium	**5600**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 13:56	7440-09-7	
Sodium	**26200**	ug/L	500	144	1	11/21/19 15:17	11/23/19 13:56	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**30.5**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:03	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**347**	mg/L	20.0	6.5	1		11/12/19 15:38		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**677**	mg/L	10.0	10.0	1		11/11/19 13:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.6**	mg/L	1.0	0.22	1		11/26/19 21:37	16887-00-6	
Fluoride	**0.20J**	mg/L	0.20	0.085	1		11/26/19 21:37	16984-48-8	
Sulfate	**227**	mg/L	20.0	4.6	20		12/02/19 16:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-9D **Lab ID: 60320431004** Collected: 11/06/19 11:23 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**536**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 13:58	7440-39-3	
Boron	**106**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 13:58	7440-42-8	
Calcium	**119000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 13:58	7440-70-2	
Iron	**24000**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 13:58	7439-89-6	
Lithium	**16.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 13:58	7439-93-2	
Magnesium	**33300**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 13:58	7439-95-4	
Manganese	**376**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 13:58	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 13:58	7439-98-7	
Potassium	**4080**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 13:58	7440-09-7	
Sodium	**13800**	ug/L	500	144	1	11/21/19 15:17	11/23/19 13:58	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**35.6**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:04	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**463**	mg/L	20.0	6.5	1		11/12/19 15:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**459**	mg/L	10.0	10.0	1		11/12/19 09:50		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.7**	mg/L	2.0	0.44	2		11/26/19 22:57	16887-00-6	
Fluoride	**0.19J**	mg/L	0.20	0.085	1		11/26/19 22:41	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		11/26/19 22:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-BMW-1D **Lab ID: 60320431005** Collected: 11/05/19 10:00 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**1120**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:01	7440-39-3	
Boron	**82.3J**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:01	7440-42-8	
Calcium	**124000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:01	7440-70-2	
Iron	**10100**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:01	7439-89-6	
Lithium	**30.3**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:01	7439-93-2	
Magnesium	**29500**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:01	7439-95-4	
Manganese	**542**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:01	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:01	7439-98-7	
Potassium	**4380**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:01	7440-09-7	
Sodium	**9090**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:01	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.9**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:34	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**453**	mg/L	20.0	6.5	1		11/12/19 15:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**446**	mg/L	10.0	10.0	1		11/11/19 13:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.4**	mg/L	1.0	0.22	1		11/26/19 23:13	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.085	1		11/26/19 23:13	16984-48-8	
Sulfate	**12.2**	mg/L	1.0	0.23	1		11/26/19 23:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-BMW-2D **Lab ID: 60320431006** Collected: 11/05/19 12:40 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**321**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:03	7440-39-3	
Boron	**65.6J**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:03	7440-42-8	
Calcium	**124000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:03	7440-70-2	
Iron	**6940**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:03	7439-89-6	
Lithium	**41.1**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:03	7439-93-2	
Magnesium	**27300**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:03	7439-95-4	
Manganese	**295**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:03	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:03	7439-98-7	
Potassium	**3730**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:03	7440-09-7	
Sodium	**6450**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:03	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**44.2**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:35	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**405**	mg/L	20.0	6.5	1		11/12/19 15:56		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**456**	mg/L	10.0	10.0	1		11/11/19 13:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.1**	mg/L	1.0	0.22	1		11/26/19 23:45	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.085	1		11/26/19 23:45	16984-48-8	
Sulfate	**28.2**	mg/L	5.0	1.2	5		11/27/19 00:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-DUP-1 **Lab ID: 60320431007** Collected: 11/06/19 08:00 Received: 11/07/19 03:50 Matrix: Water

Comments: • Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. The samples were not preserved <2 within the required 5 days of collection.

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								
Barium	**513**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:05	7440-39-3	
Boron	**1360**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:05	7440-42-8	
Calcium	**144000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:05	7440-70-2	
Iron	**15400**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:05	7439-89-6	
Lithium	**30.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:05	7439-93-2	
Magnesium	**36100**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:05	7439-95-4	
Manganese	**413**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:05	7439-96-5	
Molybdenum	**6.5J**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:05	7439-98-7	
Potassium	**6530**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:05	7440-09-7	
Sodium	**45300**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:05	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**55.4**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:36	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**501**	mg/L	20.0	6.5	1		11/13/19 13:56		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**646**	mg/L	10.0	10.0	1		11/12/19 09:50		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.2**	mg/L	1.0	0.22	1		11/27/19 00:17	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.085	1		11/27/19 00:17	16984-48-8	
Sulfate	**73.9**	mg/L	20.0	4.6	20		11/27/19 01:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-FB-1 **Lab ID: 60320431008** Collected: 11/06/19 11:46 Received: 11/07/19 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:07	7440-39-3	
Boron	**<10.7**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:07	7440-42-8	
Calcium	**<50.0**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:07	7440-70-2	
Iron	**<14.0**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:07	7439-89-6	
Lithium	**<5.9**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:07	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:07	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:07	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:07	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:07	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:07	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:33	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		11/13/19 14:06		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**7.0**	mg/L	5.0	5.0	1		11/12/19 09:50		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.22**	mg/L	1.0	0.22	1		11/27/19 02:26	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		11/27/19 02:26	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		11/27/19 02:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-2D **Lab ID: 60320742001** Collected: 11/07/19 12:30 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**101**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:10	7440-39-3	
Boron	**1010**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:10	7440-42-8	
Calcium	**85000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:10	7440-70-2	
Iron	**2350**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:10	7439-89-6	
Lithium	**26.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:10	7439-93-2	
Magnesium	**18500**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:10	7439-95-4	
Manganese	**271**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:10	7439-96-5	
Molybdenum	**40.7**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:10	7439-98-7	
Potassium	**6570**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:10	7440-09-7	
Sodium	**61100**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:10	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.5**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:37	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**250**	mg/L	20.0	6.5	1		11/13/19 14:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**545**	mg/L	10.0	10.0	1		11/13/19 13:44		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.8**	mg/L	5.0	1.1	5		12/02/19 12:38	16887-00-6	
Fluoride	**0.34**	mg/L	0.20	0.085	1		11/26/19 14:17	16984-48-8	
Sulfate	**172**	mg/L	20.0	4.6	20		11/26/19 15:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-3D **Lab ID: 60320742002** Collected: 11/07/19 14:15 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**105**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:12	7440-39-3	
Boron	**9090**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:12	7440-42-8	
Calcium	**119000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:12	7440-70-2	
Iron	**65.5**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:12	7439-89-6	
Lithium	**20.0**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:12	7439-93-2	
Magnesium	**2570**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:12	7439-95-4	
Manganese	**67.7**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:12	7439-96-5	
Molybdenum	**168**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:12	7439-98-7	
Potassium	**14400**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:12	7440-09-7	
Sodium	**66300**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:12	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**52.1**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:43	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**163**	mg/L	20.0	6.5	1		11/13/19 14:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**661**	mg/L	10.0	10.0	1		11/13/19 13:44		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.5**	mg/L	2.0	0.44	2		12/02/19 12:54	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		11/26/19 15:36	16984-48-8	
Sulfate	**298**	mg/L	50.0	11.5	50		11/26/19 15:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-4D **Lab ID: 60320742003** Collected: 11/07/19 09:25 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**119**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:21	7440-39-3	
Boron	**4810**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:21	7440-42-8	
Calcium	**90000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:21	7440-70-2	
Iron	**272**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:21	7439-89-6	
Lithium	**32.9**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:21	7439-93-2	
Magnesium	**8670**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:21	7439-95-4	
Manganese	**316**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:21	7439-96-5	
Molybdenum	**120**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:21	7439-98-7	
Potassium	**11000**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:21	7440-09-7	
Sodium	**144000**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:21	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.14J**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:44	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**143**	mg/L	20.0	6.5	1		11/13/19 14:26		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**811**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.0**	mg/L	1.0	0.22	1		11/26/19 16:08	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	0.085	1		11/26/19 16:08	16984-48-8	
Sulfate	**410**	mg/L	50.0	11.5	50		11/26/19 16:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-5D **Lab ID: 60320742004** Collected: 11/07/19 10:46 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**88.4**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:23	7440-39-3	
Boron	**10200**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:23	7440-42-8	
Calcium	**96100**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:23	7440-70-2	
Iron	**<14.0**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:23	7439-89-6	
Lithium	**35.9**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:23	7439-93-2	
Magnesium	**122**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:23	7439-95-4	
Manganese	**18.3**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:23	7439-96-5	
Molybdenum	**263**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:23	7439-98-7	
Potassium	**13200**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:23	7440-09-7	
Sodium	**73800**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:23	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**11.9**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:46	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**95.2**	mg/L	20.0	6.5	1		11/13/19 14:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**590**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**22.1**	mg/L	2.0	0.44	2		12/02/19 18:42	16887-00-6	
Fluoride	**0.12J**	mg/L	0.20	0.085	1		11/26/19 16:39	16984-48-8	
Sulfate	**292**	mg/L	20.0	4.6	20		11/26/19 16:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-6D **Lab ID: 60320742005** Collected: 11/07/19 12:48 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**131**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:25	7440-39-3	
Boron	**13200**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:25	7440-42-8	
Calcium	**118000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:25	7440-70-2	
Iron	**422**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:25	7439-89-6	
Lithium	**16.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:25	7439-93-2	
Magnesium	**4050**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:25	7439-95-4	
Manganese	**351**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:25	7439-96-5	
Molybdenum	**535**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:25	7439-98-7	
Potassium	**26400**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:25	7440-09-7	
Sodium	**102000**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:25	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**29.0**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:47	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**73.5**	mg/L	20.0	6.5	1		11/13/19 14:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**864**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.0**	mg/L	1.0	0.22	1		11/26/19 17:11	16887-00-6	
Fluoride	**0.091J**	mg/L	0.20	0.085	1		11/26/19 17:11	16984-48-8	
Sulfate	**504**	mg/L	50.0	11.5	50		12/03/19 10:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-AM-1S **Lab ID: 60320742006** Collected: 11/07/19 14:05 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**527**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 14:27	7440-39-3	
Boron	**242**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 14:27	7440-42-8	
Calcium	**218000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 14:27	7440-70-2	
Iron	**3790**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 14:27	7439-89-6	
Lithium	**28.2**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 14:27	7439-93-2	
Magnesium	**44200**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 14:27	7439-95-4	
Manganese	**902**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 14:27	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 14:27	7439-98-7	
Potassium	**6220**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 14:27	7440-09-7	
Sodium	**21300**	ug/L	500	144	1	11/21/19 15:17	11/23/19 14:27	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**3.7**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:29	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**677**	mg/L	20.0	6.5	1		11/13/19 14:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**826**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**7.9**	mg/L	1.0	0.22	1		11/26/19 18:30	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.085	1		11/26/19 18:30	16984-48-8	
Sulfate	**78.0**	mg/L	10.0	2.3	10		11/26/19 18:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-AM-1D **Lab ID: 60320742007** Collected: 11/07/19 15:25 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**75.6**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 16:12	7440-39-3	
Boron	**7010**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 16:12	7440-42-8	
Calcium	**87800**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 16:12	7440-70-2	
Iron	**4150**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 16:12	7439-89-6	
Lithium	**38.6**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 16:12	7439-93-2	
Magnesium	**13000**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 16:12	7439-95-4	
Manganese	**227**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 16:12	7439-96-5	
Molybdenum	**390**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 16:12	7439-98-7	
Potassium	**8140**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 16:12	7440-09-7	
Sodium	**113000**	ug/L	500	144	1	11/21/19 15:17	11/23/19 16:12	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**4.0**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:31	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**172**	mg/L	20.0	6.5	1		11/13/19 14:56		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**726**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**36.9**	mg/L	5.0	1.1	5		11/26/19 19:34	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.085	1		11/26/19 19:18	16984-48-8	
Sulfate	**302**	mg/L	50.0	11.5	50		11/26/19 19:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-DUP-2 **Lab ID: 60320742008** Collected: 11/07/19 08:00 Received: 11/09/19 02:55 Matrix: Water

Comments: • Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. The samples were not preserved <2 within the required 5 days of collection.

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								
Barium	**525**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 16:14	7440-39-3	
Boron	**206**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 16:14	7440-42-8	
Calcium	**218000**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 16:14	7440-70-2	
Iron	**3710**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 16:14	7439-89-6	
Lithium	**24.8**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 16:14	7439-93-2	
Magnesium	**43700**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 16:14	7439-95-4	
Manganese	**883**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 16:14	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 16:14	7439-98-7	
Potassium	**6190**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 16:14	7440-09-7	
Sodium	**21100**	ug/L	500	144	1	11/21/19 15:17	11/23/19 16:14	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**3.5**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:32	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**691**	mg/L	20.0	6.5	1		11/13/19 15:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**814**	mg/L	10.0	10.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.0**	mg/L	1.0	0.22	1		11/26/19 20:05	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.085	1		11/26/19 20:05	16984-48-8	
Sulfate	**78.1**	mg/L	20.0	4.6	20		11/26/19 20:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-FB-2 **Lab ID: 60320742009** Collected: 11/07/19 15:08 Received: 11/09/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<1.4**	ug/L	5.0	1.4	1	11/21/19 15:17	11/23/19 16:16	7440-39-3	
Boron	**<10.7**	ug/L	100	10.7	1	11/21/19 15:17	11/23/19 16:16	7440-42-8	
Calcium	**<50.0**	ug/L	200	50.0	1	11/21/19 15:17	11/23/19 16:16	7440-70-2	
Iron	**<14.0**	ug/L	50.0	14.0	1	11/21/19 15:17	11/23/19 16:16	7439-89-6	
Lithium	**<5.9**	ug/L	10.0	5.9	1	11/21/19 15:17	11/23/19 16:16	7439-93-2	
Magnesium	**<13.0**	ug/L	50.0	13.0	1	11/21/19 15:17	11/23/19 16:16	7439-95-4	
Manganese	**<2.1**	ug/L	5.0	2.1	1	11/21/19 15:17	11/23/19 16:16	7439-96-5	
Molybdenum	**<2.6**	ug/L	20.0	2.6	1	11/21/19 15:17	11/23/19 16:16	7439-98-7	
Potassium	**<79.0**	ug/L	500	79.0	1	11/21/19 15:17	11/23/19 16:16	7440-09-7	
Sodium	**<144**	ug/L	500	144	1	11/21/19 15:17	11/23/19 16:16	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	11/11/19 09:30	11/11/19 16:45	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<6.5**	mg/L	20.0	6.5	1		11/13/19 15:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		11/13/19 13:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.22**	mg/L	1.0	0.22	1		11/26/19 21:41	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		11/26/19 21:41	16984-48-8	
Sulfate	**<0.23**	mg/L	1.0	0.23	1		11/26/19 21:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 624002 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60320431001, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 2544458 Matrix: Water
Associated Lab Samples: 60320431001, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	11/22/19 20:24	
Boron	ug/L	<10.7	100	10.7	11/22/19 20:24	
Calcium	ug/L	<50.0	200	50.0	11/22/19 20:24	
Iron	ug/L	<14.0	50.0	14.0	11/22/19 20:24	
Lithium	ug/L	<5.9	10.0	5.9	11/22/19 20:24	
Magnesium	ug/L	<13.0	50.0	13.0	11/22/19 20:24	
Manganese	ug/L	<2.1	5.0	2.1	11/22/19 20:24	
Molybdenum	ug/L	<2.6	20.0	2.6	11/22/19 20:24	
Potassium	ug/L	84.4J	500	79.0	11/22/19 20:24	
Sodium	ug/L	<144	500	144	11/22/19 20:24	

LABORATORY CONTROL SAMPLE: 2544459

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1000	100	85-115	
Boron	ug/L	1000	992	99	85-115	
Calcium	ug/L	10000	9140	91	85-115	
Iron	ug/L	10000	9450	94	85-115	
Lithium	ug/L	1000	1020	102	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1050	105	85-115	
Molybdenum	ug/L	1000	1030	103	85-115	
Potassium	ug/L	10000	9810	98	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544460 2544461

Parameter	Units	60320431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	502	1000	1000	1540	1550	104	105	70-130	1	20	
Boron	ug/L	1340	1000	1000	2370	2440	104	110	70-130	3	20	
Calcium	ug/L	130000	10000	10000	155000	156000	243	251	70-130	1	20	M1
Iron	ug/L	14600	10000	10000	25600	25700	110	111	70-130	0	20	
Lithium	ug/L	24.8	1000	1000	1030	1040	101	101	70-130	1	20	
Magnesium	ug/L	35600	10000	10000	45600	46500	100	109	70-130	2	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

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544460 2544461

Parameter	Units	60320431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	420	1000	1000	1420	1440	100	102	70-130	2	20	
Molybdenum	ug/L	6.9J	1000	1000	1040	1060	104	105	70-130	2	20	
Potassium	ug/L	6500	10000	10000	16700	16800	102	103	70-130	1	20	
Sodium	ug/L	46000	10000	10000	55300	55800	94	98	70-130	1	20	

MATRIX SPIKE SAMPLE: 2544462

Parameter	Units	60320742002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	105	1000	1120	102	70-130	
Boron	ug/L	9090	1000	10000	94	70-130	
Calcium	ug/L	119000	10000	127000	84	70-130	
Iron	ug/L	65.5	10000	10100	100	70-130	
Lithium	ug/L	20.0	1000	1020	100	70-130	
Magnesium	ug/L	2570	10000	12500	99	70-130	
Manganese	ug/L	67.7	1000	1080	102	70-130	
Molybdenum	ug/L	168	1000	1220	105	70-130	
Potassium	ug/L	14400	10000	24100	97	70-130	
Sodium	ug/L	66300	10000	75200	89	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 624660
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60320431002

METHOD BLANK: 2547136
Matrix: Water
Associated Lab Samples: 60320431002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.4	5.0	1.4	11/27/19 16:20	
Boron	ug/L	29.2J	100	10.7	11/27/19 16:20	
Calcium	ug/L	<50.0	200	50.0	11/27/19 16:20	
Iron	ug/L	<14.0	50.0	14.0	11/27/19 16:20	
Lithium	ug/L	<5.9	10.0	5.9	11/27/19 16:20	
Magnesium	ug/L	<13.0	50.0	13.0	11/27/19 16:20	
Manganese	ug/L	<2.1	5.0	2.1	11/27/19 16:20	
Molybdenum	ug/L	<2.6	20.0	2.6	11/27/19 16:20	
Potassium	ug/L	<79.0	500	79.0	11/27/19 16:20	
Sodium	ug/L	<144	500	144	11/27/19 16:20	

LABORATORY CONTROL SAMPLE: 2547137

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	999	100	85-115	
Boron	ug/L	1000	1020	102	85-115	
Calcium	ug/L	10000	10100	101	85-115	
Iron	ug/L	10000	10000	100	85-115	
Lithium	ug/L	1000	1000	100	85-115	
Magnesium	ug/L	10000	9970	100	85-115	
Manganese	ug/L	1000	980	98	85-115	
Molybdenum	ug/L	1000	1020	102	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	9970	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547138 2547139

Parameter	Units	60320431002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	131	1000	1000	1110	1140	98	101	70-130	2	20	
Boron	ug/L	11000	1000	1000	12000	12000	107	108	70-130	0	20	
Calcium	ug/L	266000	10000	10000	266000	270000	3	45	70-130	2	20	M1
Iron	ug/L	13500	10000	10000	22700	23200	92	97	70-130	2	20	
Lithium	ug/L	18.8	1000	1000	1000	1040	99	102	70-130	3	20	
Magnesium	ug/L	30700	10000	10000	38700	39500	80	88	70-130	2	20	
Manganese	ug/L	2390	1000	1000	3360	3350	97	96	70-130	0	20	
Molybdenum	ug/L	342	1000	1000	1370	1380	102	104	70-130	1	20	
Potassium	ug/L	8160	10000	10000	17800	18400	96	102	70-130	3	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547138 2547139

Parameter	Units	60320431002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sodium	ug/L	161000	10000	10000	167000	167000	57	63	70-130	0	20	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 621463 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 2534757 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/11/19 15:55	

LABORATORY CONTROL SAMPLE: 2534758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.2	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2534759 2534760

Parameter	Units	60320431002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	24.1	40	40	67.2	67.4	108	108	70-130	0	20	

MATRIX SPIKE SAMPLE: 2534761

Parameter	Units	60320742001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1.5	40	47.3	114	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 621881 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006

METHOD BLANK: 2535850 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	11/12/19 15:03	

LABORATORY CONTROL SAMPLE: 2535851

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

SAMPLE DUPLICATE: 2535852

Parameter	Units	60320431001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	530	549	4	10	

SAMPLE DUPLICATE: 2535854

Parameter	Units	60320431002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	165	177	7	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 622137 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 2536730 Matrix: Water
Associated Lab Samples: 60320431007, 60320431008, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	11/13/19 13:43	

LABORATORY CONTROL SAMPLE: 2536731

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	520	104	90-110	

SAMPLE DUPLICATE: 2536732

Parameter	Units	60320431007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	501	502	0	10	

SAMPLE DUPLICATE: 2536733

Parameter	Units	60320742008 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	691	694	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 621544 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60320431003, 60320431005, 60320431006

METHOD BLANK: 2534910 Matrix: Water
Associated Lab Samples: 60320431003, 60320431005, 60320431006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/11/19 13:18	

LABORATORY CONTROL SAMPLE: 2534911

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

SAMPLE DUPLICATE: 2534912

Parameter	Units	60320422001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	673	691	3	10	

SAMPLE DUPLICATE: 2534913

Parameter	Units	60320429001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	804	844	5	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 621708 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60320431001, 60320431002, 60320431004, 60320431007, 60320431008

METHOD BLANK: 2535262 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431004, 60320431007, 60320431008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/12/19 09:48	

LABORATORY CONTROL SAMPLE: 2535263

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

SAMPLE DUPLICATE: 2535264

Parameter	Units	60320431002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1560	1590	1	10	

SAMPLE DUPLICATE: 2535265

Parameter	Units	60320431004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	459	466	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 622003 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 2536188 Matrix: Water
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/13/19 13:43	

LABORATORY CONTROL SAMPLE: 2536189

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

SAMPLE DUPLICATE: 2536190

Parameter	Units	60320741001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1820	1980	8	10	

SAMPLE DUPLICATE: 2536191

Parameter	Units	60320739001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	777	794	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 624756 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 2547287 Matrix: Water
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	11/26/19 12:26	
Fluoride	mg/L	<0.085	0.20	0.085	11/26/19 12:26	
Sulfate	mg/L	<0.23	1.0	0.23	11/26/19 12:26	

METHOD BLANK: 2550033 Matrix: Water
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	12/02/19 09:29	
Fluoride	mg/L	<0.085	0.20	0.085	12/02/19 09:29	
Sulfate	mg/L	<0.23	1.0	0.23	12/02/19 09:29	

METHOD BLANK: 2551056 Matrix: Water
Associated Lab Samples: 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	12/03/19 09:14	
Fluoride	mg/L	<0.085	0.20	0.085	12/03/19 09:14	
Sulfate	mg/L	<0.23	1.0	0.23	12/03/19 09:14	

LABORATORY CONTROL SAMPLE: 2547288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

LABORATORY CONTROL SAMPLE: 2550034

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

LABORATORY CONTROL SAMPLE: 2550034

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

LABORATORY CONTROL SAMPLE: 2551057

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547289 2547290

Parameter	Units	60321883001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1160	1000	1000	2960	2830	181	168	80-120	5	15	M1
Fluoride	mg/L	ND	500	500	832	789	166	158	80-120	5	15	M1
Sulfate	mg/L	ND	1000	1000	1740	1660	170	162	80-120	5	15	M1

MATRIX SPIKE SAMPLE: 2547291

Parameter	Units	60320742008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	8.0	5	13.2	104	80-120	
Fluoride	mg/L	0.13J	2.5	3.0	113	80-120	
Sulfate	mg/L	78.1	100	177	99	80-120	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 624757 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008

METHOD BLANK: 2547292 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.27J	1.0	0.22	11/26/19 17:04	
Fluoride	mg/L	<0.085	0.20	0.085	11/26/19 17:04	
Sulfate	mg/L	<0.23	1.0	0.23	11/26/19 17:04	

METHOD BLANK: 2550031 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.30J	1.0	0.22	12/02/19 20:17	
Fluoride	mg/L	<0.085	0.20	0.085	12/02/19 20:17	
Sulfate	mg/L	<0.23	1.0	0.23	12/02/19 20:17	

METHOD BLANK: 2551058 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	12/03/19 09:14	
Fluoride	mg/L	<0.085	0.20	0.085	12/03/19 09:14	
Sulfate	mg/L	<0.23	1.0	0.23	12/03/19 09:14	

LABORATORY CONTROL SAMPLE: 2547293

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	4.6	93	90-110	

LABORATORY CONTROL SAMPLE: 2550032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

LABORATORY CONTROL SAMPLE: 2550032

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

LABORATORY CONTROL SAMPLE: 2551059

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547294 2547295

Parameter	Units	60320431002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	17.4	25	25	40.8	40.5	94	92	80-120	1	15	
Fluoride	mg/L	0.16J	2.5	2.5	2.8	2.9	107	110	80-120	2	15	
Sulfate	mg/L	992	250	250	1240	1220	100	91	80-120	2	15	E

MATRIX SPIKE SAMPLE: 2547296

Parameter	Units	60320431007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	14.2	5	19.5	106	80-120	
Fluoride	mg/L	0.23	2.5	2.8	102	80-120	
Sulfate	mg/L	73.9	100	175	101	80-120	

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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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-1D **Lab ID: 60320431001** Collected: 11/06/19 10:00 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.767 ± 0.585 (0.832) C:NA T:82%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**1.43 ± 0.525 (0.804) C:83% T:88%**	pCi/L	12/03/19 14:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-7D **Lab ID: 60320431002** Collected: 11/06/19 09:30 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.148 ± 0.321 (0.593) C:NA T:85%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.584 ± 0.408 (0.785) C:82% T:78%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-8D **Lab ID: 60320431003** Collected: 11/05/19 14:45 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.386 ± 0.421 (0.662) C:NA T:89%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.816 ± 0.431 (0.783) C:84% T:88%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-9D **Lab ID: 60320431004** Collected: 11/06/19 11:23 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.258 ± 0.305 (0.480) C:NA T:97%**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.546 ± 0.312 (0.558) C:82% T:98%**	pCi/L	12/03/19 14:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-BMW-1D **Lab ID: 60320431005** Collected: 11/05/19 10:00 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.29 ± 0.538 (0.366) C:NA T:100%**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.922 ± 0.386 (0.607) C:83% T:93%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-BMW-2D **Lab ID: 60320431006** Collected: 11/05/19 12:40 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.511 ± 0.374 (0.418) C:NA T:91%**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.252 ± 0.318 (0.674) C:83% T:90%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-DUP-1 **Lab ID: 60320431007** Collected: 11/06/19 08:00 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. The samples were not preserved <2 within the required 5 days of collection.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.105 ± 0.251 (0.485) C:NA T:93%**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.292 ± 0.351 (0.742) C:82% T:87%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-FB-1 **Lab ID: 60320431008** Collected: 11/06/19 11:46 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.496 ± 0.342 (0.365) C:NA T:96%**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.211 ± 0.321 (0.693) C:82% T:96%**	pCi/L	12/03/19 14:22	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-7D MS **Lab ID: 60320431009** Collected: 11/06/19 09:30 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**99.98 %REC ± NA (NA) C:NA T:NA**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**66.84 %REC ± NA (NA) C:NA T:NA**	pCi/L	12/03/19 14:22	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-7D MSD **Lab ID: 60320431010** Collected: 11/06/19 09:30 Received: 11/07/19 03:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**114.90 %REC 13.88 RPD ± NA (NA) C:NA T:NA**	pCi/L	12/03/19 12:35	13982-63-3	
Radium-228	EPA 904.0	**72.42 %REC 8.01 RPD ± NA (NA) C:NA T:NA**	pCi/L	12/03/19 14:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-2D **Lab ID: 60320742001** Collected: 11/07/19 12:30 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0548 ± 0.468 (0.913) C:NA T:91%**	pCi/L	12/03/19 11:53	13982-63-3	
Radium-228	EPA 904.0	**0.306 ± 0.404 (0.861) C:77% T:82%**	pCi/L	12/03/19 14:20	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-3D **Lab ID: 60320742002** Collected: 11/07/19 14:15 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.117 ± 0.362 (0.701) C:NA T:86%**	pCi/L	12/03/19 11:53	13982-63-3	
Radium-228	EPA 904.0	**0.696 ± 0.390 (0.707) C:84% T:85%**	pCi/L	12/03/19 14:20	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-4D **Lab ID: 60320742003** Collected: 11/07/19 09:25 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.393 ± 0.482 (0.791) C:NA T:86%**	pCi/L	12/03/19 11:53	13982-63-3	
Radium-228	EPA 904.0	**0.756 ± 0.408 (0.729) C:85% T:82%**	pCi/L	12/03/19 14:20	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-5D **Lab ID: 60320742004** Collected: 11/07/19 10:46 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.376 (0.770) C:NA T:93%**	pCi/L	12/03/19 11:53	13982-63-3	
Radium-228	EPA 904.0	**0.611 ± 0.338 (0.606) C:85% T:92%**	pCi/L	12/03/19 14:20	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-6D **Lab ID: 60320742005** Collected: 11/07/19 12:48 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.346 ± 0.322 (0.424) C:NA T:93%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.851 ± 0.361 (0.564) C:84% T:93%**	pCi/L	12/03/19 14:20	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-AM-1S **Lab ID: 60320742006** Collected: 11/07/19 14:05 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.170 ± 0.368 (0.680) C:NA T:86%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.707 ± 0.390 (0.713) C:84% T:95%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-AM-1D **Lab ID: 60320742007** Collected: 11/07/19 15:25 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.176 ± 0.346 (0.632) C:NA T:88%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**1.27 ± 0.480 (0.711) C:83% T:83%**	pCi/L	12/03/19 14:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-DUP-2 **Lab ID: 60320742008** Collected: 11/07/19 08:00 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. The samples were not preserved <2 within the required 5 days of collection.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.605 ± 0.522 (0.776) C:NA T:92%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.940 ± 0.468 (0.841) C:85% T:89%**	pCi/L	12/03/19 14:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Sample: L-UMW-FB-2 **Lab ID: 60320742009** Collected: 11/07/19 15:08 Received: 11/09/19 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.361 ± 0.367 (0.555) C:NA T:100%**	pCi/L	12/03/19 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.317 ± 0.294 (0.599) C:87% T:99%**	pCi/L	12/03/19 14:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 371011 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320431009, 60320431010, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 1800152 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320431009, 60320431010, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.613 ± 0.350 (0.631) C:88% T:88%	pCi/L	12/03/19 14:22	

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

QC Batch: 371012 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320431009, 60320431010, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

METHOD BLANK: 1800153 Matrix: Water
Associated Lab Samples: 60320431001, 60320431002, 60320431003, 60320431004, 60320431005, 60320431006, 60320431007, 60320431008, 60320431009, 60320431010, 60320742001, 60320742002, 60320742003, 60320742004, 60320742005, 60320742006, 60320742007, 60320742008, 60320742009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.121 ± 0.185 (0.484) C:NA T:98%	pCi/L	12/03/19 11:53	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-PA	Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60320431001	L-UMW-1D	EPA 200.7	624002	EPA 200.7	624096
60320431002	L-UMW-7D	EPA 200.7	624660	EPA 200.7	624740
60320431003	L-UMW-8D	EPA 200.7	624002	EPA 200.7	624096
60320431004	L-UMW-9D	EPA 200.7	624002	EPA 200.7	624096
60320431005	L-BMW-1D	EPA 200.7	624002	EPA 200.7	624096
60320431006	L-BMW-2D	EPA 200.7	624002	EPA 200.7	624096
60320431007	L-UMW-DUP-1	EPA 200.7	624002	EPA 200.7	624096
60320431008	L-UMW-FB-1	EPA 200.7	624002	EPA 200.7	624096
60320742001	L-UMW-2D	EPA 200.7	624002	EPA 200.7	624096
60320742002	L-UMW-3D	EPA 200.7	624002	EPA 200.7	624096
60320742003	L-UMW-4D	EPA 200.7	624002	EPA 200.7	624096
60320742004	L-UMW-5D	EPA 200.7	624002	EPA 200.7	624096
60320742005	L-UMW-6D	EPA 200.7	624002	EPA 200.7	624096
60320742006	L-AM-1S	EPA 200.7	624002	EPA 200.7	624096
60320742007	L-AM-1D	EPA 200.7	624002	EPA 200.7	624096
60320742008	L-UMW-DUP-2	EPA 200.7	624002	EPA 200.7	624096
60320742009	L-UMW-FB-2	EPA 200.7	624002	EPA 200.7	624096
60320431001	L-UMW-1D	EPA 200.8	621463	EPA 200.8	621523
60320431002	L-UMW-7D	EPA 200.8	621463	EPA 200.8	621523
60320431003	L-UMW-8D	EPA 200.8	621463	EPA 200.8	621523
60320431004	L-UMW-9D	EPA 200.8	621463	EPA 200.8	621523
60320431005	L-BMW-1D	EPA 200.8	621463	EPA 200.8	621523
60320431006	L-BMW-2D	EPA 200.8	621463	EPA 200.8	621523
60320431007	L-UMW-DUP-1	EPA 200.8	621463	EPA 200.8	621523
60320431008	L-UMW-FB-1	EPA 200.8	621463	EPA 200.8	621523
60320742001	L-UMW-2D	EPA 200.8	621463	EPA 200.8	621523
60320742002	L-UMW-3D	EPA 200.8	621463	EPA 200.8	621523
60320742003	L-UMW-4D	EPA 200.8	621463	EPA 200.8	621523
60320742004	L-UMW-5D	EPA 200.8	621463	EPA 200.8	621523
60320742005	L-UMW-6D	EPA 200.8	621463	EPA 200.8	621523
60320742006	L-AM-1S	EPA 200.8	621463	EPA 200.8	621523
60320742007	L-AM-1D	EPA 200.8	621463	EPA 200.8	621523
60320742008	L-UMW-DUP-2	EPA 200.8	621463	EPA 200.8	621523
60320742009	L-UMW-FB-2	EPA 200.8	621463	EPA 200.8	621523
60320431001	L-UMW-1D	EPA 903.1	371012		
60320431002	L-UMW-7D	EPA 903.1	371012		
60320431003	L-UMW-8D	EPA 903.1	371012		
60320431004	L-UMW-9D	EPA 903.1	371012		
60320431005	L-BMW-1D	EPA 903.1	371012		
60320431006	L-BMW-2D	EPA 903.1	371012		
60320431007	L-UMW-DUP-1	EPA 903.1	371012		
60320431008	L-UMW-FB-1	EPA 903.1	371012		
60320431009	L-UMW-7D MS	EPA 903.1	371012		
60320431010	L-UMW-7D MSD	EPA 903.1	371012		
60320742001	L-UMW-2D	EPA 903.1	371012		
60320742002	L-UMW-3D	EPA 903.1	371012		
60320742003	L-UMW-4D	EPA 903.1	371012		

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60320742004	L-UMW-5D	EPA 903.1	371012		
60320742005	L-UMW-6D	EPA 903.1	371012		
60320742006	L-AM-1S	EPA 903.1	371012		
60320742007	L-AM-1D	EPA 903.1	371012		
60320742008	L-UMW-DUP-2	EPA 903.1	371012		
60320742009	L-UMW-FB-2	EPA 903.1	371012		
60320431001	L-UMW-1D	EPA 904.0	371011		
60320431002	L-UMW-7D	EPA 904.0	371011		
60320431003	L-UMW-8D	EPA 904.0	371011		
60320431004	L-UMW-9D	EPA 904.0	371011		
60320431005	L-BMW-1D	EPA 904.0	371011		
60320431006	L-BMW-2D	EPA 904.0	371011		
60320431007	L-UMW-DUP-1	EPA 904.0	371011		
60320431008	L-UMW-FB-1	EPA 904.0	371011		
60320431009	L-UMW-7D MS	EPA 904.0	371011		
60320431010	L-UMW-7D MSD	EPA 904.0	371011		
60320742001	L-UMW-2D	EPA 904.0	371011		
60320742002	L-UMW-3D	EPA 904.0	371011		
60320742003	L-UMW-4D	EPA 904.0	371011		
60320742004	L-UMW-5D	EPA 904.0	371011		
60320742005	L-UMW-6D	EPA 904.0	371011		
60320742006	L-AM-1S	EPA 904.0	371011		
60320742007	L-AM-1D	EPA 904.0	371011		
60320742008	L-UMW-DUP-2	EPA 904.0	371011		
60320742009	L-UMW-FB-2	EPA 904.0	371011		
60320431001	L-UMW-1D	SM 2320B	621881		
60320431002	L-UMW-7D	SM 2320B	621881		
60320431003	L-UMW-8D	SM 2320B	621881		
60320431004	L-UMW-9D	SM 2320B	621881		
60320431005	L-BMW-1D	SM 2320B	621881		
60320431006	L-BMW-2D	SM 2320B	621881		
60320431007	L-UMW-DUP-1	SM 2320B	622137		
60320431008	L-UMW-FB-1	SM 2320B	622137		
60320742001	L-UMW-2D	SM 2320B	622137		
60320742002	L-UMW-3D	SM 2320B	622137		
60320742003	L-UMW-4D	SM 2320B	622137		
60320742004	L-UMW-5D	SM 2320B	622137		
60320742005	L-UMW-6D	SM 2320B	622137		
60320742006	L-AM-1S	SM 2320B	622137		
60320742007	L-AM-1D	SM 2320B	622137		
60320742008	L-UMW-DUP-2	SM 2320B	622137		
60320742009	L-UMW-FB-2	SM 2320B	622137		
60320431001	L-UMW-1D	SM 2540C	621708		
60320431002	L-UMW-7D	SM 2540C	621708		
60320431003	L-UMW-8D	SM 2540C	621544		
60320431004	L-UMW-9D	SM 2540C	621708		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR LCPA
Pace Project No.: 60320431

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60320431005	**L-BMW-1D**	SM 2540C	621544		
60320431006	**L-BMW-2D**	SM 2540C	621544		
60320431007	**L-UMW-DUP-1**	SM 2540C	621708		
60320431008	**L-UMW-FB-1**	SM 2540C	621708		
60320742001	**L-UMW-2D**	SM 2540C	622003		
60320742002	**L-UMW-3D**	SM 2540C	622003		
60320742003	**L-UMW-4D**	SM 2540C	622003		
60320742004	**L-UMW-5D**	SM 2540C	622003		
60320742005	**L-UMW-6D**	SM 2540C	622003		
60320742006	**L-AM-1S**	SM 2540C	622003		
60320742007	**L-AM-1D**	SM 2540C	622003		
60320742008	**L-UMW-DUP-2**	SM 2540C	622003		
60320742009	**L-UMW-FB-2**	SM 2540C	622003		
60320431001	**L-UMW-1D**	EPA 300.0	624757		
60320431002	**L-UMW-7D**	EPA 300.0	624757		
60320431003	**L-UMW-8D**	EPA 300.0	624757		
60320431004	**L-UMW-9D**	EPA 300.0	624757		
60320431005	**L-BMW-1D**	EPA 300.0	624757		
60320431006	**L-BMW-2D**	EPA 300.0	624757		
60320431007	**L-UMW-DUP-1**	EPA 300.0	624757		
60320431008	**L-UMW-FB-1**	EPA 300.0	624757		
60320742001	**L-UMW-2D**	EPA 300.0	624756		
60320742002	**L-UMW-3D**	EPA 300.0	624756		
60320742003	**L-UMW-4D**	EPA 300.0	624756		
60320742004	**L-UMW-5D**	EPA 300.0	624756		
60320742005	**L-UMW-6D**	EPA 300.0	624756		
60320742006	**L-AM-1S**	EPA 300.0	624756		
60320742007	**L-AM-1D**	EPA 300.0	624756		
60320742008	**L-UMW-DUP-2**	EPA 300.0	624756		
60320742009	**L-UMW-FB-2**	EPA 300.0	624756		

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Sample Condition Upon Receipt

WO# : 60320431

60320431

Client Name: Golder Associates

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

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

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

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

Thermometer Used: T296 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.1,2.6 **Corr. Factor** +0.0 **Corrected** 0.1,2.6, 10.9,3.2

Temperature should be above freezing to 6°C 10.9, 3.2

Date and initials of person examining contents: VB 11/7/19

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	Cooler at 10.9°C contained Radium containers
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jasmi Chunk 11/7/19

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center LCPA
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Metals**	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226/228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G			11/6/19	1000		4	1		3						Y	/	/	/	/	/	/		60320431 001
2	L-UMW-2D	WT	G																							
3	L-UMW-3D	WT	G																							
4	L-UMW-4D	WT	G																							
5	~~L-UMW-5D~~ L-UMW-7D-145	WT	G			11/6/19	0930		4	1		3							/	/	/	/	/	/		002
6	~~L-UMW-6D~~ L-UMW-7DMS	WT	G			"	0930																			002 003
7	L-UMW-7D	WT	G			11/6/19	0930																			002 004
8	L-UMW-8D	WT	G			11/5/19	1445																			003 005 11/7
9	L-UMW-9D	WT	G			11/6/19	1123																			004 006
10	L-BMW-1D	WT	G			11/5/19	1000																			005 007
11	L-BMW-2D	WT	G			"	1240																			006 008
12	L-AM-1S	WT	G																							007

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: B, Ca, Fe, Mn, Mg, K, Na, Ba, Li, Mo	Golder	11/6/19	1745	Natalie B / Pace	11/7/19	0350
**EPA 200.8: As						

SAMPLE CONDITIONS			
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
0.1	Y	Y	Y
2.6			
10.9			
3.2			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/06/19

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

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center LCPA
Project Number:	

Section C Invoice Information

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Metals**	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226/228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N				
1	L-AM-1D	WT	G																							
2	L-UMW-DUP-1	WT	G			11/6/19	—		4	1		3							1	1	1	1	1	1		007 008 009
3	L-UMW-DUP-2	WT	G																							
4	L-UMW-FB-1	WT	G			11/6/19	1146		4	1		3							1	1	1	1	1	1		009 010
5	L-UMW-FB-2	WT	G																							
6		WT	G																							
7		WT	G																							
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: B, Ca, Fe, Mn, Mg, K, Na, Ba, Li, Mo	[signature] / Golder	11/6/19	1745	[signature] / Trace	11/7/19	0450
**EPA 200.8: As						

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
0.1	Y	Y	Y
2.6			
10.9			
3.2			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] (MM/DD/YY): 11/06/19

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Sample Condition Upon Receipt

WO# : 60320742

60320742

Client Name: Golder Associates

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

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

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

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

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

Cooler Temperature (°C): **As-read** 0.1, 0.6 **Corr. Factor** +0.0 **Corrected** 0.1, 0.6

Date and initials of person examining contents: WS 11/9/19

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Church Date: 11/10/19

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Dr., Ste 260	Copy To:		Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center LCPA	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:		Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Metals**	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226/228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N					
1	L-UMW-1D	WT	G																								6032 0742
2	L-UMW-2D	WT	G	11/7/19		11-7-19	1230		4	1		3						✓	✓	✓	✓	✓	✓				001
3	L-UMW-3D	WT	G				1415		4	1		3						✓	✓	✓	✓		✓				002
4	L-UMW-4D	WT	G				0925		4	1		3						✓	✓	✓		✓	✓				003
5	L-UMW-5D	WT	G				1046		4	1		3						✓	✓	✓	✓	✓	✓				004
6	L-UMW-6D	WT	G	↓		↓	1248		4	1		3						✓	✓	✓	✓	✓	✓				005
7	L-UMW-7D	WT	G																								
8	L-UMW-8D	WT	G																								
9	L-UMW-9D	WT	G																								
10	L-BMW-1D	WT	G																								
11	L-BMW-2D	WT	G																								
12	L-AM-1S	WT	G			11-7-19	1405		4	1		3						✓	✓	✓	✓	✓	✓				006

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Fe, Mn, Mg, K, Na, Ba, Li, Mo	Annie Muehlfarth / Golder	11/8/19	1620	Angela Mcnew	11/8	16:25				
**EPA 200.8: As	Angela Mcnew	11/8	16:25	Pace	11/9/19	0255	0.1 / 0.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Annie Muehlfarth

SIGNATURE of SAMPLER: Annie Muehlfarth DATE Signed (MM/DD/YY): 11-7-19

*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.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Dr., Ste 260	Copy To:		Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Labadie Energy Center LCPA	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:		Pace Profile #:	9285

REGULATORY AGENCY

NPDES (GROUND WATER) DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Metals**	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226/228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N				
1	L-AM-1D	WT	G	11/7/19		11-7-19	1525		4	1		3							✓	✓	✓	✓	✓	✓		007
2	L-UMW-DUP-1	WT	G																							
3	L-UMW-DUP-2	WT	G	11/7/19		11-7-19	—		4	1		3							✓	✓	✓	✓	✓	✓		008
4	L-UMW-FB-1	WT	G																							
5	L-UMW-FB-2	WT	G	11/7/19		11-7-19	1508		4	1		3							✓	✓	✓	✓	✓	✓		009
6		WT	G																							
7		WT	G																							
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

6032 67 4/2

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, Fe, Mn, Mg, K, Na, Ba, Li, Mo	Annie Muehlfarth / Golder	11/8/19	1620	Angela Mc	11/8/19	1625	0.1,0.6 Y Y Y
**EPA 200.8: As	Angela Mc	11/8/19	16:25	Pace	11/9/19	0255	

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Annie Muehlfarth	(MM/DD/YY):	11-7-19
SIGNATURE of SAMPLER:	Annie Muehlfarth		

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

MEMORANDUM

DATE January 6, 2020 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin **EMAIL Tommy_Goodwin@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCPA – DETECTION MONITORING - DATA PACKAGE 60320431

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a duplicate comparison criterion was not met, associated samples were qualified as estimates (J).
- When a matrix spike/matrix spike duplicate recovered outside accepted limits corresponding sample detections were recorded at the result and qualified as estimates (J).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260,
Ballwin, Missouri, USA 63021

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J Ingram
Project Name: Ameren - Labadie - LCPA
Project Number: 1531406
Reviewer: T Goodwin
Validation Date: 1/6/2020

Laboratory: Pace Analytical - KS
SDG #: 60320431
Analytical Method (type and no.): EPA 200.7/200.8 (Metals); SM2540C (TDS); SM2320B (Alk); EPA 300.0 (Anions); EPA 903.1/904.0 (Radium)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names L-UMW-1D, L-UMW-2D, L-UMW-3D, L-UMW-4D, L-UMW-5D, L-UMW-6D, L-UMW-7D, L-UMW-8D, L-UMW-9D, L-BMW-1D, L-BMW-2D, L-AM-1S, L-AM-1D, L-UMW-DUP-1, L-UMW-FB-1, L-UMW-DUP-2, L-UMW-FB-2, L-UMW-7D MS, L-UMW-7D MSD

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	11/5-7/2019
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	DUP-1 @ L-UMW-1D, DUP-2 @ L-AM-1S FB-1 @ L-UMW-9D, FB-2 @ L-AM-1D
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	-31001 (Alk); -31002 (Alk, TDS); -31007 (Alk); -42008 (Alk); -31004 (TDS)
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	See Notes

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

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

Comments/Notes:

FB-1: TDS (7.0), Ra-226 (0.496),

MB: 31001,3-8 and 42001-9: K (84.4), 31002: B (29.2); 31001-8: Cl (0.27/0.30)

MS/MSD: -31001 Ca_MS/MSD_High; -31002 Ca&Na_MS/MSD_Low

DUP-1: Li (22), Ra-228 (200); DUP-2: Ra-228 (200)

Max Lab Duplicate RPD: 7% (Limit 10%)

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

Preservative: samples for L-UMW-DUP-1 were not preserved <2 within the required 5 days of sample collection. Laboratory preserved samples upon arrival for radiochemistry analysis.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-UMW-1D	Calcium (Ca)	-	J	MS/MSD Recovered High; Result > MDL
L-UMW-7D	Ca	-	J	MS/MSD Recovered Low; Result > MDL
"	Sodium (Na)	-	J	"
L-UMW-1D	Radium-228 (Ra-228)		J	Field Duplicate (FD) RPD Exceeded Limits; Result > MDC
L-UMW-DUP-2	"		J	

Signature: _____ Date: 1/6/2020

APPENDIX D

November 2018 Assessment Monitoring Statistical Evaluation

TECHNICAL MEMORANDUM

DATE February 28, 2019 **Project No.** 153-1406

TO Bill Kutosky
Ameren Missouri

CC Susan Knowles, Craig Giesmann, Paul Pike, Charlie Henderson

FROM Mark Haddock - Golder Associates **EMAIL mhaddock@golder.com**

ASSESSMENT MONITORING STATISTICAL EVALUATION FOR THE LCPA SURFACE IMPOUNDMENT, LABADIE ENERGY CENTER, FRANKLIN COUNTY MISSOURI

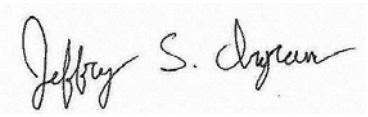
This Technical Memorandum provides the results of the Assessment Monitoring Statistical Evaluation for the LCPA Surface Impoundment November 2018 sampling event at the Labadie Energy Center located in Franklin County Missouri. Included in this memorandum is a brief summary of constituents that are present at a Statistically Significant Level (SSL), a list of site-specific Groundwater Protection Standards (**Table 1**), and the Sanitas Technologies™ (Sanitas) statistical software output for each of the Appendix IV parameters (**Appendix A** and **Appendix B**).

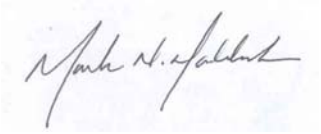
SSLs were calculated using the methods and procedures outlined in the Groundwater Monitoring Plan's (GMP) Statistical Analysis Plan (SAP). No outliers were removed prior to calculation of the confidence intervals. A summary of SSLs at corresponding well(s) is as follows:

- Molybdenum at UMW-3D, UMW-4D, UMW-5D, UMW-6D, and UMW-7D

Golder appreciates this opportunity to provide hydrogeological and engineering support services to Ameren. If you have any questions or comments regarding the information provided, please call our office at (314) 984-8800.

Sincerely,





Jeffrey Ingram, R.G.
Project Geologist

Mark Haddock, P.E., R.G.
Principal, Practice Leader

JSI/MNH

Enclosures:
Table 1 – LCPA Groundwater Protection Standards
Appendix A – Sanitas Confidence Interval Statistical Output
Appendix B – Sanitas Trending Confidence Bands Statistical Output

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

Table 1
LCPA Groundwater Protection Standards
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

Parameter	Units	MCL or Health Based GWPS	Site GWPS	Value to Return to Detection Monitoring[7]
Antimony	µg/L	6	6	DQR
Arsenic	µg/L	10	42.6	42.6
Barium	µg/L	2000	2000	1290
Beryllium	µg/L	4	4	DQR
Cadmium	µg/L	5	5	DQR
Chromium	µg/L	100	100	DQR
Cobalt	µg/L	6	6	DQR
Fluoride	mg/l	4	4	0.29
Lead	µg/L	15	15	DQR
Lithium	µg/L	40	54.85	55.39
Mercury	µg/L	2	2	DQR
Molybdenum	µg/L	100	100	DQR
Radium 226 + 228	pCi/L	5	5	3.51
Selenium	µg/L	50	50	DQR
Thallium	µg/L	2	2	DQR

Notes:

Prepared by: JSI 10/3/2018
Checked by:TJG 10/4/2018
Reviewed by:MNH 10/10/2018

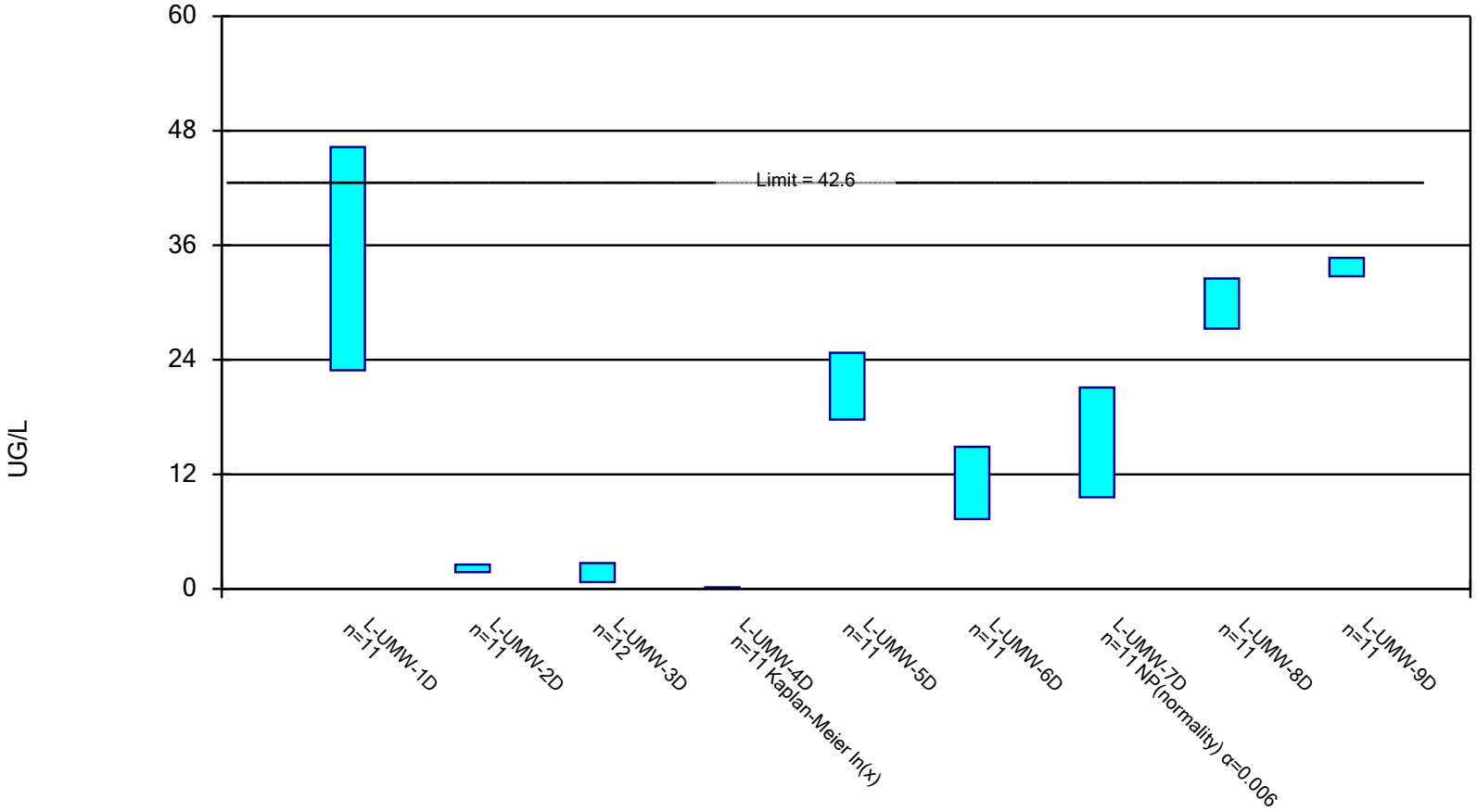
1. µg/L - micrograms per liter
2. mg/L - milligrams per liter
3. pCi/L - picocuries per liter
4. MCL - Maximum Contaminant Level. MCLs from United States Environmental Protection Agency (USEPA) 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012. http://water.epa.gov/drink/contaminants/index.cfm.
5. Health Based Groundwater Protection Standards (GWPS) were adoped for Appendix IV parameters without an MCL (i.e. cobalt, lithium, molybdenum, and lead). Information available at https://www.epa.gov/coalash/coal-ash-rule.
6. Values were calculated using statistical methods outlined for Detection Monitoring and are used for returning to Detection Monitoring based on available data to date.
7. DQR - Double Quantification Rule. If all baseline data are less than the Practical Quantitation Limit (PQL), then the DQR will be used. More information on the DQR is provided in the Statistical Analysis Plan.
8. Site GWPS is either the MCL/Health Based GWPS or based on background levels (calculated as described in the Statistical Analysis Plan for Assessment Monitoring), whichever is higher.
9. GWPS and background values calculated using baseline sampling results from monitoring wells BMW-1D and BMW-2D.

APPENDIX A

Sanitas Confidence Interval Statistical Output

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

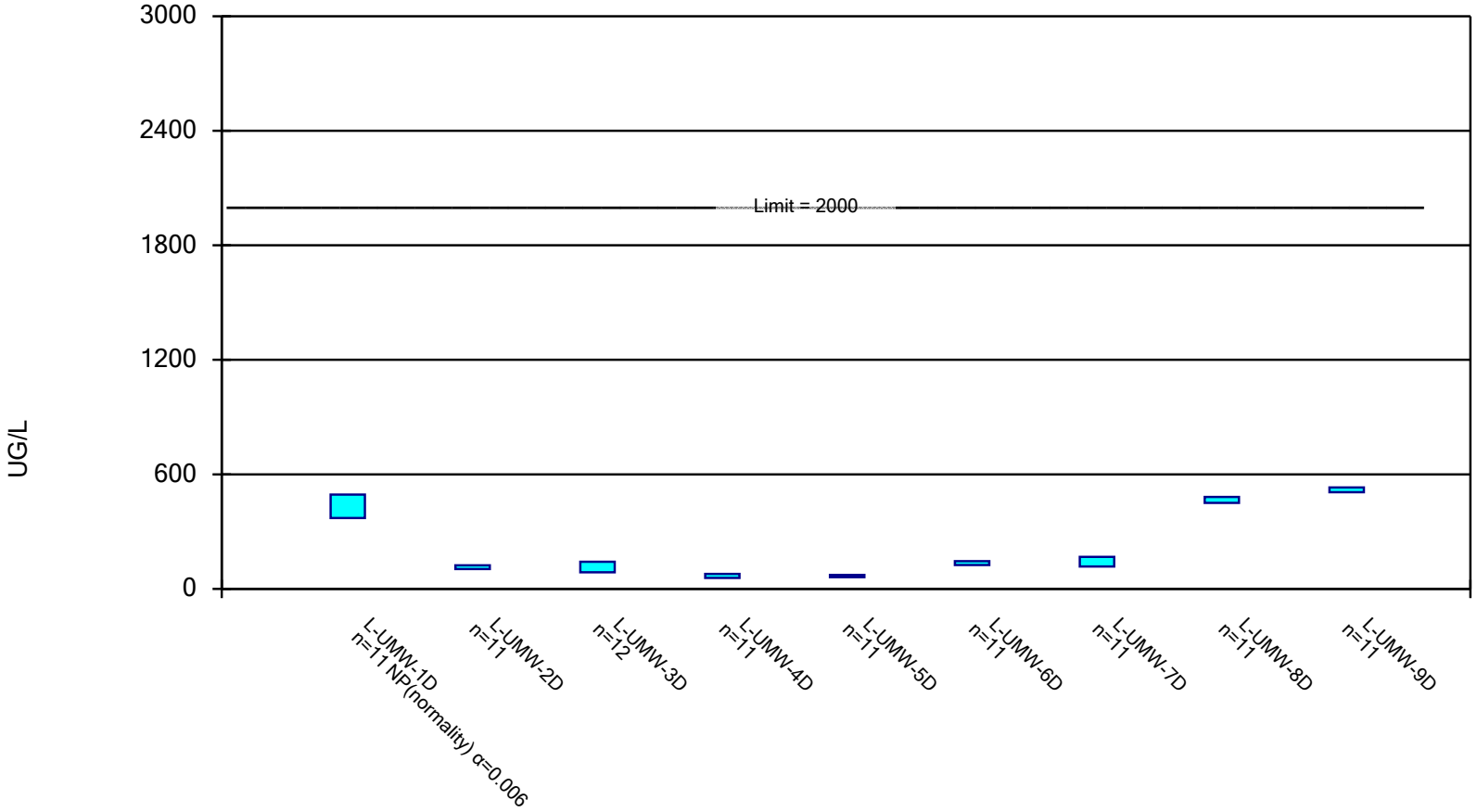


Constituent: ARSENIC, TOTAL Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

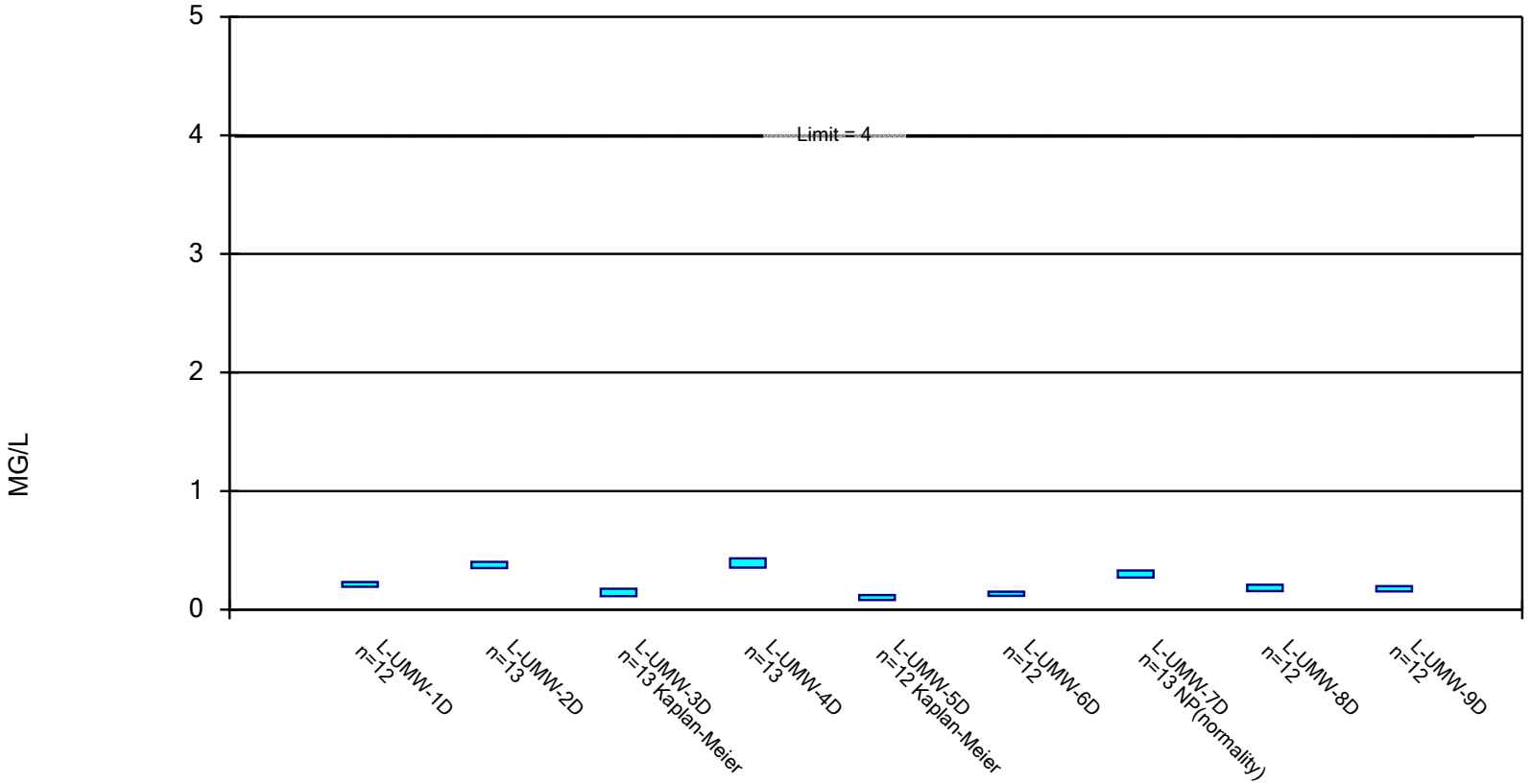


Constituent: BARIUM, TOTAL Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

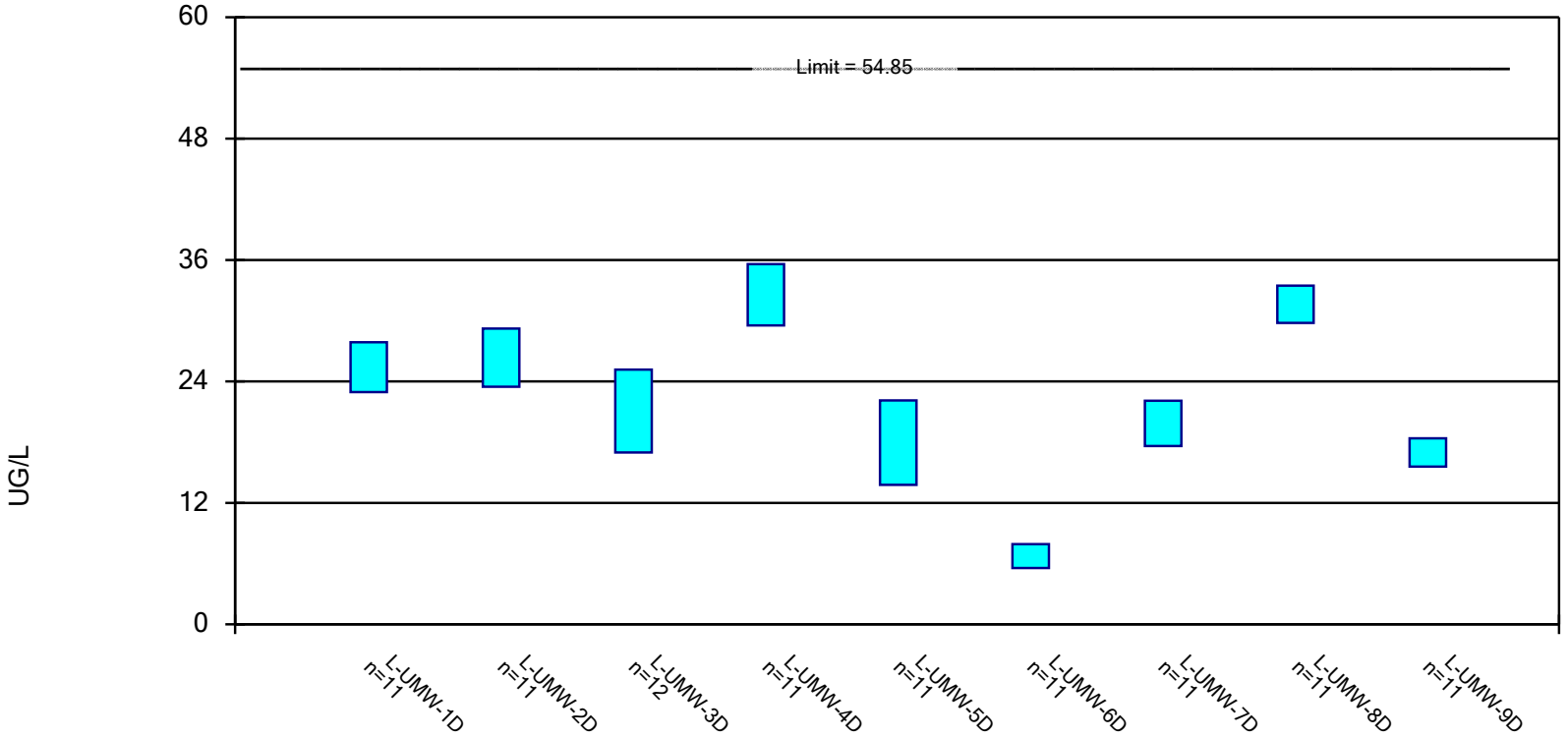


Constituent: FLUORIDE, TOTAL Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

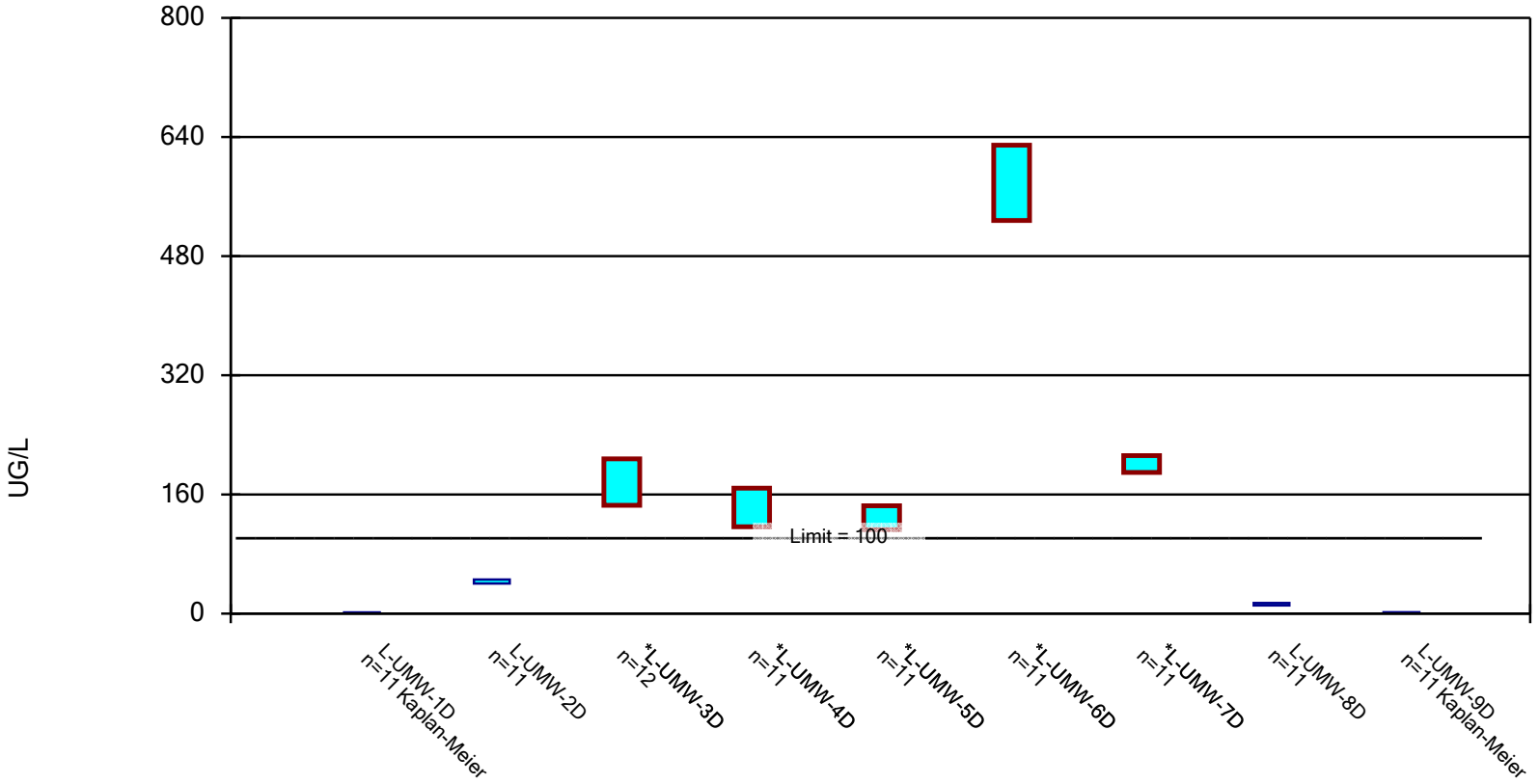


Constituent: LITHIUM, TOTAL Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

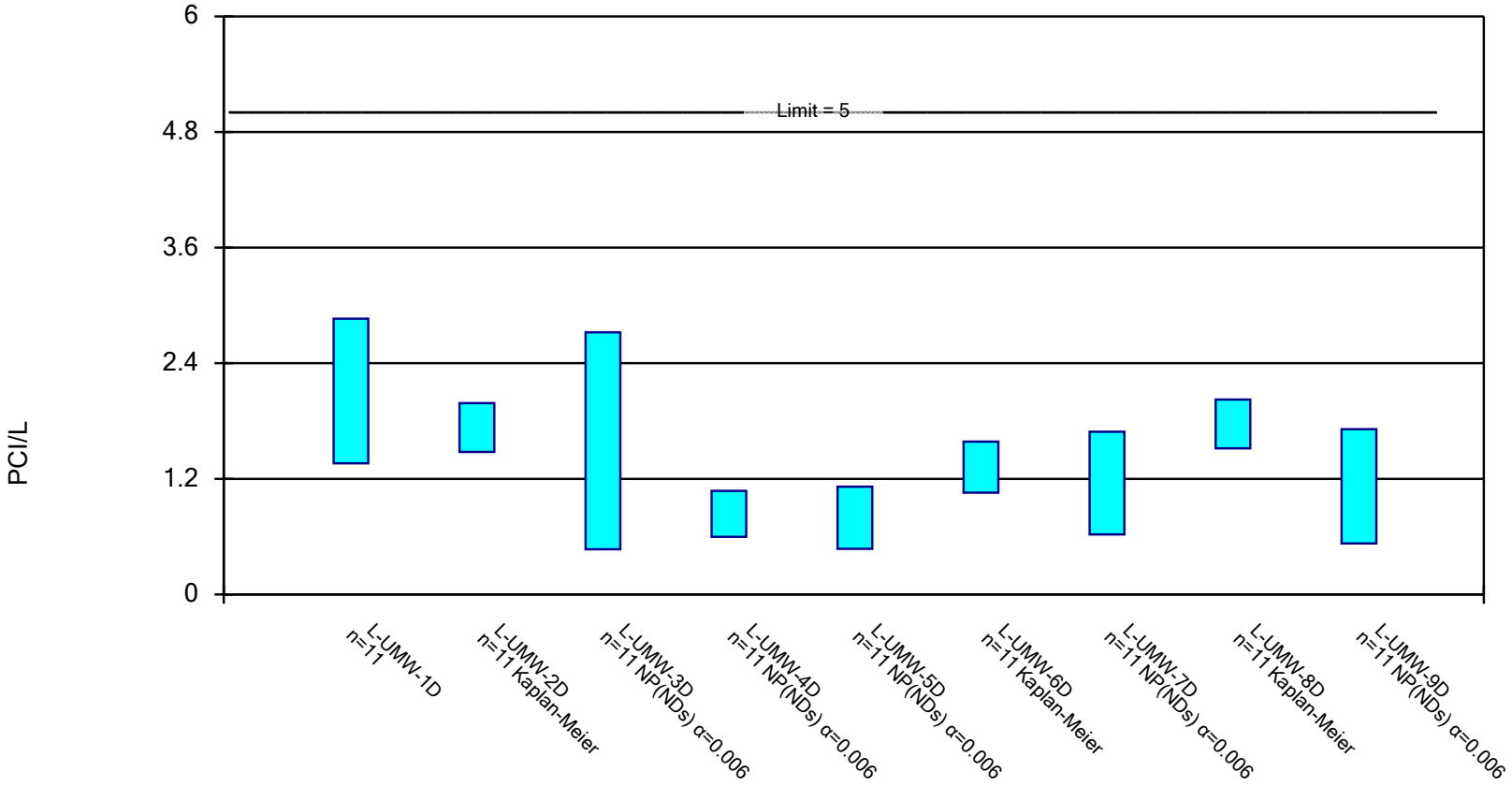


Constituent: MOLYBDENUM, TOTAL Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Radium [226 + 228] Analysis Run 2/20/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 2/20/2019, 8:23 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
ARSENIC, TOTAL (UG/L)	L-UMW-1D	46.3	22.9	42.6	No	11	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-2D	2.544	1.747	42.6	No	11	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-3D	2.703	0.7118	42.6	No	12	8.333	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-4D	0.1743	0.09087	42.6	No	11	36.36	ln(x)	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-5D	24.74	17.75	42.6	No	11	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-6D	14.89	7.312	42.6	No	11	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-7D	21.1	9.6	42.6	No	11	0	No	0.006	NP (normality)
ARSENIC, TOTAL (UG/L)	L-UMW-8D	32.52	27.28	42.6	No	11	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-9D	34.68	32.75	42.6	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-1D	494	371	2000	No	11	0	No	0.006	NP (normality)
BARIUM, TOTAL (UG/L)	L-UMW-2D	123.3	103.7	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-3D	142	86.66	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-4D	77.95	57.33	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-5D	73.02	61.02	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-6D	144.9	125.3	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-7D	167.6	116.8	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-8D	481.5	450.1	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-9D	531.1	506.2	2000	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-1D	0.2323	0.1927	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-2D	0.4029	0.3509	4	No	13	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-3D	0.1758	0.1134	4	No	13	23.08	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-4D	0.4319	0.3543	4	No	13	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-5D	0.1223	0.08192	4	No	12	16.67	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-6D	0.1515	0.116	4	No	12	8.333	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-7D	0.33	0.27	4	No	13	0	No	0.01	NP (normality)
FLUORIDE, TOTAL (MG/L)	L-UMW-8D	0.21	0.1567	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-9D	0.1976	0.154	4	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-1D	27.88	22.95	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-2D	29.23	23.48	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-3D	25.18	16.99	54.85	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-4D	35.6	29.53	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-5D	22.12	13.78	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-6D	7.924	5.567	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-7D	22.1	17.61	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-8D	33.46	29.79	54.85	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-9D	18.38	15.59	54.85	No	11	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	L-UMW-1D	1.528	0.6077	100	No	11	27.27	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	L-UMW-2D	45.81	40.3	100	No	11	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-3D**	**207.7**	**145.5**	**100**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-4D**	**168.5**	**116.6**	**100**	**Yes**	**11**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-5D**	**144.7**	**112.7**	**100**	**Yes**	**11**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-6D**	**629**	**527.9**	**100**	**Yes**	**11**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-7D**	**212.1**	**189.5**	**100**	**Yes**	**11**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	L-UMW-8D	14.33	11.03	100	No	11	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	L-UMW-9D	1.854	0.673	100	No	11	27.27	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-1D	2.862	1.362	5	No	11	9.091	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-2D	1.986	1.478	5	No	11	27.27	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-3D	2.721	0.4685	5	No	11	63.64	No	0.006	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-4D	1.075	0.5985	5	No	11	72.73	No	0.006	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-5D	1.118	0.473	5	No	11	90.91	No	0.006	NP (NDs)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 2/20/2019, 8:23 AM

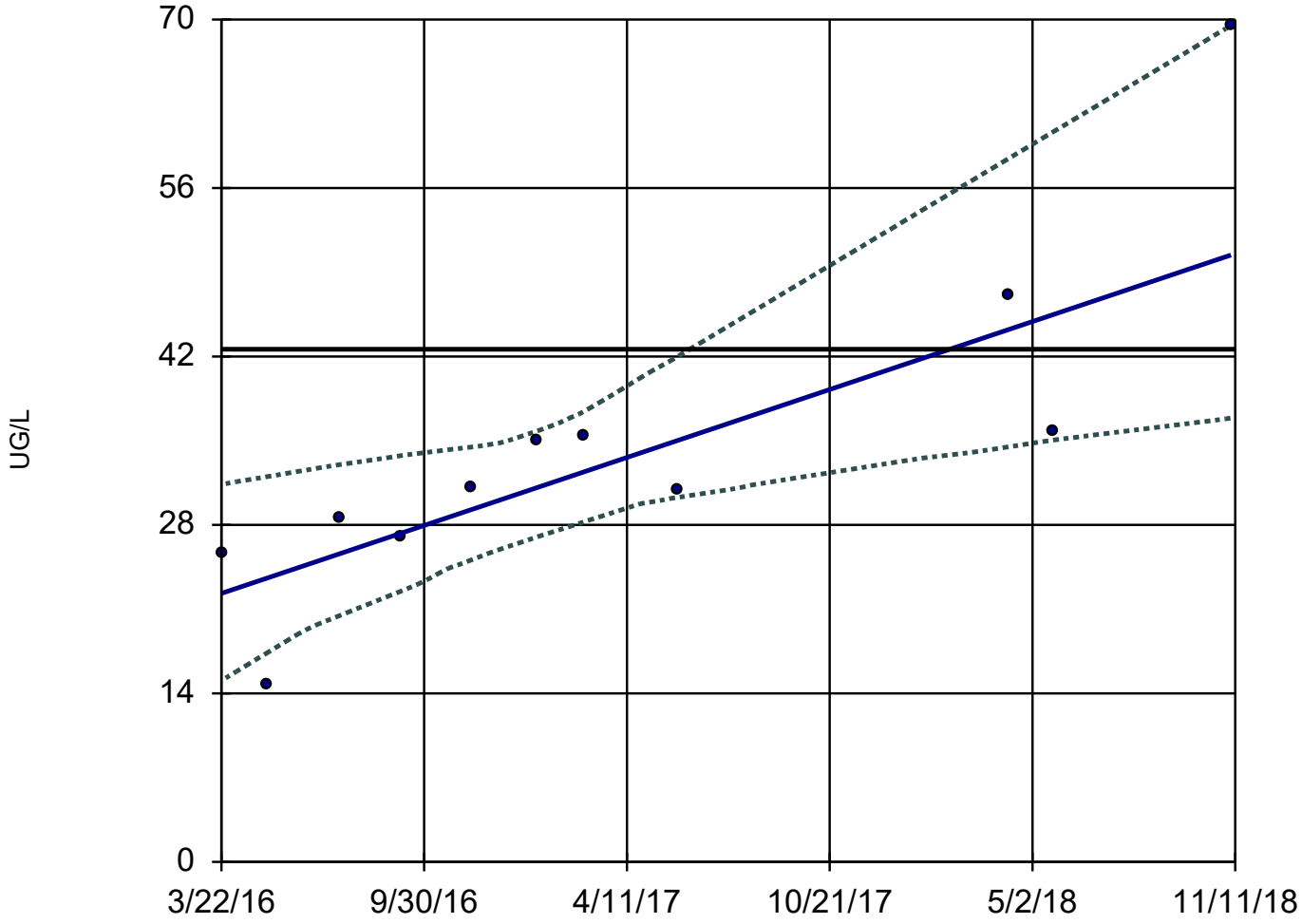
Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Radium [226 + 228] (PCI/L)	L-UMW-6D	1.586	1.056	5	No	11	45.45	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-7D	1.689	0.623	5	No	11	81.82	No	0.006	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-8D	2.023	1.517	5	No	11	36.36	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-9D	1.716	0.529	5	No	11	81.82	No	0.006	NP (NDs)

APPENDIX B

Sanitas Trending Confidence Bands Statistical Output

Sen's Slope and 95% Confidence Band

L-UMW-1D



n = 11

Slope = 10.69 units per year.

Mann-Kendall statistic = 43
critical = 31

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

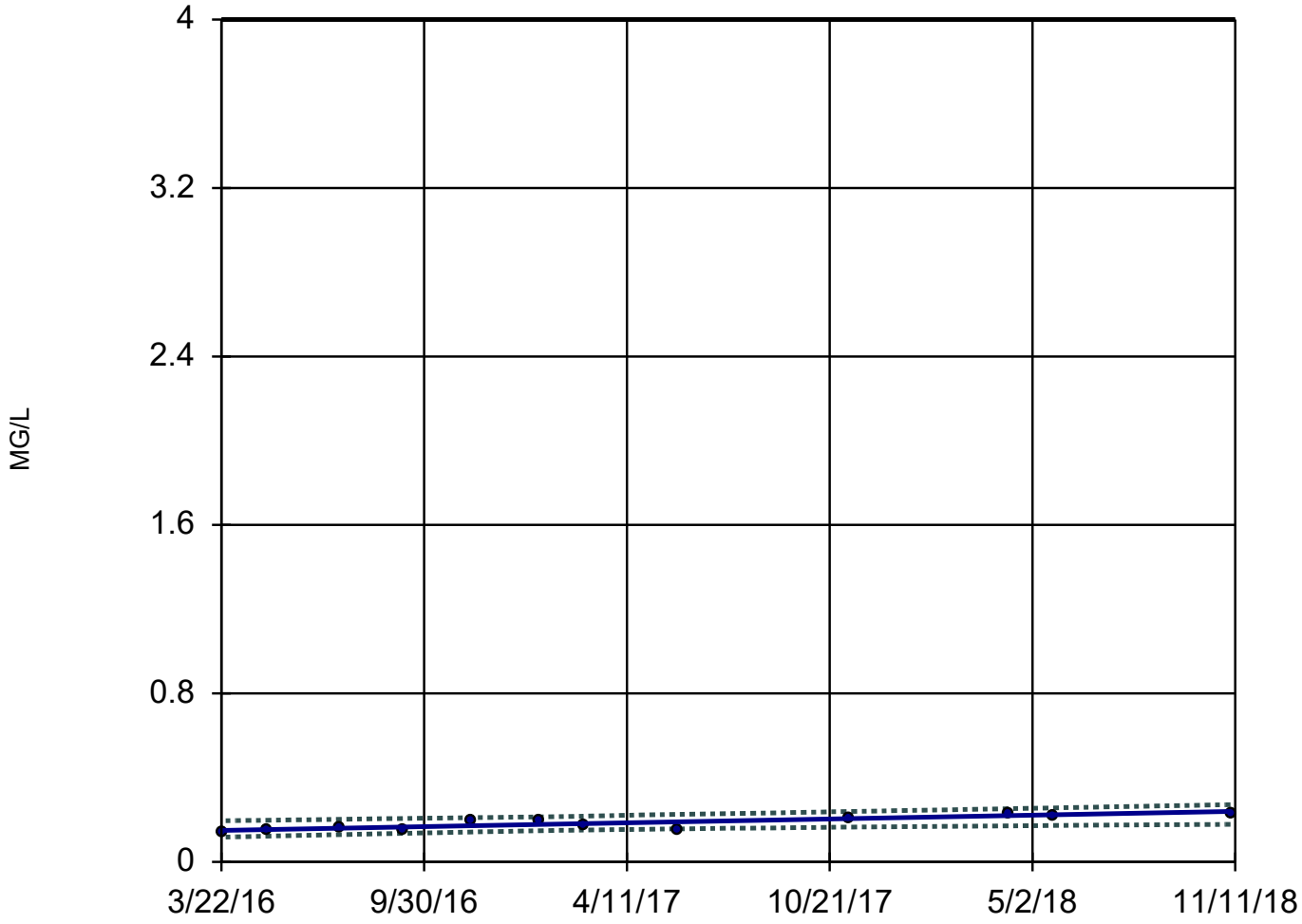
GWPS = 42.6.

Constituent: ARSENIC, TOTAL Analysis Run 2/20/2019 9:06 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-8D



n = 12

Slope = 0.03419 units per year.

Mann-Kendall statistic = 44
critical = 35

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

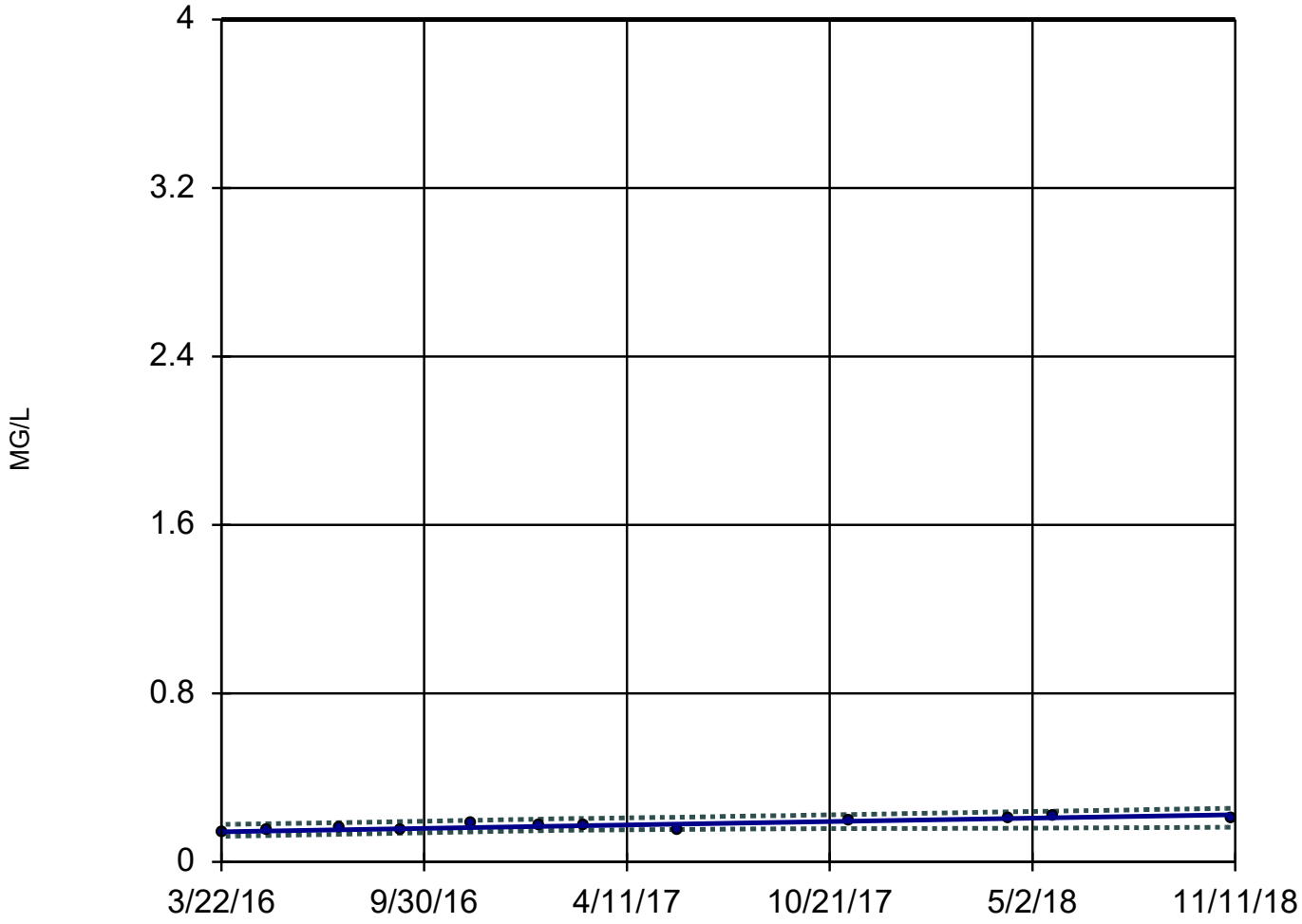
GWPS = 4.

Constituent: FLUORIDE, TOTAL Analysis Run 2/20/2019 9:07 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-9D



n = 12

Slope = 0.03061 units per year.

Mann-Kendall statistic = 45
critical = 35

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

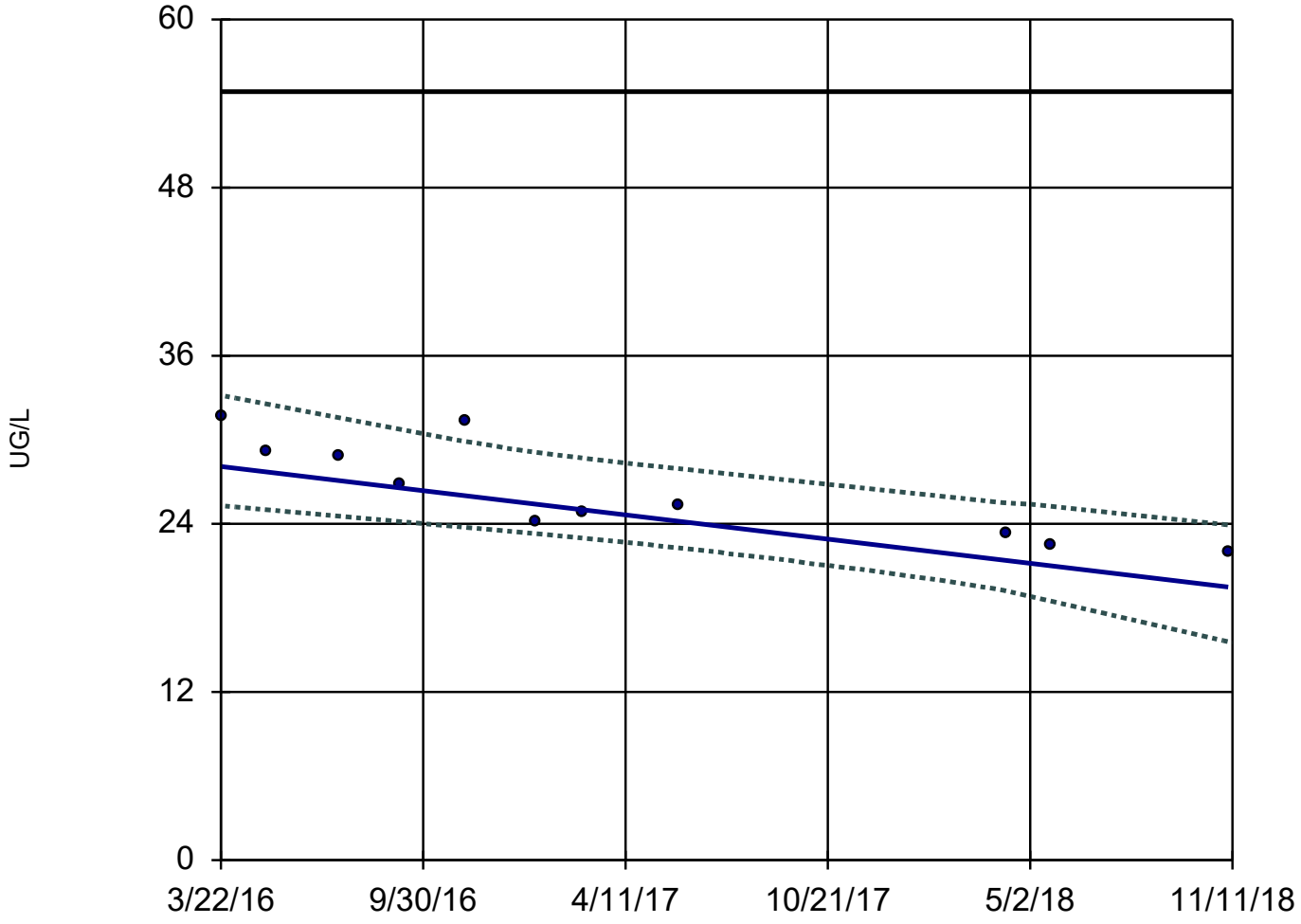
GWPS = 4.

Constituent: FLUORIDE, TOTAL Analysis Run 2/20/2019 9:07 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-2D



n = 11

Slope = -3.274 units per year.

Mann-Kendall statistic = -43
critical = -31

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

GWPS = 54.85.

Constituent: LITHIUM, TOTAL Analysis Run 2/20/2019 9:07 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

APPENDIX G

April-May 2019 Assessment Monitoring Statistical Evaluation

TECHNICAL MEMORANDUM

DATE September 6, 2019 **Project No.** 153-140601

TO Bill Kutosky
Ameren Missouri

CC Susan Knowles, Craig Giesmann, Paul Pike, Charlie Henderson

FROM Mark Haddock - Golder Associates **EMAIL mhaddock@golder.com**

ASSESSMENT MONITORING STATISTICAL EVALUATION FOR THE LCPA SURFACE IMPOUNDMENT, LABADIE ENERGY CENTER, FRANKLIN COUNTY MISSOURI

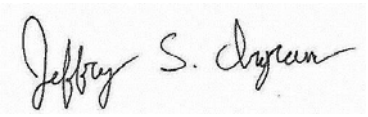
This Technical Memorandum provides the results of the Assessment Monitoring Statistical Evaluation for the LCPA Surface Impoundment April-May 2019 sampling event at the Labadie Energy Center located in Franklin County Missouri. Included in this memorandum is a brief summary of constituents that are present at a Statistically Significant Level (SSL), a list of site-specific Groundwater Protection Standards (**Table 1**), and the Sanitas Technologies™ (Sanitas) statistical software output for each of the Appendix IV parameters (**Appendix A** and **Appendix B**).

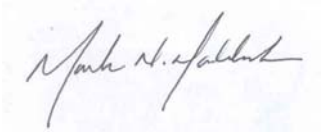
SSLs were calculated using the methods and procedures outlined in the Groundwater Monitoring Plan's (GMP) Statistical Analysis Plan (SAP). No outliers were removed prior to calculation of the confidence intervals. A summary of SSLs at corresponding well(s) is as follows:

- Molybdenum at UMW-3D, UMW-4D, UMW-5D, UMW-6D, and UMW-7D

Golder appreciates this opportunity to provide hydrogeological and engineering support services to Ameren. If you have any questions or comments regarding the information provided, please call our office at (314) 984-8800.

Sincerely,





Jeffrey Ingram, R.G.
Project Geologist

Mark Haddock, P.E., R.G.
Principal, Practice Leader

JSI/MNH

Enclosures:
Table 1 – LCPA Groundwater Protection Standards
Appendix A – Sanitas Confidence Interval Statistical Output
Appendix B – Sanitas Trending Confidence Bands Statistical Output

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

Table 1 - LCPA Groundwater Protection Standards
LCPA Surface Impoundment
Labadie Energy Center

Parameter	Units	MCL or Health Based GWPS	Site GWPS	Value to Return to Detection Monitoring [7]
Antimony	µg/L	6	6	DQR
Arsenic	µg/L	10	42.6	42.6
Barium	µg/L	2000	2000	1290
Beryllium	µg/L	4	4	DQR
Cadmium	µg/L	5	5	DQR
Chromium	µg/L	100	100	DQR
Cobalt	µg/L	6	6	DQR
Fluoride	mg/L	4	4	0.2999
Lead	µg/L	15	15	DQR
Lithium	µg/L	40	51.96	52.55
Mercury	µg/L	2	2	DQR
Molybdenum	µg/L	100	100	DQR
Radium 226 + 228	pCi/L	5	5	4.14
Selenium	µg/L	50	50	DQR
Thallium	µg/L	2	2	DQR

Notes:

Prepared by: JSI 8/1/2019
Checked by: LMS 8/27/2019
Reviewed by: MNH 9/5/2019

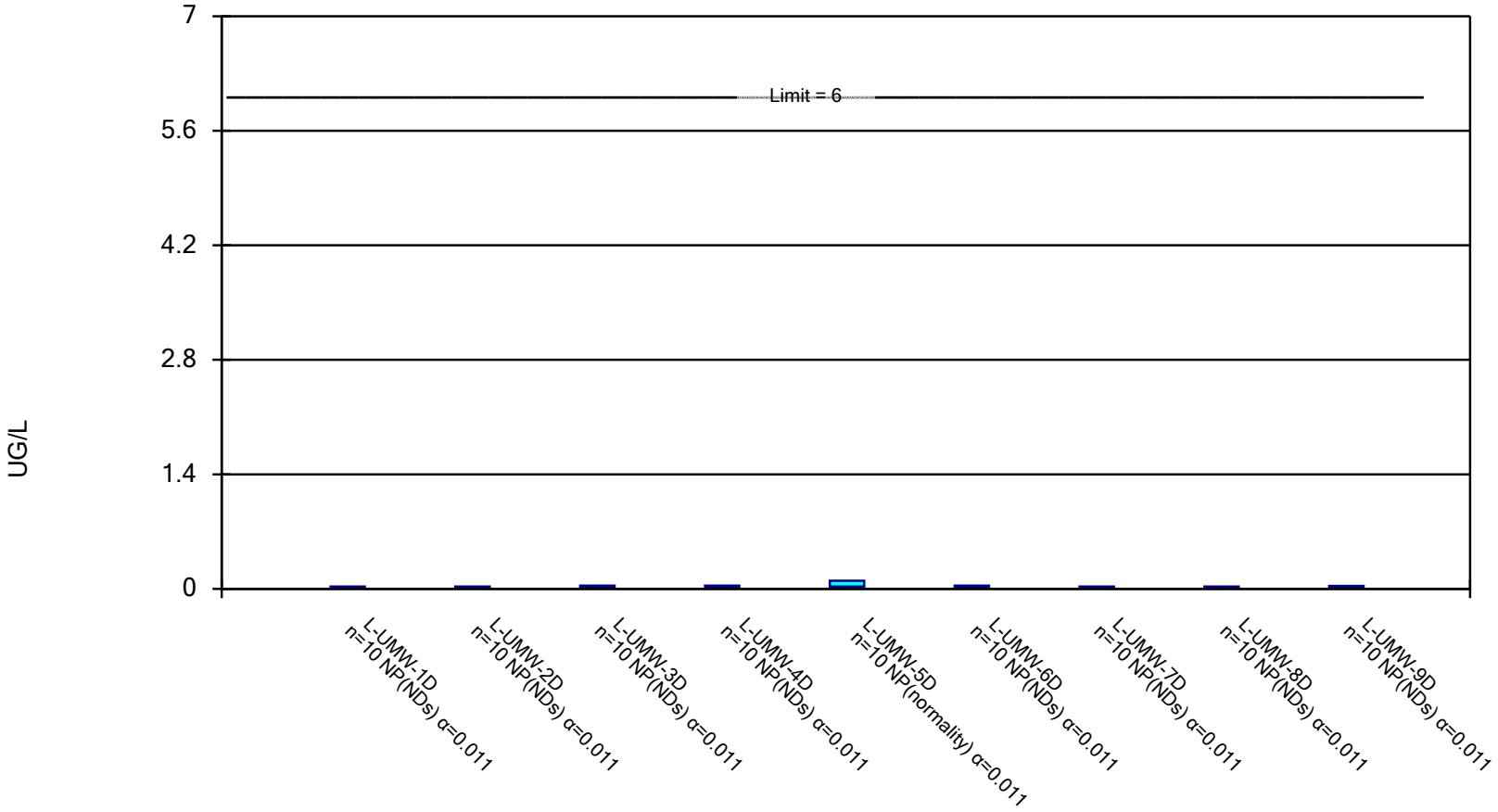
1. µg/L - micrograms per liter
2. mg/L - milligrams per liter
3. pCi/L - picocuries per liter
4. MCL - Maximum Contaminant Level. MCLs from United States Environmental Protection Agency (USEPA) 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012. http://water.epa.gov/drink/contaminants/index.cfm.
5. Health Based Groundwater Protection Standards (GWPS) were adoped for Appendix IV parameters without an MCL (i.e. cobalt, lithium, molybdenum, and lead). Information available at https://www.epa.gov/coalash/coal-ash-rule.
6. Values were calculated using statistical methods outlined for Detection Monitoring and are used for returning to Detection Monitoring based on available data to date.
7. DQR - Double Quantification Rule. If all baseline data are less than the Practical Quantitation Limit (PQL), then the DQR will be used. More information on the DQR is provided in the Statistical Analysis Plan.
8. Site GWPS is either the MCL/Health Based GWPS or based on background levels (calculated as described in the Statistical Analysis Plan for Assessment Monitoring), whichever is higher.
9. GWPS and background values calculated using results collected through May 2019 from monitoring wells BMW-1D and BMW-2D.

APPENDIX A

Sanitas Confidence Interval Statistical Output

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

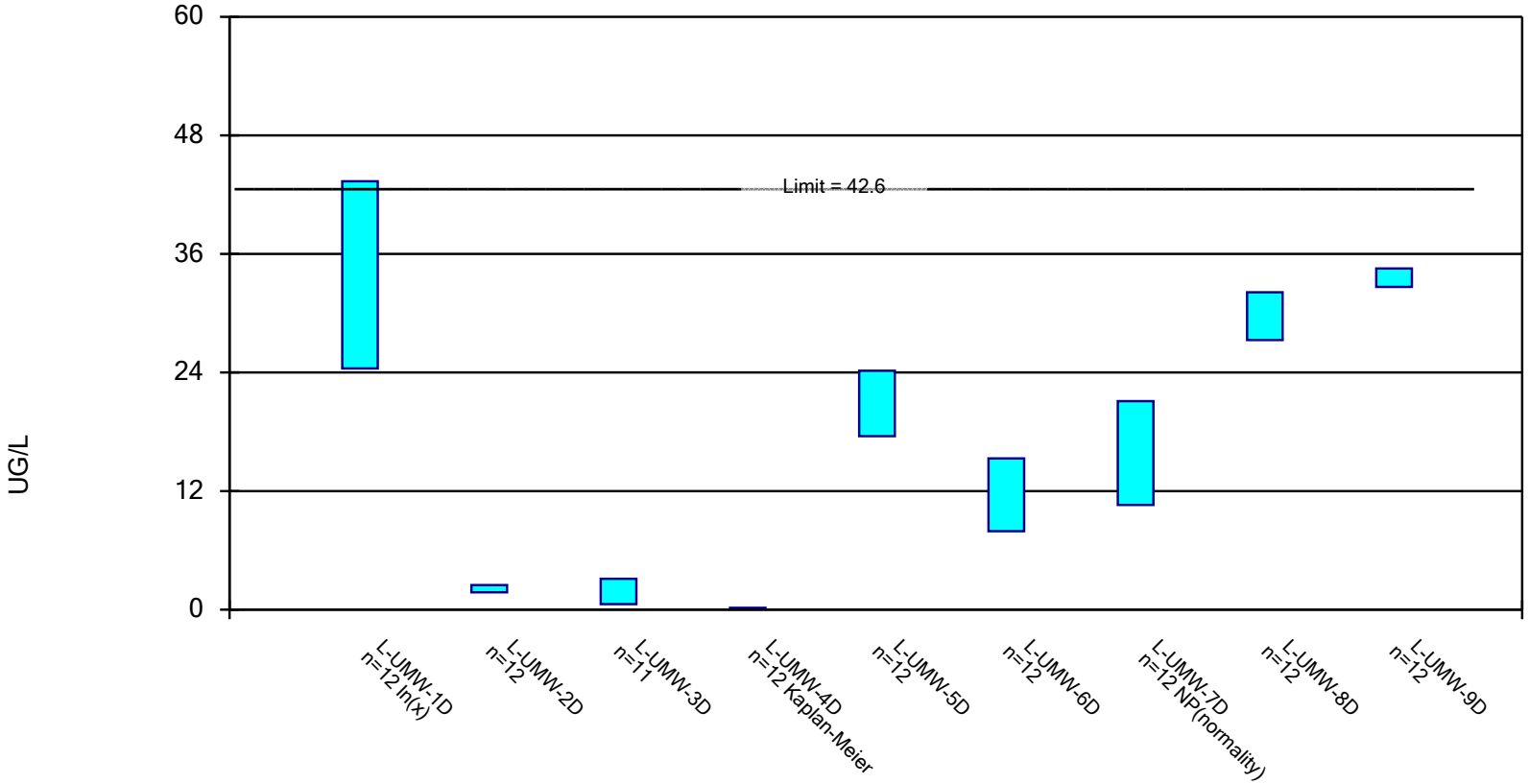


Constituent: ANTIMONY, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

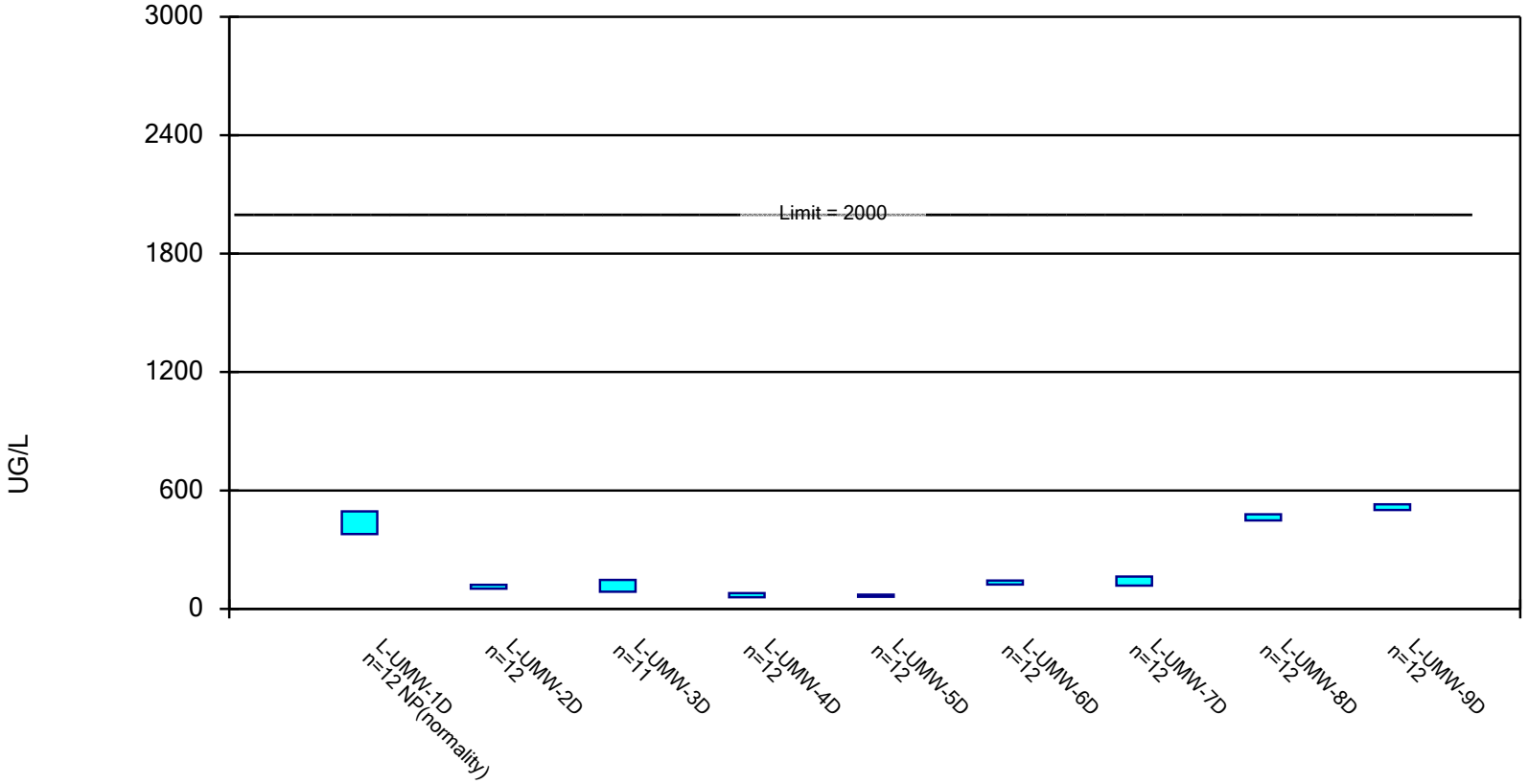


Constituent: ARSENIC, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

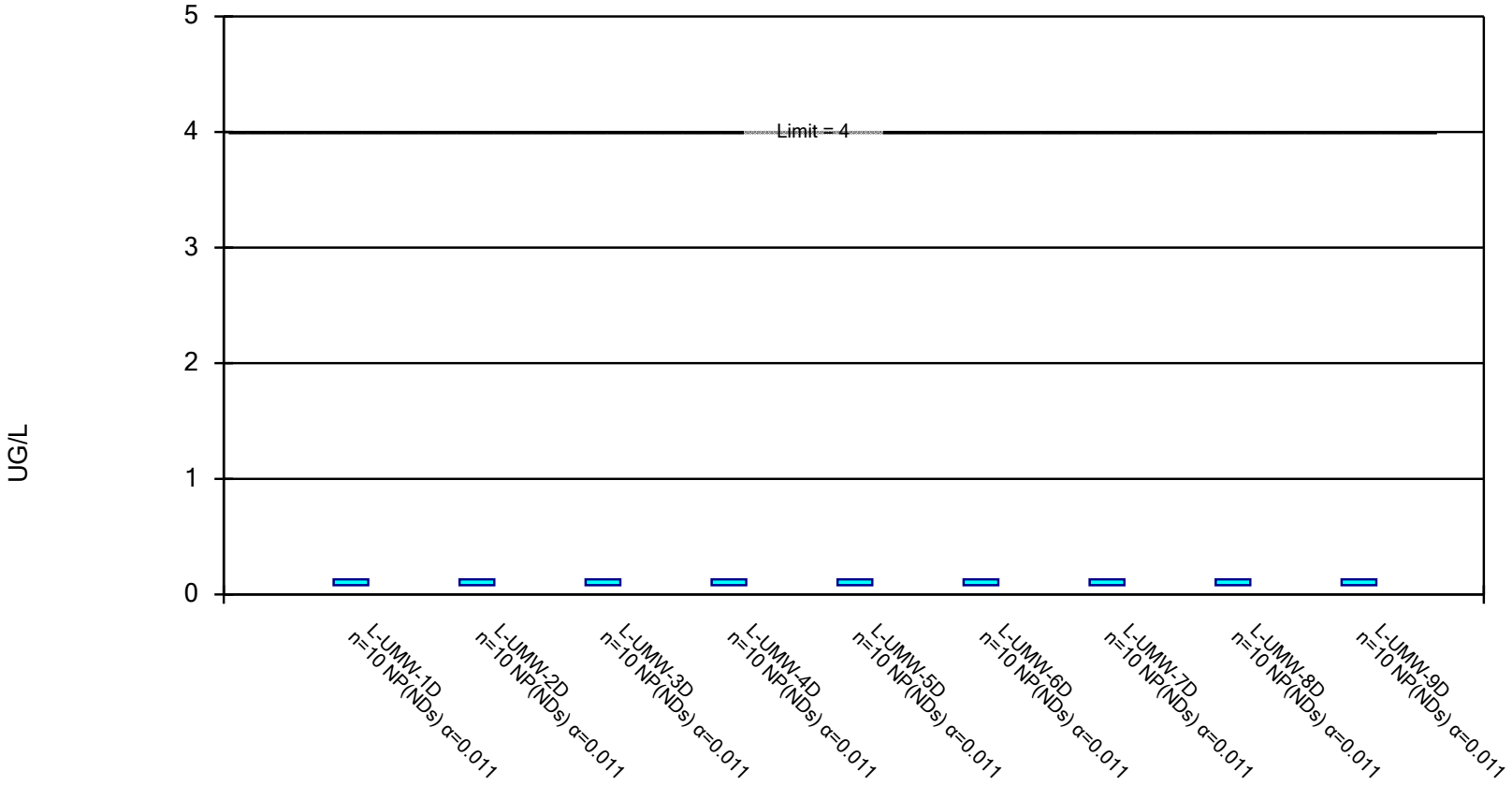


Constituent: BARIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

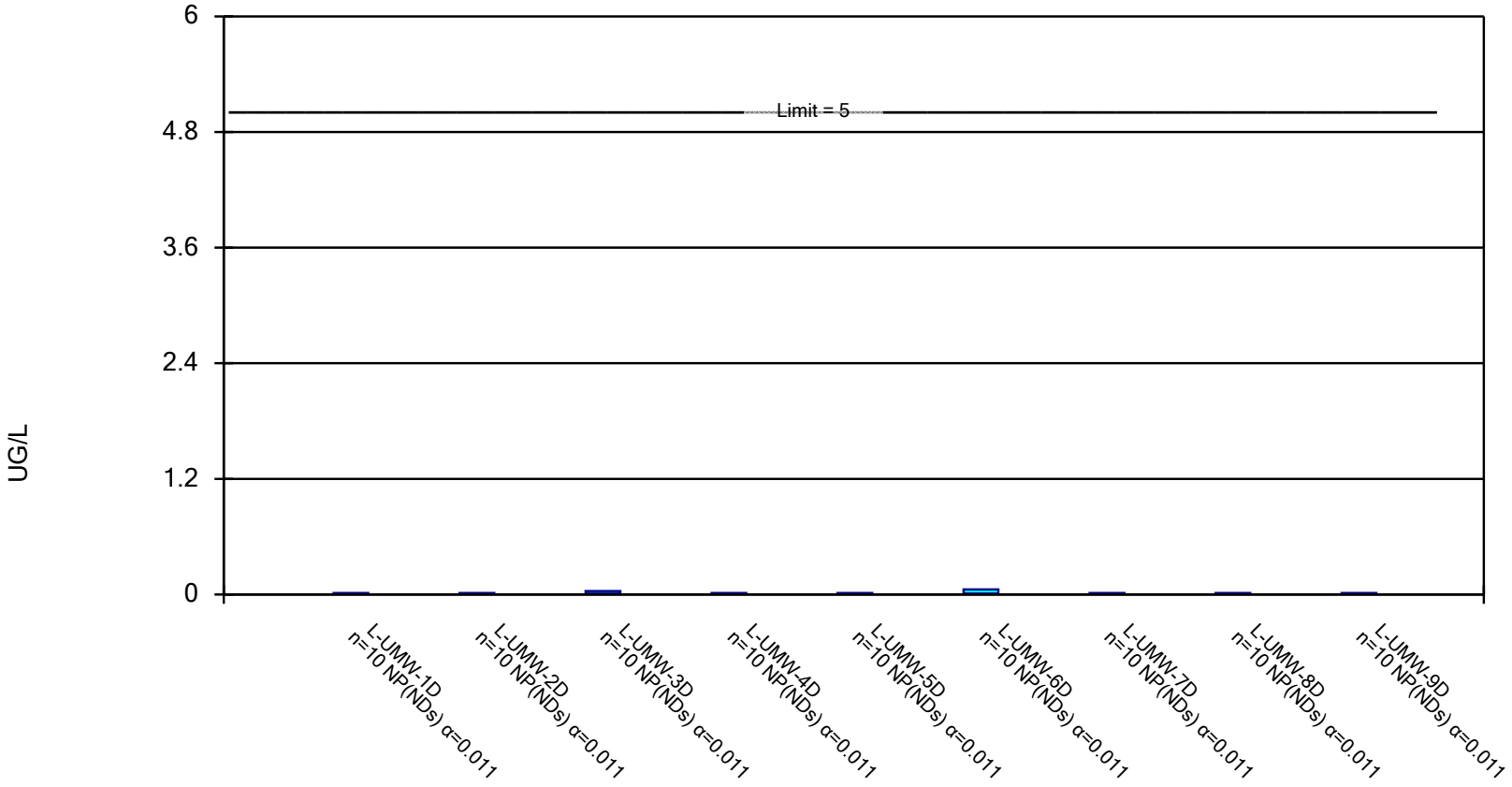


Constituent: BERYLLIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

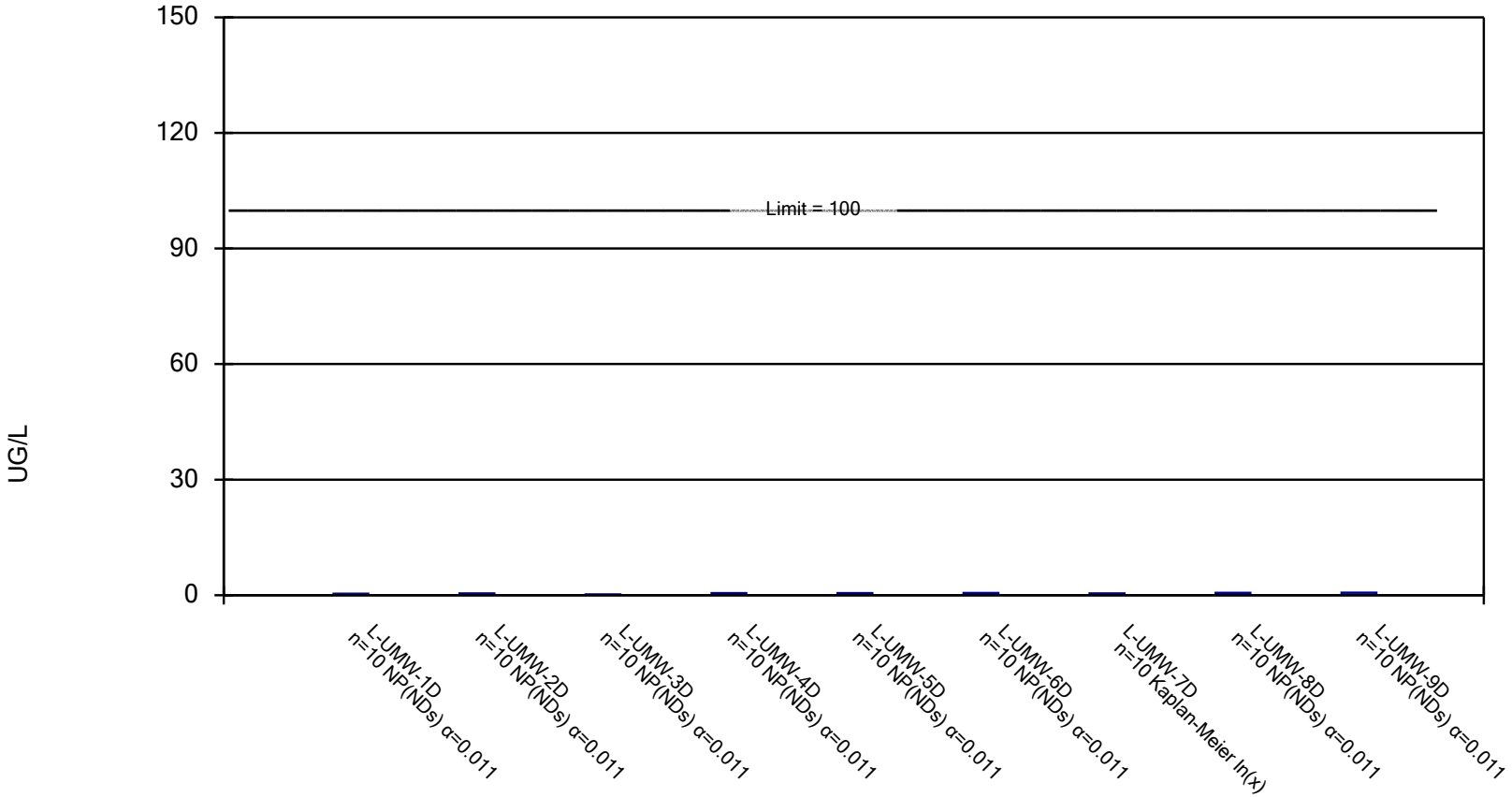


Constituent: CADMIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

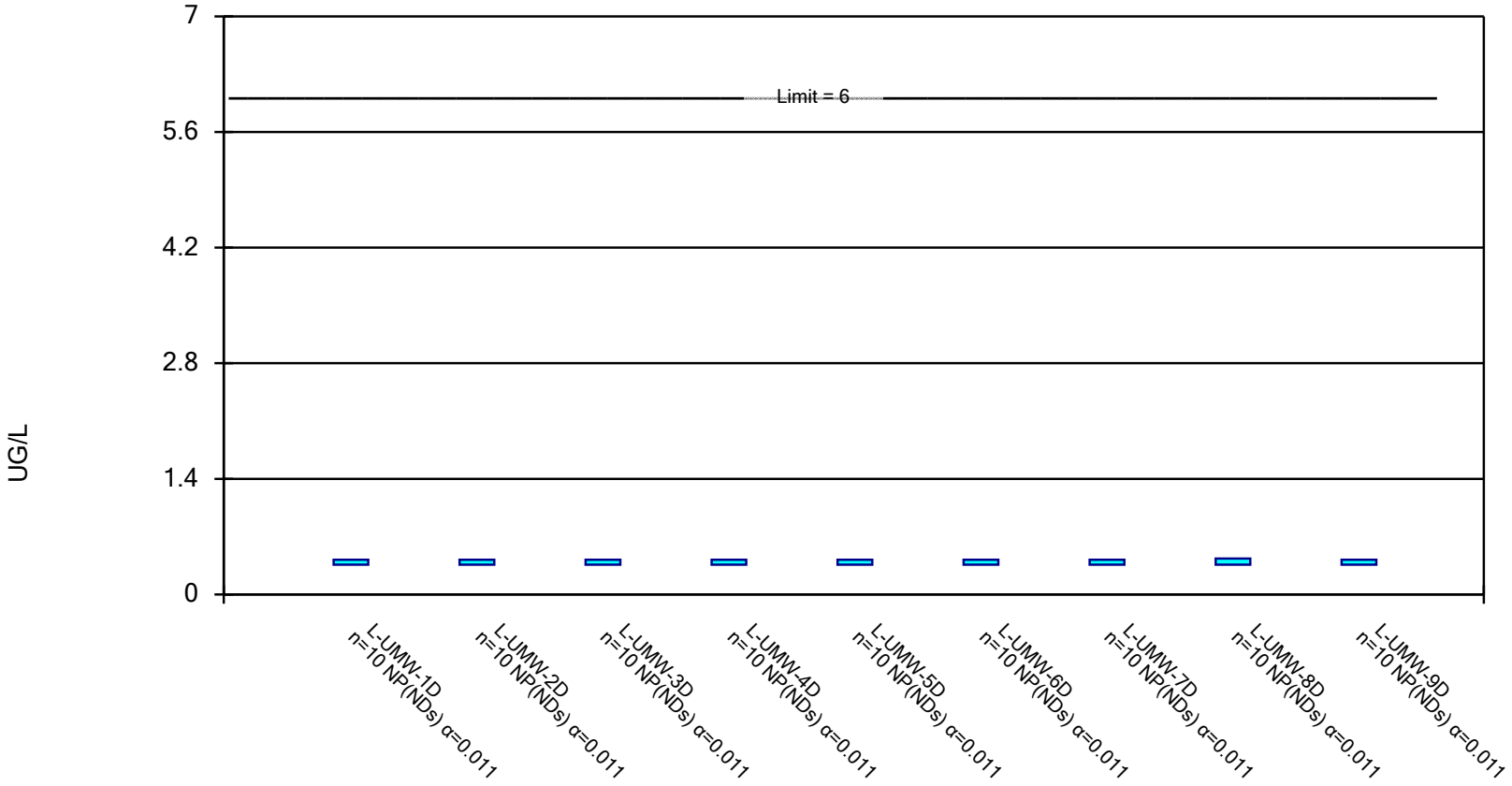


Constituent: CHROMIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

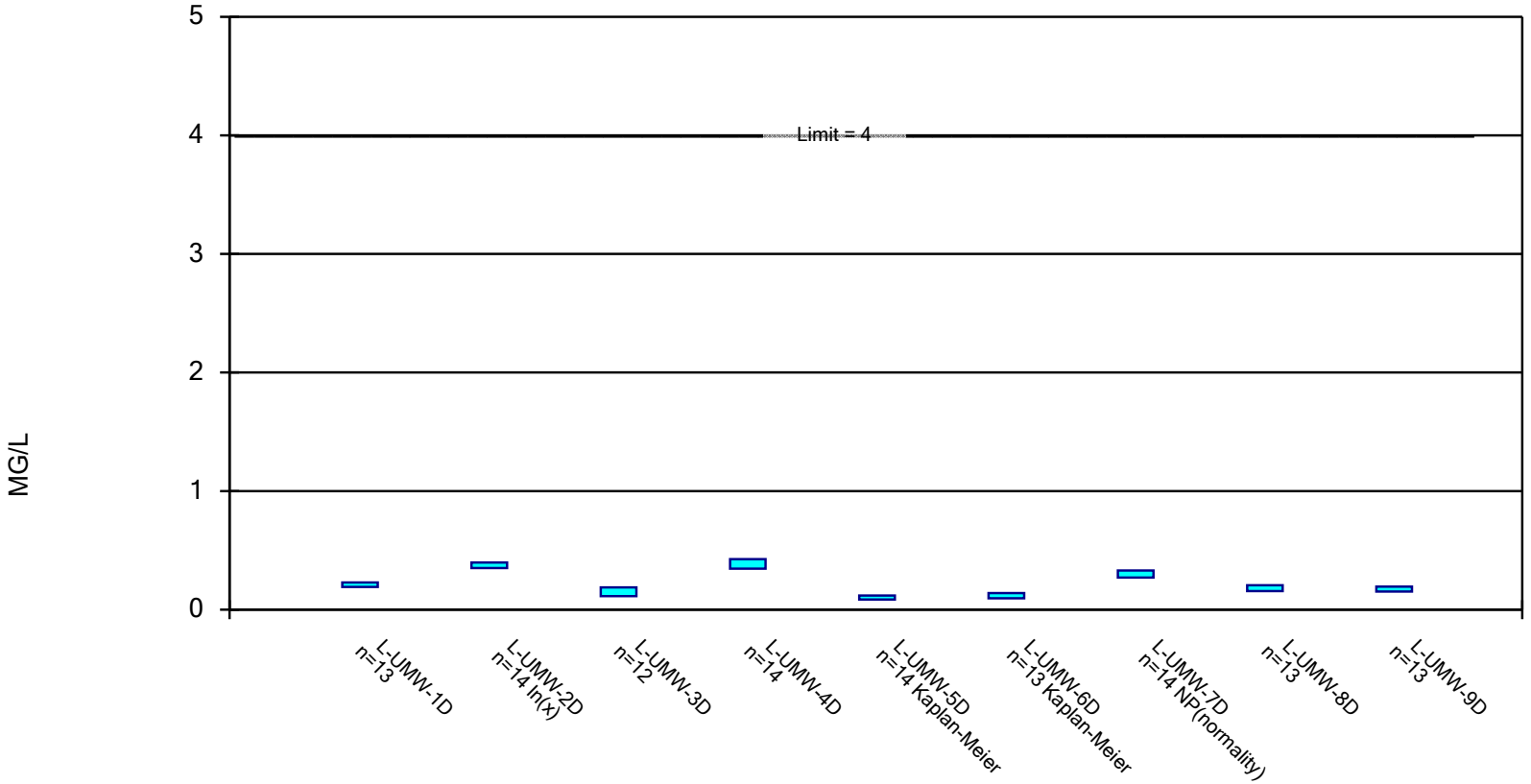


Constituent: COBALT, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

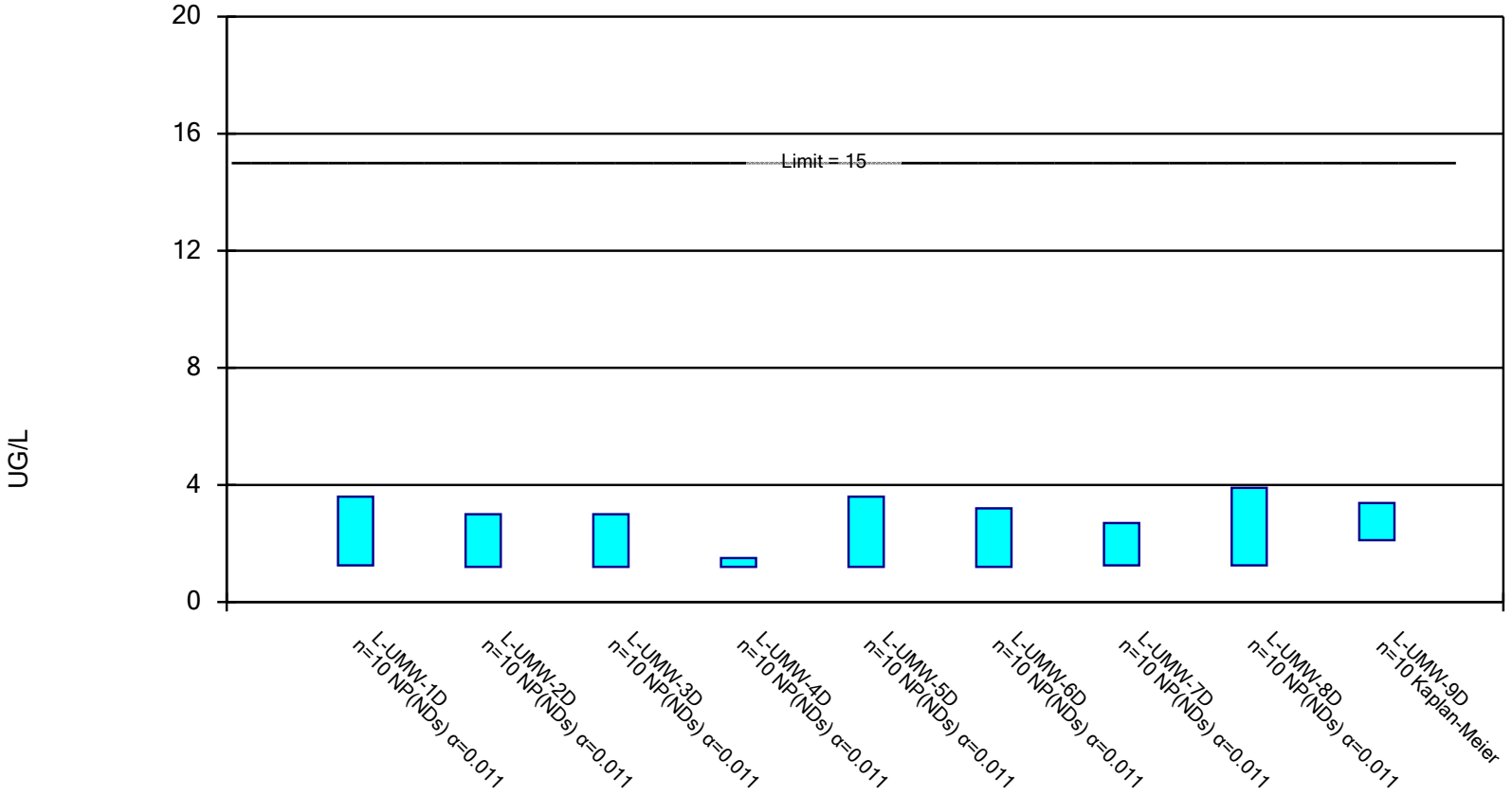


Constituent: FLUORIDE, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

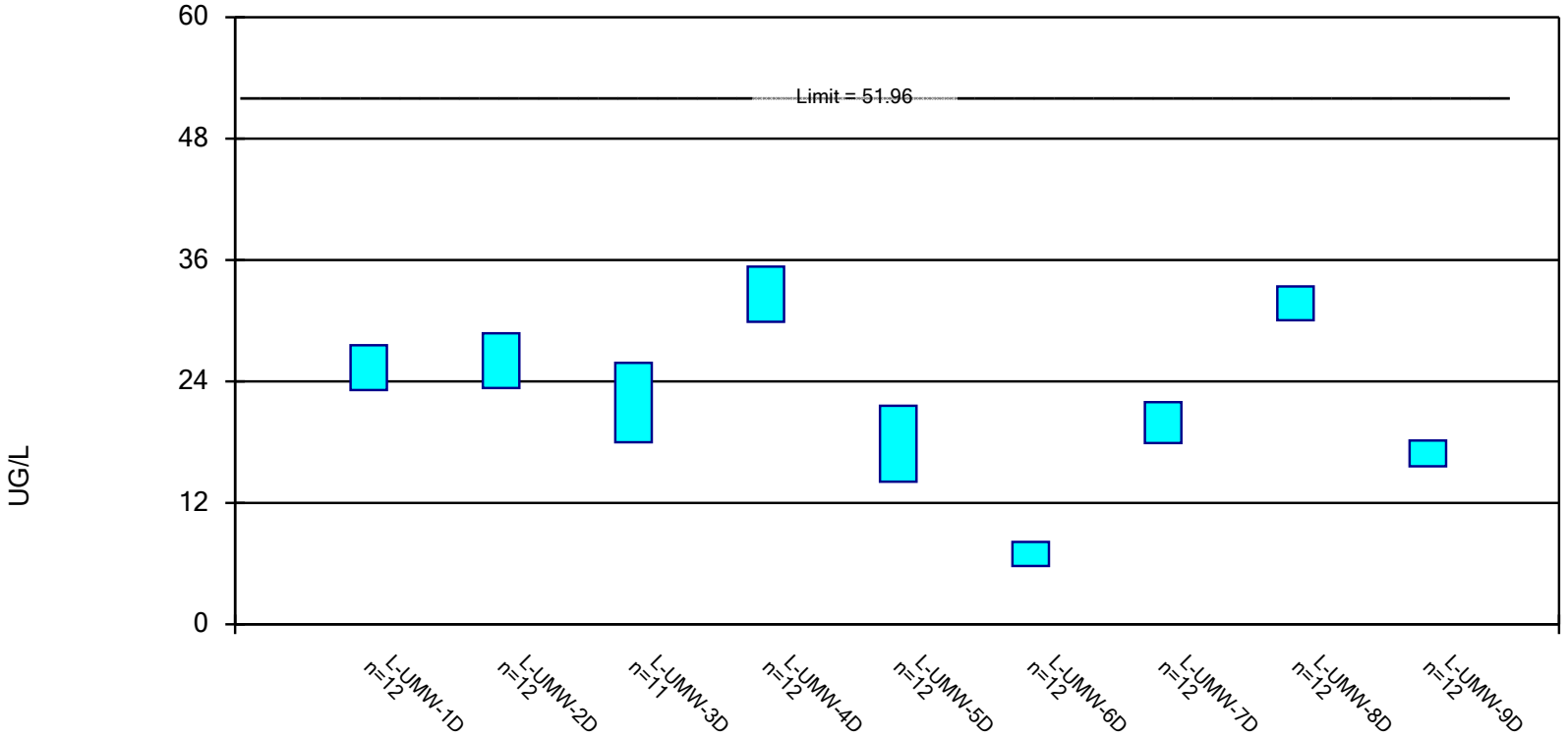


Constituent: LEAD, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

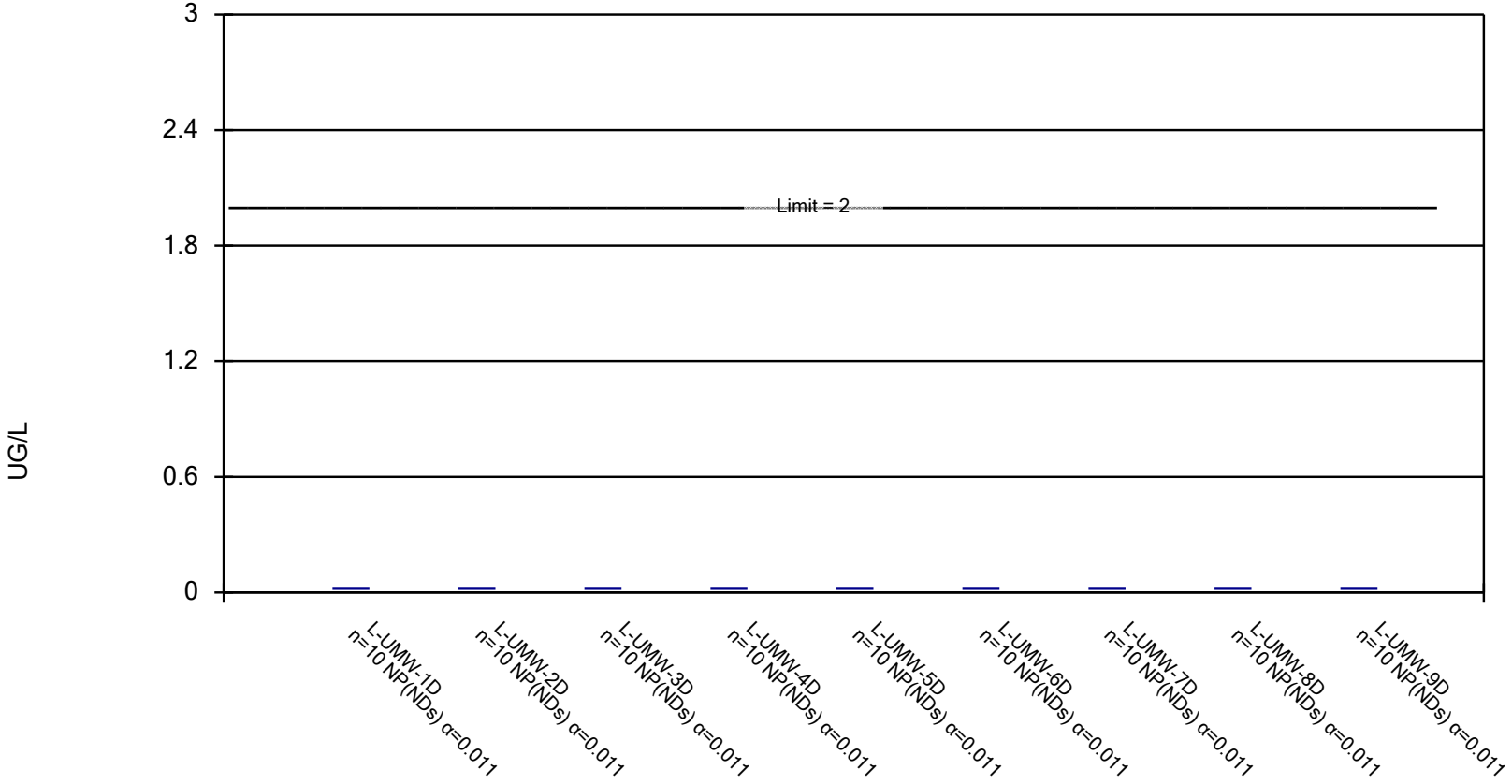


Constituent: LITHIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

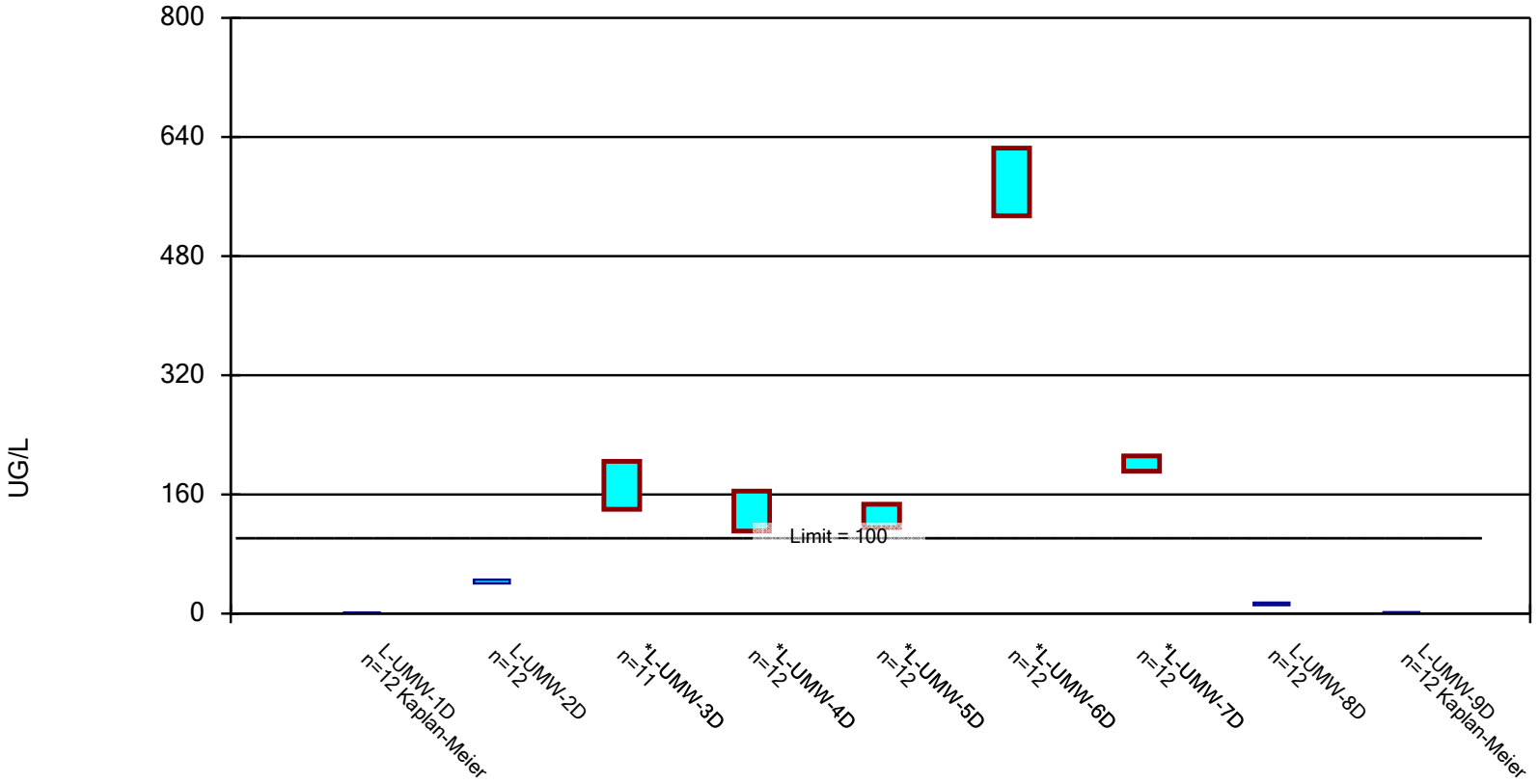


Constituent: MERCURY, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

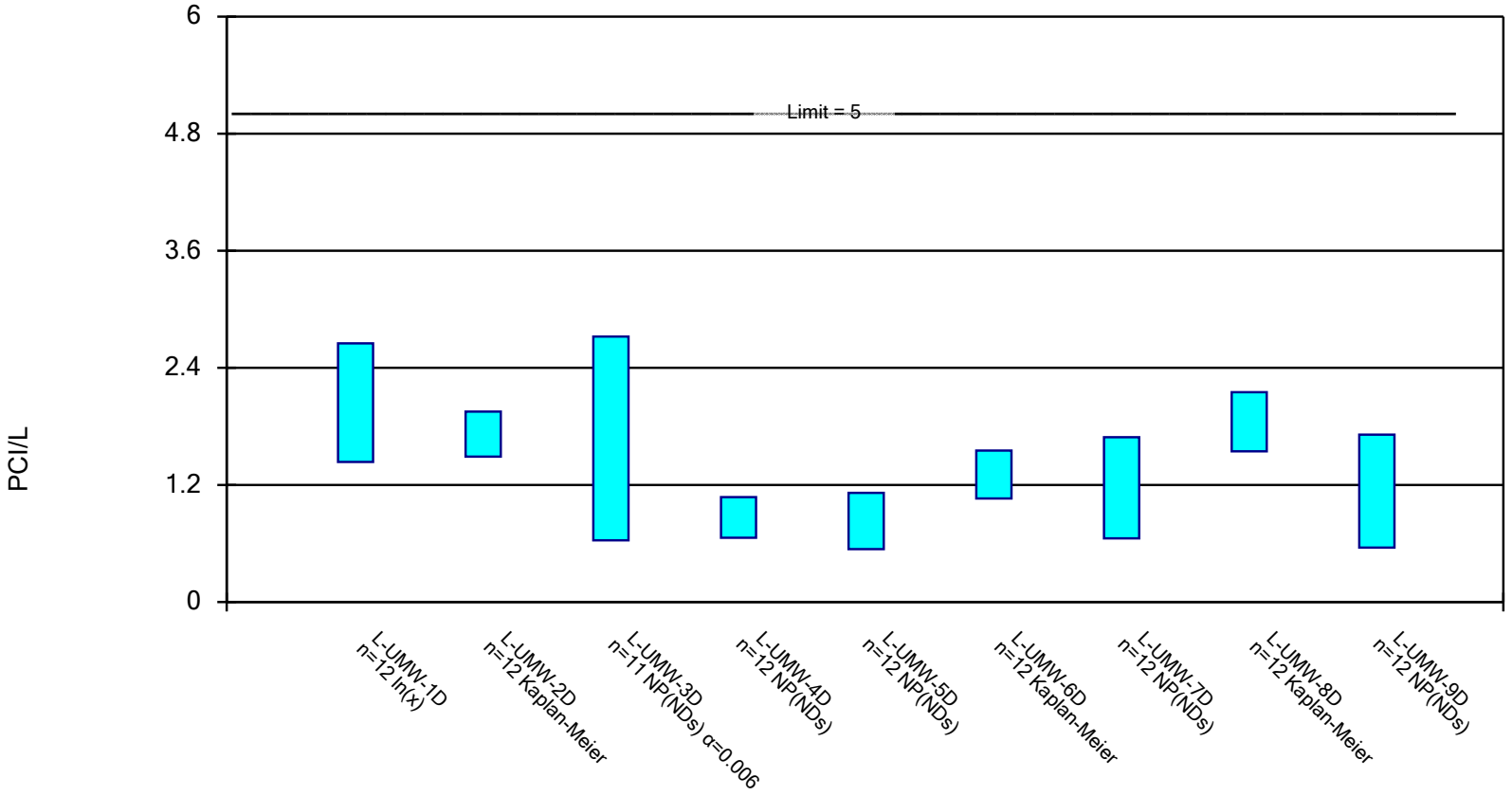


Constituent: MOLYBDENUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

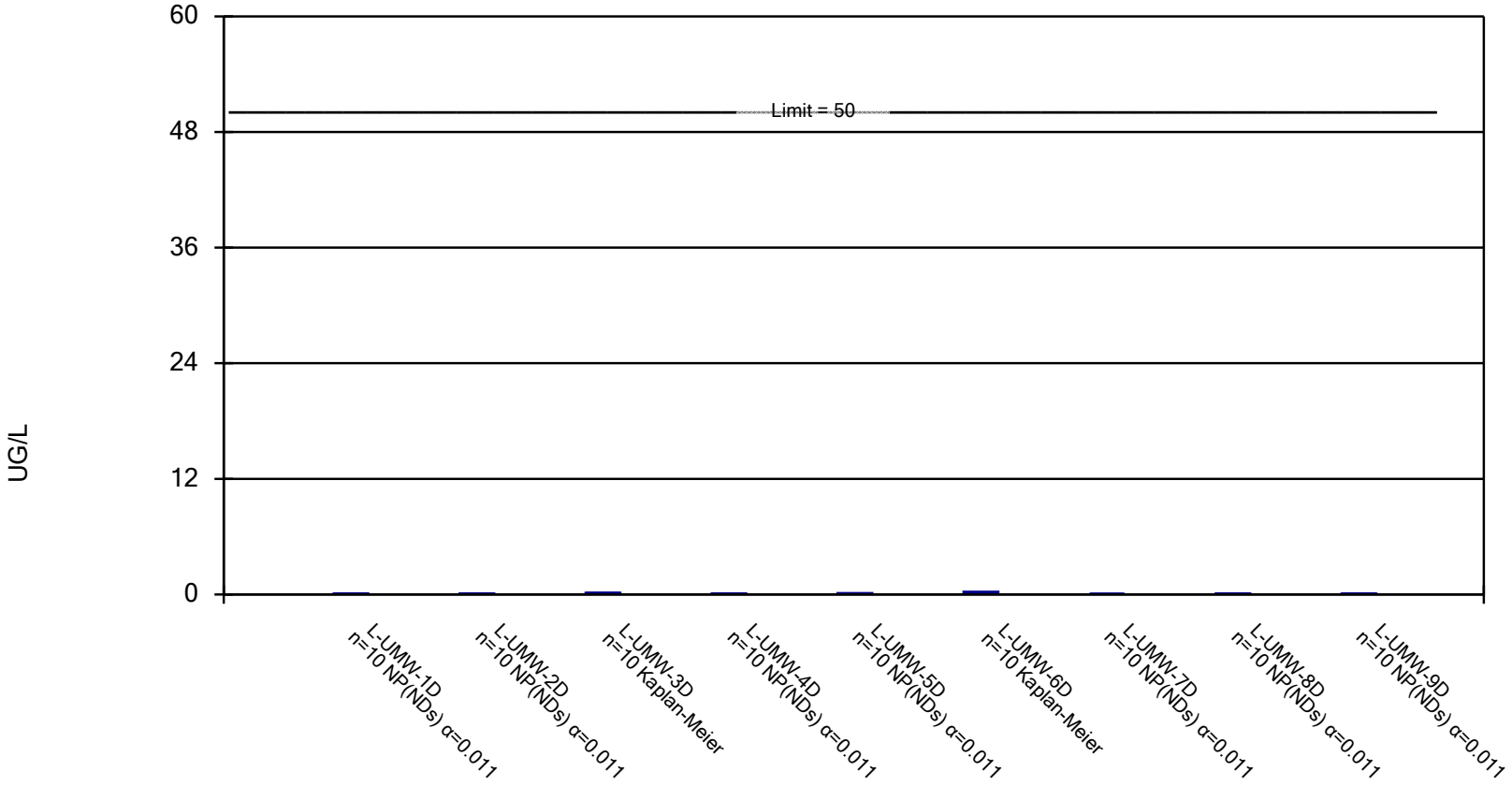


Constituent: Radium [226 + 228] Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

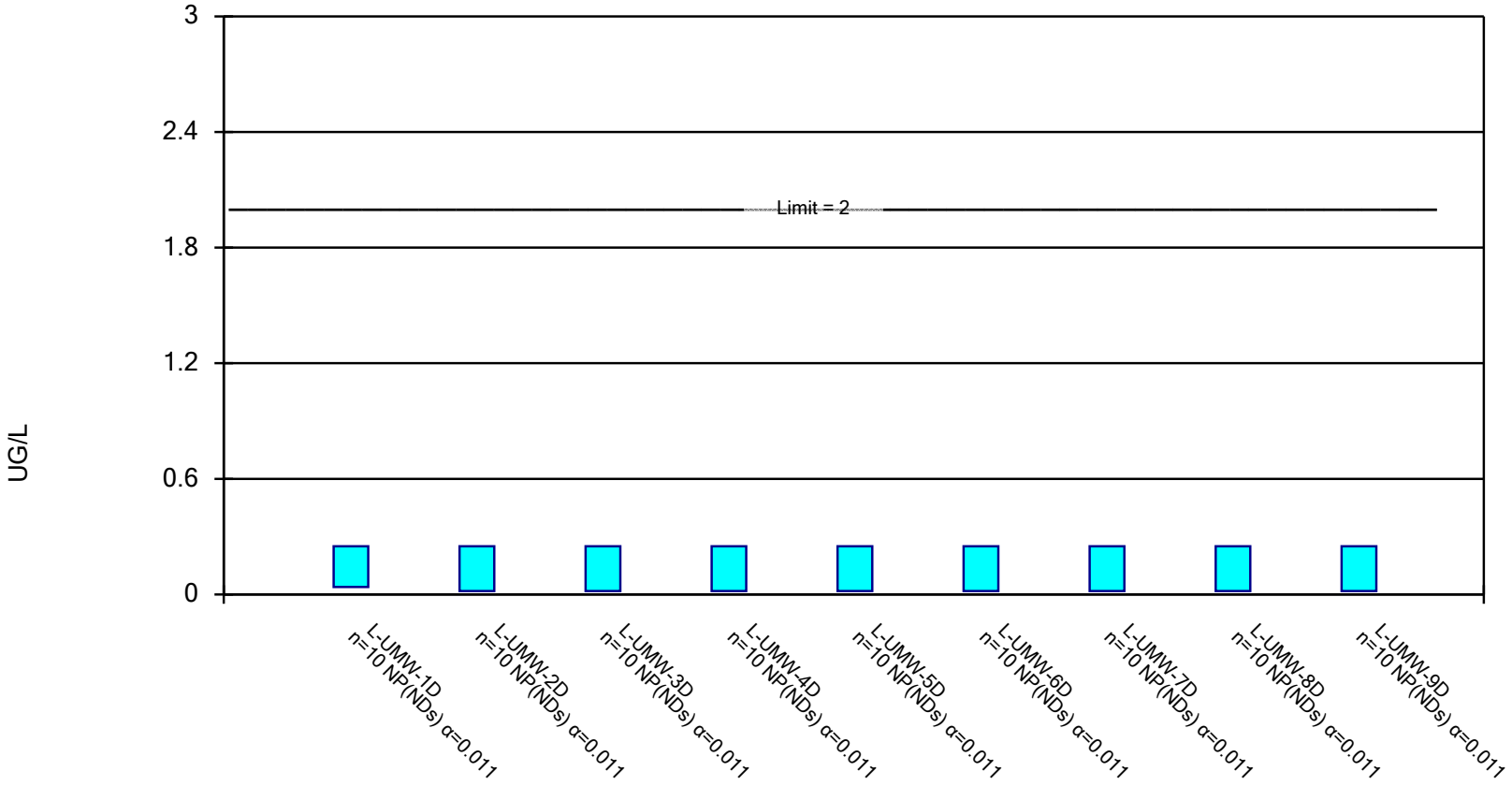


Constituent: SELENIUM, TOTAL Analysis Run 8/28/2019 8:21 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: THALLIUM, TOTAL Analysis Run 8/28/2019 8:22 AM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/28/2019, 8:23 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
ANTIMONY, TOTAL (UG/L)	L-UMW-1D	0.029	0.013	6	No	10	80	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-2D	0.029	0.013	6	No	10	100	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-3D	0.039	0.013	6	No	10	90	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-4D	0.039	0.013	6	No	10	90	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-5D	0.1	0.029	6	No	10	40	No	0.011	NP (normality)
ANTIMONY, TOTAL (UG/L)	L-UMW-6D	0.039	0.013	6	No	10	90	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-7D	0.029	0.013	6	No	10	100	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-8D	0.029	0.013	6	No	10	100	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-9D	0.035	0.013	6	No	10	90	No	0.011	NP (NDs)
ARSENIC, TOTAL (UG/L)	L-UMW-1D	43.36	24.42	42.6	No	12	0	ln(x)	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-2D	2.483	1.75	42.6	No	12	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-3D	3.118	0.5533	42.6	No	11	9.091	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-4D	0.183	0.08969	42.6	No	12	33.33	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-5D	24.17	17.56	42.6	No	12	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-6D	15.3	7.937	42.6	No	12	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-7D	21.1	10.6	42.6	No	12	0	No	0.01	NP (normality)
ARSENIC, TOTAL (UG/L)	L-UMW-8D	32.12	27.28	42.6	No	12	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-9D	34.52	32.66	42.6	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-1D	494	379	2000	No	12	0	No	0.01	NP (normality)
BARIUM, TOTAL (UG/L)	L-UMW-2D	121.7	102.3	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-3D	146.9	86.7	2000	No	11	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-4D	79.79	58.98	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-5D	72.19	61.34	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-6D	143.3	123.5	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-7D	163.9	117.7	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-8D	478.9	448.1	2000	No	12	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-9D	529.7	501	2000	No	12	0	No	0.01	Param.
BERYLLIUM, TOTAL (UG/L)	L-UMW-1D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-2D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-3D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-4D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-5D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-6D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-7D	0.13	0.08	4	No	10	90	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-8D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-9D	0.13	0.08	4	No	10	100	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-1D	0.0145	0.009	5	No	10	100	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-2D	0.0145	0.009	5	No	10	100	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-3D	0.036	0.009	5	No	10	80	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-4D	0.0145	0.009	5	No	10	90	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-5D	0.0145	0.009	5	No	10	90	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-6D	0.052	0.009	5	No	10	70	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-7D	0.0145	0.009	5	No	10	90	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-8D	0.0145	0.009	5	No	10	100	No	0.011	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-9D	0.0145	0.009	5	No	10	100	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-1D	0.36	0.027	100	No	10	70	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-2D	0.47	0.027	100	No	10	70	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-3D	0.17	0.027	100	No	10	90	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-4D	0.55	0.039	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-5D	0.54	0.027	100	No	10	70	No	0.011	NP (NDs)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/28/2019, 8:23 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
CHROMIUM, TOTAL (UG/L)	L-UMW-6D	0.56	0.027	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-7D	0.4449	0.06334	100	No	10	50	ln(x)	0.01	Param.
CHROMIUM, TOTAL (UG/L)	L-UMW-8D	0.62	0.027	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-9D	0.65	0.027	100	No	10	70	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-1D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-2D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-3D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-4D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-5D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-6D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-7D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-8D	0.435	0.36	6	No	10	90	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-9D	0.42	0.36	6	No	10	100	No	0.011	NP (NDs)
FLUORIDE, TOTAL (MG/L)	L-UMW-1D	0.2292	0.1908	4	No	13	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-2D	0.3976	0.3511	4	No	14	0	ln(x)	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-3D	0.1876	0.1141	4	No	12	8.333	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-4D	0.4262	0.3452	4	No	14	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-5D	0.1193	0.08463	4	No	14	21.43	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-6D	0.1401	0.09562	4	No	13	15.38	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-7D	0.33	0.27	4	No	14	0	No	0.01	NP (normality)
FLUORIDE, TOTAL (MG/L)	L-UMW-8D	0.2062	0.1569	4	No	13	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-9D	0.1942	0.152	4	No	13	0	No	0.01	Param.
LEAD, TOTAL (UG/L)	L-UMW-1D	3.6	1.25	15	No	10	60	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-2D	3	1.2	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-3D	3	1.2	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-4D	1.5	1.2	15	No	10	100	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-5D	3.6	1.2	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-6D	3.2	1.2	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-7D	2.7	1.25	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-8D	3.9	1.25	15	No	10	80	No	0.011	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-9D	3.383	2.111	15	No	10	50	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-1D	27.58	23.15	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-2D	28.76	23.36	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-3D	25.84	18	51.96	No	11	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-4D	35.35	29.9	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-5D	21.6	14.1	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-6D	8.145	5.755	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-7D	21.96	17.91	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-8D	33.4	30.05	51.96	No	12	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-9D	18.17	15.62	51.96	No	12	0	No	0.01	Param.
MERCURY, TOTAL (UG/L)	L-UMW-1D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-2D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-3D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-4D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-5D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-6D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-7D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-8D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-9D	0.023	0.0195	2	No	10	100	No	0.011	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	L-UMW-1D	1.501	0.6346	100	No	12	33.33	No	0.01	Param.

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/28/2019, 8:23 AM

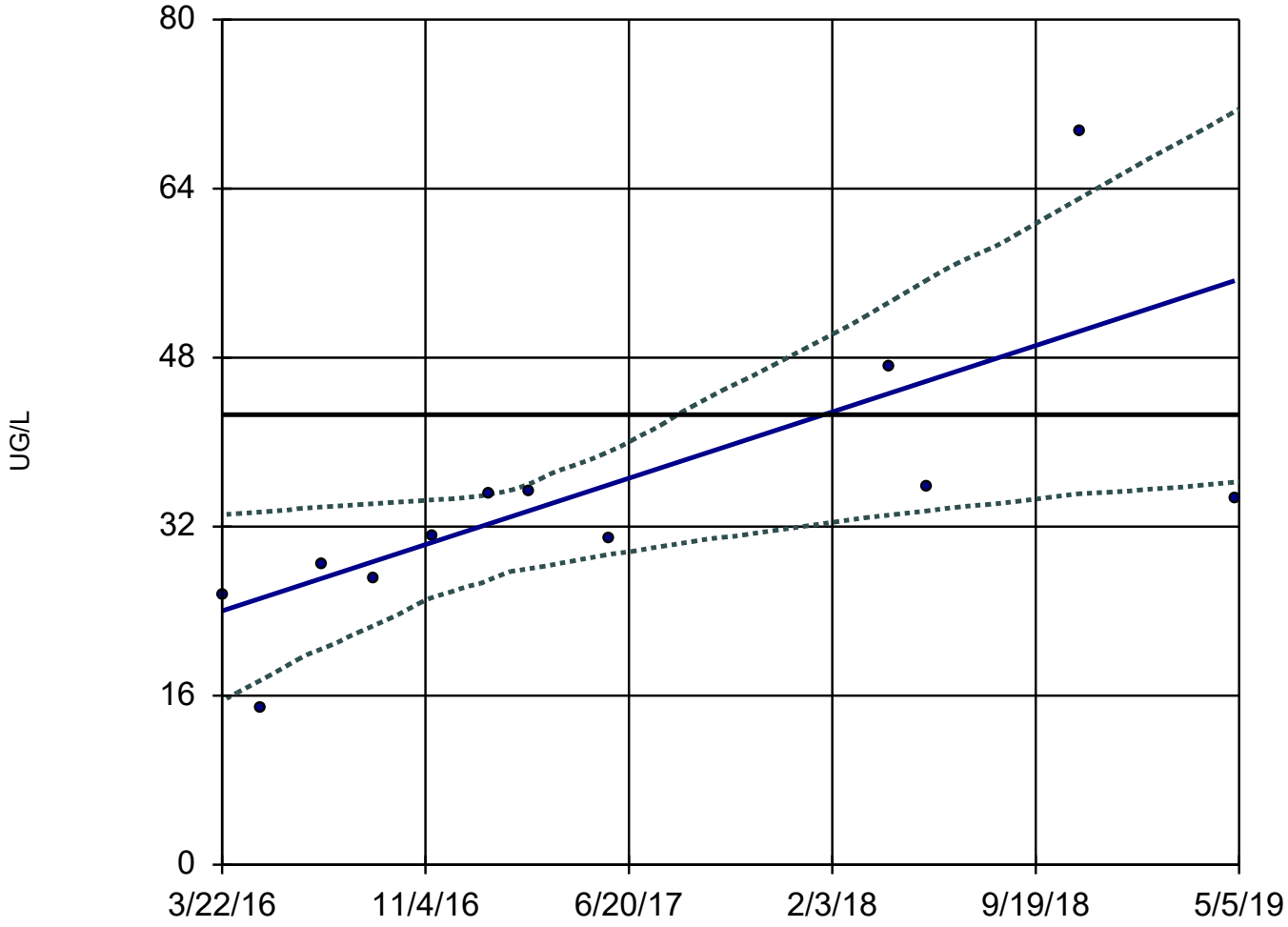
Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
MOLYBDENUM, TOTAL (UG/L)	L-UMW-2D	45.56	40.61	100	No	12	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-3D**	**204.5**	**140**	**100**	**Yes**	**11**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-4D**	**164.5**	**110.7**	**100**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-5D**	**146.8**	**115.4**	**100**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-6D**	**625.1**	**534.2**	**100**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-7D**	**211.7**	**191.1**	**100**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	L-UMW-8D	14.76	11.28	100	No	12	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	L-UMW-9D	1.803	0.7023	100	No	12	33.33	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-1D	2.65	1.435	5	No	12	8.333	ln(x)	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-2D	1.951	1.491	5	No	12	25	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-3D	2.721	0.632	5	No	11	63.64	No	0.006	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-4D	1.075	0.659	5	No	12	75	No	0.01	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-5D	1.118	0.542	5	No	12	91.67	No	0.01	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-6D	1.552	1.062	5	No	12	50	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-7D	1.689	0.6525	5	No	12	83.33	No	0.01	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-8D	2.15	1.544	5	No	12	33.33	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-9D	1.716	0.5575	5	No	12	83.33	No	0.01	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-1D	0.09	0.043	50	No	10	90	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-2D	0.09	0.043	50	No	10	90	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-3D	0.1748	0.1134	50	No	10	50	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	L-UMW-4D	0.09	0.043	50	No	10	100	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-5D	0.14	0.09	50	No	10	60	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-6D	0.2714	0.1896	50	No	10	20	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	L-UMW-7D	0.09	0.089	50	No	10	70	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-8D	0.09	0.043	50	No	10	90	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-9D	0.09	0.043	50	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-1D	0.25	0.039	2	No	10	80	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-2D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-3D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-4D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-5D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-6D	0.25	0.018	2	No	10	90	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-7D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-8D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-9D	0.25	0.018	2	No	10	100	No	0.011	NP (NDs)

APPENDIX B

Sanitas Trending Confidence Bands Statistical Output

Sen's Slope and 95% Confidence Band

L-UMW-1D



n = 12

Slope = 10.06 units per year.

Mann-Kendall statistic = 44
critical = 35

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

GWPS = 42.6.

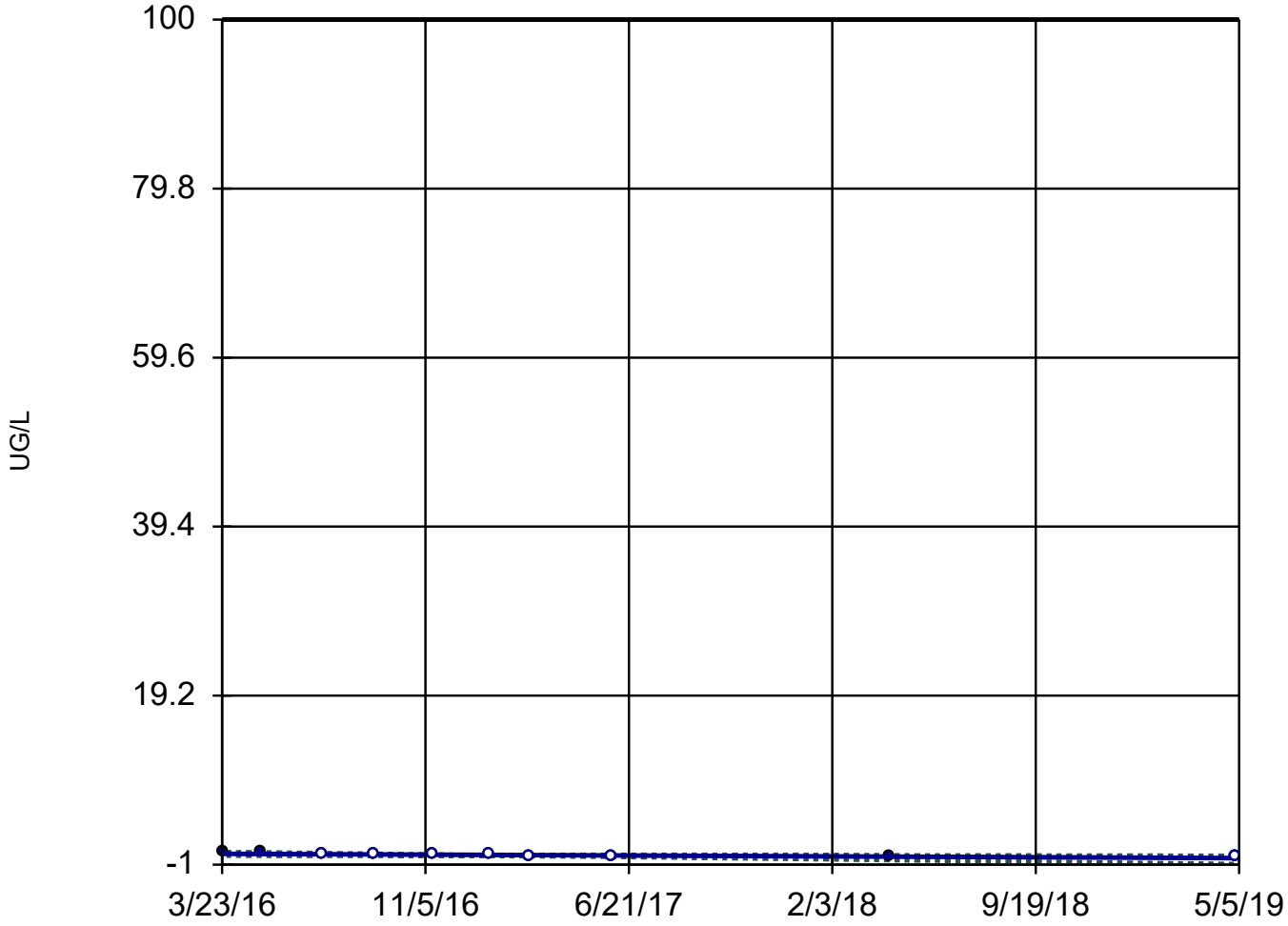
Constituent: ARSENIC, TOTAL Analysis Run 8/20/2019 4:11 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

L-UMW-5D



n = 10

Slope = -0.1616 units per year.

Mann-Kendall statistic = -28
critical = -27

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

GWPS = 100.

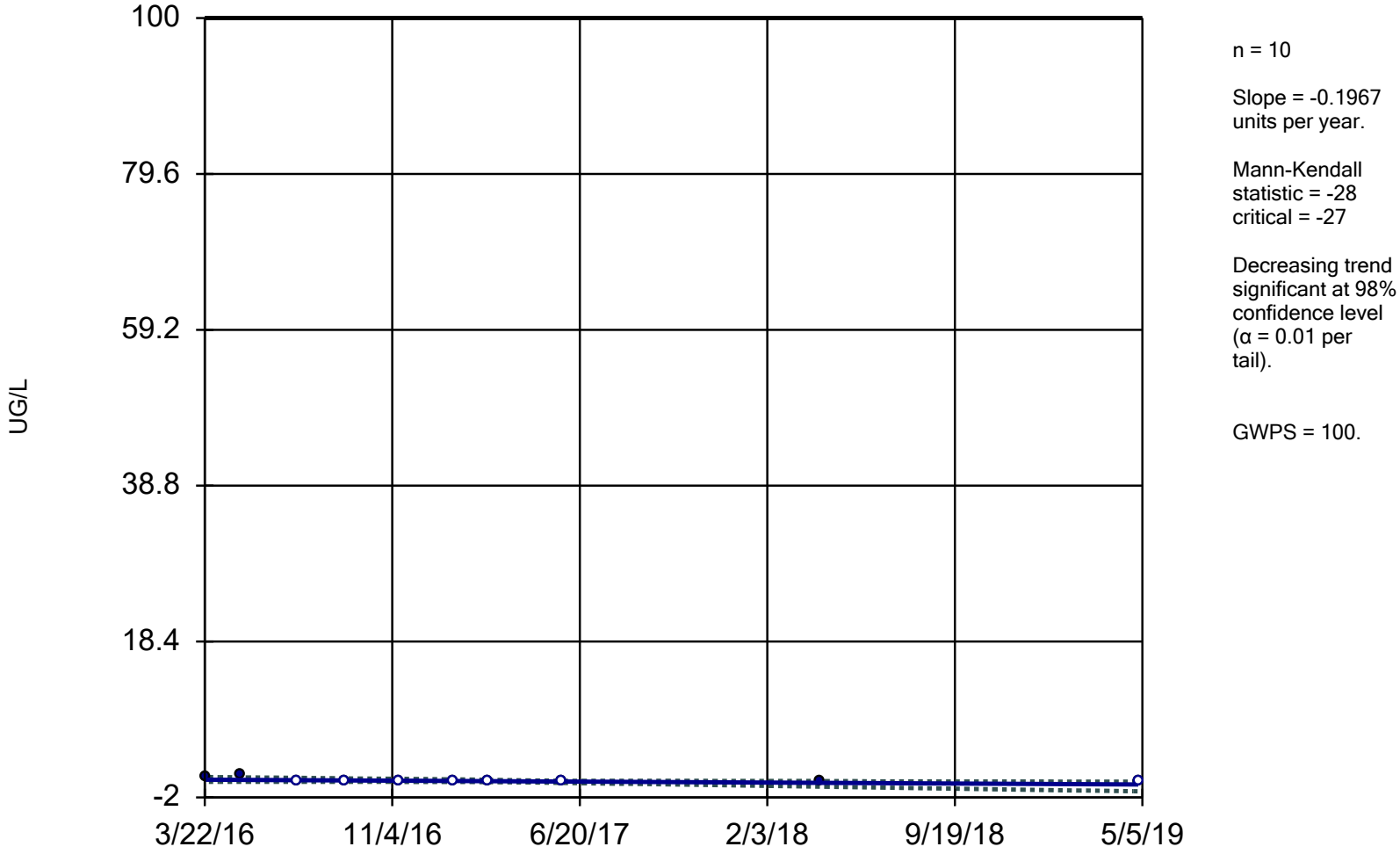
Constituent: CHROMIUM, TOTAL Analysis Run 8/20/2019 4:12 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

L-UMW-9D



n = 10

Slope = -0.1967 units per year.

Mann-Kendall statistic = -28
critical = -27

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

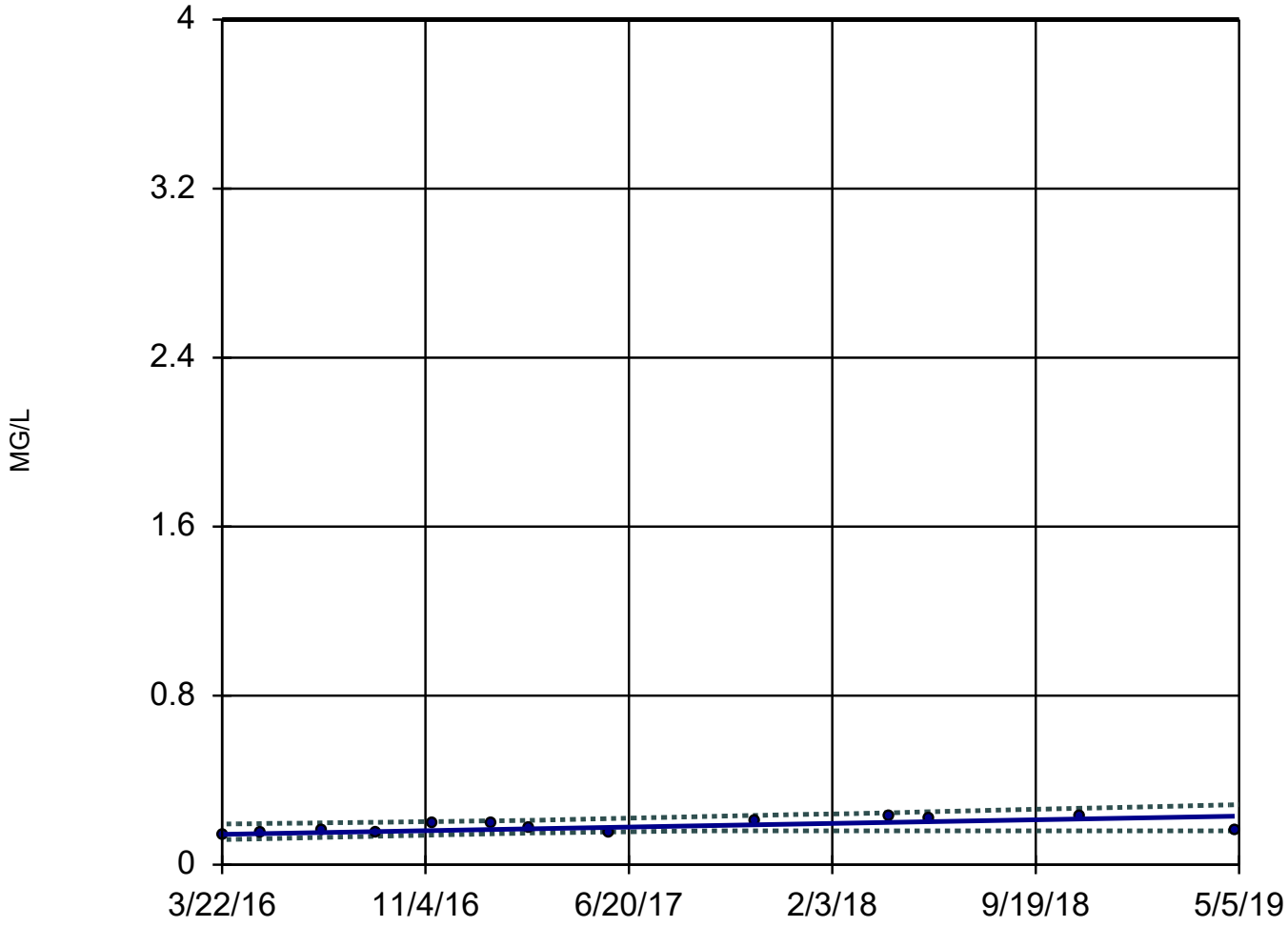
GWPS = 100.

Constituent: CHROMIUM, TOTAL Analysis Run 8/20/2019 4:12 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-8D



n = 13

Slope = 0.02748 units per year.

Mann-Kendall statistic = 41
critical = 39

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

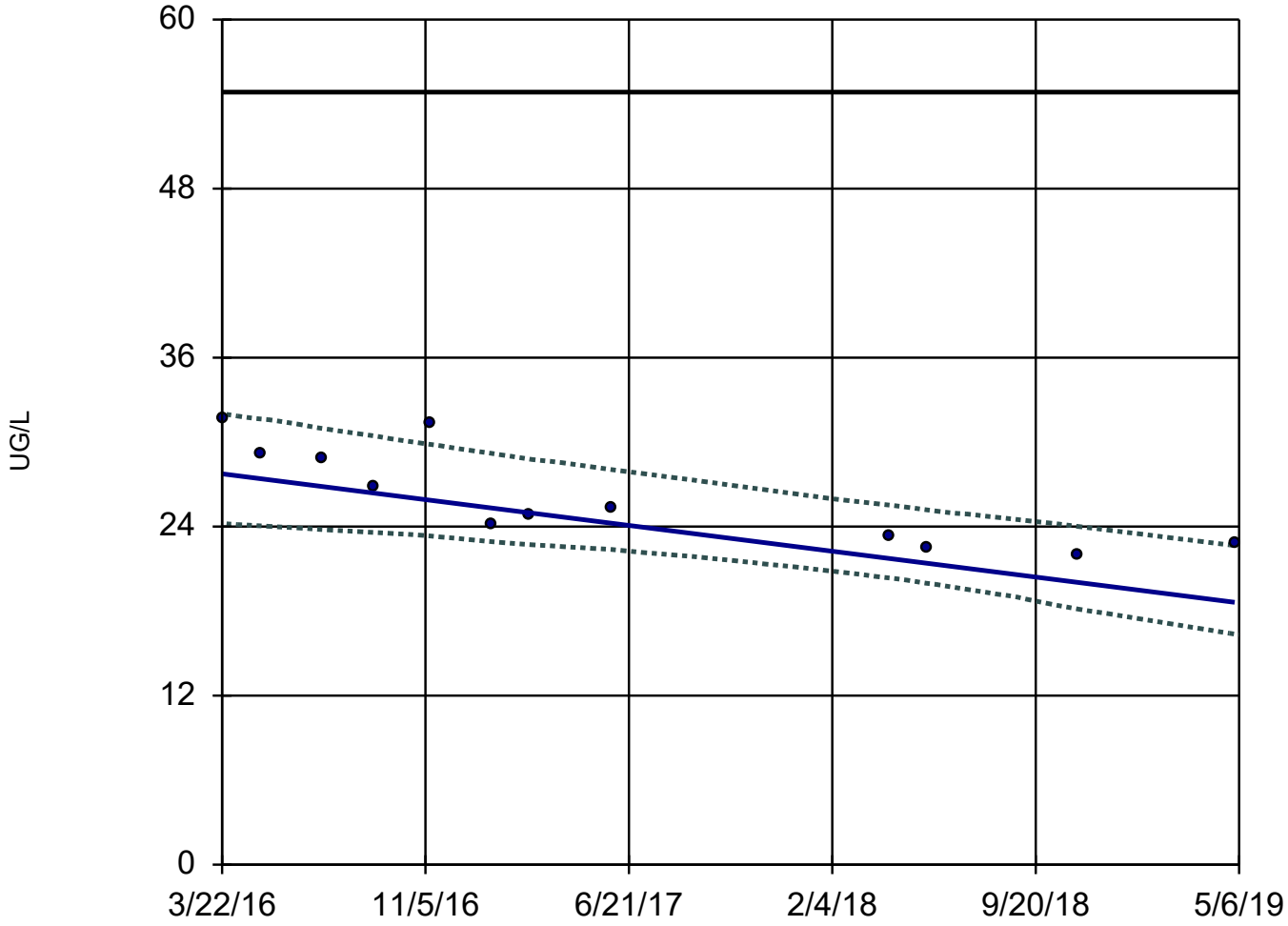
GWPS = 4.

Constituent: FLUORIDE, TOTAL Analysis Run 8/20/2019 4:12 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-2D



n = 12

Slope = -2.932 units per year.

Mann-Kendall statistic = -50
critical = -35

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

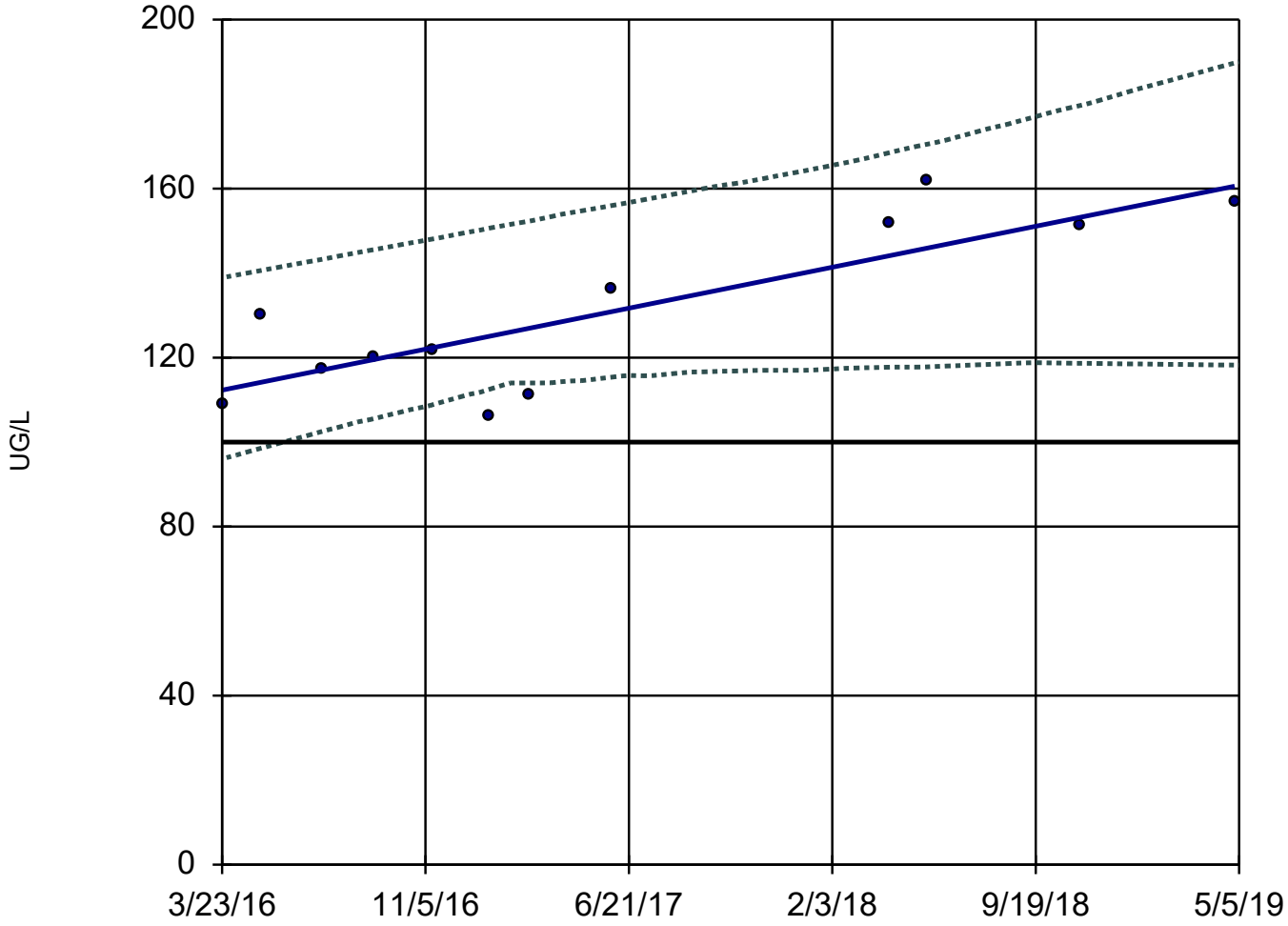
GWPS = 54.85.

Constituent: LITHIUM, TOTAL Analysis Run 8/20/2019 4:13 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Sen's Slope and 95% Confidence Band

L-UMW-5D



n = 12

Slope = 15.55 units per year.

Mann-Kendall statistic = 36
critical = 35

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

GWPS = 100.

Constituent: MOLYBDENUM, TOTAL Analysis Run 8/20/2019 4:13 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Trend Test

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/20/2019, 4:14 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
ANTIMONY, TOTAL (UG/L)	L-UMW-1D	0	-3	-27	No	10	80	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-2D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-3D	-0.00...	-14	-27	No	10	90	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-4D	0	-10	-27	No	10	90	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-5D	0.004069	11	27	No	10	40	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-6D	-0.00...	-16	-27	No	10	90	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-7D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-8D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
ANTIMONY, TOTAL (UG/L)	L-UMW-9D	0	5	27	No	10	90	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	**L-UMW-1D**	**10.06**	**44**	**35**	**Yes**	**12**	**0**	**n/a**	**n/a**	**0.02**	**NP**
ARSENIC, TOTAL (UG/L)	L-UMW-2D	-0.02437	-3	-35	No	12	0	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-3D	0.9286	21	31	No	11	9.091	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-4D	0	2	35	No	12	33.33	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-5D	-0.2801	-6	-35	No	12	0	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-6D	2.423	22	35	No	12	0	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-7D	2.091	9	35	No	12	0	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-8D	-0.3121	-11	-35	No	12	0	n/a	n/a	0.02	NP
ARSENIC, TOTAL (UG/L)	L-UMW-9D	0.1312	3	35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-1D	22.58	26	35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-2D	-7.521	-35	-35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-3D	-4.156	-3	-31	No	11	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-4D	4.927	17	35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-5D	-1.64	-11	-35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-6D	1.967	3	35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-7D	-11.49	-12	-35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-8D	-12.46	-26	-35	No	12	0	n/a	n/a	0.02	NP
BARIUM, TOTAL (UG/L)	L-UMW-9D	-11.04	-26	-35	No	12	0	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-1D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-2D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-3D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-4D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-5D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-6D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-7D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-8D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
BERYLLIUM, TOTAL (UG/L)	L-UMW-9D	-0.00...	-21	-27	No	10	100	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-1D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-2D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-3D	0	5	27	No	10	80	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-4D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-5D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-6D	0	8	27	No	10	70	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-7D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-8D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
CADMIUM, TOTAL (UG/L)	L-UMW-9D	0	-9	-27	No	10	100	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-1D	-0.05643	-18	-27	No	10	70	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-2D	-0.172	-25	-27	No	10	70	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-3D	-0.04387	-21	-27	No	10	90	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-4D	-0.0574	-21	-27	No	10	60	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	**L-UMW-5D**	**-0.1616**	**-28**	**-27**	**Yes**	**10**	**70**	**n/a**	**n/a**	**0.02**	**NP**

Trend Test

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/20/2019, 4:14 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
CHROMIUM, TOTAL (UG/L)	L-UMW-6D	-0.2253	-27	-27	No	10	60	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-7D	-0.2223	-19	-27	No	10	50	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	L-UMW-8D	-0.203	-25	-27	No	10	60	n/a	n/a	0.02	NP
CHROMIUM, TOTAL (UG/L)	**L-UMW-9D**	**-0.1967**	**-28**	**-27**	**Yes**	**10**	**70**	**n/a**	**n/a**	**0.02**	**NP**
COBALT, TOTAL (UG/L)	L-UMW-1D	0.006913	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-2D	0.006861	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-3D	0.006992	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-4D	0.006992	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-5D	0.006887	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-6D	0.006887	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-7D	0.006966	27	27	No	10	100	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-8D	0.00565	16	27	No	10	90	n/a	n/a	0.02	NP
COBALT, TOTAL (UG/L)	L-UMW-9D	0.006913	27	27	No	10	100	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-1D	0.004142	8	39	No	13	0	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-2D	0.009264	19	44	No	14	0	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-3D	0.01637	17	35	No	12	8.333	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-4D	0.02761	25	44	No	14	0	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-5D	0.006006	19	44	No	14	21.43	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-6D	-0.00...	-6	-39	No	13	15.38	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	L-UMW-7D	0	-7	-44	No	14	0	n/a	n/a	0.02	NP
FLUORIDE, TOTAL (MG/L)	**L-UMW-8D**	**0.02748**	**41**	**39**	**Yes**	**13**	**0**	**n/a**	**n/a**	**0.02**	**NP**
FLUORIDE, TOTAL (MG/L)	L-UMW-9D	0.02526	34	39	No	13	0	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-1D	0	1	27	No	10	60	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-2D	0	6	27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-3D	0	4	27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-4D	0	5	27	No	10	100	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-5D	0	-2	-27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-6D	0	-2	-27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-7D	0	10	27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-8D	0.122	11	27	No	10	80	n/a	n/a	0.02	NP
LEAD, TOTAL (UG/L)	L-UMW-9D	0	-3	-27	No	10	50	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-1D	-0.7453	-8	-35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	**L-UMW-2D**	**-2.932**	**-50**	**-35**	**Yes**	**12**	**0**	**n/a**	**n/a**	**0.02**	**NP**
LITHIUM, TOTAL (UG/L)	L-UMW-3D	-1.255	-18	-31	No	11	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-4D	-1.714	-19	-35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-5D	-2.95	-30	-35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-6D	-0.7307	-22	-35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-7D	0.5591	10	35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-8D	-0.5864	-14	-35	No	12	0	n/a	n/a	0.02	NP
LITHIUM, TOTAL (UG/L)	L-UMW-9D	-0.9501	-28	-35	No	12	0	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-1D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-2D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-3D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-4D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-5D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-6D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-7D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-8D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MERCURY, TOTAL (UG/L)	L-UMW-9D	0	4	27	No	10	100	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-1D	-0.05411	-7	-35	No	12	33.33	n/a	n/a	0.02	NP

Trend Test

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 8/20/2019, 4:14 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
MOLYBDENUM, TOTAL (UG/L)	L-UMW-2D	-1.154	-22	-35	No	12	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-3D	10.14	12	31	No	11	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-4D	-17.27	-21	-35	No	12	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-5D**	**15.55**	**36**	**35**	**Yes**	**12**	**0**	**n/a**	**n/a**	**0.02**	**NP**
MOLYBDENUM, TOTAL (UG/L)	L-UMW-6D	-29.1	-20	-35	No	12	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-7D	6.627	24	35	No	12	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-8D	0.1331	1	35	No	12	0	n/a	n/a	0.02	NP
MOLYBDENUM, TOTAL (UG/L)	L-UMW-9D	-0.1314	-8	-35	No	12	33.33	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-1D	0.1884	17	35	No	12	8.333	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-2D	0.07801	6	35	No	12	25	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-3D	-0.04485	-5	-31	No	11	63.64	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-4D	-0.02941	-6	-35	No	12	75	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-5D	-0.164	-24	-35	No	12	91.67	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-6D	-0.04433	-4	-35	No	12	50	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-7D	-0.09536	-18	-35	No	12	83.33	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-8D	-0.2002	-8	-35	No	12	33.33	n/a	n/a	0.02	NP
Radium [226 + 228] (PCI/L)	L-UMW-9D	-0.1504	-22	-35	No	12	83.33	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-1D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-2D	0	-9	-27	No	10	90	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-3D	0	-4	-27	No	10	50	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-4D	-0.01589	-27	-27	No	10	100	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-5D	0.0115	22	27	No	10	60	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-6D	0.03106	13	27	No	10	20	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-7D	0	-11	-27	No	10	70	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-8D	-0.00...	-25	-27	No	10	90	n/a	n/a	0.02	NP
SELENIUM, TOTAL (UG/L)	L-UMW-9D	-0.01589	-27	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-1D	-0.06708	-24	-27	No	10	80	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-2D	-0.06702	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-3D	-0.06714	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-4D	-0.06708	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-5D	-0.06714	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-6D	-0.07168	-23	-27	No	10	90	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-7D	-0.06696	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-8D	-0.06708	-21	-27	No	10	100	n/a	n/a	0.02	NP
THALLIUM, TOTAL (UG/L)	L-UMW-9D	-0.06708	-21	-27	No	10	100	n/a	n/a	0.02	NP

APPENDIX F

Nature and Extent Technical Memorandum

Technical Memorandum

DATE January 2020 **Project No.** 153140601

TO Bill Kutosky
Ameren Missouri

CC Susan Knowles, Craig Giesmann, Charley Henderson, Paul Pike

FROM Jeffrey Ingram, Mark Haddock **EMAIL Jingram@Golder.com**

NATURE AND EXTENT INVESTIGATION, LABADIE ENERGY CENTER, FRANKLIN COUNTY, MISSOURI

Dear Mr. Kutosky,

Golder Associates Inc. (Golder) is pleased to submit this Technical Memorandum summarizing recent groundwater sampling and groundwater level measurements near the Ameren Missouri (Ameren) Labadie Energy Center (LEC) in Franklin County, Missouri. This Technical Memorandum provides the groundwater sampling results and groundwater level measurement results from this ongoing investigation of Coal Combustion Residual (CCR) impacts from LCPA Surface Impoundment to groundwater. A figure displaying the locations of the monitoring wells used for this investigation is provided as **Figure 1**.

1.0 PROJECT SCOPE OF WORK

The scope of work for this investigation included the following:

- Collect multiple samples in the nature and extent monitoring network for CCR Rule constituents
- Complete multiple rounds of groundwater elevation measurements to produce potentiometric surface maps
- Tabulate sampling results and prepare a Technical Memorandum

2.0 GROUNDWATER SAMPLING

Groundwater sampling was completed in November 2018 and April – August 2019. Sampling was completed using low flow sampling techniques and guidelines as provided in the LCPA Groundwater Monitoring Plan. Tables summarizing the analytical results are provided in **Tables 1** and **2**. Laboratory data report packets and data validation memos are included in the 2018 and 2019 Annual Reports.

Samples were collected from monitoring wells used to monitor the LCPB, LCL1, as well as 17 monitoring wells and piezometers installed for nature and extent purposes. Well construction diagrams for these monitoring wells are provided in the 2017, 2018 or 2019 Annual Reports for the LCPA, LCPB and LCL1.

Golder Associates Inc.
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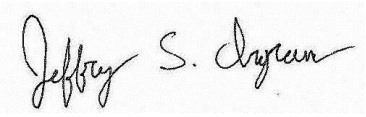
3.0 GROUNDWATER LEVEL MONITORING

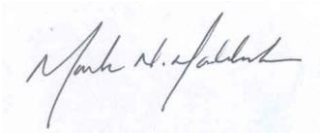
Multiple rounds of water level measurements were collected from available monitoring wells. A table displaying the groundwater level monitoring results is provided in **Table 3.** Measurements were used to create site-wide potentiometric surface maps for evaluating groundwater flow direction. Potentiometric surface maps are provided in the 2018 and 2019 Annual Reports for the LCPA.

4.0 CLOSING

Golder appreciates the opportunity to serve as your consultant on this project. If you have any questions concerning this letter report or need additional information, please contact the undersigned at 314-984-8800.

GOLDER ASSOCIATES INC.





Jeffrey Ingram, R.G.
Project Geologist

Mark Haddock, P.E., R.G.
Principal, Practice Leader

JSI/MNH

Attachments or Enclosures:

Tables
Table 1 – Nature and Extent Groundwater Sampling Analytical Results – November 2018
Table 2 – Nature and Extent Groundwater Sampling Analytical Results – April-August 2019
Table 3 – Summary of Groundwater Elevation Monitoring Results

Figures
Figure 1 – Site Location and Monitoring Well and Piezometer Location Map

Tables

Table 1
Nature and Extent Groundwater Sampling Analytical Results - November 2018
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

Analyte	Units	LCPB Groundwater Monitoring Wells										LCL1 Groundwater Monitoring Wells			
		BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	MW-26	TMW-1	TMW-2	TMW-3
Field Parameters															
DATE	NA	11/7/2018	11/7/2018	11/7/2018	11/8/2018	11/7/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/9/2018	11/9/2018	11/9/2018	11/9/2018
DISSOLVED OXYGEN	mg/L	0.22	0.61	1.09	0.11	0.24	0.48	1.33	0.66	0.68	0.46	0.57	0.31	0.13	0.13
pH	SU	6.83	7.12	7.22	9.82	7.52	7.46	7.48	7.28	7.40	7.48	7.00	6.94	6.93	6.81
REDOX POTENTIAL	mV	-13.2	26.4	-79.3	-133.6	-163.3	-84.0	-57.8	-107.3	-73.2	11.6	6.9	97.0	-50.1	-88.7
SPECIFIC CONDUCTIVITY	mS/cm	0.91	0.52	1.72	0.43	0.63	1.07	0.75	1.07	1.02	1.13	0.69	0.91	0.95	0.94
TURBIDITY	NTU	4.88	2.57	4.98	0.09	9.93	4.65	4.62	4.85	4.38	3.08	0.74	1.02	2.50	4.35
Appendix III Parameters															
BORON, TOTAL	µg/L	151	84.8 J	13,900	4,210	3,840	9,450	97.2 J	3,760	6,620	6,970	76.9 J	124	106	128
CALCIUM, TOTAL	µg/L	201,000	128,000	301,000	55,100	58,200	132,000	153,000	182,000	149,000	167,000	134,000	162,000	178,000	184,000
CHLORIDE, TOTAL	mg/L	5.6	1.3 J	16.4	22.8	20.9	23.8	4.0	12.2	19.3	19.5 J	2.7	3.7	5.5	6.7
FLUORIDE, TOTAL	mg/L	ND	ND	ND	0.23	0.46	0.23	ND	0.20	0.20	0.35 J	ND	0.29	0.21	ND
SULFATE, TOTAL	mg/L	36.7	28.4	982	222	263	270	12.1	122	257	334 J	24.8	96.8	91.0	66.9
TOTAL DISSOLVED SOLIDS	mg/L	751	958 J	1,580	420	496	757	473	740	734	867	494 J	677 J	686 J	720 J
Appendix IV Parameters															
ANTIMONY, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC, TOTAL	µg/L	38.5	0.44 J	26.4	36.9	1.8	18.8	0.58 J	25.8	20.7	9.3	0.52 J	1.8	2.0	16.1
BARIUM, TOTAL	µg/L	323	287	180	34.4	67.4	150	349	387	287	222	186	375	203	313
BERYLLIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE, TOTAL	mg/L	ND	ND	ND	0.23	0.46	0.23	ND	0.20	0.20	0.35 J	ND	0.29	0.21	ND
LEAD, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LITHIUM, TOTAL	µg/L	17.3	18.4	31.0	12.8	19.6	39.9	9.6 J	43.9	37.9	30.9 J	29.1	40.3	43.7	52.0
MERCURY, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOLYBDENUM, TOTAL	µg/L	ND	1.9 J	6.1 J	97.5	145	83.2	ND	25.6	111	157	1.1 J	ND	1.1 J	ND
RADIUM [226 + 228]	pCi/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
THALLIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Additional Parameters															
ALKALINITY	mg/L	733	392	327	31.1	91.1	351	454	538	365	368	435	534	565	589
IRON, TOTAL	µg/L	31,100	12.6 J	25,400	10.4 J	3,400	8,060	27.7 J	27,300	7,150	4,490	ND	368	1,970	9,970
MAGNESIUM, TOTAL	µg/L	49,400	21,200	56,500	108	4,200	27,100	17,900	32,900	33,200	31,700	26,000	44,100	42,600	39,200
MANGANESE, TOTAL	µg/L	2,930	ND	3,040	ND	309	1,720	57.7	2,430	1,190	1,880	36.5	4,550	2,740	1,400
PHOSPHORUS, TOTAL	mg/L	0.86	ND	0.45	ND	0.50	0.37	ND	0.37	0.23	0.21	ND	ND	ND	0.19
POTASSIUM, TOTAL	µg/L	6,100	7,530	7,730	8,640	7,510	7,050	3,180	6,930	6,640	7,470	4,980	5,880	6,640	6,730
SODIUM, TOTAL	µg/L	22,200	9,390	51,500	59,000	88,300	89,200	6,700	23,800	50,300	69,100	9,790	11,500	9,920	8,410

1) Unit Abbreviations-: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - Standard Units, mV - millivolts, mS/cm - millisiemens- per centimeter, NTU - nephelometric turbidity unit, pCi/L - picoCuries per liter.
2) "-" Not sampled.
3) J - Result is an estimated value.
4) ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect.
5) NA - Not Applicable.
6) Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: EMS/RJF
Checked By: LMS/TJG
Reviewed By: CMR

Table 1
Nature and Extent Groundwater Sampling Analytical Results - November 2018
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

Analyte	Units	Nature and Extent Piezometers																
		UMW-10D (AM-1D)	UMW-10S (AM-1S)	TP-1D	TP-1M	TP-1S	TP-2D	TP-2M	TP-2S	TP-3D	TP-3M	TP-3S	TP-4D	TP-4M	TP-4S	TP-5D	TP-5M	TP-5S
Field Parameters																		
DATE	NA	11/9/2018	11/9/2018	11/8/2018	11/8/2018	11/8/2018	11/9/2018	11/9/2018	11/9/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018
DISSOLVED OXYGEN	mg/L	0.40	0.14	0.24	0.17	0.23	0.13	0.10	0.13	0.13	0.13	0.16	0.25	0.15	0.18	0.15	0.12	0.13
pH	SU	7.65	6.93	7.06	7.09	7.01	7.63	7.70	7.33	7.71	7.28	7.10	7.15	7.24	7.10	7.29	7.14	7.13
REDOX POTENTIAL	mV	-70.5	9.7	-122.7	-112.8	-138.9	-45.2	-83.4	-51.5	-46.5	-3.7	42.7	-114.2	-144.4	-146.1	13.6	-2.8	-5.0
SPECIFIC CONDUCTIVITY	mS/cm	0.73	0.96	0.78	0.76	0.87	0.55	0.57	0.83	0.78	0.60	0.53	0.75	0.64	0.68	0.65	0.67	0.68
TURBIDITY	NTU	0.02	0.11	1.73	2.47	3.18	0.76	0.07	1.67	1.11	3.21	4.46	1.60	1.74	1.25	3.86	1.50	0.62
Appendix III Parameters																		
BORON, TOTAL	µg/L	7,410	494	69.6 J	69.4 J	105	1,930	3,560	679	10,600	6,210	88.8 J	4,380	659	131	4,590	612	128
CALCIUM, TOTAL	µg/L	79,300	157,000	136,000	129,000	152,000	88,600	95,100	141,000	99,600	101,000	130,000	122,000	109,000	110,000	140,000	160,000	157,000
CHLORIDE, TOTAL	mg/L	33.6	157	4.9	3.5	4.3	22.6	22.3	67.6	24.4	18.4	7.4	13.5	8.5	10.7	13.2	2.7	1.6
FLUORIDE, TOTAL	mg/L	0.41	0.27	ND	0.20 J	ND	0.43	0.47	0.31	0.27	0.22	ND	ND	0.24	0.23	ND	ND	ND
SULFATE, TOTAL	mg/L	336	18.7	25.7	29.0	39.2	156	154	141	441	205	21.1	169	45.0	23.8	156	33.3	8.0
TOTAL DISSOLVED SOLIDS	mg/L	700	725	520	528	556	523	534	720	858	585	480	566	454	456	631	582	564
Appendix IV Parameters																		
ANTIMONY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.10 J	ND	0.18 J	0.097 J	0.084 J	0.12 J	ND	ND	ND
ARSENIC, TOTAL	µg/L	2.7	4.5	ND	ND	12.8	5.9	0.26 J	11.0	1.8	ND	0.27 J	5.2	4.5	24.2	11.8	0.72 J	11.9
BARIUM, TOTAL	µg/L	76.4	539	1,420	980	355	112	115	315	83.7	238	246	418	374	302	534	888	431
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	0.18 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.14 J	ND	ND	ND	ND	0.057 J	0.057 J	0.080 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	ND	0.26 J	0.081 J	0.10 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
COBALT, TOTAL	µg/L	ND	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4 J
FLUORIDE, TOTAL	mg/L	0.41	0.27	ND	0.20 J	ND	0.43	0.47	0.31	0.27	0.22	ND	ND	0.24	0.23	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	3.2 J	ND	ND	ND	ND	ND	3.6 J	ND	ND	ND	3.4 J	ND
LITHIUM, TOTAL	µg/L	32.5	37.0	26.4	21.8	14.3	42.7	34.3	39.7	37.0	26.9	22.3	26.1	12.5	18.2	23.9	26.5	30.5
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	375	3.6 J	ND	ND	4.5 J	125	117	43.0	547	355	7.3 J	1.8 J	2.2 J	ND	1.4 J	0.98 J	1.8 J
RADIUM [226 + 228]	pCi/L	ND	ND	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.14 J	ND	3.5	0.091 J	0.11 J	0.19 J	ND	ND	0.15 J
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Additional Parameters																		
ALKALINITY	mg/L	138	449	489	467	511	231	256	408	115	250	367	301	344	393	377	550	570
IRON, TOTAL	µg/L	4,210	5,600	8,090	8,520	24,500	4,480	3,690	16,800	5,620	7,500	10.1 J	5,760	7,700	12,200	7,230	10,900	14,500
MAGNESIUM, TOTAL	µg/L	11,600	34,600	35,000	34,100	30,700	16,000	14,300	29,400	22,500	22,300	21,600	32,800	21,600	23,100	34,600	36,700	37,400
MANGANESE, TOTAL	µg/L	210	1,840	230	586	1710	316	436	1330	195	1,070	276	336	897	1,160	227	673	2,610
PHOSPHORUS, TOTAL	mg/L	0.34	0.14	0.47	0.64	0.22	0.18	0.35	0.15	0.19	0.30	ND	0.20	0.32	0.58	0.22	0.32	0.12
POTASSIUM, TOTAL	µg/L	7,120	6,700	4,230	4,020	4,760	5,510	6,300	7,120	6,760	5,320	4,300	4,770	4,650	5,420	4,810	4,940	5,540
SODIUM, TOTAL	µg/L	113,000	59,700	11,400	8,780	10,100	58,300	61,900	72,600	117,000	60,300	4,770	24,800	23,000	23,500	27,400	13,200	12,000

1) Unit Abbreviations-: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - Standard Units, mV - millivolts, mS/cm - millisiemens- per centimeter, NTU - nephelometric turbidity unit, pCi/L - picoCuries per liter.
2) "-" Not sampled.
3) J - Result is an estimated value.
4) ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect.
5) NA - Not Applicable.
6) Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: EMS/RJF
Checked By: LMS/TJG
Reviewed By: CMR

Table 2
Nature and Extent Groundwater Sampling Analytical Results - April-August 2019
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

Analyte	Units	LCPB Groundwater Monitoring Wells										LCL1 Groundwater Monitoring Wells			
		BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	MW-26	TMW-1	TMW-2	TMW-3
Field Parameters															
DATE	NA	5/1/2019	5/1/2019	5/1/2019	4/30/2019	5/2/2019	5/1/2019	5/1/2019	5/8/2019	5/8/2019	5/2/2019	5/8/2019	5/2/2019	5/2/2019	5/8/2019
DISSOLVED OXYGEN	mg/L	1.09	0.52	0.58	0.71	0.12	0.13	3.83	0.60	0.50	0.43	0.24	0.20	0.16	0.12
pH	SU	6.53	6.18	6.70	9.54	7.33	6.15	5.96	6.67	7.08	6.92	6.02	6.91	6.87	5.83
REDOX POTENTIAL	mV	-96.5	59.9	-74.2	-63.2	51.5	11.4	131.3	-39.6	-38.3	-98.4	210.6	119.1	64.8	176.5
SPECIFIC CONDUCTIVITY	mS/cm	1.005	0.436	1.203	0.461	0.670	0.790	0.405	1.178	1.198	1.094	0.600	0.810	0.880	0.820
TURBIDITY	NTU	4.62	2.54	4.96	1.21	2.18	4.91	1.80	4.85	5.11	4.70	3.02	1.97	4.45	4.73
Appendix III Parameters															
BORON, TOTAL	µg/L	111	61.3 J	8,840	3,770	4,080	8,770	73.9 J	5,660	7,790	8,340	98.2 J	109	98.5 J	114
CALCIUM, TOTAL	µg/L	196,000	126,000	261,000	51,300	64,300	121,000	133,000	164,000	139,000	187,000	142,000	164,000	176,000	170,000
CHLORIDE, TOTAL	mg/L	4.4	1.4	9.5	22.3	20.2	23.7	2.9	16.2	20.2	17.3	3.3	3.7	5.3	6.2
FLUORIDE, TOTAL	mg/L	0.22	0.21	0.20 J	0.24	0.45	0.31	0.18 J	0.090 J	0.17 J	0.17 J	0.20	0.24	0.24	0.19 J
SULFATE, TOTAL	mg/L	39.2	29.4	451	195	237	234	9.0	130	242	460	19.3	98.6	86.4	48.9
TOTAL DISSOLVED SOLIDS	mg/L	740	459	1,130	395	561	749	417	738	873	1,050	516	664	676	733
Appendix IV Parameters															
ANTIMONY, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC, TOTAL	µg/L	35.1	0.52 J	19.0	41.1	3.6	21.0	0.47 J	3.1	17.2	22.0	1.0	1.6	1.1	1.5
BARIUM, TOTAL	µg/L	288	266	114	33.1	69.7	116	291	323	296	298	210	360	194	386
BERYLLIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE, TOTAL	mg/L	0.22	0.21	0.20 J	0.24	0.45	0.31	0.18 J	0.090 J	0.17 J	0.17 J	0.20	0.24	0.24	0.19 J
LEAD, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LITHIUM, TOTAL	µg/L	17.6	20.2	26.4	10.6	23.2	35.8	9.6 J	34.6	35.7	21.4	37.0	43.3	45.2	41.2
MERCURY, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOLYBDENUM, TOTAL	µg/L	ND	ND	4.7 J	112	157	151	ND	26.2	118	244	ND	ND	ND	ND
RADIUM [226 + 228]	pCi/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
THALLIUM, TOTAL	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Additional Parameters															
ALKALINITY	mg/L	694	392	427	30.8	133	317	392	442	341	325	432	543	576	580
IRON, TOTAL	µg/L	30,000	21.5 J	17,300	ND	3,700	6,680	45.7 J	13,700	5,750	12,200	1,200	286	1,120	321
MAGNESIUM, TOTAL	µg/L	47,000	20,900	47,800	89.0	5,280	24,400	14,400	32,100	35,000	35,500	43,500	44,200	41,600	47,000
MANGANESE, TOTAL	µg/L	2,810	ND	2,840	ND	391	1,470	11.6	2,210	1,450	2,590	2,870	4,600	2,710	5,020
POTASSIUM, TOAL	µg/L	5,760	6,860	6,590	8,500	7,310	6,720	2,740	6,350	7,210	7,750	6,540	5,510	6,540	5,720
SODIUM, TOTAL	µg/L	19,100	9,440	24,300	58,800	99,100	85,300	5,770	26,800	58,500	83,400	9,650	11,200	9,660	11,500

1) Unit Abbreviations-: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - Standard Units, mV - millivolts, mS/cm - millisiemens- per centimeter, NTU - nephelometric turbidity unit, pCi/L - picoCuries per liter.
2) "-" Not sampled.
3) J - Result is an estimated value.
4) ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect.
5) NA - Not Applicable.
6) Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: JSI
Checked By: RJF/EMS
Reviewed By: CMR

Table 2
Nature and Extent Groundwater Sampling Analytical Results - April-August 2019
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

Analyte	Units	Nature and Extent Piezometers														
		TP-1D	TP-1M	TP-1S	TP-2D	TP-2M	TP-2S	TP-3D	TP-3M	TP-3S	TP-4D	TP-4M	TP-4S	TP-5D	TP-5M	TP-5S
Field Parameters																
DATE	NA	5/8/2019	5/8/2019	5/8/2019	8/20/2019	8/20/2019	8/20/2019	5/9/2019	5/9/2019	5/9/2019	8/20/2019	8/20/2019	8/20/2019	5/9/2019	5/9/2019	5/9/2019
DISSOLVED OXYGEN	mg/L	0.76	0.99	0.76	0.23	0.17	0.21	1.05	1.28	0.84	0.29	0.34	0.31	0.11	1.17	0.15
pH	SU	6.83	6.74	6.61	7.15	7.17	6.70	7.20	6.67	6.77	6.69	7.27	7.09	7.06	6.60	6.81
REDOX POTENTIAL	mV	-87.4	-101.1	-78.8	-147.9	-160.8	-146.1	-144.9	-91.9	164.9	-127.5	-104.2	-128.2	110.3	-71.2	213.9
SPECIFIC CONDUCTIVITY	mS/cm	0.997	1.024	1.061	0.885	0.922	1.347	1.121	0.923	0.720	0.903	0.760	0.847	0.890	1.036	0.860
TURBIDITY	NTU	1.63	1.59	0.62	1.33	3.30	2.83	1.07	3.27	3.35	0.87	1.74	4.14	2.08	0.44	1.51
Appendix III Parameters																
BORON, TOTAL	µg/L	56.6 J	60.6 J	ND	1,650	1,250	221	10,000	4,880	67.2 J	4,610	463	83.5 J	4,510	828	119
CALCIUM, TOTAL	µg/L	132,000	133,000	147,000	92,200	98,100	143,000 J	85,400	105,000	132,000	121,000	109,000	93,500	133,000	150,000	145,000
CHLORIDE, TOTAL	mg/L	4.1	5.4	3.3	22.5	19.2	47.3	27.1	16.8	8.7	12.9	8.7	10.4	14.0	4.1	1.5
FLUORIDE, TOTAL	mg/L	0.23	0.16 J	0.099 J	0.42	0.43	0.24	0.28	0.20 J	0.17 J	0.22	0.25	0.27	0.088 J	ND	ND
SULFATE, TOTAL	mg/L	24.7	29.9	36.3	164	149	63.3	387	168	21.2	154	44.2	18.4	151	48.8	19.6
TOTAL DISSOLVED SOLIDS	mg/L	581	548	565	539	541 J	721 J	825	607	457	603 J	450 J	433 J	693	618	575
Appendix IV Parameters																
ANTIMONY, TOTAL	µg/L	0.77 J	0.094 J	ND	ND	0.090 J	0.086 J	0.085 J	0.23 J	0.16 J	0.35 J	ND	0.085 J	ND	ND	ND
ARSENIC, TOTAL	µg/L	0.65 J	0.50 J	28.7	11.7	0.48 J	5.5	4.7	0.58 J	0.26 J	7.5	6.1	71.2	13.9	0.92 J	0.96 J
BARIUM, TOTAL	µg/L	1,410	947	322	107	120	347	77.2	257	243	434	379	257	572	831	378
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	0.21 J	0.055 J	0.054 J	0.050 J	0.051 J	0.26 J	0.17 J	0.038 J	ND	0.033 J	0.050 J	ND	0.044 J	0.035 J
CHROMIUM, TOTAL	µg/L	0.26 J	0.40 J	ND	0.11 J	0.14 J	0.27 J	0.13 J	0.22 J	0.84 J	0.28 J	0.15 J	0.22 J	ND	0.18 J	0.10 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4 J
FLUORIDE, TOTAL	mg/L	0.23	0.16 J	0.099 J	0.42	0.43	0.24	0.28	0.20 J	0.17 J	0.22	0.25	0.27	0.088 J	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	3.9 J	ND	3.9 J	ND	ND	ND	ND	3.6 J	ND
LITHIUM, TOTAL	µg/L	23.8	24.0	19.0	37.7	32.6	27.3	29.8	33.8	21.1	22.5	12.1	10.9	22.4	22.3	23.2
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	ND	119	64.0	22.4	766	247	3.3 J	ND	ND	ND	ND	ND	ND
RADIUM [226 + 228]	pCi/L	5.45	3.29 J	ND	1.604	2.93	ND	1.759	ND	1.685	2.9	1.297	1.2293	2.364	2.935	ND
SELENIUM, TOTAL	µg/L	ND	0.31 J	0.14 J	ND	0.091 J	0.14 J	0.11 J	0.16 J	2.2	ND	0.11 J	0.20 J	ND	0.14 J	0.54 J
THALLIUM, TOTAL	µg/L	ND	0.24 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Additional Parameters																
ALKALINITY	mg/L	471	486	490	232	281	534	113	292	390	318	354	400	380	519	552
IRON, TOTAL	µg/L	8,120	9,570	22,600	3,570	3,300	18,400	5,580	8,650	ND	5,320	7,330	16,600	6,640	10,200	1,330
MAGNESIUM, TOTAL	µg/L	35,000	36,400	28,500	15,700	14,100	23,000	19,900	23,900	21,600	31,800	21,000	29,400	34,600	36,100	36,000
MANGANESE, TOTAL	µg/L	226	754	1,300	302	440	768	172	1,310	36.0	320	929	375	222	739	2,100
POTASSIUM, TOAL	µg/L	4,170	4,170	4,050	5,510	6,390	5,720	6,390	5,130	4,040	4,700	4,430	5,140	4,490	4,540	4,990
SODIUM, TOTAL	µg/L	11,000	9,980	9,030	57,000	61,900	93,300	114,000	48,000	5,100	25,600	20,400	23,300	25,900	12,700	9,480

1) Unit Abbreviations-: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - Standard Units, mV - millivolts, mS/cm - millisiemens- per centimeter, NTU - nephelometric turbidity unit, pCi/L - picoCuries per liter.
2) "-" Not sampled.
3) J - Result is an estimated value.
4) ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect.
5) NA - Not Applicable.
6) Radium [226 + 228] is reported as the sum of Radium 226 and Radium 228 activity concentrations unless the sum of Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: JSI
Checked By: RJF/EMS
Reviewed By: CMR

Table 3
Summary of Groundwater Elevation Monitoring Results
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

	Well ID	Location		Top of Casing	Ground Surface	Groundwater Elevation Measurements 11/7/2018		Groundwater Elevation Measurements 4/29/2019		Groundwater Elevation Measurements 10/4/2019	
		Northing	Easting	Feet MSL[3]	Feet MSL[3]	DTW[1]	GWE[2]	DTW[1]	GWE[2]	DTW[1]	GWE[2]
LCPA CCR Wells[8]	UMW-1D	988822.5	723129.4	489.72	487.8	27.80	461.92	23.89	465.83	22.09	467.63
	UMW-2D	990437.2	722248.6	484.81	482.7	23.13	461.68	19.29	465.52	16.95	467.86
	UMW-3D (R)	991823.5	723545.1	491.13	488.8	29.81	461.32	25.93	465.20	23.90	467.23
	UMW-4D	992512.3	724538.1	494.95	493.2	33.96	460.99	29.93	465.02	28.37	466.58
	UMW-5D	992027.2	725067.9	496.76	494.9	35.70	461.06	31.69	465.07	30.45	466.31
	UMW-6D	991382.8	725540.9	496.19	494.5	35.03	461.16	31.08	465.11	25.52	466.99
	UMW-7D	990722.8	726032.4	469.79	468.0	8.51	461.28	4.62	465.17	4.14	465.65
	UMW-8D	989892.7	725179.5	469.47	467.5	7.55	461.92	3.62	465.85	3.04	466.43
	UMW-9D	989220.0	724447.8	470.61	468.8	8.51	462.10	4.56	466.05	3.64	466.97
	BMW-1D	988310.6	715138.4	473.54	471.2	12.14	461.40	7.72	465.82	4.45	469.09
	BMW-2D	987204.3	715104.2	474.39	472.4	12.98	461.41	8.28	466.11	5.74	468.65
	AM-1S	995288.1	723817.1	483.00	480.2	23.28	459.72	19.40	463.60	15.04	467.96
	AM-1D	995298.6	723827.3	482.78	480.0	23.06	459.72	19.09	463.69	15.10	467.68
LCPB CCR Wells[8]	LMW-1S	990727.7	726039.1	470.06	468.1	8.56	461.50	4.62	465.44	4.78	465.28
	LMW-2S	992017.5	725074.2	496.64	494.9	35.54	461.10	31.53	465.11	30.37	466.27
	LMW-3S	993254.3	725081.6	492.56	490.5	31.86	460.70	27.73	464.83	NA	NA
	LMW-4S	994194.9	725624.1	472.83	470.7	12.36	460.47	8.11	464.72	7.17	465.66
	LMW-5S	994201.6	726366.8	468.75	466.9	8.42	460.33	4.15	464.60	3.37	465.38
	LMW-6S	993320.2	726391.4	469.56	467.2	9.09	460.47	5.91	463.65	4.24	465.32
	LMW-7S	992330.1	726371.1	468.43	466.7	7.72	460.71	3.71	464.72	3.03	465.40
	LMW-8S	991371.2	726351.3	467.24	465.2	6.29	460.95	2.40	464.84	1.94	465.30
	BMW-1S	988310.0	715131.6	473.49	471.2	12.18	461.31	7.70	465.79	4.50	468.99
	BMW-2S	987210.1	715104.3	474.56	472.5	13.10	461.46	8.41	466.15	5.92	468.64
LCL1 CCR Wells[8]	TMW-1	993782.9	728656.8	469.34	466.9	9.46	459.88	5.01	464.33	5.38	463.96
	TMW-2	994513.1	728663.8	470.40	468.0	10.84	459.56	6.08	464.32	6.41	463.99
	TMW-3	994635.7	727842.0	469.41	467.1	9.56	459.85	4.98	464.43	4.85	464.56
	MW-26	993976.5	726910.9	469.20	466.7	8.85	460.35	4.61	464.59	4.12	465.08
Utility Waste Landfill Wells	MW-1	995572.0	727213.0	472.05	469.5	12.40	459.65	7.39	464.66	7.05	465.00
	MW-2	995657.0	727664.0	471.86	469.3	12.32	459.54	7.04	464.82	7.17	464.69
	MW-3	995739.6	728101.2	471.01	468.5	11.56	459.45	7.43	463.58	6.59	464.42
	MW-4	995818.4	728546.3	470.96	468.3	11.81	459.15	6.41	464.55	6.76	464.20
	MW-5	995545.8	728819.2	470.06	467.4	10.74	459.32	5.58	464.48	6.04	464.02
	MW-6	995177.0	729226.7	469.68	467.1	10.37	459.31	5.31	464.37	5.86	463.82
	MW-7	994621.5	729411.4	469.15	466.7	9.78	459.37	4.89	464.26	5.43	463.72
	MW-8	994382.7	729643.2	468.25	465.6	8.90	459.35	4.06	464.19	4.66	463.59
	MW-9	994168.3	729892.6	467.81	465.1	8.48	459.33	3.68	464.13	4.31	463.50
	MW-10	993950.5	730148.7	468.56	465.8	9.25	459.31	4.51	464.05	5.12	463.44
	MW-11	993724.6	730398.4	468.55	466.1	9.28	459.27	4.06	464.49	5.23	463.32
	MW-12	993469.5	730622.5	468.11	465.7	8.89	459.22	4.23	463.88	4.93	463.18
	MW-13	993255.5	730912.8	468.10	465.6	9.91	458.19	4.32	463.78	5.05	463.05
	MW-14	993052.3	731166.4	466.83	464.2	7.72	459.11	3.21	463.62	3.97	462.86
	MW-15	992807.3	731405.9	467.30	465.0	8.14	459.16	3.81	463.49	4.50	462.80
	MW-16	992617.6	731651.2	466.57	464.0	7.31	459.26	3.57	463.00	4.03	462.54
	MW-17	992302.1	731675.3	467.89	465.3	8.83	459.06	4.55	463.34	5.33	462.56
	MW-18	991677.7	730928.2	465.27	462.8	4.37	460.90	2.43	462.84	2.87	462.40
	MW-19	992089.0	730177.6	466.16	463.5	6.15	460.01	2.65	463.51	NA	NA
	MW-20	991669.1	729951.7	465.97	463.6	6.02	459.95	2.45	463.52	NA	NA
	MW-21	991334.0	729950.0	465.90	463.4	5.44	460.46	2.71	463.19	NA	NA
	MW-22	990929.1	729354.6	466.80	464.2	6.62	460.18	2.95	463.85	NA	NA
	MW-23	991099.5	728511.5	467.54	464.9	7.42	460.12	3.95	463.59	5.58	461.96
	MW-24	991818.3	727992.3	467.10	464.6	6.81	460.29	2.83	464.27	2.85	464.25
	MW-25	992706.9	727528.7	468.61	466.0	8.21	460.40	4.20	464.41	3.95	464.66
	MW-27	994663.9	726607.5	470.05	467.4	9.87	460.18	5.22	464.83	4.84	465.21
	MW-28	995276.3	726639.9	471.18	468.6	11.36	459.82	5.84	465.34	6.50	464.68
	MW-29	995678.8	726962.2	472.97	470.4	13.29	459.68	8.31	464.66	7.79	465.18
	MW-30	995759.9	727408.8	472.02	469.3	12.44	459.58	7.38	464.64	7.13	464.89
	MW-31	995836.2	727853.5	472.51	469.9	13.04	459.47	7.96	464.55	7.92	464.59
	MW-32	995912.4	728305.6	471.07	468.2	11.69	459.38	6.50	464.57	6.76	464.31
	MW-33D	995741.5	727408.7	472.15	469.4	12.50	459.65	7.69	464.46	7.11	465.04
	MW-34D	995560.9	728820.5	470.19	467.4	10.78	459.41	5.93	464.26	6.02	464.17
	MW-35D	992693.5	727536.2	468.59	465.9	8.22	460.37	4.14	464.45	3.83	464.76

Created by: RJF
Checked by: KAB
Reviewed by: CMR

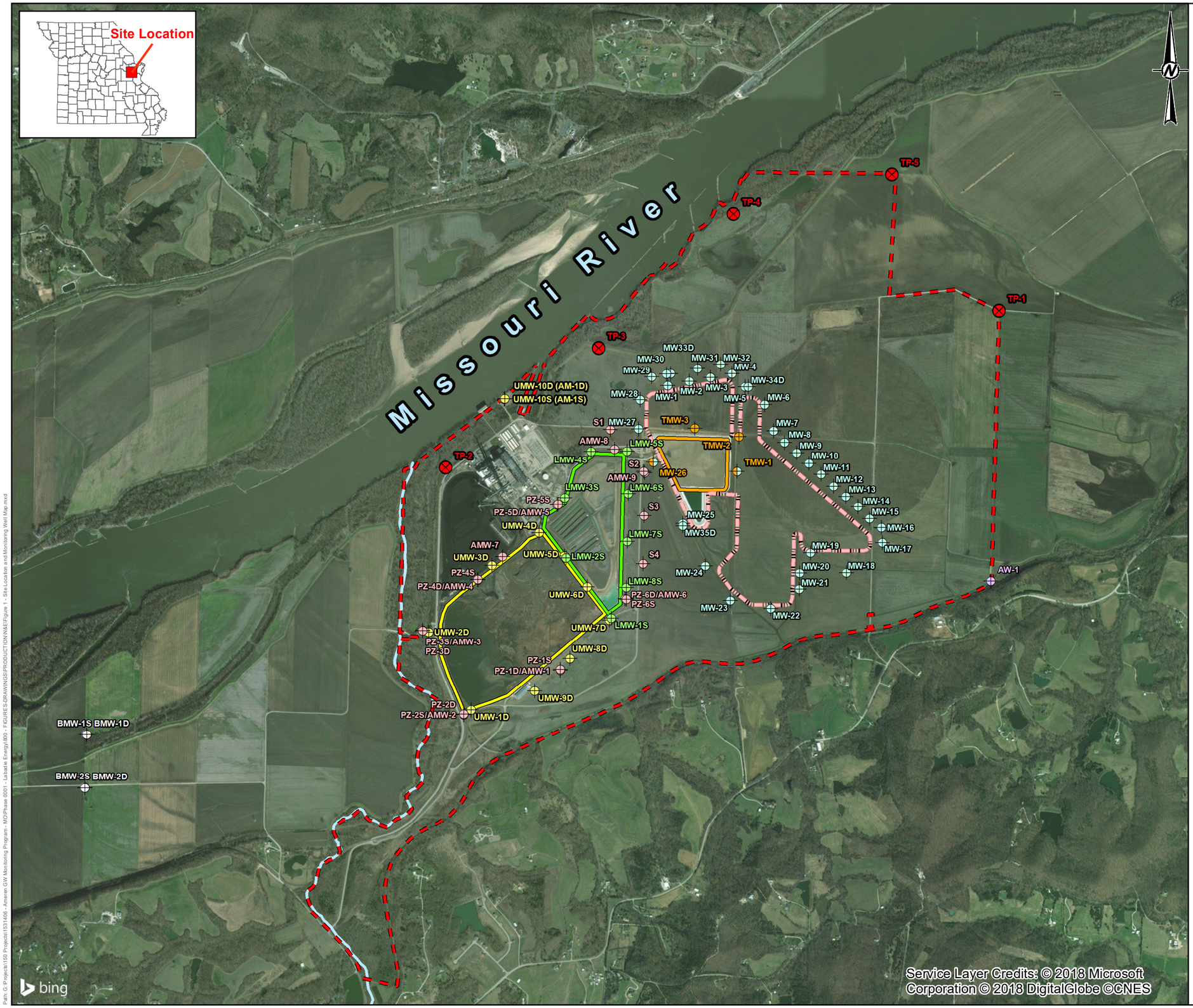
Table 3
Summary of Groundwater Elevation Monitoring Results
Labadie Nature and Extent Investigation
Labadie Energy Center, Franklin County, MO

	Well ID	Location		Top of Casing	Ground Surface	Groundwater Elevation Measurements 11/7/2018		Groundwater Elevation Measurements 4/29/2019		Groundwater Elevation Measurements 10/4/2019	
		Northing	Easting	Feet MSL[3]	Feet MSL[3]	DTW[1]	GWE[2]	DTW[1]	GWE[2]	DTW[1]	GWE[2]
Other	AW-1	991502.4	733926.6	466.78	463.4	6.75	460.03	3.86	462.92	4.12	462.66
Nature and Extent Temporary Piezometers	TP-1S	997122.3	734100.3	469.08	465.8	10.97	458.11	5.02	464.06	6.81	462.27
	TP-1M	997122.3	734100.3	469.08	465.8	10.96	458.12	5.09	463.99	6.80	462.28
	TP-1D	997122.3	734100.3	469.09	465.8	10.95	458.14	6.07	463.02	6.79	462.30
	TP-2S	993865.6	722603.7	471.24	468.2	10.82	460.42	6.98	464.26	3.22	468.02
	TP-2M	993865.6	722603.7	471.22	468.2	10.72	460.50	7.81	463.41	3.67	467.55
	TP-2D	993865.6	722603.7	471.22	468.2	10.71	460.51	7.86	463.36	3.68	467.54
	TP-3S	996343.6	725783.7	475.60	472.6	16.20	459.40	11.80	463.80	8.95	466.65
	TP-3M	996343.6	725783.7	475.64	472.6	16.17	459.47	11.90	463.74	8.89	466.75
	TP-3D	996343.6	725783.7	475.63	472.6	16.21	459.42	11.91	463.72	8.85	466.78
	TP-4S	999139.8	728578.3	472.07	469.1	13.65	458.42	9.25	462.82	NA	NA
	TP-4M	999139.8	728578.3	472.07	469.1	13.61	458.46	9.26	462.81	NA	NA
	TP-4D	999139.8	728578.3	472.08	469.1	13.62	458.46	9.29	462.79	NA	NA
	TP-5S	999955.0	731876.6	470.39	467.4	12.37	458.02	7.38	463.01	5.97	464.42
	TP-5M	999955.0	731876.6	470.39	467.4	12.37	458.02	7.41	462.98	5.88	464.51
	TP-5D	999955.0	731876.6	470.37	467.4	12.33	458.04	7.37	463.00	5.94	464.43
NPDES Wells[9]	PZ-1D/AMW-1	989663.9	724916.0	470.28	468.1	8.16	462.12	4.24	466.04	3.46	466.82
	PZ-2S/AMW-2	988727.0	723029.3	489.65	487.4	27.60	462.05	23.57	466.08	21.80	467.85
	PZ-3S/AMW-3	990485.6	722115.3	482.50	479.9	20.75	461.75	16.92	465.58	NA	NA
	PZ-4D/AMW-4	991567.2	723197.6	488.37	486.2	26.86	461.51	23.41	464.96	20.85	467.52
	PZ-5D/AMW-5	993079.9	725005.8	492.73	490.8	31.93	460.80	27.84	464.89	NA	NA
	PZ-6D/AMW-6	991152.7	726348.8	468.35	466.0	7.23	461.12	3.39	464.96	2.94	465.41
	AMW-7	991996.3	723769.5	491.14	489.1	29.91	461.23	26.01	465.13	23.86	467.28
	AMW-8	994225.9	726113.0	471.06	468.4	10.73	460.33	6.53	464.53	5.51	465.55
	AMW-9	993784.5	726717.8	468.93	466.8	8.61	460.32	4.36	464.57	3.73	465.20
	S1	994676.8	726055.1	472.64	470.4	12.30	460.34	7.70	464.94	NA	NA
	S2	993763.7	726717.6	469.48	467.2	9.04	460.44	4.81	464.67	4.34	465.14
	S3	992855.4	726692.5	468.97	466.6	8.37	460.60	4.24	464.73	3.72	465.25
	S4	991859.2	726669.0	468.24	466.0	7.38	460.86	3.41	464.83	3.02	465.22
River Level	Missouri River[7]	995047.6	723234.9	NA	NA	459.40	NA	NA	463.14	NA	468.67

Notes:
1.) DTW - Depth to water measured in feet below top of casing.
2.) GWE - Groundwater elevation measured in feet above mean sea level.
3.) Feet MSL - Feet above mean sea level.
4.) Horizontal Datum: State Plane Coordinates NAD83 (2000) Missouri East Zone feet.
5.) Vertical Datum: NAVD88 feet.
6.) NA - Not Applicable.
7.) Missouri River level obtained from United States Geological Survey (USGS) gauge 06935550.
8.) CCR - Coal Combustion Residuals.
9.) NPDES - National Pollutant Discharge Elimination System.

Created by: RJF
Checked by: KAB
Reviewed by: CMR

Figures



LEGEND

Approximate Property Boundary

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Utility Waste Landfill (UWL)

- Proposed UWL Final Fence Perimeter
- LCL1 - UWL Landfill Cell 1

Monitoring Well/Piezometer Locations

- Background CCR Rule Monitoring Well
- LCPA - Bottom Ash Surface Impoundment Monitoring Well
- LCPB - Fly Ash Surface Impoundment Monitoring Well
- UWL CCR Rule Monitoring Well
- UWL CCR Rule and Solid Waste Disposal Area Monitoring Well
- UWL Solid Waste Disposal Area Monitoring Well
- National Pollutant Discharge Elimination System (NPDES) Piezometers
- Alluvial Aquifer Piezometer
- Triple Nested Nature and Extent Piezometer

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) CCR - COAL COMBUSTION RESIDUALS.

REFERENCES

1.) ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.

0 1,000 2,000 3,000 4,000 5,000 6,000
Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AND MONITORING WELL AND PIEZOMETER LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-09
PREPARED	JSI
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

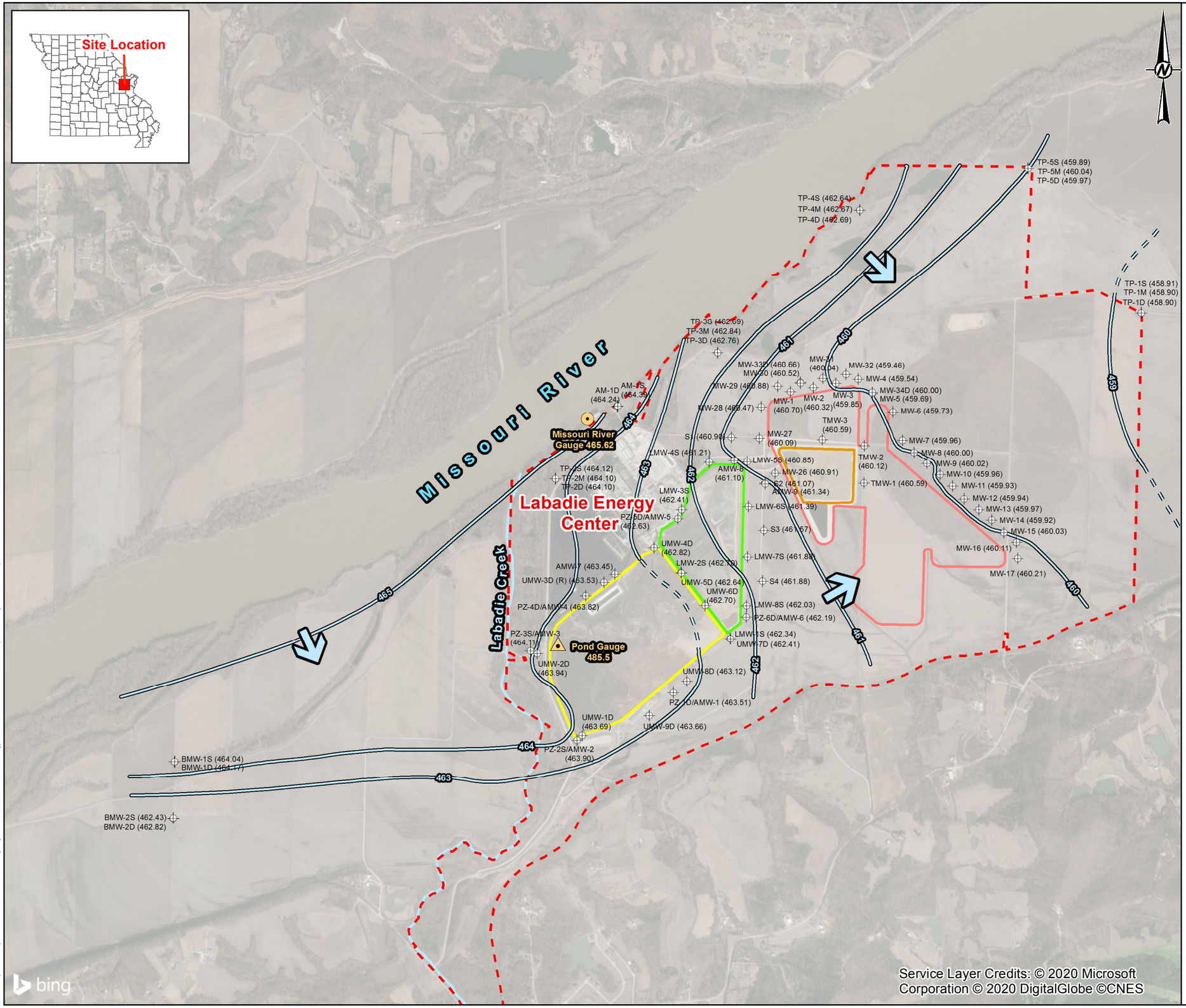
PROJECT No. 153-1406 | PHASE 0001 | Rev. 0.0 | FIGURE 1

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

Path: G:\Projects\1530 Projects\15314\06 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\N&E\Figure 1 - Site Location and Monitoring Well Map.mxd

APPENDIX G

2019 Potentiometric Surface Maps



LEGEND

- Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

- Proposed Final UWL Fence Perimeter
- Utility Waste Landfill Cell LCL1

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Groundwater Elevation Measurement Location

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge
- LCPA - Bottom Ash Surface Impoundment

Groundwater Elevation Contours

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

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
6. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000

Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JANUARY 2, 2019 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER

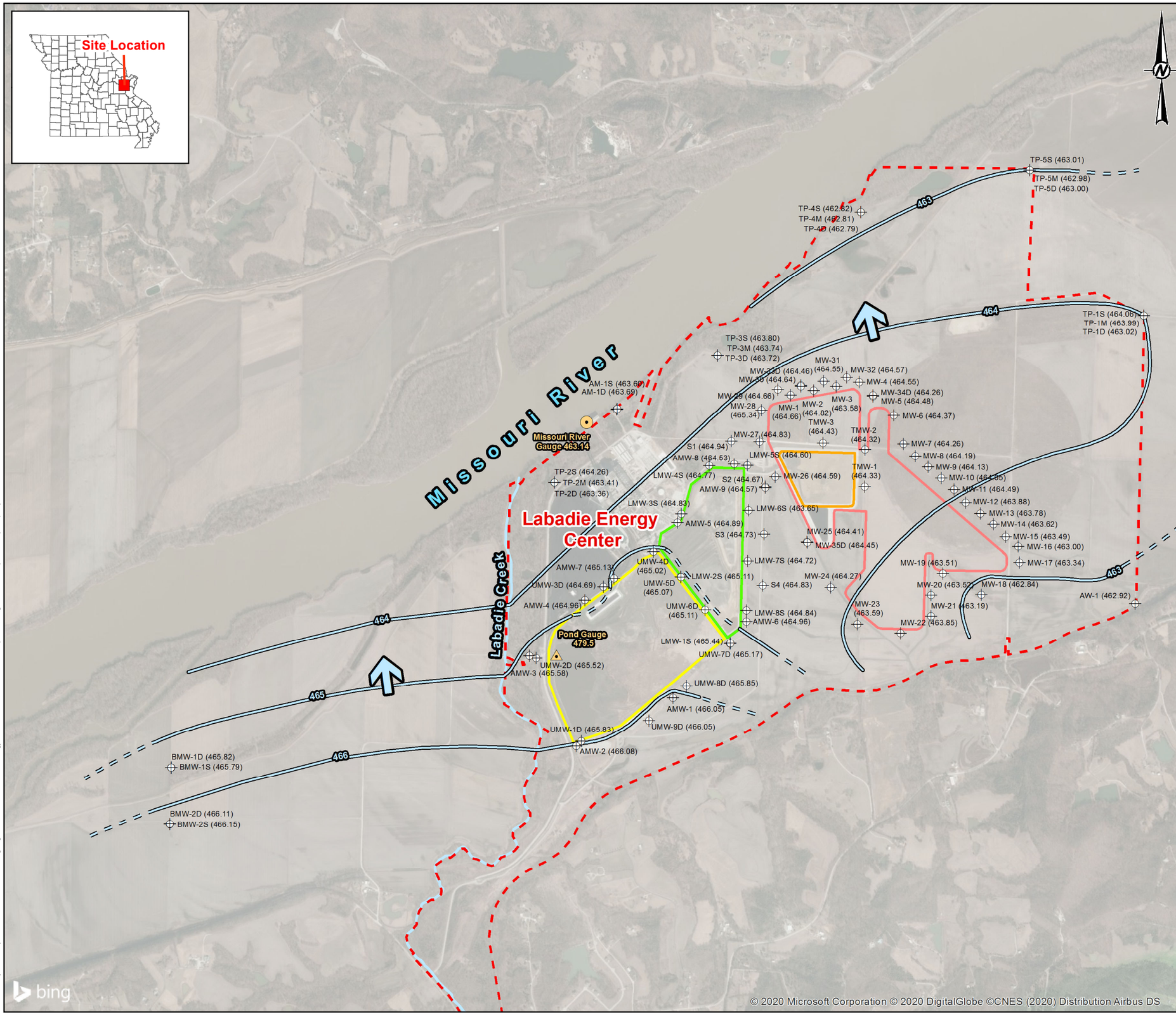
YYYY-MM-DD	2019-11-22
PREPARED	EMS/RJF
DESIGN	JSI
REVIEW	TJG
APPROVED	CMR

PROJECT No.
153-140601

FIGURE
P1

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

Path: G:\Projects\1560 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\200 - REPORTS\DRAFT\2019 Annual Report\IL CPA\Figures\2019 Pot maps\LEC - VS Jan 2019.mxd



LEGEND

- Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

- Proposed Final UWL Fence Perimeter
- Utility Waste Landfill Cell LCL1

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Groundwater Elevation Measurement Location

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge
- LCPA Bottom Ash Surface Impoundment Gauge

Groundwater Elevation Contours

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

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
6. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
7. LMW-6S, TP-1D AND MW-28 WERE NOT USED IN POTENTIOMETRIC SURFACE CONTOURING.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
APRIL 29, 2019 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER

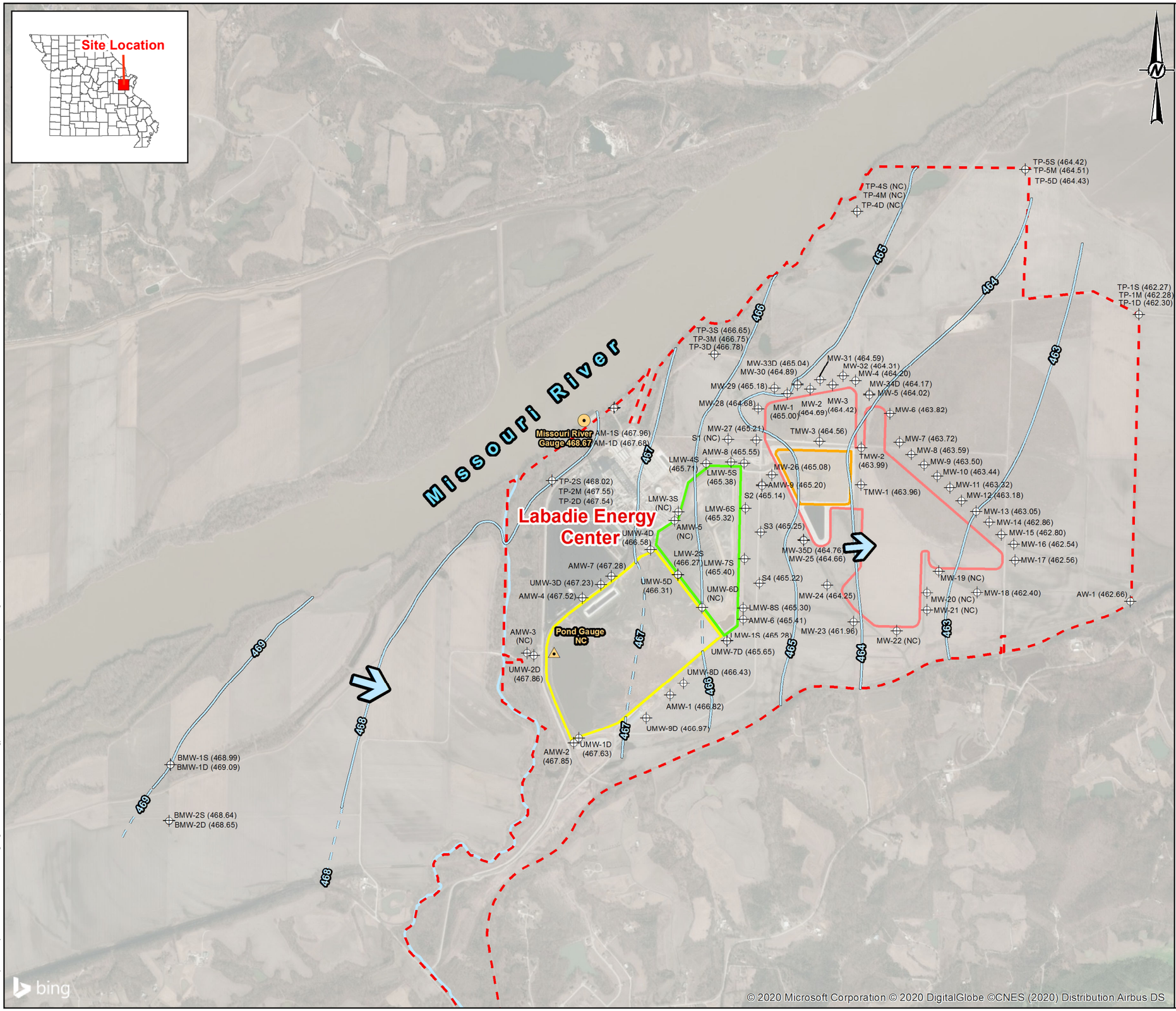
YYYY-MM-DD	2019-06-03
PREPARED	EMS
DESIGN	JSI
REVIEW	RJF
APPROVED	MNH

PROJECT No.
153-140601

FIGURE
P2

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

Path: G:\Projects\153 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\200 - REPORTS\DRAFT\2019 Annual Reports\LCPA\Figures\2019 Pot map\LEC - NE pot map May 2019.mxd



LEGEND

- Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

- Proposed Final UWL Fence Perimeter
- Utility Waste Landfill Cell LCL1

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Groundwater Elevation Measurement Location

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge
- LCPA Bottom Ash Surface Impoundment Gauge

Groundwater Elevation Contours

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

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
6. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
7. THE POND GAUGE WAS BELOW THE GAUGE AND THEREFORE A POND ELEVATION LEVEL WAS NOT COLLECTED (NC).
8. WATER LEVELS WERE NOT COLLECTED AT WELLS LMW-3S, MW-19, MW-20, MW-21, MW-22, TP-4S, TP-4M, TP-4D, PZ-3S/AMW-3, PZ-5D/AMW-5, AND S1.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
OCTOBER 4, 2019 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER

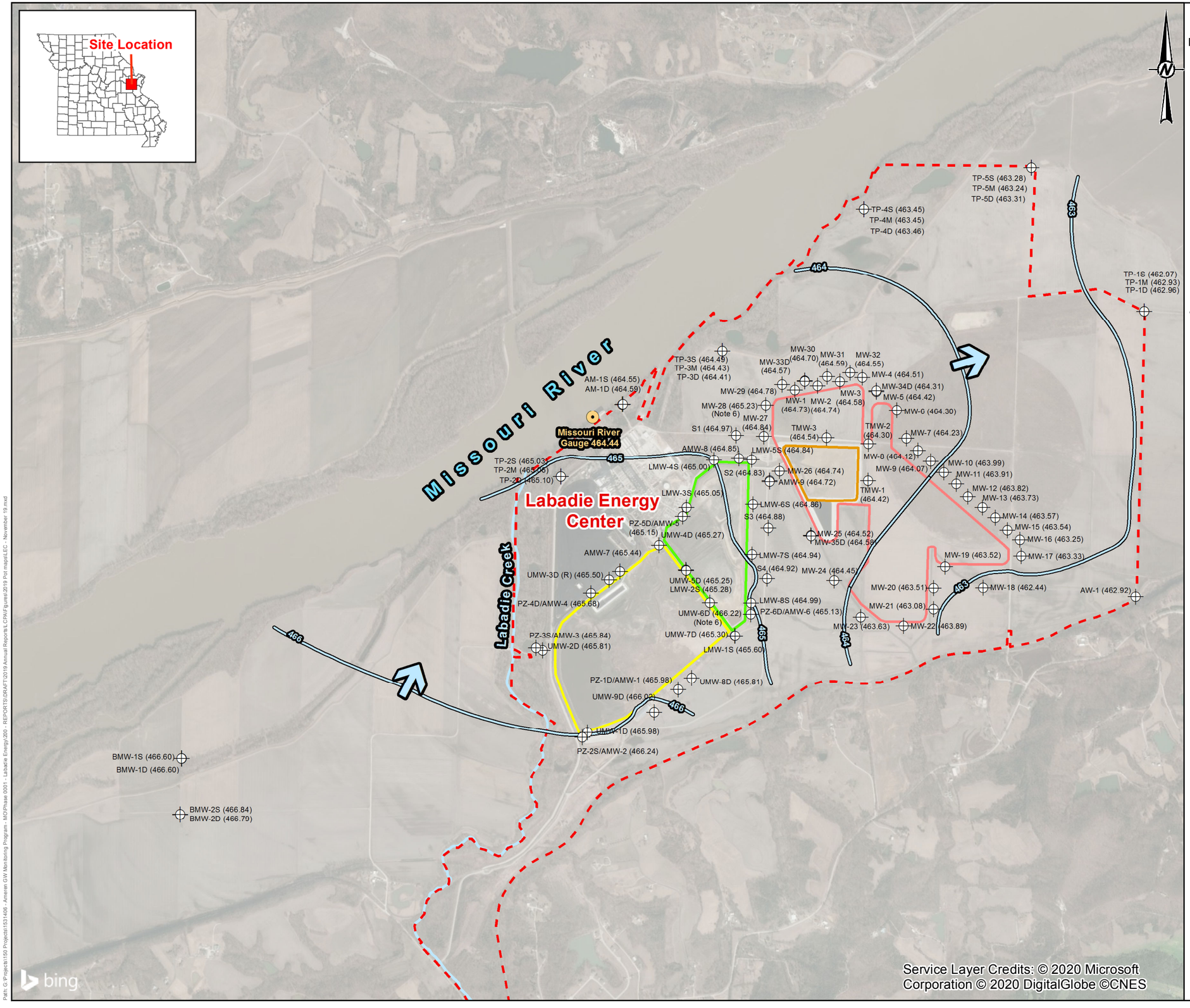
YYYY-MM-DD	2019-10-21
PREPARED	AMM
DESIGN	JSI
REVIEW	BCW
APPROVED	MNH

PROJECT No.
153-140601

FIGURE
P3

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

Path: G:\Projects\1560 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\200 - REPORTS\DRAFT\2019 Annual Report\LCPA\Figures\2019 Pot maps\LEC - NE pot map Oct 2019.mxd



LEGEND

Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

Proposed Final UWL Fence Perimeter

Utility Waste Landfill Cell LCL1

Surface Impoundments

LCPA - Bottom Ash Surface Impoundment

LCPB - Fly Ash Surface Impoundment

Groundwater Elevation Measurement Location

Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

Missouri River Gauge

Groundwater Elevation Contours

Groundwater Elevation Contour (FT MSL)

Inferred Groundwater Elevation Contour (FT MSL)

Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
6. MONITORING WELLS UMW-6D AND MW-28 WERE NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
NOVEMBER 4, 2019 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-11-22
PREPARED	EMS
DESIGN	JSI
REVIEW	TJG
APPROVED	CMR

PROJECT No.
153-140601

FIGURE
P4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 11in 0

Path: G:\Projects\153 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\200 - REPORTS\DRAFT\2019 Annual Reports\LCPA\Figures\2019 Pot maps\LEC - November 19.mxd

APPENDIX H

UMW-6D Modification Records

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

P.O. Box 250 111 Fairgrounds Rd. Rolla, MO 65402-0250
(573) 368-2165
FAX(573)368-2317

COPY

VARIANCE: Approved **VARIANCE NUMBER:** 6605

WELL OWNER INFORMATION									
NAME:	AMEREN MISSOURI								
BUSINESS NAME:	AMEREN MISSOURI								
ADDRESS 1:	1901 CHOUTEAU AVE.						**FAX:**		
ADDRESS 2:									
CITY:	ST. LOUIS	**STATE:**	MO	**ZIP:**	63103		**TELEPHONE:**		

WELL LOCATION											
COUNTY:	FRANKLIN		**LAT.**	38	33	20.9	**LONG.**	90	49	51.3	
1/4	**1/4**	**1/4**	SE	**SEC.**	18		**TWN.**	44	**N**	**RNG.**	2E

CONTRACTOR INFORMATION					
BUSINESS NAME:	DIRTY DOG DRLG DBA BULLDOG DRLG		**PERMIT NUMBER:**		003503
CONTRACTOR NAME:	CRAIG MAXEINER				
ADDRESS:	411 TRANSPOINT DR			**FAX:**	618-286-0354
CITY:	DUPO	**STATE:** IL	**ZIP:** 62239	**TELEPHONE:**	618-286-3800

VARIANCE INFORMATION

VARIANCE EXPLANATION

VARIANCE GRANTED TO DELAY INSTALLATION OF MONITORING WELL SURFACE COMPLETION CONCRETE FOR A PERIOD OF UP TO ONE YEAR FROM CONSTRUCTION. CONTRACTOR WILL INSTALL A FIVE-FOOT LONG BY FOUR-INCH DIAMETER STEEL WELL PROTECTOR 2.5 FEET INTO THE GROUND AROUND THE RISER. STEEL PROTECTOR WILL BE COVERED WITH A LOCKING WELL COVER. CONTRACTOR WILL NOTIFY THE SECTION UPON COMPLETION OF THE CONCRETE SEAL BY SUBMISSION OF MONITORING WELL RECONSTRUCTION RECORD.

RULE NUMBER MODIFIED: 10 CSR 23-4.060

REASON FOR VARIANCE

VARIANCE REQUESTED TO LEAVE CONCRETE SURFACE COMPLETION GROUT UNFINISHED FOR A PERIOD OF UP TO ONE YEAR. OWNER PLANS TO REGRADE THE AREA AROUND THE WELL IN COORDINATION WITH PLACEMENT OF A LINER. WELL IS LOCATED IN A SECURE AREA AND A LOCKING COVER WILL BE INSTALLED.

DATE: 09/04/2019 **BY:** BRAD MITCHELL

Cc: **Cc:**

SEP 0 9 2019

golder.com