2018 Annual Groundwater Monitoring and Corrective Action Report

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

Submitted to:

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Project No. 153-1406

January 31, 2019

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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, 2018 through December 31, 2018.

2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the LCPA. The groundwater monitoring system consists of eleven (11) monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**.

On July 11, 2018, UMW-3D was hit by a bulldozer and sustained damage to the protective cover and the PVC riser pipe. The monitoring well was unable to be repaired and had to be replaced. On October 25, 2018, UMW-3D was abandoned and replaced with UMW-3D(R). A summary of the construction details of the replacement well is provided in **Table 1** and **Appendix A**. Information on the other monitoring wells in the LCPA well network is provided in the 2017 Annual Groundwater Monitoring Report for the LCPA.

Additionally, a nature and extent investigation was initiated in 2018 and five (5) triple-nested piezometers and two (2) monitoring wells were installed. A summary of the construction details of these new piezometers, wells, and the LCPA well network is provided in **Table 1** and **Appendix A**. A map displaying the locations of these piezometers and wells is provided in **Figure 1**.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the LCPA CCR Unit in 2018. **Table 2** provides a summary including the date of sample collection and the monitoring program.

3.1 Detection Monitoring Program

The first Detection Monitoring event was completed November 7-8, 2017. Verification sampling and the statistical analysis to evaluate for Statistically Significant Increases (SSI) for the November 2017 event were not completed until 2018 and are included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 4-5, 2018 and verified SSIs. A table summarizing the results of the statistical analysis of the November 2017 Detection Monitoring event is provided in **Table 3** and laboratory analytical data are provided in **Appendix B**. The results of this analysis indicated SSIs and a notification of the establishment of an Assessment Monitoring Program was placed in the operating record and on the publicly available website.

A Detection Monitoring event was completed May 21-22, 2018, and testing was completed for all Appendix III analytes. Statistical analysis of these data determined that there were SSIs. A table summarizing the results of the statistical analysis of the May 2018 Detection Monitoring event is provided in **Table 4** and laboratory analytical data are provided in **Appendix B**.

A Detection Monitoring event was completed November 7-9, 2018 and testing was performed for all Appendix III analytes. Statistical analyses to evaluate for SSIs in the November 2018 data were not completed in 2018.

Results of the statistical evaluation for the November 2018 data will be included in the 2019 annual report. A table summarizing the results of the November 2018 Detection Monitoring event is provided in **Table 5** and laboratory analytical data are provided in **Appendix B.**

3.2 Assessment Monitoring Program

After the determination of a verified SSI, an Assessment Monitoring Program was established for the LCPA. The April 2018 Assessment Monitoring event was completed April 9-10, 2018 and testing was completed for all Appendix IV parameters. A summary of the results is provided in **Table 6** and laboratory analytical data are provided in **Appendix B**. Based on the results from the initial analysis, the May 2018 Assessment Monitoring event was completed to analyze the Appendix IV constituents detected in groundwater during the initial assessment monitoring sampling event. This sampling was completed on May 21-22, 2018. A summary of the results is provided in **Table 7** and laboratory analytical data are provided in **Appendix B**.

Using the data collected in these two sampling events along with data collected during baseline sampling, a statistical analysis was completed to identify parameters at a Statistically Significant Level (SSL) over the LCPA Groundwater Protection Standards (GWPS). The results from this analysis and a table that displays the site-specific GWPS are provided in **Appendix C**. Results from this evaluation indicated SSLs and a notification of the detection of the SSLs above LCPA GWPS was placed in the operating record and on the publicly available website. A summary of SSLs and their well locations are as follows:

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

On November 7-9, 2018, the November 2018 Assessment Monitoring event was completed. This sampling event analyzed the Appendix IV constituents detected in groundwater during the initial assessment monitoring sampling event (the same parameters as the May 2018 sampling event). A summary of the results is provided in **Table 8**, however, statistical analyses to evaluate for SSLs over GWPS were not completed in 2018. Results of the statistical evaluation will be included in the 2019 annual report.

3.2.1 Nature and Extent Evaluation

As required by the CCR Rule, after an SSL is determined to be above site GWPS, an investigation into the nature and extent of impacts that may affect the corrective measures selection must be initiated. This investigation began in 2018, however, data validation, evaluation, and statistical analysis of this data were not completed in 2018. A characterization of the nature and extent of the groundwater impacts and evaluation of site conditions that may affect the assessment of corrective measures or corrective measures selection is underway. Nature and extent data and results will be provided in 2019.

3.3 Assessment of Corrective Measures

Since an SSL was determined above the LCPA GWPS, a notification that an Assessment of Corrective Measures has been initiated was posted to the operating record and to the publicly available website. An Assessment of Corrective Measures will be completed in 2019 and will be posted as required by the CCR Rule.

3.4 Groundwater Elevation, Flow Rate and Direction

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

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix D**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in water level of the adjacent Missouri River. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce "bank recharge" and "bank discharge" conditions. 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 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 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 0.0003 to 0.0006 feet/foot with an estimated net annual groundwater velocity of approximately 19 feet per year.

4.0 STATUS OF THE GROUNDWATER MONITORING PROGRAM

As required by the CCR Rule, in 2018 Ameren posted a notification of Assessment Monitoring and notification of constituents exceeding CCR Groundwater Protection Standards for the LCPA. Currently, the LCPA CCR Unit is in Assessment Monitoring and has begun an Assessment of Corrective Measures. Detection and Assessment Monitoring will continue as required by the CCR Rule.

4.1 Sampling Issues

Some sampling issues were encountered during the sampling events in 2018. While taking a water level measurement at L-BMW-2D, the approximately top 2 ft of riser pipe became unthreaded from the rest of the riser pipe. Filter sand that had been placed around the top of the riser pipe inside the protective cover fell into the well. The riser pipe was repaired and on August 31, 2018, L-BMW-2D was re-developed to remove the filter sand from the well.

Additionally, as discussed above, UMW-3D was abandoned and replaced by UMW-3D(R).

5.0 ACTIVITIES PLANNED FOR 2019

Detection and Assessment Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2019. Statistical analysis of the November 2018 Detection and Assessment Monitoring data will be competed in 2019 and included in the 2019 Annual Report.

As required by the Assessment Monitoring Program, a characterization of the nature and extent of impacts began in 2018 and will continue in 2019. Additionally, an Assessment of Corrective Measures will be performed in 2019. After this assessment is completed and as soon as feasible, a corrective measure will be selected. A semiannual report describing the progress in selecting and designing the corrective measures will be completed and posted to the website as required by the CCR Rule.

Tables

Table 1
Summary of Well Construction Details
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

Monitoring Well ID	Installation Date	Location[4]		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 MONITORING WELLS								
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
NATURE AND EXTENT MONITORING WELLS								
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
TP-1S	6/3/2018	997122.3	734100.3	469.08	465.8	446.1	441.0	24.8
TP-1M	6/3/2018	997122.3	734100.3	469.08	465.8	410.8	405.7	60.1
TP-1D	6/3/2018	997122.3	734100.3	469.09	465.8	380.1	375.0	90.8
TP-2S	6/2/2018	993865.6	722603.7	471.24	468.2	446.9	441.8	26.4
TP-2M	6/2/2018	993865.6	722603.7	471.22	468.2	412.9	407.8	60.4
TP-2D	6/2/2018	993865.6	722603.7	471.22	468.2	374.6	369.5	98.7
TP-3S	6/17/2018	996343.6	725783.7	475.60	472.6	452.4	447.3	25.3
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-4S	6/13/2018	999139.8	728578.3	472.07	469.1	444.3	439.2	29.9
TP-4M	6/13/2018	999139.8	728578.3	472.07	469.1	414.0	408.9	60.2
TP-4D	6/13/2018	999139.8	728578.3	472.08	469.1	379.0	373.9	95.2
TP-5S	6/12/2018	999955.0	731876.6	470.39	467.4	447.0	441.9	25.5
TP-5M	6/12/2018	999955.0	731876.6	470.39	467.4	412.6	407.5	59.9
TP-5D	6/12/2018	999955.0	731876.6	470.37	467.4	377.0	371.9	95.5

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: JAP
Reviewed by: MNH

Table 2
Summary of Groundwater Sampling Dates
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

Groundwater Monitoring Wells	Date of Sample Collection					
	January 2018 - Verification Sampling	April 2018 - Assessment Monitoring Sampling	May 2018 - Assessment/ Detection Monitoring Sampling	July 2018 - Verification Sampling	November 2018 - Nature and Extent Sampling	November 2018 - Assessment/ Detection Monitoring Sampling
BMW-1D	-	4/9/2018	5/21/2018	-		11/7/2018
BMW-2D	-	4/9/2018	5/21/2018	-		11/7/2018
UMW-1D	1/5/2018	4/9/2018	5/21/2018	-		11/7/2018
UMW-2D	1/4/2018	4/10/2018	5/21/2018	-		11/7/2018
UMW-3D	1/5/2018	4/10/2018	5/22/2018	-		11/8/2018
UMW-4D	1/5/2018	4/9/2018	5/22/2018	7/2/2018		11/9/2018
UMW-5D	1/5/2018	4/9/2018	5/22/2018	-		11/8/2018
UMW-6D	1/5/2018	4/9/2018	5/22/2018	-		11/9/2018
UMW-7D	1/4/2018	4/9/2018	5/22/2018	-		11/7/2018
UMW-8D	1/4/2018	4/9/2018	5/22/2018	-		11/7/2018
UMW-9D	1/4/2018	4/9/2018	5/21/2018	-		11/7/2018
UMW-10D	-	-	-	-	11/9/2018	-
UMW-10S	-	-	-	-	11/9/2018	-
L-TP-1D	-	-	-	-	11/8/2018	-
L-TP-1M	-	-	-	-	11/8/2018	-
L-TP-1S	-	-	-	-	11/8/2018	-
L-TP-2D	-	-	-	-	11/9/2018	-
L-TP-2M	-	-	-	-	11/9/2018	-
L-TP-2S	-	-	-	-	11/9/2018	-
L-TP-3D	-	-	-	-	11/8/2018	-
L-TP-3M	-	-	-	-	11/8/2018	-
L-TP-3S	-	-	-	-	11/8/2018	-
L-TP-4D	-	-	-	-	11/8/2018	-
L-TP-4M	-	-	-		11/8/2018	
L-TP-4S	-	-	-	-	11/8/2018	-
L-TP-5D	-	-	-	-	11/8/2018	-
L-TP-5M	-	-	-	-	11/8/2018	-
L-TP-5S	-	-	-	-	11/8/2018	-
Detection or Assessment Monitoring	Detection	Assessment	Assessment/ Detection	Detection	Assessment	Assessment/ Detection

Notes:

1.) Verification Sampling Events tested for Appendix III Parameters with initial exceedances that have not already been verified.

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

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

4.) "-" No sample collected.

5.) NA - Not applicable.

Prepared by: MSG
Checked by: JAP/RJF
Reviewed by: MNH

Table 3
November 2017 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	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
November 2017 Detection Monitoring Event													
DATE	NA	NA	11/7/2017	11/7/2017	11/8/2017	11/8/2017	11/8/2017	11/7/2017	11/7/2017	11/7/2017	11/8/2017	11/8/2017	11/8/2017
pH	SU	6.634-7.617	7.15	7.25	7.06	7.52	7.93	7.33	9.21	7.99	7.13	7.05	6.96
BORON, TOTAL	µg/L	DQR	106	91.8 J	567	1,990	9,850	4,020	5,920	15,700	6,360	375	126
CALCIUM, TOTAL	µg/L	156,193	135,000	134,000	135,000	101,000	127,000	47,400	68,300	95,500	180,000	132,000	119,000
CHLORIDE, TOTAL	mg/L	18.1	8.7	18.5	10.9	18.7	14.1	19.7	18.8	21.8	13.0	9.0	19.6
FLUORIDE, TOTAL	mg/L	0.29	0.22	0.26	0.24	0.36	0.19 J	0.39	0.14 J	0.16 J	0.32	0.21	0.20
SULFATE, TOTAL	mg/L	67.9	35.0	35.8	7.4	241	422	312	236	467	313	3.5	ND
TOTAL DISSOLVED SOLIDS	mg/L	579	475	454	456	583	596	536	404	645	825	444	462
January 2018 Verification Sampling													
DATE	NA	NA			1/5/2018	1/4/2018	1/5/2018	1/5/2018	1/5/2018	1/5/2018	1/4/2018	1/4/2018	1/4/2018
pH	SU	6.634-7.617					7.59		8.99	7.98			
BORON, TOTAL	µg/L	DQR			646	2,310	8,960	2,830	5,410	15,700	7,160	535	111
CALCIUM, TOTAL	µg/L	156,193									190,000		
CHLORIDE, TOTAL	mg/L	18.1				55.6		19.3	19.8	21.7			19.9
FLUORIDE, TOTAL	mg/L	0.29				0.38		0.48			0.37		
SULFATE, TOTAL	mg/L	67.9				168	474	272	252	392	436		
TOTAL DISSOLVED SOLIDS	mg/L	579				641	784			678	949		

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 were tested during Verification Sampling.

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

Table 4
May 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	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
May 2018 Detection Monitoring Event													
DATE	NA	NA	5/21/2018	5/21/2018	5/21/2018	5/21/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/21/2018
pH	SU	6.634-7.617	7.09	7.05	7.06	7.53	8.14	8.29	9.42	7.91	7.21	6.79	6.98
BORON, TOTAL	µg/L	DQR	83.6 J	68.7 J	448	1,740	8,700	4,930	5,520	14,100	6,680	347	101
CALCIUM, TOTAL	µg/L	156,193	135,000	124,000 J	118,000	96,800	96,600	47,800	71,800	106,000	190,000	128,000	116,000
CHLORIDE, TOTAL	mg/L	18.1	9.5	8.6	11.3	27.8	15.0	21.2	16.7	21.9	13.6	8.8	20.7
FLUORIDE, TOTAL	mg/L	0.29	0.23	0.26	0.25	0.37	0.17 J	0.38	0.13 J	0.15 J	0.37	0.22	0.22
SULFATE, TOTAL	mg/L	67.9	41.2	34.7	1.6	219	402	328	280	496	420	4.1	ND
TOTAL DISSOLVED SOLIDS	mg/L	579	519	448	538	614	622	565	535	792	957	491	473
July 2018 Verification Sampling													
DATE	NA	NA						7/2/2018					
pH	SU	6.634-7.617						7.77					
BORON, TOTAL	µg/L	DQR											
CALCIUM, TOTAL	µg/L	156,193											
CHLORIDE, TOTAL	mg/L	18.1											
FLUORIDE, TOTAL	mg/L	0.29											
SULFATE, TOTAL	mg/L	67.9											
TOTAL DISSOLVED SOLIDS	mg/L	579											

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
Checked By: MSG
Reviewed By: MNH

Table 5
November 2018 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
November 2018 Detection Monitoring Event												
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
pH	SU	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	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	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	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	0.25	0.25	0.21	0.42	ND	0.49	ND	ND	0.29	0.23	0.21
SULFATE, TOTAL	mg/L	34.9	31.9	81.9	187	350	366	269	433	568	62.2	ND
TOTAL DISSOLVED SOLIDS	mg/L	550 J	427 J	556 J	1,080 J	600	1,040	708	669	1,020 J	667 J	541 J

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. 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: JSI
Checked By: MSG
Reviewed By: MNH

Table 6
April 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	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
Field Parameters												
DATE	NA	4/9/2018	4/9/2018	4/9/2018	4/10/2018	4/10/2018	4/9/2018	4/9/2018	4/9/2018	4/9/2018	4/9/2018	4/9/2018
DISSOLVED OXYGEN	mg/L	0.79	0.71	0.46	1.16	0.74	0.80	0.33	0.39	0.68	0.75	1.02
pH	SU	6.42	7.11	7.06	7.75	8.14	7.82	9.35	7.98	7.25	7.00	7.08
REDOX POTENTIAL	mV	35.5	74.4	-47.3	90.9	68.8	-106.5	-208.7	-119.4	-120.1	-114.7	-106.9
SPECIFIC CONDUCTIVITY	mS/cm	0.926	0.815	1.071	0.876	0.951	0.820	0.739	1.338	1.357	0.930	0.910
TURBIDITY	NTU	4.02	1.25	0.61	3.86	1.09	2.40	1.22	1.60	1.66	2.40	3.12
Appendix IV Parameters												
ANTIMONY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	0.10 J	ND	ND	ND	0.035 J
ARSENIC, TOTAL	µg/L	0.72 J	31.3	47.1	1.9	2.4	0.088 J	26.0	9.4	19.7	27.9	31.9
BARIUM, TOTAL	µg/L	1,160	313	494	104	102	68.0	70.8	152	157	452	515
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	0.036 J	ND	ND	0.034 J	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	ND	0.061 J	ND	0.069 J	0.11 J	0.067 J	0.079 J	0.085 J	0.064 J	0.064 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORIDE, TOTAL	mg/L	0.23	0.26	0.26	0.46	0.18 J	0.41	0.15 J	0.17 J	0.28	0.23	0.21
LEAD, TOTAL	µg/L	3.3 J	3.4 J	3.4 J	4.1 J	3.0 J	ND	ND	ND	ND	ND	3.0 J
LITHIUM, TOTAL	µg/L	30.2	41.5	26.8	23.3	18.2	31.1	12.7	6.9 J	19.4	30.9	17.1
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	1.3 J	2.4 J	1.2 J	44.7	200	134	152	564	214	11.0 J	1.3 J
RADIUM [226 + 228]	pCi/L	2.65	ND	2.564	2.017	1.572 J	0.814	ND	1.334	ND	1.484 J	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.17 J	ND	0.11 J	0.26 J	0.089 J	0.087 J	ND
THALLIUM, TOTAL	µg/L	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, and 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 the Radium 226 and the Radium 228 activity concentrations unless the sum of the 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 B.

Prepared By: EMS
Checked By: TJG
Reviewed By: MNH

Table 7
May 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	UMW-4D	UMW-5D	UMW-6D	UMW-7D	UMW-8D	UMW-9D
Field Parameters												
DATE	NA	5/21/2018	5/21/2018	5/21/2018	5/21/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018
DISSOLVED OXYGEN	mg/L	0.46	0.83	0.70	0.56	0.65	0.52	0.66	0.54	0.63	0.57	0.81
pH	SU	7.09	7.05	7.06	7.53	8.14	8.29	9.42	7.91	7.21	6.79	6.98
REDOX POTENTIAL	mV	-76.8	63.6	-73.3	78.0	51.5	10.0	-63.0	14.6	-70.3	0.3	-65.6
SPECIFIC CONDUCTIVITY	mS/cm	0.936	0.805	0.960	0.957	0.895	0.862	0.746	1.134	1.315	0.929	0.928
TURBIDITY	NTU	1.52	4.77	1.75	4.86	1.43	2.82	2.46	4.63	3.26	3.23	3.54
Appendix IV Parameters												
ARSENIC, TOTAL	µg/L	1.1	32.7	35.8	2.2	2.6	ND	24.6	8.7	17.8	29.5	34.0
BARIUM, TOTAL	µg/L	1,210	311	386	112	86.7	72.1	70.6	137	154	449	517
FLUORIDE, TOTAL	mg/L	0.23	0.26	0.25	0.37	0.17 J	0.38	0.13 J	0.15 J	0.37	0.22	0.22
LITHIUM, TOTAL	µg/L	29.9	41.8	21.7	22.4	17.2	29.9	12.6	5.0 J	19.9	31.8	15.8
MOLYBDENUM, TOTAL	µg/L	1.4 J	2.8 J	ND	38.4	233	157	162	534	203	10.7 J	1.1 J
RADIUM [226 + 228]	pCi/L	3.760	ND	1.983	1.514	ND	ND	ND	1.587	ND	ND	ND

NOTES

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and 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 the Radium 226 and the Radium 228 activity concentrations unless the sum of the 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 B.

Prepared By: EMS
Checked By: TJG
Reviewed By: MNH

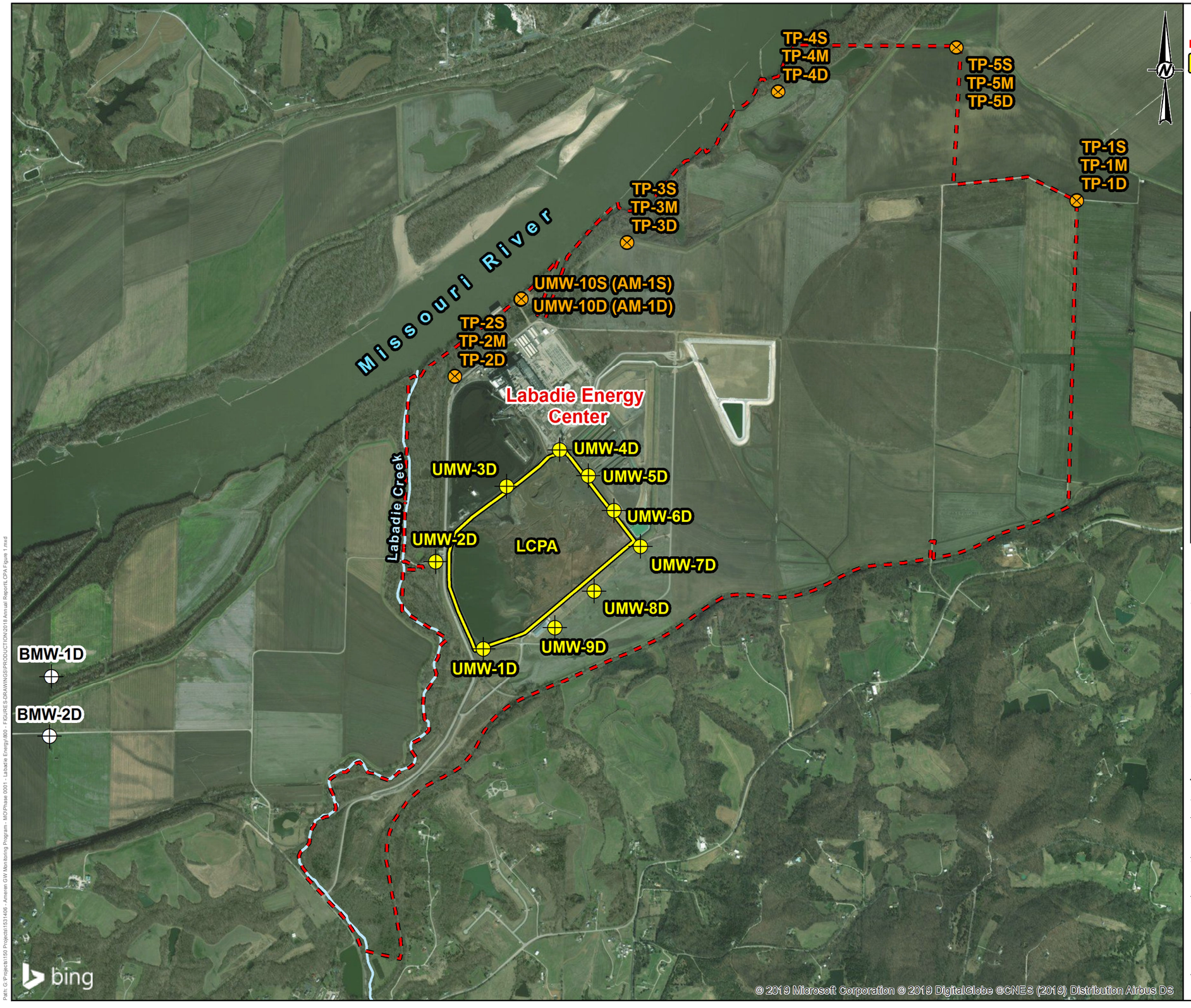
Table 8
November 2018 Assessment Monitoring Results
LCPA Surface Impoundment
Labadie Energy Center, Franklin County, MO

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	0.8	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	4.14	ND	4.33 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, and 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 the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

Prepared By: EMS
Checked By: TJG
Reviewed By: MNH

Figures



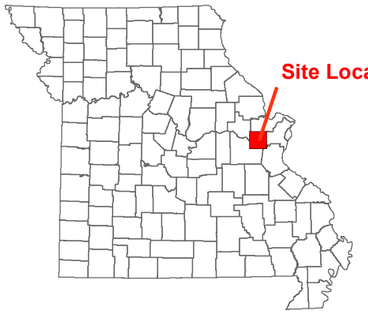
LEGEND

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

Ground/Surface Water Measurement Locations

- Background Monitoring Well
- LCPA - Bottom Ash Surface Impoundment Monitoring Well
- Nature and Extent Piezometer or 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
SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2018-12-20
PREPARED	JSI
DESIGN	JSI
REVIEW	MSG
APPROVED	MNH

PROJECT No. 153-1406 PHASE 0001 FIGURE 1

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

Path: G:\Projects\153 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\2018 Annual Report\LCPA Figure 1.mxd

Appendices

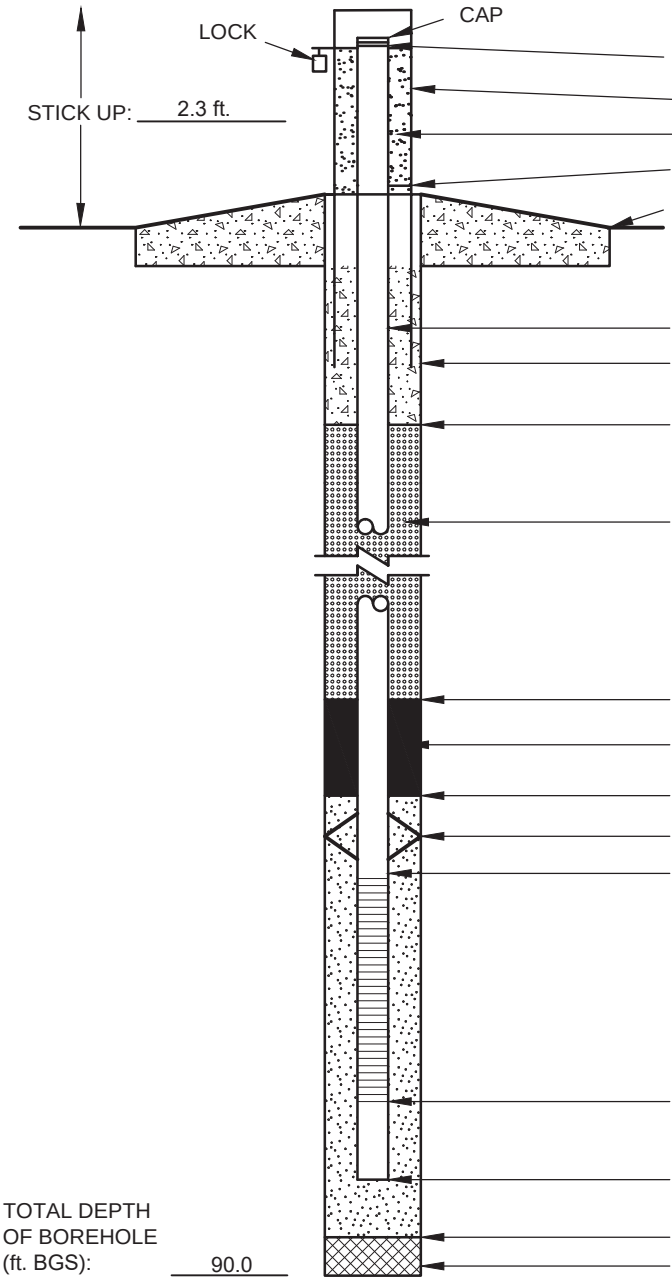
APPENDIX A

Well Construction Diagrams

GOLDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG UMW-3D (R)

PROJECT NAME: AMEREN	PROJECT NUMBER: 1531406.0001I	
SITE NAME: LABADIE ENERGY CENTER	LOCATION: UMW-3D (R)	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 488.87 ft. MSL	
GEOLOGIST: J. INGRAM	NORTHING: 991823.5	EASTING: 723545.1
DRILLER: B. BEUNING	STATIC WATER LEVEL: N/A	COMPLETION DATE: 10/25/2018
DRILLING COMPANY: CASCADE	DRILLING METHODS: SONIC	



TOP OF CASING ELEVATION: 491.13 ft. MSL

PROTECTIVE CASING (yes / no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 488.87 ft. MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 6.0

CONCRETE SEAL DEPTH (ft. BGS): 2.5

TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE
CEMENT: 5 BAGS
WATER: 14 GALLONS PER BAG

TOP OF BENTONITE SEAL DEPTH (ft. BGS): 69.0

TYPE AND AMOUNT OF BENTONITE SEAL: 1 BAG 3/8 in. CHIPS

TOP OF SAND PACK DEPTH (ft. BGS): COARSE: 77.0, FINE: 75.0

CENTRALIZER (yes / no) - TYPE: STAINLESS STEEL (TOP+BOTTOM)

TOP OF SCREEN DEPTH (ft. BGS): 79.5

TYPE OF SCREEN: 2 in. X 9.7 ft.

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: COARSE: 20/40 FINE: #7 64/01

AMOUNT OF SAND: COARSE: 4 BAGS FINE: 1/2 BAG

BOTTOM OF SCREEN DEPTH (ft. BGS): 89.2

BOTTOM OF WELL DEPTH (ft. BGS): 89.7

TOTAL DEPTH OF BOREHOLE (ft. BGS): 90.0

BOTTOM OF FILTER PACK (ft. BGS): 89.7

TYPE AND AMOUNT OF BACKFILL: NATURAL BACKFILL 0.3 FT

ADDITIONAL NOTES: ft. BGS = FEET BELOW GROUND SURFACE, ft. MSL = FEET ABOVE MEAN SEA LEVEL, in. = INCHES. 275 GALLONS OF H2O USED DURING DRILLING. 2 CENTRALIZERS AT TOP AND BOTTOM OF SCREEN. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON NOVEMBER 14, 2018. ft. BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

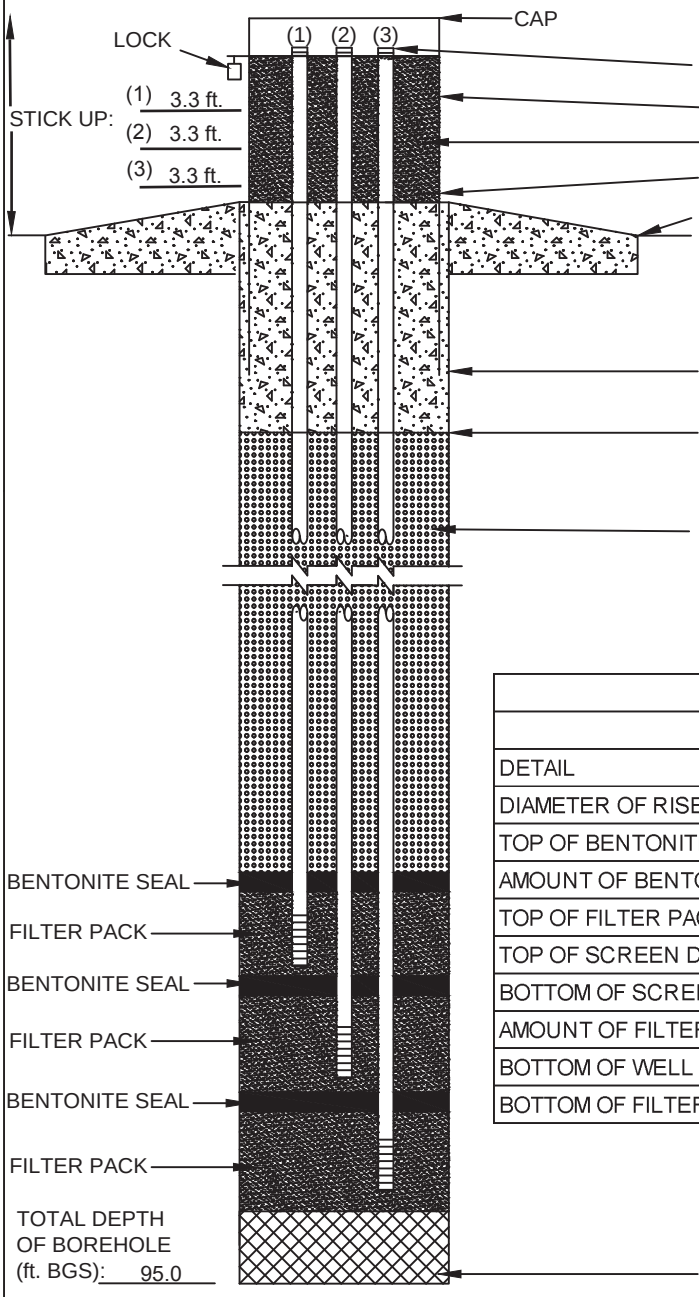
CHECKED BY: J. PEREZ

DATE CHECKED: 1/25/2019

PREPARED BY: E. SCHNEIDER

ABOVE GROUND NESTED MONITORING WELL CONSTRUCTION LOG TP-1

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 1531406.0001I	
SITE NAME: LABADIE ENERGY CENTER	LOCATION: TP-1	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 465.79 ft. MSL	
GEOLOGIST: R. FELDMANN	NORTHING: 997122.3	EASTING: 734100.3
DRILLER: M. PATRICK	COMPLETION DATE: 06/12/2018	DRILLING COMPANY: SONIC
DRILLING METHODS: M&W DRILLING		



TOP OF CASING ELEVATION (ft. MSL): (1) 469.08 (2) 469.08 (3) 469.09

PROTECTIVE CASING (yes)/ no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION (ft. MSL): 465.79

STATIC WATER LEVEL (ft. BGS): (1) 10.32 (2) 10.33 (3) 10.34

DIAMETER OF BOREHOLE (in.): 8.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: PORTLAND: 4 BAGS. QUIKSAND: 0.25 BAG.

TYPE AND AMOUNT OF BACKFILL: 4.2 ft. NATURAL BACKFILL

WELL CONSTRUCTION DETAILS			
	NESTED WELL NUMBER		
DETAIL	(1)	(2)	(3)
DIAMETER OF RISER PIPE (in.)	1.0	1.0	1.0
TOP OF BENTONITE SEAL (ft. BGS)	16.0	27.0	62.0
AMOUNT OF BENTONITE	1 BUCKET	8 BUCKETS	8 BUCKETS
TOP OF FILTER PACK DEPTH (ft. BGS)	18.0	53.0	83.5
TOP OF SCREEN DEPTH (ft. BGS)	19.7	55.0	85.7
BOTTOM OF SCREEN DEPTH (ft. BGS)	24.4	59.7	90.4
AMOUNT OF FILTER PACK	5 BAGS	5 BAGS	5 BAGS
BOTTOM OF WELL DEPTH (ft. BGS)	24.8	60.1	90.8
BOTTOM OF FILTER PACK (ft. BGS)	27.0	62.0	90.8

ADDITIONAL NOTES: TYPE AND LENGTH OF SCREEN: 3 OF 1 in. X 4.7 ft. SCHEDULE 40 PVC, 0.010 in. SCREEN SLOT SIZE FILTER PACK TYPE: #1 SAND. ft. MSL = FEET ABOVE MEAN SEA LEVEL. ft. BGS = FEET BELOW GROUND SURFACE. ft. BTOC = FEET BELOW TOP OF CASING. in. - INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. BAGS OF SAND ARE 50 LBS EACH. BENTONITE PELLETS ARE MEASURED BY 5 GALLON BUCKETS.

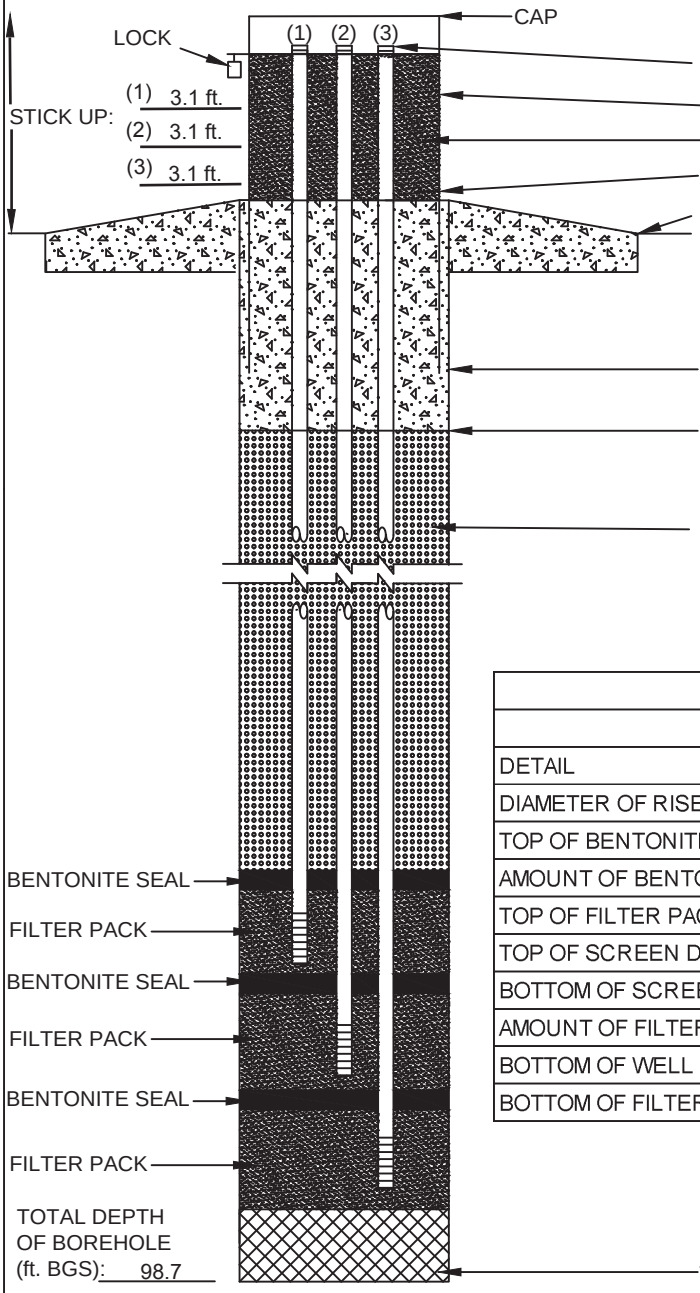
CHECKED BY: J. PEREZ

DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

ABOVE GROUND NESTED MONITORING WELL CONSTRUCTION LOG TP-2

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 1531406.0001I	
SITE NAME: LABADIE ENERGY CENTER	LOCATION: TP-2	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 468.17 ft. MSL	
GEOLOGIST: R. FELDMANN	NORTHING: 993865.6	EASTING: 722603.7
DRILLER: M. PATRICK	COMPLETION DATE: 06/11/2018	DRILLING METHODS: SONIC
DRILLING COMPANY: M&W DRILLING		



TOP OF CASING ELEVATION (ft. MSL): (1) 471.24 (2) 471.22 (3) 471.22

PROTECTIVE CASING (yes)/ no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION (ft. MSL): 468.17

STATIC WATER LEVEL (ft. BGS): (1) 11.63 (2) 11.46 (3) 11.45

DIAMETER OF BOREHOLE (in.): 8.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: CEMENT: 4 BAGS. QUIK GEL: 0.25 BAG

TYPE AND AMOUNT OF BACKFILL: NA

WELL CONSTRUCTION DETAILS			
	NESTED WELL NUMBER		
DETAIL	(1)	(2)	(3)
DIAMETER OF RISER PIPE (in.)	1.0	1.0	1.0
TOP OF BENTONITE SEAL (ft. BGS)	15.0	28.0	63.0
AMOUNT OF BENTONITE	1 BUCKET	7.5 BUCKETS	8.5 BUCKETS
TOP OF FILTER PACK DEPTH (ft. BGS)	19.0	53.5	91.0
TOP OF SCREEN DEPTH (ft. BGS)	21.3	55.4	93.6
BOTTOM OF SCREEN DEPTH (ft. BGS)	26.0	60.1	98.3
AMOUNT OF FILTER PACK	4 BAGS	4 BAGS	4 BAGS
BOTTOM OF WELL DEPTH (ft. BGS)	26.4	60.5	98.7
BOTTOM OF FILTER PACK (ft. BGS)	28.0	63.0	98.7

ADDITIONAL NOTES: TYPE AND LENGTH OF SCREEN: 3 OF 1 in. X 4.7 ft. SCHEDULE 40 PVC, 0.010 in. SCREEN SLOT SIZE + 0.5 BAG SAND FILTER PACK TYPE: #1 SAND ft. MSL = FEET ABOVE MEAN SEA LEVEL. ft. BGS = FEET BELOW GROUND SURFACE. ft. BTOC = FEET BELOW TOP OF CASING. in. - INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. BAGS OF SAND ARE 50 LBS EACH. BENTONITE PELLETS ARE MEASURED BY 5 GALLON BUCKETS.

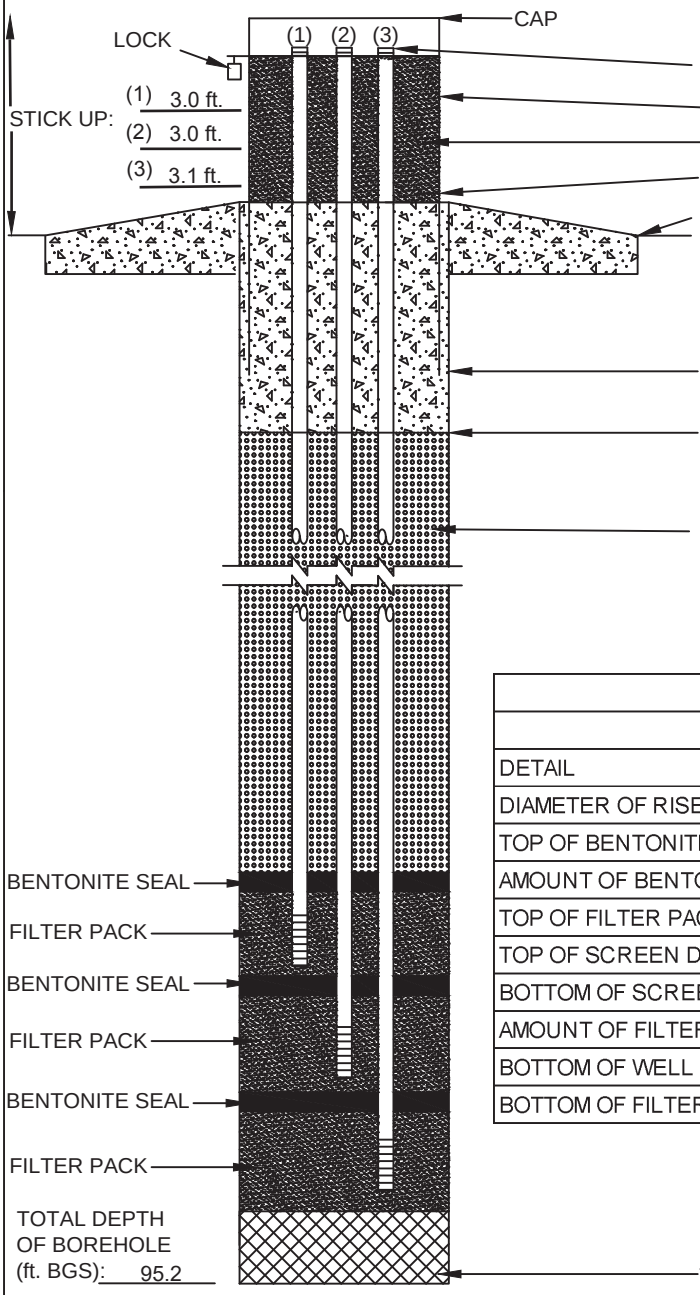
CHECKED BY: J. PEREZ

DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

ABOVE GROUND NESTED MONITORING WELL CONSTRUCTION LOG TP-3

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 1531406.0001I	
SITE NAME: LABADIE ENERGY CENTER	LOCATION: TP-3	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 472.58 ft. MSL	
GEOLOGIST: J. INGRAM	NORTHING: 996343.6	EASTING: 725783.7
DRILLER: M. PATRICK	COMPLETION DATE: 06/17/2018	DRILLING METHODS: SONIC
DRILLING COMPANY: M&W DRILLING		



TOP OF CASING ELEVATION (ft. MSL): (1) 475.60 (2) 475.64 (3) 475.63

PROTECTIVE CASING (yes)/ no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION (ft. MSL): 472.58

STATIC WATER LEVEL (ft. BGS): (1) 17.02 (2) 17.07 (3) 17.05

DIAMETER OF BOREHOLE (in.): 8.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: CEMENT AND BENTONITE GROUT

TYPE AND AMOUNT OF BACKFILL: 0.21 ft. NATURAL BACKFILL

WELL CONSTRUCTION DETAILS			
	NESTED WELL NUMBER		
DETAIL	(1)	(2)	(3)
DIAMETER OF RISER PIPE (in.)	1.0	1.0	1.0
TOP OF BENTONITE SEAL (ft. BGS)	13.5	27.3	62.0
AMOUNT OF BENTONITE	1 BUCKET	8 BUCKETS	10 BUCKETS
TOP OF FILTER PACK DEPTH (ft. BGS)	17.5	52.5	87.8
TOP OF SCREEN DEPTH (ft. BGS)	20.2	54.8	90.1
BOTTOM OF SCREEN DEPTH (ft. BGS)	24.9	59.5	94.8
AMOUNT OF FILTER PACK	5 BAGS	5 BAGS	5 BAGS
BOTTOM OF WELL DEPTH (ft. BGS)	25.3	59.9	95.2
BOTTOM OF FILTER PACK (ft. BGS)	27.3	62.0	95.2

ADDITIONAL NOTES: TYPE AND LENGTH OF SCREEN: 3 OF 1 in. X 4.7 ft. SCHEDULE 40 PVC, 0.010 in. SCREEN SLOT SIZE. FILTER PACK TYPE: #1 SAND. ft. MSL = FEET ABOVE MEAN SEA LEVEL. ft. BGS = FEET BELOW GROUND SURFACE. ft. BTOC = FEET BELOW TOP OF CASING. in. - INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. BAGS OF SAND ARE 50 LBS EACH. BENTONITE PELLETS ARE MEASURED BY 5 GALLON BUCKETS. 800 GALLONS OF H20 USED WHILE DRILLING.

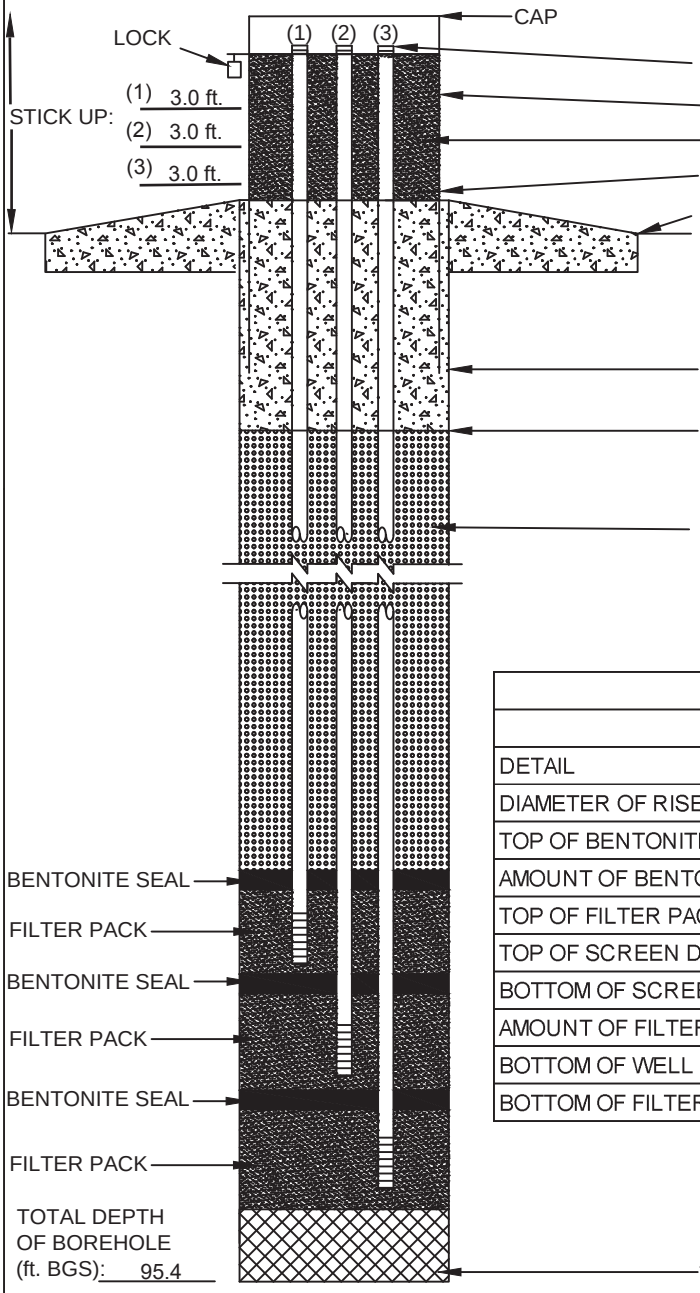
CHECKED BY: J. PEREZ

DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

ABOVE GROUND NESTED MONITORING WELL CONSTRUCTION LOG TP-4

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 1531406.0001I	
SITE NAME: LABADIE ENERGY CENTER	LOCATION: TP-4	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 469.05 ft. MSL	
GEOLOGIST: J. INGRAM	NORTHING: 999139.8	EASTING: 728578.3
DRILLER: M. PATRICK	COMPLETION DATE: 06/13/2018	DRILLING METHODS: SONIC
DRILLING COMPANY: M&W DRILLING		



TOP OF CASING ELEVATION (ft. MSL): (1) 472.07 (2) 472.07 (3) 472.08

PROTECTIVE CASING (yes)/ no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION (ft. MSL): 469.05

STATIC WATER LEVEL (ft. BGS): (1) 14.44 (2) 14.44 (3) 14.44

DIAMETER OF BOREHOLE (in.): 8.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: CEMENT AND BENTONITE GROUT

TYPE AND AMOUNT OF BACKFILL: NONE

WELL CONSTRUCTION DETAILS			
	NESTED WELL NUMBER		
DETAIL	(1)	(2)	(3)
DIAMETER OF RISER PIPE (in.)	1.0	1.0	1.0
TOP OF BENTONITE SEAL (ft. BGS)	15.0	32.0	62.0
AMOUNT OF BENTONITE	2 BUCKETS	8 BUCKETS	8 BUCKETS
TOP OF FILTER PACK DEPTH (ft. BGS)	23.0	53.0	88.0
TOP OF SCREEN DEPTH (ft. BGS)	24.8	55.1	90.1
BOTTOM OF SCREEN DEPTH (ft. BGS)	29.5	59.8	94.8
AMOUNT OF FILTER PACK	5 BAGS	5 BAGS	5 BAGS
BOTTOM OF WELL DEPTH (ft. BGS)	29.9	60.2	95.2
BOTTOM OF FILTER PACK (ft. BGS)	32.0	62.0	95.4

ADDITIONAL NOTES: TYPE AND LENGTH OF SCREEN: 3 OF 1 in. X 4.7 ft. SCHEDULE 40 PVC, 0.010 in. SCREEN SLOT SIZE FILTER PACK TYPE: #0 SAND. ft. MSL = FEET ABOVE MEAN SEA LEVEL. ft. BGS = FEET BELOW GROUND SURFACE. ft. BTOC = FEET BELOW TOP OF CASING. in. - INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. BAGS OF SAND ARE 50 LBS EACH. BENTONITE PELLETS ARE MEASURED BY 5 GALLON BUCKETS. 600 GALLONS OF H2O USED WHILE DRILLING.

CHECKED BY: J. PEREZ

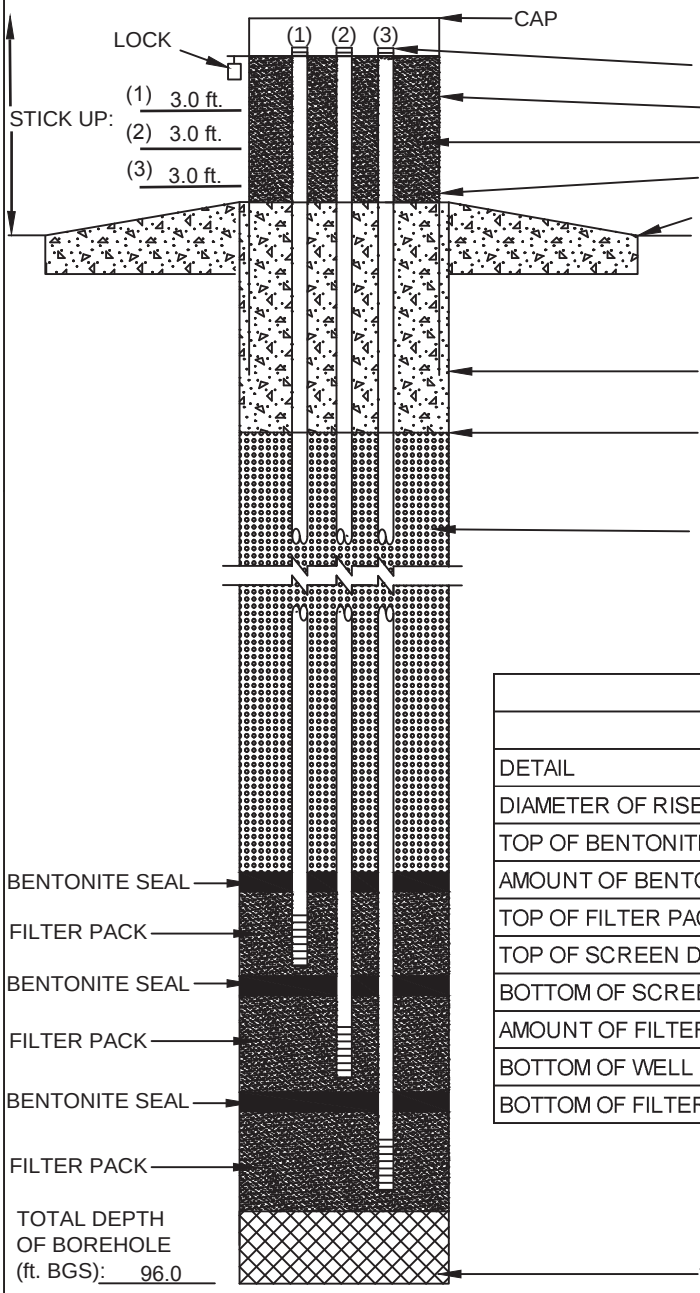
DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

ABOVE GROUND NESTED MONITORING WELL CONSTRUCTION LOG TP-5

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 1531406.0001I
SITE NAME: LABADIE ENERGY CENTER	LOCATION: TP-5
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 467.36 ft. MSL

GEOLOGIST: R. FELDMANN	NORTHING: 999955.0	EASTING: 731876.6
DRILLER: M. PATRICK	COMPLETION DATE: 06/12/2018	DRILLING METHODS: SONIC
DRILLING COMPANY: M&W DRILLING		



TOP OF CASING ELEVATION (ft. MSL): (1) 470.39 (2) 470.39 (3) 470.37

PROTECTIVE CASING (yes)/ no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION (ft. MSL): 467.36

STATIC WATER LEVEL (ft. BGS): (1) 12.54 (2) 12.57 (3) 12.54

DIAMETER OF BOREHOLE (in.): 8.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: CEMENT AND BENTONITE GROUT

TYPE AND AMOUNT OF BACKFILL: NONE

WELL CONSTRUCTION DETAILS			
	NESTED WELL NUMBER		
DETAIL	(1)	(2)	(3)
DIAMETER OF RISER PIPE (in.)	1.0	1.0	1.0
TOP OF BENTONITE SEAL (ft. BGS)	14.0	27.0	62.0
AMOUNT OF BENTONITE	1 BUCKET	8 BUCKETS	8 BUCKETS
TOP OF FILTER PACK DEPTH (ft. BGS)	18.0	53.0	88.0
TOP OF SCREEN DEPTH (ft. BGS)	20.4	54.8	90.4
BOTTOM OF SCREEN DEPTH (ft. BGS)	25.1	59.5	95.1
AMOUNT OF FILTER PACK	5 BAGS	5 BAGS	4 BAGS
BOTTOM OF WELL DEPTH (ft. BGS)	25.5	59.9	95.5
BOTTOM OF FILTER PACK (ft. BGS)	27.0	62.0	96.0

ADDITIONAL NOTES: TYPE AND LENGTH OF SCREEN: 3 OF 1 in. X 4.7 ft. SCHEDULE 40 PVC, 0.010 in. SCREEN SLOT SIZE FILTER PACK TYPE: #1 SAND. ft. MSL = FEET ABOVE MEAN SEA LEVEL. ft. BGS = FEET BELOW GROUND SURFACE. ft. BTOC = FEET BELOW TOP OF CASING. in. - INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. BAGS OF SAND ARE 50 LBS EACH. BENTONITE PELLETS ARE MEASURED BY 5 GALLON BUCKETS. 825 GALLONS OF H2O USED DURING DRILLING.

CHECKED BY: J. PEREZ

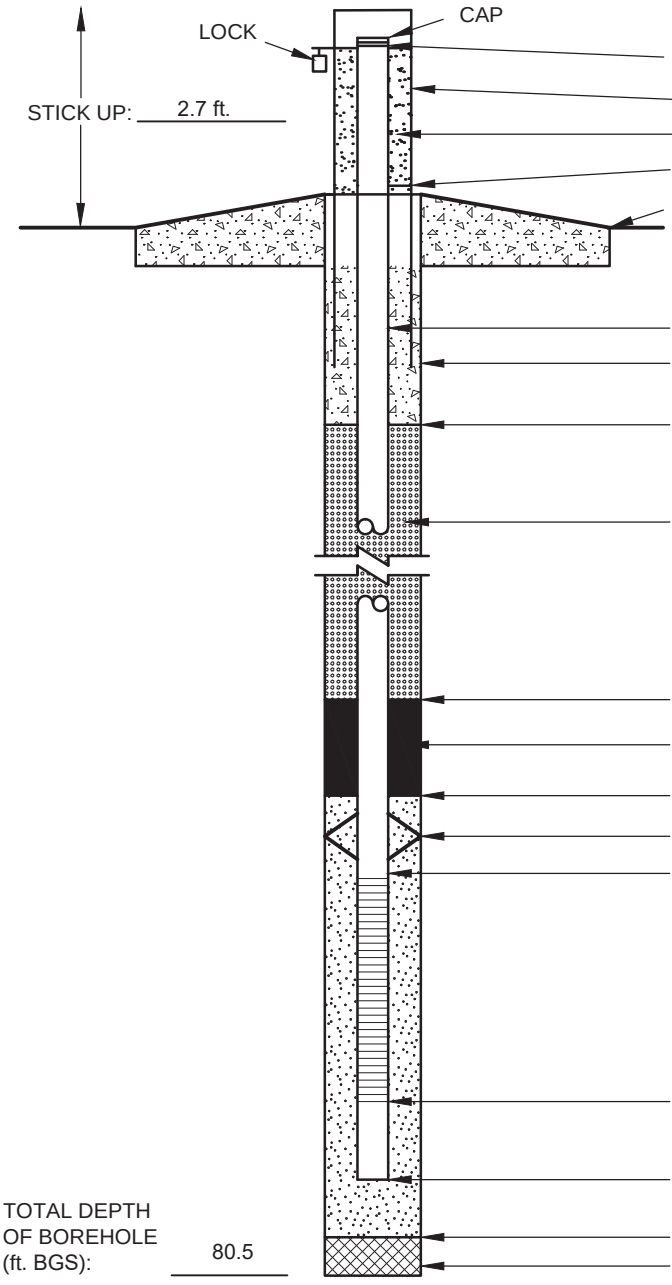
DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

GOLDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG UMW-10D (AM-1D)

PROJECT NAME: AMEREN NATURE AND EXTENT		PROJECT NUMBER: 1531406.0001I
SITE NAME: LABADIE ENERGY CENTER		LOCATION: UMW-10D (AM-1D)
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 480.04 ft. MSL
GEOLOGIST: J. INGRAM	NORTHING: 995298.6	EASTING: 723827.3
DRILLER: M. PATRICK	STATIC WATER LEVEL: 24.28	COMPLETION DATE: 05/31/2018
DRILLING COMPANY: M&W DRILLING		DRILLING METHODS: SONIC



TOP OF CASING ELEVATION: 482.78 ft. MSL

PROTECTIVE CASING (yes / no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 480.04 ft. MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 6.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: CEMENT: 12 BAGS. BENTONITE: 0.5 BAG

TOP OF BENTONITE SEAL DEPTH (ft. BGS): 64.0

TYPE AND AMOUNT OF BENTONITE SEAL: 3/8 in. BENTONITE CHIPS: 1 BUCKET

TOP OF SAND PACK DEPTH (ft. BGS): 67.5

CENTRALIZER (yes / no) - TYPE: STAINLESS STEEL (TOP + BOTTOM)

TOP OF SCREEN DEPTH (ft. BGS): 70.2

TYPE OF SCREEN: 2 in. X 9.7 ft.

SCREEN SLOT SIZE (in.): 0.10

SIZE OF SAND PACK: #1 SAND

AMOUNT OF SAND: 4.5 BAGS

BOTTOM OF SCREEN DEPTH (ft. BGS): 79.9

BOTTOM OF WELL DEPTH (ft. BGS): 80.4

TOTAL DEPTH OF BOREHOLE (ft. BGS): 80.5

BOTTOM OF FILTER PACK (ft. BGS): 80.4

TYPE AND AMOUNT OF BACKFILL: 0.1 ft. NATURAL BACKFILL

ADDITIONAL NOTES: ft. BGS = FEET BELOW GROUND SURFACE, ft. MSL = FEET ABOVE MEAN SEA LEVEL, in. = INCHES. 275 GALLONS OF H2O USED DURING DRILLING. 2 CENTRALIZERS AT TOP AND BOTTOM OF SCREEN. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. ft. BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH. BENTONITE CHIPS USED IN SEAL ARE MEASURED BY 5 GALLON BUCKETS.

CHECKED BY: J. PEREZ

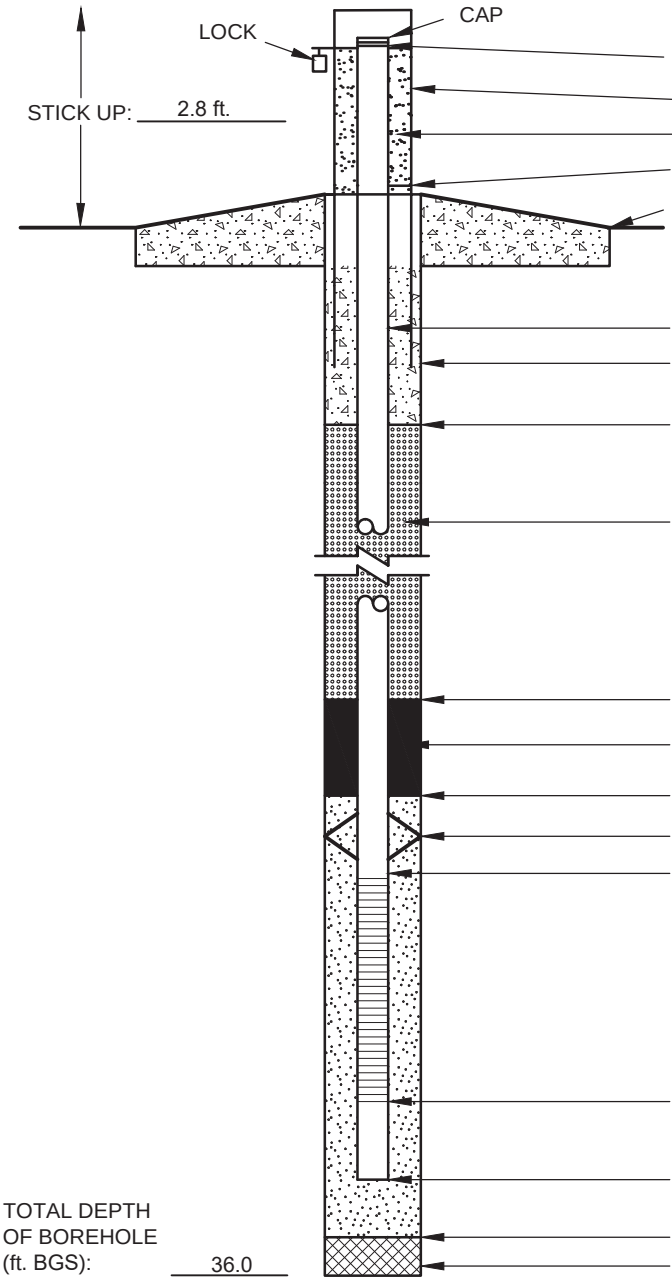
DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

GOLDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG UMW-10S (AM-1S)

PROJECT NAME: AMEREN NATURE AND EXTENT		PROJECT NUMBER: 1531406.0001I
SITE NAME: LABADIE ENERGY CENTER		LOCATION: UMW-10S (AM-1S)
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 480.24 ft. MSL
GEOLOGIST: R. FELDMANN	NORTHING: 995288.1	EASTING: 723817.1
DRILLER: M. PATRICK	STATIC WATER LEVEL: 24.55	COMPLETION DATE: 05/31/2018
DRILLING COMPANY: M&W DRILLING		DRILLING METHODS: SONIC



TOP OF CASING ELEVATION: 483.00 ft. MSL

PROTECTIVE CASING (yes / no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 480.24 ft. MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 6.0

CONCRETE SEAL DEPTH (ft. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE (6 BAGS CEMENT, 0.5 BAGS BENTONITE)

TOP OF BENTONITE SEAL DEPTH (ft. BGS): 19.0

TYPE AND AMOUNT OF BENTONITE SEAL: 3/8 in. BENTONITE CHIPS: 1 BUCKET

TOP OF SAND PACK DEPTH (ft. BGS): 23.0

CENTRALIZER (yes / no) - TYPE: STAINLESS STEEL (TOP + BOTTOM)

TOP OF SCREEN DEPTH (ft. BGS): 25.4

TYPE OF SCREEN: 2 in. X 9.7 ft.

SCREEN SLOT SIZE (in.): 0.010 SLOT

SIZE OF SAND PACK: #1 SAND

AMOUNT OF SAND: 5 BAGS

BOTTOM OF SCREEN DEPTH (ft. BGS): 35.1

BOTTOM OF WELL DEPTH (ft. BGS): 35.6

BOTTOM OF FILTER PACK (ft. BGS): 35.6

TYPE AND AMOUNT OF BACKFILL: 0.4 ft. NATURAL BACKFILL

ADDITIONAL NOTES: ft. BGS = FEET BELOW GROUND SURFACE, ft. MSL = FEET ABOVE MEAN SEA LEVEL, in. = INCHES. 125 GALLONS OF H2O USED DURING DRILLING. 2 CENTRALIZERS AT TOP AND BOTTOM OF SCREEN. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 2, 2018. ft. BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH. BENTONITE CHIPS USED IN SEAL ARE MEASURED BY 5 GALLON BUCKETS.

CHECKED BY: J. PEREZ

DATE CHECKED: 10/09/18

PREPARED BY: L. SWINDLE

APPENDIX B

Laboratory Analytical Data

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

January 16, 2018

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

RE: Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 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, 1/16/18: Chloride and Sulfate added to L-UMW-2D

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

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

CERTIFICATIONS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60261613001	**L-UMW-1D**	Water	01/05/18 10:50	01/06/18 03:45
60261613002	**L-UMW-2D**	Water	01/04/18 15:25	01/06/18 03:45
60261613003	**L-UMW-3D**	Water	01/05/18 14:35	01/06/18 03:45
60261613004	**L-UMW-4D**	Water	01/05/18 12:00	01/06/18 03:45
60261613005	**L-UMW-5D**	Water	01/05/18 11:05	01/06/18 03:45
60261613006	**L-UMW-6D**	Water	01/05/18 09:15	01/06/18 03:45
60261613007	**L-UMW-7D**	Water	01/04/18 11:20	01/06/18 03:45
60261613008	**L-UMW-8D**	Water	01/04/18 10:10	01/06/18 03:45
60261613009	**L-UMW-9D**	Water	01/04/18 19:10	01/06/18 03:45
60261613010	**L-UMW-DUP-1**	Water	01/04/18 10:10	01/06/18 03:45
60261613011	**L-UMW-FB-1**	Water	01/05/18 08:52	01/06/18 03:45

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60261613001	**L-UMW-1D**	EPA 200.7	JGP	1	PASI-K
60261613002	**L-UMW-2D**	EPA 200.7	JGP	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	LDB, OL	3	PASI-K
60261613003	**L-UMW-3D**	EPA 200.7	JGP	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261613004	**L-UMW-4D**	EPA 200.7	JGP	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261613005	**L-UMW-5D**	EPA 200.7	SMW	1	PASI-K
		EPA 300.0	OL	2	PASI-K
60261613006	**L-UMW-6D**	EPA 200.7	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	LDB, OL	2	PASI-K
60261613007	**L-UMW-7D**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261613008	**L-UMW-8D**	EPA 200.7	SMW	1	PASI-K
60261613009	**L-UMW-9D**	EPA 200.7	SMW	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261613010	**L-UMW-DUP-1**	EPA 200.7	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261613011	**L-UMW-FB-1**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	3	PASI-K

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-1D **Lab ID: 60261613001** Collected: 01/05/18 10:50 Received: 01/06/18 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								
Boron	**646**	ug/L	100	3.5	1	01/08/18 12:59	01/10/18 16:10	7440-42-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-2D **Lab ID: 60261613002** Collected: 01/04/18 15:25 Received: 01/06/18 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								
Boron	**2310**	ug/L	100	3.5	1	01/08/18 12:59	01/10/18 16:17	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**641**	mg/L	5.0	5.0	1		01/11/18 09:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**55.6**	mg/L	5.0	2.5	5		01/16/18 12:10	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.10	1		01/09/18 12:46	16984-48-8	
Sulfate	**168**	mg/L	20.0	10.0	20		01/16/18 12:51	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-BOTT
Pace Project No.: 60261613

Sample: L-UMW-3D **Lab ID: 60261613003** Collected: 01/05/18 14:35 Received: 01/06/18 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								
Boron	**8960**	ug/L	100	3.5	1	01/08/18 12:59	01/10/18 16:21	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**784**	mg/L	5.0	5.0	1		01/11/18 09:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**474**	mg/L	50.0	25.0	50		01/11/18 01:07	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-BOTT
Pace Project No.: 60261613

Sample: L-UMW-4D **Lab ID: 60261613004** Collected: 01/05/18 12:00 Received: 01/06/18 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								
Boron	**2830**	ug/L	100	3.5	1	01/08/18 12:59	01/10/18 16:24	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.3**	mg/L	2.0	1.0	2		01/11/18 01:21	16887-00-6	
Fluoride	**0.48**	mg/L	0.20	0.10	1		01/09/18 13:15	16984-48-8	
Sulfate	**272**	mg/L	20.0	10.0	20		01/11/18 01:35	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-BOTT
Pace Project No.: 60261613

Sample: L-UMW-5D **Lab ID: 60261613005** Collected: 01/05/18 11:05 Received: 01/06/18 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								
Boron	**5410**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 11:52	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.8**	mg/L	1.0	0.50	1		01/09/18 13:29	16887-00-6	
Sulfate	**252**	mg/L	20.0	10.0	20		01/11/18 01:49	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-BOTT
Pace Project No.: 60261613

Sample: L-UMW-6D **Lab ID: 60261613006** Collected: 01/05/18 09:15 Received: 01/06/18 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								
Boron	**15700**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 11:54	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**678**	mg/L	5.0	5.0	1		01/11/18 09:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.7**	mg/L	2.0	1.0	2		01/11/18 02:03	16887-00-6	
Sulfate	**392**	mg/L	100	50.0	100		01/12/18 09:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-7D **Lab ID: 60261613007** Collected: 01/04/18 11:20 Received: 01/06/18 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								
Boron	**7160**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 11:56	7440-42-8	
Calcium	**190000**	ug/L	100	36.0	1	01/08/18 12:59	01/11/18 11:56	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**949**	mg/L	5.0	5.0	1		01/11/18 09:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.8**	mg/L	1.0	0.50	1		01/10/18 18:10	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.10	1		01/10/18 18:10	16984-48-8	
Sulfate	**436**	mg/L	50.0	25.0	50		01/10/18 19:20	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-BOTT
Pace Project No.: 60261613

Sample: L-UMW-8D **Lab ID: 60261613008** Collected: 01/04/18 10:10 Received: 01/06/18 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								
Boron	**535**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 12:03	7440-42-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-9D **Lab ID: 60261613009** Collected: 01/04/18 19:10 Received: 01/06/18 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								
Boron	**111**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 12:05	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.9**	mg/L	2.0	1.0	2		01/10/18 20:01	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-DUP-1 **Lab ID: 60261613010** Collected: 01/04/18 10:10 Received: 01/06/18 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								
Boron	**2450**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 12:08	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**639**	mg/L	5.0	5.0	1		01/11/18 09:22		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**55.7**	mg/L	5.0	2.5	5		01/10/18 20:29	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.10	1		01/10/18 20:15	16984-48-8	
Sulfate	**175**	mg/L	20.0	10.0	20		01/10/18 20:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Sample: L-UMW-FB-1 **Lab ID: 60261613011** Collected: 01/05/18 08:52 Received: 01/06/18 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								
Boron	**9.1J**	ug/L	100	3.5	1	01/08/18 12:59	01/11/18 12:10	7440-42-8	B
Calcium	**<36.0**	ug/L	100	36.0	1	01/08/18 12:59	01/11/18 12:10	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		01/11/18 09:22		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.64J**	mg/L	1.0	0.50	1		01/10/18 20:57	16887-00-6	
Fluoride	**<0.10**	mg/L	0.20	0.10	1		01/10/18 20:57	16984-48-8	
Sulfate	**<0.50**	mg/L	1.0	0.50	1		01/10/18 20:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 509842 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60261613001, 60261613002, 60261613003, 60261613004, 60261613005, 60261613006, 60261613007, 60261613008, 60261613009, 60261613010, 60261613011

METHOD BLANK: 2088174 Matrix: Water
Associated Lab Samples: 60261613001, 60261613002, 60261613003, 60261613004, 60261613005, 60261613006, 60261613007, 60261613008, 60261613009, 60261613010, 60261613011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	8.8J	100	3.5	01/10/18 16:06	
Calcium	ug/L	<36.0	100	36.0	01/10/18 16:06	

LABORATORY CONTROL SAMPLE: 2088175

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	992	99	85-115	
Calcium	ug/L	10000	10900	109	85-115	

MATRIX SPIKE SAMPLE: 2088176

Parameter	Units	60261613001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	646	1000	1670	103	70-130	
Calcium	ug/L	151000	10000	164000	132	70-130	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2088177 2088178

Parameter	Units	60261613007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	7160	1000	1000	8100	8140	94	98	70-130	0	20	
Calcium	ug/L	190000	10000	10000	197000	202000	70	115	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 510170 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60261613002, 60261613003, 60261613006, 60261613007, 60261613010, 60261613011

METHOD BLANK: 2089188 Matrix: Water
Associated Lab Samples: 60261613002, 60261613003, 60261613006, 60261613007, 60261613010, 60261613011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/11/18 09:17	

LABORATORY CONTROL SAMPLE: 2089189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	961	96	80-120	

SAMPLE DUPLICATE: 2089190

Parameter	Units	60261611002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	445	442	1	10	

SAMPLE DUPLICATE: 2089191

Parameter	Units	60261613007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	949	940	1	10	

SAMPLE DUPLICATE: 2089192

Parameter	Units	60261738002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1170	1200	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 509912 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261613002, 60261613004, 60261613005

METHOD BLANK: 2088428 Matrix: Water
Associated Lab Samples: 60261613002, 60261613004, 60261613005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/09/18 09:42	
Fluoride	mg/L	<0.10	0.20	0.10	01/09/18 09:42	

LABORATORY CONTROL SAMPLE: 2088429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2088430 2088431

Parameter	Units	60261611002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.21	2.5	2.5	3.1	3.2	114	118	80-120	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 510148 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261613003, 60261613004, 60261613005, 60261613006, 60261613007, 60261613009, 60261613010, 60261613011

METHOD BLANK: 2089068 Matrix: Water
Associated Lab Samples: 60261613003, 60261613004, 60261613005, 60261613006, 60261613007, 60261613009, 60261613010, 60261613011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/10/18 17:42	
Fluoride	mg/L	<0.10	0.20	0.10	01/10/18 17:42	
Sulfate	mg/L	<0.50	1.0	0.50	01/10/18 17:42	

LABORATORY CONTROL SAMPLE: 2089069

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	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: 2089070 2089071

Parameter	Units	60261613007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.8	5	5	19.8	19.8	120	119	80-120	0	15	
Fluoride	mg/L	0.37	2.5	2.5	3.0	3.0	105	104	80-120	1	15	
Sulfate	mg/L	436	250	250	713	718	111	113	80-120	1	15	

MATRIX SPIKE SAMPLE: 2089072

Parameter	Units	60261611002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20.5	10	32.1	116	80-120	
Sulfate	mg/L	249	100	368	119	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 510259 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261613006

METHOD BLANK: 2089535 Matrix: Water
Associated Lab Samples: 60261613006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.50	1.0	0.50	01/11/18 13:04	

LABORATORY CONTROL SAMPLE: 2089536

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.4	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2089537 2089538

Parameter	Units	60261738002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	691	500	500	1230	1230	108	108	80-120	0	15	

MATRIX SPIKE SAMPLE: 2089539

Parameter	Units	60261746008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	441	250	715	110	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

QC Batch: 510539 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261613002

METHOD BLANK: 2091060 Matrix: Water
Associated Lab Samples: 60261613002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/16/18 11:42	
Sulfate	mg/L	<0.50	1.0	0.50	01/16/18 11:42	

LABORATORY CONTROL SAMPLE: 2091061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2091062 2091063

Parameter	Units	60261613002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	55.6	25	25	83.5	83.9	112	113	80-120	0	15	
Sulfate	mg/L	168	100	100	274	272	107	104	80-120	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

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.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE ENERGY CTR-BOTT
Pace Project No.: 60261613

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60261613001	**L-UMW-1D**	EPA 200.7	509842	EPA 200.7	509901
60261613002	**L-UMW-2D**	EPA 200.7	509842	EPA 200.7	509901
60261613003	**L-UMW-3D**	EPA 200.7	509842	EPA 200.7	509901
60261613004	**L-UMW-4D**	EPA 200.7	509842	EPA 200.7	509901
60261613005	**L-UMW-5D**	EPA 200.7	509842	EPA 200.7	509901
60261613006	**L-UMW-6D**	EPA 200.7	509842	EPA 200.7	509901
60261613007	**L-UMW-7D**	EPA 200.7	509842	EPA 200.7	509901
60261613008	**L-UMW-8D**	EPA 200.7	509842	EPA 200.7	509901
60261613009	**L-UMW-9D**	EPA 200.7	509842	EPA 200.7	509901
60261613010	**L-UMW-DUP-1**	EPA 200.7	509842	EPA 200.7	509901
60261613011	**L-UMW-FB-1**	EPA 200.7	509842	EPA 200.7	509901
60261613002	**L-UMW-2D**	SM 2540C	510170		
60261613003	**L-UMW-3D**	SM 2540C	510170		
60261613006	**L-UMW-6D**	SM 2540C	510170		
60261613007	**L-UMW-7D**	SM 2540C	510170		
60261613010	**L-UMW-DUP-1**	SM 2540C	510170		
60261613011	**L-UMW-FB-1**	SM 2540C	510170		
60261613002	**L-UMW-2D**	EPA 300.0	509912		
60261613002	**L-UMW-2D**	EPA 300.0	510539		
60261613003	**L-UMW-3D**	EPA 300.0	510148		
60261613004	**L-UMW-4D**	EPA 300.0	509912		
60261613004	**L-UMW-4D**	EPA 300.0	510148		
60261613005	**L-UMW-5D**	EPA 300.0	509912		
60261613005	**L-UMW-5D**	EPA 300.0	510148		
60261613006	**L-UMW-6D**	EPA 300.0	510148		
60261613006	**L-UMW-6D**	EPA 300.0	510259		
60261613007	**L-UMW-7D**	EPA 300.0	510148		
60261613009	**L-UMW-9D**	EPA 300.0	510148		
60261613010	**L-UMW-DUP-1**	EPA 300.0	510148		
60261613011	**L-UMW-FB-1**	EPA 300.0	510148		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60261613

60261613

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 ☐ JLS

Thermometer Used: T-266 / T-239 (CF 0.0 / CF +0.2) **Type of Ice:** Wet Blue None RH V6/18

Cooler Temperature (°C): As-read 1.5/2.3 **Corr. Factor** (CF 0.0 / CF +0.2) **Corrected** 1.5/2.3

Date and initials of person examining contents:

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	5 day
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	
Cyanide water sample checks: ☑ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐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 Check 1/8/18

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical
www.pacelabs.com

Section A Required Client Information:

Company:	Golder Associates
Address:	820 South Main Street, Suite 100
	St Charles, MO 63301
Email To:	maddock@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	5 Day TAT (Standard)

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
	Ryan_Feldmann@golder.com
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406.0001

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

Bottom Ash

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	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G			1/05/18	1050		2	1		1						N	1							BP3N, BP2U
2	L-UMW-2D	WT	G			1-4-18	1525											N	1			1	1	1		
3	L-UMW-3D	WT	G			1/05/18	1435											N	1				1	1		
4	L-UMW-4D	WT	G			1/05/18	1200											N	1			1	1	1		
5	L-UMW-5D	WT	G			1/05/18	1105											N	1			1		1		
6	L-UMW-6D	WT	G			1/05/18	0915											N	1			1	1	1		
7	L-UMW-7D	WT	G			1-4-18	1120											N	1	1	1	1	1	1		3(BP3N),3(BP2U)
8	L-UMW-7D-MS	WT	G			1-4-18	1120											N	1	1	1	1	1	1		BP3N BP2U
9	L-UMW-7D-MSD	WT	G			1-4-18	1120											N	1	1	1	1	1	1		BP1U/1610
10	L-UMW-8D	WT	G			1-4-18	1010											N	1							BP3N BP2U
11	L-UMW-9D	WT	G			1-4-18	1910											N	1			1				
12	L-UMW-DUP-1	WT	G			1-4-18	—											N	1			1	1	1		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Confirm analysis w/ Jeff Ingram	Brian Koelder	1/05/18	1630	Jamie Church / PACE	1/5/18	1630
	Jamie Church / PACE	1/5/18	1700		1/6/18	0345

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brian Koelder

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 1/05/18

*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.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	Golder Associates
Address:	820 South Main Street, Suite 100
	St Charles, MO 63301
Email To:	maddock@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	5 Day (Standard)

Section B Required Project information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
	Ryan-Feldmann@golder.com
Purchase Order No.:	
Project Name:	Ameren Labadie Energy Center
Project Number:	153-1406.0001

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

Bottom Ash

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 #	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	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WT	G			11/05/18	0852		2	1		1						N	1	1	1	1	1	1		60161613 BP3N, BP2N
2	WT	G																							
3	WT	G																							
4	WT	G																							
5	WT	G																							
6	WT	G																							
7	WT	G																							
8	WT	G																							
9	WT	G																							
10	WT	G																							
11	WT	G																							
12	WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Confirm analysis w/ Jeff Ingram	Golder	11/05/18	1630	PACE	11/5/18	1630				
	PACE	11/5/18	1700		11/6/18	0345	1.5	Y	Y	Y
							2.3	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brit Works

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/05/18

*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.

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 – VERIFICATION SAMPLING – DATA PACKAGE 60261613

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

- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a 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 - LCPA - VS - Jan 2018
Reviewer: T Goodwin

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

Laboratory: Pace Analytical (12) SDG #: 60261613 (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), ~~P (365.4), Ra (903.1&904.0)~~ (12)
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-UMW-DUP1, L-UMW-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?	☒	☐	☐	
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(8.8),
b) Were analytes detected in the field blank(s)?	☑	☐	☐	B(9.1), Cl⁻(0.64)
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-7D
	☑	☐	☐	FB-1@ L-UMW-6D
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?	☐	☑	☐	Ca
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-UMW-FB-1	Boron (B)	100	U	Method Blank; MDL<Result<PQL

Signature: Tommy A. Goodson Date: 1/10/19

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

May 04, 2018

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

RE: Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 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

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

CERTIFICATIONS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

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
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

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

SAMPLE SUMMARY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60267849001	**L-UMW-1D**	Water	04/09/18 09:05	04/11/18 03:45
60267849002	**L-UMW-2D**	Water	04/10/18 09:55	04/11/18 03:45
60267849003	**L-UMW-3D**	Water	04/10/18 09:10	04/11/18 03:45
60267849004	**L-UMW-4D**	Water	04/09/18 16:20	04/11/18 03:45
60267849005	**L-UMW-5D**	Water	04/09/18 15:35	04/11/18 03:45
60267849006	**L-UMW-6D**	Water	04/09/18 14:50	04/11/18 03:45
60267849007	**L-UMW-7D**	Water	04/09/18 12:40	04/11/18 03:45
60267849008	**L-UMW-8D**	Water	04/09/18 11:20	04/11/18 03:45
60267849009	**L-UMW-9D**	Water	04/09/18 10:10	04/11/18 03:45
60267849010	**L-BMW-1D**	Water	04/09/18 14:55	04/11/18 03:45
60267849011	**L-BMW-2D**	Water	04/09/18 13:20	04/11/18 03:45
60267849012	**L-UMW-DUP-1**	Water	04/09/18 08:00	04/11/18 03:45
60267849013	**L-UMW-DUP-2**	Water	04/10/18 08:00	04/11/18 03:45
60267849014	**L-UMW-FB-1**	Water	04/09/18 08:35	04/11/18 03:45
60267849015	**L-UMW-FB-2**	Water	04/10/18 10:20	04/11/18 03:45
60267849016	**L-UMW-7D MS**	Water	04/09/18 12:40	04/11/18 03:45
60267849017	**L-UMW-7D MSD**	Water	04/09/18 12:40	04/11/18 03:45

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60267849001	L-UMW-1D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849002	L-UMW-2D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849003	L-UMW-3D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849004	L-UMW-4D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849005	L-UMW-5D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849006	L-UMW-6D	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849007	**L-UMW-7D**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849008	**L-UMW-8D**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849009	**L-UMW-9D**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849010	**L-BMW-1D**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849011	**L-BMW-2D**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849012	**L-UMW-DUP-1**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849013	**L-UMW-DUP-2**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849014	**L-UMW-FB-1**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849015	**L-UMW-FB-2**	EPA 200.7	SMW	12	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60267849016	**L-UMW-7D MS**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60267849017	**L-UMW-7D MSD**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-1D **Lab ID: 60267849001** Collected: 04/09/18 09:05 Received: 04/11/18 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	**494**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:00	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:00	7440-41-7	
Calcium	**139000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:00	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:00	7440-48-4	
Iron	**13900**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:00	7439-89-6	
Lead	**3.4J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:00	7439-92-1	
Lithium	**26.8**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:00	7439-93-2	
Magnesium	**36900**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:00	7439-95-4	
Manganese	**386**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:00	7439-96-5	
Molybdenum	**1.2J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:00	7439-98-7	
Potassium	**7010**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:00	7440-09-7	
Sodium	**27500**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:00	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 11:50	7440-36-0	
Arsenic	**47.1**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 11:50	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 11:50	7440-43-9	
Chromium	**0.061J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 11:50	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 11:50	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 11:50	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:18	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**537**	mg/L	20.0	4.9	1		04/13/18 12:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.9**	mg/L	1.0	0.46	1		04/22/18 09:07	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.063	1		04/22/18 09:07	16984-48-8	
Sulfate	**28.0**	mg/L	2.0	0.47	2		04/22/18 10:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-2D **Lab ID: 60267849002** Collected: 04/10/18 09:55 Received: 04/11/18 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	**104**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:04	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:04	7440-41-7	
Calcium	**87300**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:04	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:04	7440-48-4	
Iron	**2610**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:04	7439-89-6	
Lead	**4.1J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:04	7439-92-1	
Lithium	**23.3**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:04	7439-93-2	
Magnesium	**18800**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:04	7439-95-4	
Manganese	**295**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:04	7439-96-5	
Molybdenum	**44.7**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:04	7439-98-7	
Potassium	**7160**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:04	7440-09-7	
Sodium	**65000**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 11:54	7440-36-0	
Arsenic	**1.9**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 11:54	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 11:54	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 11:54	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 11:54	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 11:54	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:20	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**229**	mg/L	20.0	4.9	1		04/13/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**23.1**	mg/L	2.0	0.92	2		04/22/18 16:58	16887-00-6	
Fluoride	**0.46**	mg/L	0.20	0.063	1		04/22/18 10:14	16984-48-8	
Sulfate	**194**	mg/L	20.0	4.7	20		04/22/18 17:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-3D **Lab ID: 60267849003** Collected: 04/10/18 09:10 Received: 04/11/18 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	**102**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:06	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:06	7440-41-7	
Calcium	**112000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:06	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:06	7440-48-4	
Iron	**500**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:06	7439-89-6	
Lead	**3.0J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:06	7439-92-1	
Lithium	**18.2**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:06	7439-93-2	
Magnesium	**7810**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:06	7439-95-4	
Manganese	**250**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:06	7439-96-5	
Molybdenum	**200**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:06	7439-98-7	
Potassium	**11000**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:06	7440-09-7	
Sodium	**71700**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:03	7440-36-0	
Arsenic	**2.4**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:03	7440-38-2	
Cadmium	**0.036J**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:03	7440-43-9	
Chromium	**0.069J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:03	7440-47-3	
Selenium	**0.17J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:03	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:22	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**60.6**	mg/L	20.0	4.9	1		04/13/18 15:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.7**	mg/L	1.0	0.46	1		04/22/18 10:27	16887-00-6	
Fluoride	**0.18J**	mg/L	0.20	0.063	1		04/22/18 10:27	16984-48-8	
Sulfate	**405**	mg/L	50.0	11.8	50		04/22/18 17:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-4D **Lab ID: 60267849004** Collected: 04/09/18 16:20 Received: 04/11/18 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	**68.0**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:09	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:09	7440-41-7	
Calcium	**45600**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:09	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:09	7440-48-4	
Iron	**309**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:09	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:09	7439-92-1	
Lithium	**31.1**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:09	7439-93-2	
Magnesium	**7390**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:09	7439-95-4	
Manganese	**255**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:09	7439-96-5	
Molybdenum	**134**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:09	7439-98-7	
Potassium	**7520**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:09	7440-09-7	
Sodium	**104000**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:09	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:08	7440-36-0	
Arsenic	**0.088J**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:08	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:08	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:08	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:08	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:24	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**67.8**	mg/L	20.0	4.9	1		04/13/18 12:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.8**	mg/L	2.0	0.92	2		04/22/18 17:39	16887-00-6	
Fluoride	**0.41**	mg/L	0.20	0.063	1		04/22/18 10:40	16984-48-8	
Sulfate	**286**	mg/L	20.0	4.7	20		04/22/18 17:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-5D **Lab ID: 60267849005** Collected: 04/09/18 15:35 Received: 04/11/18 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	**70.8**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:11	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:11	7440-41-7	
Calcium	**72600**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:11	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:11	7440-48-4	
Iron	**17.0J**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:11	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:11	7439-92-1	
Lithium	**12.7**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:11	7439-93-2	
Magnesium	**60.3**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:11	7439-95-4	
Manganese	**7.8**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:11	7439-96-5	B
Molybdenum	**152**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:11	7439-98-7	
Potassium	**13600**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:11	7440-09-7	
Sodium	**71900**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:11	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.10J**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:12	7440-36-0	
Arsenic	**26.0**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:12	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:12	7440-43-9	
Chromium	**0.067J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:12	7440-47-3	
Selenium	**0.11J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:12	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:12	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:27	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**73.6**	mg/L	20.0	4.9	1		04/13/18 12:28		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**17.7**	mg/L	1.0	0.46	1		04/22/18 12:17	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.063	1		04/22/18 12:17	16984-48-8	
Sulfate	**254**	mg/L	20.0	4.7	20		04/22/18 18:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-6D **Lab ID: 60267849006** Collected: 04/09/18 14:50 Received: 04/11/18 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	**152**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:17	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:17	7440-41-7	
Calcium	**114000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:17	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:17	7440-48-4	
Iron	**1040**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:17	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:17	7439-92-1	
Lithium	**6.9J**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:17	7439-93-2	
Magnesium	**7890**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:17	7439-95-4	
Manganese	**610**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:17	7439-96-5	
Molybdenum	**564**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:17	7439-98-7	
Potassium	**15200**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:17	7440-09-7	
Sodium	**94900**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:17	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:16	7440-36-0	
Arsenic	**9.4**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:16	7440-38-2	
Cadmium	**0.034J**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:16	7440-43-9	
Chromium	**0.079J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:16	7440-47-3	
Selenium	**0.26J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:16	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:16	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:29	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**60.5**	mg/L	20.0	4.9	1		04/13/18 12:33		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.1**	mg/L	2.0	0.92	2		04/22/18 18:46	16887-00-6	
Fluoride	**0.17J**	mg/L	0.20	0.063	1		04/22/18 12:30	16984-48-8	
Sulfate	**523**	mg/L	50.0	11.8	50		04/22/18 18:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-7D **Lab ID: 60267849007** Collected: 04/09/18 12:40 Received: 04/11/18 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	**157**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:19	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:19	7440-41-7	
Calcium	**202000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:19	7440-70-2	M1
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:19	7440-48-4	
Iron	**12600**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:19	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:19	7439-92-1	
Lithium	**19.4**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:19	7439-93-2	
Magnesium	**28900**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:19	7439-95-4	
Manganese	**2100**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:19	7439-96-5	
Molybdenum	**214**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:19	7439-98-7	
Potassium	**6630**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:19	7440-09-7	
Sodium	**73800**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:19	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:21	7440-36-0	
Arsenic	**19.7**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:21	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:21	7440-43-9	
Chromium	**0.085J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:21	7440-47-3	
Selenium	**0.089J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:21	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:21	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:31	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**362**	mg/L	20.0	4.9	1		04/13/18 12:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.2**	mg/L	1.0	0.46	1		04/22/18 12:44	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	0.063	1		04/22/18 12:44	16984-48-8	
Sulfate	**424**	mg/L	50.0	11.8	50		04/22/18 19:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-8D **Lab ID: 60267849008** Collected: 04/09/18 11:20 Received: 04/11/18 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	**452**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:26	7440-39-3	
Beryllium	**0.17J**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:26	7440-41-7	B
Calcium	**128000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:26	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:26	7440-48-4	
Iron	**22100**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:26	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:26	7439-92-1	
Lithium	**30.9**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:26	7439-93-2	
Magnesium	**31800**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:26	7439-95-4	
Manganese	**807**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:26	7439-96-5	
Molybdenum	**11.0J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:26	7439-98-7	
Potassium	**4930**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:26	7440-09-7	
Sodium	**12400**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:26	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:47	7440-36-0	
Arsenic	**27.9**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:47	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:47	7440-43-9	
Chromium	**0.064J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:47	7440-47-3	
Selenium	**0.087J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:47	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:47	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:42	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**501**	mg/L	20.0	4.9	1		04/13/18 12:50		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.2**	mg/L	1.0	0.46	1		04/22/18 19:39	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.063	1		04/22/18 19:39	16984-48-8	
Sulfate	**4.9**	mg/L	1.0	0.24	1		04/22/18 19:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-9D **Lab ID: 60267849009** Collected: 04/09/18 10:10 Received: 04/11/18 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	**515**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:28	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:28	7440-41-7	
Calcium	**116000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:28	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:28	7440-48-4	
Iron	**24300**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:28	7439-89-6	
Lead	**3.0J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:28	7439-92-1	
Lithium	**17.1**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:28	7439-93-2	
Magnesium	**31100**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:28	7439-95-4	
Manganese	**401**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:28	7439-96-5	
Molybdenum	**1.3J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:28	7439-98-7	
Potassium	**4130**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:28	7440-09-7	
Sodium	**13200**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:28	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.035J**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:52	7440-36-0	
Arsenic	**31.9**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:52	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:52	7440-43-9	
Chromium	**0.064J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:52	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:52	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:52	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:44	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**469**	mg/L	20.0	4.9	1		04/13/18 12:57		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.1**	mg/L	2.0	0.92	2		04/22/18 20:06	16887-00-6	
Fluoride	**0.21**	mg/L	0.20	0.063	1		04/22/18 19:53	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		04/22/18 19:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-BMW-1D **Lab ID: 60267849010** Collected: 04/09/18 14:55 Received: 04/11/18 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	**1160**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:30	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:30	7440-41-7	
Calcium	**134000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:30	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:30	7440-48-4	
Iron	**11100**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:30	7439-89-6	
Lead	**3.3J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:30	7439-92-1	
Lithium	**30.2**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:30	7439-93-2	
Magnesium	**29400**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:30	7439-95-4	
Manganese	**644**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:30	7439-96-5	
Molybdenum	**1.3J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:30	7439-98-7	
Potassium	**4610**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:30	7440-09-7	
Sodium	**9700**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:30	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:56	7440-36-0	
Arsenic	**0.72J**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:56	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:56	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:56	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:56	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:47	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**465**	mg/L	20.0	4.9	1		04/13/18 14:55		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.2**	mg/L	1.0	0.46	1		04/22/18 13:37	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.063	1		04/22/18 13:37	16984-48-8	
Sulfate	**36.9**	mg/L	5.0	1.2	5		04/22/18 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 LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-BMW-2D **Lab ID: 60267849011** Collected: 04/09/18 13:20 Received: 04/11/18 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	**313**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:32	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:32	7440-41-7	
Calcium	**126000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:32	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:32	7440-48-4	
Iron	**6990**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:32	7439-89-6	
Lead	**3.4J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:32	7439-92-1	
Lithium	**41.5**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:32	7439-93-2	
Magnesium	**24800**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:32	7439-95-4	
Manganese	**273**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:32	7439-96-5	
Molybdenum	**2.4J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:32	7439-98-7	
Potassium	**3810**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:32	7440-09-7	
Sodium	**5090**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:32	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 13:00	7440-36-0	
Arsenic	**31.3**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 13:00	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 13:00	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 13:00	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 13:00	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 13:00	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:49	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**396**	mg/L	20.0	4.9	1		04/13/18 15:07		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**11.5**	mg/L	1.0	0.46	1		04/22/18 13:51	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.063	1		04/22/18 13:51	16984-48-8	
Sulfate	**33.9**	mg/L	2.0	0.47	2		04/22/18 20:33	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 LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-DUP-1 **Lab ID: 60267849012** Collected: 04/09/18 08:00 Received: 04/11/18 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	**455**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:34	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:34	7440-41-7	
Calcium	**130000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:34	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:34	7440-48-4	
Iron	**22400**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:34	7439-89-6	
Lead	**3.3J**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:34	7439-92-1	
Lithium	**31.8**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:34	7439-93-2	
Magnesium	**32100**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:34	7439-95-4	
Manganese	**814**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:34	7439-96-5	
Molybdenum	**10.4J**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:34	7439-98-7	
Potassium	**4930**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:34	7440-09-7	
Sodium	**12500**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:34	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 13:05	7440-36-0	
Arsenic	**27.9**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 13:05	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 13:05	7440-43-9	
Chromium	**0.12J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 13:05	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 13:05	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 13:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:51	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**499**	mg/L	20.0	4.9	1		04/13/18 15:13		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.2**	mg/L	1.0	0.46	1		04/22/18 21:13	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		04/22/18 21:13	16984-48-8	
Sulfate	**4.8**	mg/L	1.0	0.24	1		04/22/18 21:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-DUP-2 **Lab ID: 60267849013** Collected: 04/10/18 08:00 Received: 04/11/18 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	**102**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:37	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:37	7440-41-7	
Calcium	**113000**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:37	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:37	7440-48-4	
Iron	**491**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:37	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:37	7439-92-1	
Lithium	**19.5**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:37	7439-93-2	
Magnesium	**7810**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:37	7439-95-4	
Manganese	**250**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:37	7439-96-5	
Molybdenum	**200**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:37	7439-98-7	
Potassium	**11000**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:37	7440-09-7	
Sodium	**71300**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:37	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 13:09	7440-36-0	
Arsenic	**2.5**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 13:09	7440-38-2	
Cadmium	**0.019J**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 13:09	7440-43-9	
Chromium	**0.12J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 13:09	7440-47-3	
Selenium	**0.099J**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 13:09	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 13:09	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:53	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**59.9**	mg/L	20.0	4.9	1		04/13/18 15:37		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.4**	mg/L	1.0	0.46	1		04/22/18 14:18	16887-00-6	
Fluoride	**0.19J**	mg/L	0.20	0.063	1		04/22/18 14:18	16984-48-8	
Sulfate	**406**	mg/L	50.0	11.8	50		04/22/18 21:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-FB-1 **Lab ID: 60267849014** Collected: 04/09/18 08:35 Received: 04/11/18 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	**<1.5**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:43	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:43	7440-41-7	
Calcium	**<53.5**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:43	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:43	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:43	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:43	7439-92-1	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:43	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:43	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:43	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:43	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:43	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:43	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 13:13	7440-36-0	
Arsenic	**<0.052**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 13:13	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 13:13	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 13:13	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 13:13	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 13:13	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:55	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		04/13/18 15:16		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		04/22/18 21:40	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/22/18 21:40	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		04/22/18 21:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-FB-2 **Lab ID: 60267849015** Collected: 04/10/18 10:20 Received: 04/11/18 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	**<1.5**	ug/L	5.0	1.5	1	04/19/18 09:51	04/23/18 17:45	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/19/18 09:51	04/23/18 17:45	7440-41-7	
Calcium	**<53.5**	ug/L	200	53.5	1	04/19/18 09:51	04/23/18 17:45	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/19/18 09:51	04/23/18 17:45	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	04/19/18 09:51	04/23/18 17:45	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/19/18 09:51	04/23/18 17:45	7439-92-1	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/19/18 09:51	04/23/18 17:45	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	04/19/18 09:51	04/23/18 17:45	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	04/19/18 09:51	04/23/18 17:45	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/19/18 09:51	04/23/18 17:45	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	04/19/18 09:51	04/23/18 17:45	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	04/19/18 09:51	04/23/18 17:45	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/19/18 09:51	04/27/18 12:34	7440-36-0	
Arsenic	**<0.052**	ug/L	1.0	0.052	1	04/19/18 09:51	04/27/18 12:34	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/19/18 09:51	04/27/18 12:34	7440-43-9	
Chromium	**0.14J**	ug/L	1.0	0.054	1	04/19/18 09:51	04/27/18 12:34	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/19/18 09:51	04/27/18 12:34	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/19/18 09:51	04/27/18 12:34	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/20/18 11:17	04/20/18 14:58	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		04/13/18 15:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		04/22/18 21:53	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/22/18 21:53	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		04/22/18 21:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 522546 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

METHOD BLANK: 2139209 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/20/18 14:14	

LABORATORY CONTROL SAMPLE: 2139210

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: 2139211 2139212

Parameter	Units	60267849007 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	4.8	97	97	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 522349 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

METHOD BLANK: 2138246 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	04/23/18 16:58	
Beryllium	ug/L	0.19J	1.0	0.16	04/23/18 16:58	
Calcium	ug/L	<53.5	200	53.5	04/23/18 16:58	
Cobalt	ug/L	<0.87	5.0	0.87	04/23/18 16:58	
Iron	ug/L	<6.1	50.0	6.1	04/23/18 16:58	
Lead	ug/L	<3.0	10.0	3.0	04/23/18 16:58	
Lithium	ug/L	<4.6	10.0	4.6	04/23/18 16:58	
Magnesium	ug/L	<14.0	50.0	14.0	04/23/18 16:58	
Manganese	ug/L	0.88J	5.0	0.73	04/23/18 16:58	
Molybdenum	ug/L	<0.90	20.0	0.90	04/23/18 16:58	
Potassium	ug/L	<79.3	500	79.3	04/23/18 16:58	
Sodium	ug/L	<157	500	157	04/23/18 16:58	

LABORATORY CONTROL SAMPLE: 2138247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1020	102	85-115	
Beryllium	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	9970	100	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Iron	ug/L	10000	10100	101	85-115	
Lead	ug/L	1000	1010	101	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Magnesium	ug/L	10000	9880	99	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	9780	98	85-115	
Sodium	ug/L	10000	9780	98	85-115	

MATRIX SPIKE SAMPLE: 2138248

Parameter	Units	60267849001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	494	1000	1500	101	70-130	
Beryllium	ug/L	<0.16	1000	1010	101	70-130	
Calcium	ug/L	139000	10000	146000	77	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

MATRIX SPIKE SAMPLE: 2138248

Parameter	Units	60267849001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	<0.87	1000	992	99	70-130	
Iron	ug/L	13900	10000	23500	96	70-130	
Lead	ug/L	3.4J	1000	981	98	70-130	
Lithium	ug/L	26.8	1000	1060	103	70-130	
Magnesium	ug/L	36900	10000	46300	94	70-130	
Manganese	ug/L	386	1000	1340	96	70-130	
Molybdenum	ug/L	1.2J	1000	1010	101	70-130	
Potassium	ug/L	7010	10000	16600	95	70-130	
Sodium	ug/L	27500	10000	37100	97	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2138249 2138250

Parameter	Units	60267849007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	157	1000	1000	1170	1180	101	102	70-130	0	20	
Beryllium	ug/L	<0.16	1000	1000	1000	1000	100	100	70-130	0	20	
Calcium	ug/L	202000	10000	10000	207000	214000	56	118	70-130	3	20	M1
Cobalt	ug/L	<0.87	1000	1000	986	978	99	98	70-130	1	20	
Iron	ug/L	12600	10000	10000	22300	22600	97	100	70-130	2	20	
Lead	ug/L	<3.0	1000	1000	957	953	96	95	70-130	0	20	
Lithium	ug/L	19.4	1000	1000	1060	1060	104	104	70-130	0	20	
Magnesium	ug/L	28900	10000	10000	37800	38400	88	95	70-130	2	20	
Manganese	ug/L	2100	1000	1000	3050	3090	95	99	70-130	1	20	
Molybdenum	ug/L	214	1000	1000	1220	1210	100	100	70-130	0	20	
Potassium	ug/L	6630	10000	10000	16200	16400	96	98	70-130	1	20	
Sodium	ug/L	73800	10000	10000	82200	84400	84	106	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 522350 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

METHOD BLANK: 2138251 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	04/27/18 11:41	
Arsenic	ug/L	<0.052	1.0	0.052	04/27/18 11:41	
Cadmium	ug/L	<0.018	0.50	0.018	04/27/18 11:41	
Chromium	ug/L	<0.054	1.0	0.054	04/27/18 11:41	
Selenium	ug/L	<0.086	1.0	0.086	04/27/18 11:41	
Thallium	ug/L	<0.036	1.0	0.036	04/27/18 11:41	

LABORATORY CONTROL SAMPLE: 2138252

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.0	100	85-115	
Arsenic	ug/L	40	40.9	102	85-115	
Cadmium	ug/L	40	39.8	100	85-115	
Chromium	ug/L	40	40.5	101	85-115	
Selenium	ug/L	40	39.4	98	85-115	
Thallium	ug/L	40	36.8	92	85-115	

MATRIX SPIKE SAMPLE: 2138253

Parameter	Units	60267849002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.026	40	40.6	101	70-130	
Arsenic	ug/L	1.9	40	43.1	103	70-130	
Cadmium	ug/L	<0.018	40	39.1	98	70-130	
Chromium	ug/L	0.11J	40	40.6	101	70-130	
Selenium	ug/L	<0.086	40	37.8	95	70-130	
Thallium	ug/L	<0.036	40	36.0	90	70-130	

MATRIX SPIKE SAMPLE: 2138254

Parameter	Units	60267849007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.026	40	40.3	101	70-130	
Arsenic	ug/L	19.7	40	61.5	104	70-130	
Cadmium	ug/L	<0.018	40	38.4	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

MATRIX SPIKE SAMPLE: 2138254

Parameter	Units	60267849007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	0.085J	40	39.8	99	70-130	
Selenium	ug/L	0.089J	40	38.0	95	70-130	
Thallium	ug/L	<0.036	40	35.8	89	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 521591 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60267849001, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009

METHOD BLANK: 2135241 Matrix: Water
Associated Lab Samples: 60267849001, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	04/13/18 09:14	

LABORATORY CONTROL SAMPLE: 2135242

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

SAMPLE DUPLICATE: 2135243

Parameter	Units	60267927003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	805	829	3	10	

SAMPLE DUPLICATE: 2135244

Parameter	Units	60267849007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	362	367	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 521698 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60267849002, 60267849003, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

METHOD BLANK: 2135668 Matrix: Water
Associated Lab Samples: 60267849002, 60267849003, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	04/13/18 14:44	

LABORATORY CONTROL SAMPLE: 2135669

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	502	100	90-110	

SAMPLE DUPLICATE: 2135670

Parameter	Units	60267849010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	465	458	1	10	

SAMPLE DUPLICATE: 2135671

Parameter	Units	60267849015 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	<4.9		10	

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QUALITY CONTROL DATA

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 522621 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

METHOD BLANK: 2139630 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/22/18 08:40	
Fluoride	mg/L	<0.063	0.20	0.063	04/22/18 08:40	
Sulfate	mg/L	<0.24	1.0	0.24	04/22/18 08:40	

LABORATORY CONTROL SAMPLE: 2139631

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	2.5	99	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE SAMPLE: 2139632

Parameter	Units	60267849007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	14.2	5	19.0	95	80-120	
Fluoride	mg/L	0.28	2.5	2.5	91	80-120	
Sulfate	mg/L	424	250	666	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2139954 2139955

Parameter	Units	60267849001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	12.9	5	5	17.7	17.9	94	100	80-120	2	15	
Fluoride	mg/L	0.26	2.5	2.5	2.5	2.6	88	93	80-120	4	15	
Sulfate	mg/L	28.0	10	10	38.0	37.0	100	90	80-120	3	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-1D **Lab ID: 60267849001** Collected: 04/09/18 09:05 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.564 ± 0.419 (0.524) C:NA T:83%**	pCi/L	04/28/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**2.00 ± 0.550 (0.548) C:80% T:87%**	pCi/L	05/02/18 11:00	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-2D **Lab ID: 60267849002** Collected: 04/10/18 09:55 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.867 ± 0.597 (0.815) C:NA T:80%**	pCi/L	04/28/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**1.15 ± 0.414 (0.579) C:83% T:83%**	pCi/L	05/02/18 10:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-3D **Lab ID: 60267849003** Collected: 04/10/18 09:10 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.711 ± 0.472 (0.550) C:NA T:81%**	pCi/L	04/28/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**0.861 ± 0.396 (0.656) C:78% T:83%**	pCi/L	05/02/18 13:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-4D **Lab ID: 60267849004** Collected: 04/09/18 16:20 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.200 ± 0.304 (0.180) C:NA T:75%**	pCi/L	04/28/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**0.614 ± 0.338 (0.597) C:79% T:83%**	pCi/L	05/02/18 13:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-5D **Lab ID: 60267849005** Collected: 04/09/18 15:35 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.174 ± 0.266 (0.428) C:NA T:83%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**0.981 ± 0.445 (0.748) C:79% T:81%**	pCi/L	05/02/18 13:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-6D **Lab ID: 60267849006** Collected: 04/09/18 14:50 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.564 ± 0.356 (0.153) C:NA T:89%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**0.770 ± 0.366 (0.611) C:79% T:84%**	pCi/L	05/02/18 13:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-7D **Lab ID: 60267849007** Collected: 04/09/18 12:40 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.508 ± 0.460 (0.678) C:NA T:83%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**0.380 ± 0.292 (0.568) C:79% T:88%**	pCi/L	05/02/18 13:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-8D **Lab ID: 60267849008** Collected: 04/09/18 11:20 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.695 ± 0.414 (0.393) C:NA T:88%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**0.789 ± 0.388 (0.673) C:78% T:89%**	pCi/L	05/02/18 12:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-9D **Lab ID: 60267849009** Collected: 04/09/18 10:10 Received: 04/11/18 03:45 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 ± 0.324 (0.703) C:NA T:85%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**0.375 ± 0.349 (0.717) C:79% T:93%**	pCi/L	05/02/18 12:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-BMW-1D **Lab ID: 60267849010** Collected: 04/09/18 14:55 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.53 ± 0.604 (0.154) C:NA T:86%**	pCi/L	04/28/18 19:43	13982-63-3	
Radium-228	EPA 904.0	**1.12 ± 0.446 (0.700) C:77% T:92%**	pCi/L	05/02/18 12:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-BMW-2D **Lab ID: 60267849011** Collected: 04/09/18 13:20 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.425 ± 0.299 (0.144) C:NA T:89%**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**0.0787 ± 0.287 (0.652) C:77% T:90%**	pCi/L	05/02/18 12:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-DUP-1 **Lab ID: 60267849012** Collected: 04/09/18 08:00 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.549 ± 0.435 (0.591) C:NA T:90%**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**0.814 ± 0.406 (0.708) C:82% T:85%**	pCi/L	05/02/18 15:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-DUP-2 **Lab ID: 60267849013** Collected: 04/10/18 08:00 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.575 ± 0.427 (0.534) C:NA T:82%**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**0.542 ± 0.419 (0.835) C:82% T:82%**	pCi/L	05/02/18 15:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-FB-1 **Lab ID: 60267849014** Collected: 04/09/18 08:35 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.982 ± 0.468 (0.148) C:NA T:91%**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**0.247 ± 0.380 (0.822) C:84% T:75%**	pCi/L	05/02/18 15:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-FB-2 **Lab ID: 60267849015** Collected: 04/10/18 10:20 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.272 ± 0.466 (0.817) C:NA T:85%**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**0.128 ± 0.338 (0.757) C:79% T:80%**	pCi/L	05/02/18 15:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-7D MS **Lab ID: 60267849016** Collected: 04/09/18 12:40 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**107.5 %REC ± NA (NA) C:NA T:NA**	pCi/L	04/28/18 19:57	13982-63-3	
Radium-228	EPA 904.0	**83.45 %REC ± NA (NA) C:NA T:NA**	pCi/L	05/02/18 15:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Sample: L-UMW-7D MSD **Lab ID: 60267849017** Collected: 04/09/18 12:40 Received: 04/11/18 03:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**89.86 %REC 17.87 RPD ± NA (NA) C:NA T:NA**	pCi/L	04/28/18 20:09	13982-63-3	
Radium-228	EPA 904.0	**98.00 %REC 16.04 RPD ± NA (NA) C:NA T:NA**	pCi/L	05/02/18 15:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 294766 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015, 60267849016, 60267849017

METHOD BLANK: 1443456 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015, 60267849016, 60267849017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.278 ± 0.286 (0.588) C:78% T:88%	pCi/L	05/02/18 10:46	

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 LEC ASSESSMENT
Pace Project No.: 60267849

QC Batch: 294765 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015, 60267849016, 60267849017

METHOD BLANK: 1443455 Matrix: Water
Associated Lab Samples: 60267849001, 60267849002, 60267849003, 60267849004, 60267849005, 60267849006, 60267849007, 60267849008, 60267849009, 60267849010, 60267849011, 60267849012, 60267849013, 60267849014, 60267849015, 60267849016, 60267849017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.484 ± 0.412 (0.578) C:NA T:87%	pCi/L	04/28/18 19:30	

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 LEC ASSESSMENT
Pace Project No.: 60267849

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.

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267849001	L-UMW-1D	EPA 200.7	522349	EPA 200.7	522401
60267849002	L-UMW-2D	EPA 200.7	522349	EPA 200.7	522401
60267849003	L-UMW-3D	EPA 200.7	522349	EPA 200.7	522401
60267849004	L-UMW-4D	EPA 200.7	522349	EPA 200.7	522401
60267849005	L-UMW-5D	EPA 200.7	522349	EPA 200.7	522401
60267849006	L-UMW-6D	EPA 200.7	522349	EPA 200.7	522401
60267849007	L-UMW-7D	EPA 200.7	522349	EPA 200.7	522401
60267849008	L-UMW-8D	EPA 200.7	522349	EPA 200.7	522401
60267849009	L-UMW-9D	EPA 200.7	522349	EPA 200.7	522401
60267849010	L-BMW-1D	EPA 200.7	522349	EPA 200.7	522401
60267849011	L-BMW-2D	EPA 200.7	522349	EPA 200.7	522401
60267849012	L-UMW-DUP-1	EPA 200.7	522349	EPA 200.7	522401
60267849013	L-UMW-DUP-2	EPA 200.7	522349	EPA 200.7	522401
60267849014	L-UMW-FB-1	EPA 200.7	522349	EPA 200.7	522401
60267849015	L-UMW-FB-2	EPA 200.7	522349	EPA 200.7	522401
60267849001	L-UMW-1D	EPA 200.8	522350	EPA 200.8	522400
60267849002	L-UMW-2D	EPA 200.8	522350	EPA 200.8	522400
60267849003	L-UMW-3D	EPA 200.8	522350	EPA 200.8	522400
60267849004	L-UMW-4D	EPA 200.8	522350	EPA 200.8	522400
60267849005	L-UMW-5D	EPA 200.8	522350	EPA 200.8	522400
60267849006	L-UMW-6D	EPA 200.8	522350	EPA 200.8	522400
60267849007	L-UMW-7D	EPA 200.8	522350	EPA 200.8	522400
60267849008	L-UMW-8D	EPA 200.8	522350	EPA 200.8	522400
60267849009	L-UMW-9D	EPA 200.8	522350	EPA 200.8	522400
60267849010	L-BMW-1D	EPA 200.8	522350	EPA 200.8	522400
60267849011	L-BMW-2D	EPA 200.8	522350	EPA 200.8	522400
60267849012	L-UMW-DUP-1	EPA 200.8	522350	EPA 200.8	522400
60267849013	L-UMW-DUP-2	EPA 200.8	522350	EPA 200.8	522400
60267849014	L-UMW-FB-1	EPA 200.8	522350	EPA 200.8	522400
60267849015	L-UMW-FB-2	EPA 200.8	522350	EPA 200.8	522400
60267849001	L-UMW-1D	EPA 7470	522546	EPA 7470	522598
60267849002	L-UMW-2D	EPA 7470	522546	EPA 7470	522598
60267849003	L-UMW-3D	EPA 7470	522546	EPA 7470	522598
60267849004	L-UMW-4D	EPA 7470	522546	EPA 7470	522598
60267849005	L-UMW-5D	EPA 7470	522546	EPA 7470	522598
60267849006	L-UMW-6D	EPA 7470	522546	EPA 7470	522598
60267849007	L-UMW-7D	EPA 7470	522546	EPA 7470	522598
60267849008	L-UMW-8D	EPA 7470	522546	EPA 7470	522598
60267849009	L-UMW-9D	EPA 7470	522546	EPA 7470	522598
60267849010	L-BMW-1D	EPA 7470	522546	EPA 7470	522598
60267849011	L-BMW-2D	EPA 7470	522546	EPA 7470	522598
60267849012	L-UMW-DUP-1	EPA 7470	522546	EPA 7470	522598
60267849013	L-UMW-DUP-2	EPA 7470	522546	EPA 7470	522598
60267849014	L-UMW-FB-1	EPA 7470	522546	EPA 7470	522598
60267849015	L-UMW-FB-2	EPA 7470	522546	EPA 7470	522598
60267849001	L-UMW-1D	EPA 903.1	294765		
60267849002	L-UMW-2D	EPA 903.1	294765		

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 LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267849003	L-UMW-3D	EPA 903.1	294765		
60267849004	L-UMW-4D	EPA 903.1	294765		
60267849005	L-UMW-5D	EPA 903.1	294765		
60267849006	L-UMW-6D	EPA 903.1	294765		
60267849007	L-UMW-7D	EPA 903.1	294765		
60267849008	L-UMW-8D	EPA 903.1	294765		
60267849009	L-UMW-9D	EPA 903.1	294765		
60267849010	L-BMW-1D	EPA 903.1	294765		
60267849011	L-BMW-2D	EPA 903.1	294765		
60267849012	L-UMW-DUP-1	EPA 903.1	294765		
60267849013	L-UMW-DUP-2	EPA 903.1	294765		
60267849014	L-UMW-FB-1	EPA 903.1	294765		
60267849015	L-UMW-FB-2	EPA 903.1	294765		
60267849016	L-UMW-7D MS	EPA 903.1	294765		
60267849017	L-UMW-7D MSD	EPA 903.1	294765		
60267849001	L-UMW-1D	EPA 904.0	294766		
60267849002	L-UMW-2D	EPA 904.0	294766		
60267849003	L-UMW-3D	EPA 904.0	294766		
60267849004	L-UMW-4D	EPA 904.0	294766		
60267849005	L-UMW-5D	EPA 904.0	294766		
60267849006	L-UMW-6D	EPA 904.0	294766		
60267849007	L-UMW-7D	EPA 904.0	294766		
60267849008	L-UMW-8D	EPA 904.0	294766		
60267849009	L-UMW-9D	EPA 904.0	294766		
60267849010	L-BMW-1D	EPA 904.0	294766		
60267849011	L-BMW-2D	EPA 904.0	294766		
60267849012	L-UMW-DUP-1	EPA 904.0	294766		
60267849013	L-UMW-DUP-2	EPA 904.0	294766		
60267849014	L-UMW-FB-1	EPA 904.0	294766		
60267849015	L-UMW-FB-2	EPA 904.0	294766		
60267849016	L-UMW-7D MS	EPA 904.0	294766		
60267849017	L-UMW-7D MSD	EPA 904.0	294766		
60267849001	L-UMW-1D	SM 2320B	521591		
60267849002	L-UMW-2D	SM 2320B	521698		
60267849003	L-UMW-3D	SM 2320B	521698		
60267849004	L-UMW-4D	SM 2320B	521591		
60267849005	L-UMW-5D	SM 2320B	521591		
60267849006	L-UMW-6D	SM 2320B	521591		
60267849007	L-UMW-7D	SM 2320B	521591		
60267849008	L-UMW-8D	SM 2320B	521591		
60267849009	L-UMW-9D	SM 2320B	521591		
60267849010	L-BMW-1D	SM 2320B	521698		
60267849011	L-BMW-2D	SM 2320B	521698		
60267849012	L-UMW-DUP-1	SM 2320B	521698		
60267849013	L-UMW-DUP-2	SM 2320B	521698		
60267849014	L-UMW-FB-1	SM 2320B	521698		

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 LEC ASSESSMENT
Pace Project No.: 60267849

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267849015	**L-UMW-FB-2**	SM 2320B	521698		
60267849001	**L-UMW-1D**	EPA 300.0	522621		
60267849002	**L-UMW-2D**	EPA 300.0	522621		
60267849003	**L-UMW-3D**	EPA 300.0	522621		
60267849004	**L-UMW-4D**	EPA 300.0	522621		
60267849005	**L-UMW-5D**	EPA 300.0	522621		
60267849006	**L-UMW-6D**	EPA 300.0	522621		
60267849007	**L-UMW-7D**	EPA 300.0	522621		
60267849008	**L-UMW-8D**	EPA 300.0	522621		
60267849009	**L-UMW-9D**	EPA 300.0	522621		
60267849010	**L-BMW-1D**	EPA 300.0	522621		
60267849011	**L-BMW-2D**	EPA 300.0	522621		
60267849012	**L-UMW-DUP-1**	EPA 300.0	522621		
60267849013	**L-UMW-DUP-2**	EPA 300.0	522621		
60267849014	**L-UMW-FB-1**	EPA 300.0	522621		
60267849015	**L-UMW-FB-2**	EPA 300.0	522621		

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Sample Condition Upon Receipt

WO# : 60267849

60267849

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-266 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.2 / 1.3 **Corr. Factor** +0.2 **Corrected** 0.4 / 1.5

Temperature should be above freezing to 6°C 10.1 / 10.9 10.3 / 11.1

Date and initials of person examining contents: 4/11/18

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: _____

Jann Check 4/11/18

Project Manager Review: _____ Date: _____

Pace Analytical
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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:	820 South Main Street, Suite 100
	St Charles, MO 63301
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 Energy Ctr Assessment
Project Number:	153140G.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

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* + Hg	Fluoride/Chloride/Sulfate	Radium 226	Radium 228	Alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		6026784 9
1	L-UMW-1D	WT	G			4/9/18	0905		4	1		3							1	1	1	1	1		2(BP1N) BP2N BP3N 01
2	L-UMW-2D	WT	G			4/10/18	0955		1	1		1							1	1	1	1	1		02
3	L-UMW-3D	WT	G			1	0910		1	1		1							1	1	1	1	1		03
4	L-UMW-4D	WT	G			4/9/18	1620		1	1		1							1	1	1	1	1		04
5	L-UMW-5D	WT	G			4/9/18	1355		1	1		1							1	1	1	1	1		05
6	L-UMW-6D	WT	G			4/9/18	1450		1	1		1							1	1	1	1	1		06
7	L-UMW-7D	WT	G			4/9/18	1240		12	3		9							3	3	3	3	3		6(BP1N) 3(BP2N) 3(BP3N) 07
8	L-UMW-8D	WT	G			4/5/18	1120		4	1		3							1	1	1	1	1		2(BP1N) BP2N BP3N 08
9	L-UMW-9D	WT	G			4/5/18	1010		1	1		1							1	1	1	1	1		09
10	L-BMW-1D	WT	G			4/9/18	1455		1	1		1							1	1	1	1	1		010
11	L-BMW-2D	WT	G			4/9/18	1320		1	1		1							1	1	1	1	1		011
12	L-UMW-DUP-1	WT	G			4/5/18	—		1	1		1							1	1	1	1	1		012

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: Ba, Be, Co, Pb, Li, Mo, Ca, Mg, Na, K, Fe, Mn EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Eric Schneider / Golder	4/10/18	1410		4/10/18	1410				
		4/10/18	1700	/ PACE	4/11/18	0345	0.4	Y	Y	Y
							11.1	N	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 04/10/18

*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.

Pace Analytical
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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:	820 South Main Street, Suite 100, St Charles, MO 63301
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 Energy Ctr Assessment
Project Number:	153140G.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

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): Metals* + Hg N; Fluoride/Chloride/Sulfate N; Radium 226 N; Radium 228 N; Alkalinity 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* + Hg	Fluoride/Chloride/Sulfate	Radium 226	Radium 228	Alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60267849
1	L-UMW-DUP-2	WT	G			4/10/18	—		4	1		3						1	1	1	1	1		2(BP1N) BP2U BP3N 03
2	L-UMW-FB-1	WT	G			4/9/18	0835																	04
3	L-UMW-FB-2	WT	G			4/10/18	1020		1	1		1						1	1	1	1	1		05
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

*EPA 200.7: Ba, Be, Co, Pb, Li, Mo, Ca, Mg, Na, K, Fe, Mn
EPA 200.8: Sb, As, Cd, Cr, Se, Tl

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)
Eric Schneider / Golder	4/10/18	1410	[signature]	4/10/18	1410				
[signature]	4/10/18	1700	[signature] / PACE	4/11/18	0345	10.3	N	Y	Y
						1.5	Y	Y	Y

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 04/10/18

MEMORANDUM

DATE May 9, 2018 **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 – AMEREN GROUNDWATER – DATA PACKAGE 60267849

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.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- 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 field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).

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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 Name: Ameren-Labadie-UMW-Assessment
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406.0001A
Validation Date: 5/9/18

Laboratory: Pace Analytical
SDG #: 6026789

Analytical Method (type and no.): Metals 200.7 & 200.8, Hg 7470, Alkalinity 2320B, Anions 300.0, Rad 903.1 & 904.0

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____

Sample Names L-UMW1D, 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

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?	☒	☐	☐	4/9/18 - 4/10/18
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)?	☒	☐	☐	Be(0.19), Mn(0.88)
b) Were analytes detected in the field blank(s)?	☒	☐	☐	FB-1: None FB-2: Cr(0.14)
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-8D Dup-2@ UMW-3D FB-1@ UMW-1D FB-2@ UMW-2D
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	Dup-1: ~~Be(200)~~, Pb(200), Cr(61), Se(200), ~~Hg~~(23), Ra226
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	Dup-2: Pb(200), Cd(62), Cr(54), Se(53), Ra226(21), Ra228(46)
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?	☐	☒	☐	Ca(low)
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-UMW-1D	Sulfate	28.0	D	DF of 2
L-UMW-2D	Chloride	23.1	D	2
↓	Sulfate	194	D	20
↓	Chromium (Cr)	1.0	U	Detected in Blank; PQL > Result > MDL
L-UMW-3D	Sulfate	405	D	DF of 50
↓	Lead (Pb)	3.0	J	RPD exceeded limit; Result > MDL
↓	Cadmium (Cd)	0.036	J	↓ ↓
↓	Cr	0.069	J	↓ ↓
↓	Selenium (Se)	0.17	J	↓ ↓
↓	Radium-226 (Ra-226)	0.711	J	; Result > MDL
↓	Radium-228 (Ra-228)	0.861	J	↓
L-UMW-4D	Chloride	19.8	D	DF of 2
↓	Sulfate	286	D	20
L-UMW-5D	Sulfate	254	D	20
↓	Manganese (Mn)	5.0	U	Blank; PQL > Result > MDL
L-UMW-6D	Chloride	21.1	D	DF of 2
↓	Sulfate	523	D	50
L-UMW-7D	Sulfate	424	D	50
L-UMW-8D	Beryllium (Be)	1.0	U	Blank; PQL > Result > MDL
↓	Pb	3.0	UJ	RPD exceeded limits; MDL > Result
↓	Cr	0.064	J	; Result > MDL
↓	Se	0.087	J	↓
↓	Ra-226	0.695	J	; Result > MDC
L-UMW-9D	Chloride	20.1	D	DF of 2
L-BMW-1D	Sulfate	36.9	D	5
L-BMW-2D	Sulfate	33.9	D	2
L-UMW-DUP-1	Pb	3.3	J	RPD exceeded limit; Result > MDL
↓	Cr	0.12	J	↓
↓	Se	0.086	UJ	; MDL > Result
↓	Ra-226	0.591	UJ	; MDC > Result
—	See Next	Page	—	—

Signature: Tommy J Hood Jr. Date: 5/9/18

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-UMW-DUP-2	Sulfate	406	D	DF of 50
	Pb	3.0	UJ	RPD exceeded limit; MDL > Result
	Cd	0.019	J	; Result > MDL
	Cr	0.12	J	
	Se	0.099	J	
	Ra-226	0.575	J	; Result > MDC
	Ra-228	0.835	UJ	; MDC > Result
L-UMW-FB-1	None	—	—	—
L-UMW-FB-2	None	—	—	—

TG

Signature: Tommy J. Goodwin

Date: 5/9/2018

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

June 14, 2018

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

RE: Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on May 23, 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 LEC BOTTOM ASH
Pace Project No.: 60271048

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

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174
Alabama Certification #: 41320
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
Wyoming Certification: FL NELAC Reciprocity
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

Pace Analytical Services, LLC
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Lenexa, KS 66219
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SAMPLE SUMMARY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60271048001	**L-UMW-1D**	Water	05/21/18 14:20	05/23/18 03:30
60271048002	**L-UMW-2D**	Water	05/21/18 16:10	05/23/18 03:30
60271048003	**L-UMW-3D**	Water	05/22/18 09:55	05/23/18 03:30
60271048004	**L-UMW-4D**	Water	05/22/18 14:15	05/23/18 03:30
60271048005	**L-UMW-5D**	Water	05/22/18 12:55	05/23/18 03:30
60271048006	**L-UMW-6D**	Water	05/22/18 11:15	05/23/18 03:30
60271048007	**L-UMW-7D**	Water	05/22/18 10:25	05/23/18 03:30
60271048008	**L-UMW-8D**	Water	05/22/18 09:00	05/23/18 03:30
60271048009	**L-UMW-9D**	Water	05/22/18 15:15	05/23/18 03:30
60271048010	**L-BMW-1D**	Water	05/21/18 11:45	05/23/18 03:30
60271048011	**L-BMW-2D**	Water	05/21/18 09:35	05/23/18 03:30
60271048012	**L-UMW-DUP-1**	Water	05/22/18 09:00	05/23/18 03:30
60271048013	**L-UMW-DUP-2**	Water	05/22/18 09:00	05/23/18 03:30
60271048014	**L-UMW-FB-1**	Water	05/21/18 16:10	05/23/18 03:30
60271048015	**L-UMW-FB-2**	Water	05/22/18 12:45	05/23/18 03:30
60271048016	**L-UMW-9D MS**	Water	05/22/18 15:15	05/23/18 03:30
60271048017	**L-UMW-9D MSD**	Water	05/22/18 15:15	05/23/18 03:30

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60271048001	L-UMW-1D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048002	L-UMW-2D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048003	L-UMW-3D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048004	L-UMW-4D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048005	L-UMW-5D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048006	L-UMW-6D	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O

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SAMPLE ANALYTE COUNT

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048007	**L-UMW-7D**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048008	**L-UMW-8D**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048009	**L-UMW-9D**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048010	**L-BMW-1D**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048011	**L-BMW-2D**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048012	**L-UMW-DUP-1**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048013	**L-UMW-DUP-2**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048014	**L-UMW-FB-1**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048015	**L-UMW-FB-2**	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	CRT	1	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271048016	**L-UMW-9D MS**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60271048017	**L-UMW-9D MSD**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-1D **Lab ID: 60271048001** Collected: 05/21/18 14:20 Received: 05/23/18 03:30 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	1.5	1	05/25/18 11:00	05/25/18 17:37	7440-39-3	
Boron	**448**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:37	7440-42-8	
Calcium	**118000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:37	7440-70-2	
Iron	**11800**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:37	7439-89-6	
Lithium	**21.7**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:37	7439-93-2	
Magnesium	**31700**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:37	7439-95-4	
Manganese	**296**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:37	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:37	7439-98-7	
Potassium	**5960**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:37	7440-09-7	
Sodium	**20700**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:37	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**35.8**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:31	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**497**	mg/L	20.0	4.9	1		05/31/18 11:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**538**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**11.3**	mg/L	1.0	0.46	1		06/02/18 09:26	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.063	1		06/02/18 09:26	16984-48-8	
Sulfate	**1.6**	mg/L	1.0	0.24	1		06/02/18 09:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-2D **Lab ID: 60271048002** Collected: 05/21/18 16:10 Received: 05/23/18 03:30 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	05/25/18 11:00	05/25/18 17:39	7440-39-3	
Boron	**1740**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:39	7440-42-8	
Calcium	**96800**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:39	7440-70-2	
Iron	**3060**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:39	7439-89-6	
Lithium	**22.4**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:39	7439-93-2	
Magnesium	**19300**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:39	7439-95-4	
Manganese	**310**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:39	7439-96-5	
Molybdenum	**38.4**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:39	7439-98-7	
Potassium	**7140**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:39	7440-09-7	
Sodium	**61100**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:39	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.2**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:34	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**241**	mg/L	20.0	4.9	1		05/31/18 11:32		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**614**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**27.8**	mg/L	2.0	0.92	2		06/04/18 09:20	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.063	1		06/02/18 10:10	16984-48-8	
Sulfate	**219**	mg/L	20.0	4.7	20		06/04/18 09:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-3D **Lab ID: 60271048003** Collected: 05/22/18 09:55 Received: 05/23/18 03:30 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	**86.7**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:41	7440-39-3	
Boron	**8700**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:41	7440-42-8	
Calcium	**96600**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:41	7440-70-2	
Iron	**374**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:41	7439-89-6	
Lithium	**17.2**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:41	7439-93-2	
Magnesium	**6320**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:41	7439-95-4	
Manganese	**199**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:41	7439-96-5	
Molybdenum	**233**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:41	7439-98-7	
Potassium	**9860**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:41	7440-09-7	
Sodium	**65400**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:41	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.6**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:37	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**41.6**	mg/L	20.0	4.9	1		06/04/18 18:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**622**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**15.0**	mg/L	1.0	0.46	1		06/02/18 11:10	16887-00-6	
Fluoride	**0.17J**	mg/L	0.20	0.063	1		06/02/18 11:10	16984-48-8	
Sulfate	**402**	mg/L	50.0	11.8	50		06/04/18 09:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-4D **Lab ID: 60271048004** Collected: 05/22/18 14:15 Received: 05/23/18 03:30 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	**72.1**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:48	7440-39-3	
Boron	**4930**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:48	7440-42-8	
Calcium	**47800**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:48	7440-70-2	
Iron	**327**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:48	7439-89-6	
Lithium	**29.9**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:48	7439-93-2	
Magnesium	**7340**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:48	7439-95-4	
Manganese	**265**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:48	7439-96-5	
Molybdenum	**157**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:48	7439-98-7	
Potassium	**7850**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:48	7440-09-7	
Sodium	**105000**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:48	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.50**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:39	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**57.0**	mg/L	20.0	4.9	1		06/04/18 18:47		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**565**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.2**	mg/L	2.0	0.92	2		06/04/18 10:28	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.063	1		06/02/18 11:25	16984-48-8	
Sulfate	**328**	mg/L	20.0	4.7	20		06/04/18 10:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-5D **Lab ID: 60271048005** Collected: 05/22/18 12:55 Received: 05/23/18 03:30 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	**70.6**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:50	7440-39-3	
Boron	**5520**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:50	7440-42-8	
Calcium	**71800**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:50	7440-70-2	
Iron	**16.9J**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:50	7439-89-6	
Lithium	**12.6**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:50	7439-93-2	
Magnesium	**51.6**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:50	7439-95-4	
Manganese	**7.0**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:50	7439-96-5	
Molybdenum	**162**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:50	7439-98-7	
Potassium	**13500**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:50	7440-09-7	
Sodium	**68700**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:50	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**24.6**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:42	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**65.1**	mg/L	20.0	4.9	1		06/04/18 18:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**535**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**16.7**	mg/L	1.0	0.46	1		06/02/18 11:40	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.063	1		06/02/18 11:40	16984-48-8	
Sulfate	**280**	mg/L	20.0	4.7	20		06/04/18 10:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-6D **Lab ID: 60271048006** Collected: 05/22/18 11:15 Received: 05/23/18 03:30 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	**137**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:53	7440-39-3	
Boron	**14100**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:53	7440-42-8	
Calcium	**106000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:53	7440-70-2	
Iron	**1010**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:53	7439-89-6	
Lithium	**5.0J**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:53	7439-93-2	
Magnesium	**7240**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:53	7439-95-4	
Manganese	**581**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:53	7439-96-5	
Molybdenum	**534**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:53	7439-98-7	
Potassium	**14600**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:53	7440-09-7	
Sodium	**88200**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:53	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**8.7**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:45	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**53.0**	mg/L	20.0	4.9	1		06/04/18 19:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**792**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**21.9**	mg/L	2.0	0.92	2		06/04/18 11:09	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.063	1		06/02/18 11:55	16984-48-8	
Sulfate	**496**	mg/L	50.0	11.8	50		06/04/18 11:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-7D **Lab ID: 60271048007** Collected: 05/22/18 10:25 Received: 05/23/18 03:30 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	**154**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:55	7440-39-3	
Boron	**6680**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:55	7440-42-8	
Calcium	**190000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:55	7440-70-2	
Iron	**12000**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:55	7439-89-6	
Lithium	**19.9**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:55	7439-93-2	
Magnesium	**28400**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:55	7439-95-4	
Manganese	**1990**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:55	7439-96-5	
Molybdenum	**203**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:55	7439-98-7	
Potassium	**6380**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:55	7440-09-7	
Sodium	**69400**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:55	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**17.8**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:48	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**352**	mg/L	20.0	4.9	1		06/04/18 19:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**957**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.6**	mg/L	1.0	0.46	1		06/02/18 12:10	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.063	1		06/02/18 12:10	16984-48-8	
Sulfate	**420**	mg/L	50.0	11.8	50		06/04/18 12:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-8D **Lab ID: 60271048008** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 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	**449**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:57	7440-39-3	
Boron	**347**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:57	7440-42-8	
Calcium	**128000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:57	7440-70-2	
Iron	**22400**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:57	7439-89-6	
Lithium	**31.8**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:57	7439-93-2	
Magnesium	**30400**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:57	7439-95-4	
Manganese	**780**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:57	7439-96-5	
Molybdenum	**10.7J**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:57	7439-98-7	
Potassium	**4910**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:57	7440-09-7	
Sodium	**12400**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:57	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**29.5**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:51	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**460**	mg/L	20.0	4.9	1		06/04/18 19:18		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**491**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.8**	mg/L	1.0	0.46	1		06/02/18 12:24	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		06/02/18 12:24	16984-48-8	
Sulfate	**4.1**	mg/L	1.0	0.24	1		06/02/18 12:24	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 LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-9D **Lab ID: 60271048009** Collected: 05/22/18 15:15 Received: 05/23/18 03:30 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	**517**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 17:59	7440-39-3	
Boron	**101**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 17:59	7440-42-8	
Calcium	**116000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 17:59	7440-70-2	
Iron	**24000**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 17:59	7439-89-6	
Lithium	**15.8**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 17:59	7439-93-2	
Magnesium	**30400**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 17:59	7439-95-4	
Manganese	**368**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 17:59	7439-96-5	
Molybdenum	**1.1J**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 17:59	7439-98-7	
Potassium	**4090**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 17:59	7440-09-7	
Sodium	**13200**	ug/L	500	157	1	05/25/18 11:00	05/25/18 17:59	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**34.0**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 20:59	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**440**	mg/L	20.0	4.9	1		06/04/18 19:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**473**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.7**	mg/L	2.0	0.92	2		06/04/18 12:18	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		06/02/18 12:39	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		06/02/18 12:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-BMW-1D **Lab ID: 60271048010** Collected: 05/21/18 11:45 Received: 05/23/18 03:30 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	**1210**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 18:02	7440-39-3	
Boron	**83.6J**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:02	7440-42-8	
Calcium	**135000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:02	7440-70-2	
Iron	**11500**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:02	7439-89-6	
Lithium	**29.9**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:02	7439-93-2	
Magnesium	**29800**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:02	7439-95-4	
Manganese	**596**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:02	7439-96-5	
Molybdenum	**1.4J**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:02	7439-98-7	
Potassium	**4540**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:02	7440-09-7	
Sodium	**9560**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:02	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.1**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:07	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**457**	mg/L	20.0	4.9	1		05/31/18 11:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**519**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.5**	mg/L	1.0	0.46	1		06/02/18 12:54	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.063	1		06/02/18 12:54	16984-48-8	
Sulfate	**41.2**	mg/L	5.0	1.2	5		06/04/18 12:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-BMW-2D **Lab ID: 60271048011** Collected: 05/21/18 09:35 Received: 05/23/18 03:30 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	**311**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 18:04	7440-39-3	
Boron	**68.7J**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:04	7440-42-8	
Calcium	**124000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:04	7440-70-2	M1
Iron	**6820**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:04	7439-89-6	
Lithium	**41.8**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:04	7439-93-2	
Magnesium	**23500**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:04	7439-95-4	
Manganese	**258**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:04	7439-96-5	
Molybdenum	**2.8J**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:04	7439-98-7	
Potassium	**3800**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:04	7440-09-7	
Sodium	**5170**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**32.7**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:10	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**381**	mg/L	20.0	4.9	1		05/31/18 11:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**448**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.6**	mg/L	1.0	0.46	1		06/02/18 13:09	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.063	1		06/02/18 13:09	16984-48-8	
Sulfate	**34.7**	mg/L	2.0	0.47	2		06/04/18 12:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-DUP-1 **Lab ID: 60271048012** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 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	**432**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 18:08	7440-39-3	
Boron	**312**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:08	7440-42-8	
Calcium	**123000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:08	7440-70-2	
Iron	**21700**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:08	7439-89-6	
Lithium	**28.2**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:08	7439-93-2	
Magnesium	**29700**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:08	7439-95-4	
Manganese	**759**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:08	7439-96-5	
Molybdenum	**10.6J**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:08	7439-98-7	
Potassium	**4760**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:08	7440-09-7	
Sodium	**12000**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:08	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**29.5**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:13	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**465**	mg/L	20.0	4.9	1		06/04/18 19:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**498**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**8.9**	mg/L	1.0	0.46	1		06/02/18 13:24	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		06/02/18 13:24	16984-48-8	
Sulfate	**3.4**	mg/L	1.0	0.24	1		06/02/18 13:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-DUP-2 **Lab ID: 60271048013** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 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	**146**	ug/L	5.0	1.5	1	05/25/18 11:00	05/25/18 18:15	7440-39-3	
Boron	**6400**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:15	7440-42-8	
Calcium	**181000**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:15	7440-70-2	
Iron	**11400**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:15	7439-89-6	
Lithium	**18.1**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:15	7439-93-2	
Magnesium	**27000**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:15	7439-95-4	
Manganese	**1890**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:15	7439-96-5	
Molybdenum	**194**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:15	7439-98-7	
Potassium	**6070**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:15	7440-09-7	
Sodium	**66100**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:15	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**18.2**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:21	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**362**	mg/L	20.0	4.9	1		06/04/18 19:36		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**965**	mg/L	5.0	5.0	1		05/25/18 16:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.7**	mg/L	1.0	0.46	1		06/02/18 14:09	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	0.063	1		06/02/18 14:09	16984-48-8	
Sulfate	**418**	mg/L	50.0	11.8	50		06/04/18 14:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-FB-1 **Lab ID: 60271048014** Collected: 05/21/18 16:10 Received: 05/23/18 03:30 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	05/25/18 11:00	05/25/18 18:17	7440-39-3	
Boron	**18.4J**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:17	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:17	7440-70-2	
Iron	**<6.1**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:17	7439-89-6	
Lithium	**<4.6**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:17	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:17	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:17	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:17	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:17	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:17	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.50**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:24	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		05/31/18 11:54		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		05/25/18 16:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		06/02/18 14:24	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		06/02/18 14:24	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		06/02/18 14:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-FB-2 **Lab ID: 60271048015** Collected: 05/22/18 12:45 Received: 05/23/18 03:30 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	05/25/18 11:00	05/25/18 18:19	7440-39-3	
Boron	**<12.5**	ug/L	100	12.5	1	05/25/18 11:00	05/25/18 18:19	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	05/25/18 11:00	05/25/18 18:19	7440-70-2	
Iron	**<6.1**	ug/L	50.0	6.1	1	05/25/18 11:00	05/25/18 18:19	7439-89-6	
Lithium	**<4.6**	ug/L	10.0	4.6	1	05/25/18 11:00	05/25/18 18:19	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	05/25/18 11:00	05/25/18 18:19	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	05/25/18 11:00	05/25/18 18:19	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	05/25/18 11:00	05/25/18 18:19	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	05/25/18 11:00	05/25/18 18:19	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	05/25/18 11:00	05/25/18 18:19	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.50**	ug/L	1.0	0.50	1	06/09/18 00:32	06/11/18 21:33	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		06/04/18 19:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		05/25/18 16:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		06/02/18 14:39	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		06/02/18 14:39	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		06/02/18 14:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 527333 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

METHOD BLANK: 2160165 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	05/25/18 17:22	
Boron	ug/L	<12.5	100	12.5	05/25/18 17:22	
Calcium	ug/L	<53.5	200	53.5	05/25/18 17:22	
Iron	ug/L	<6.1	50.0	6.1	05/25/18 17:22	
Lithium	ug/L	<4.6	10.0	4.6	05/25/18 17:22	
Magnesium	ug/L	<14.0	50.0	14.0	05/25/18 17:22	
Manganese	ug/L	<0.73	5.0	0.73	05/25/18 17:22	
Molybdenum	ug/L	<0.90	20.0	0.90	05/25/18 17:22	
Potassium	ug/L	<79.3	500	79.3	05/25/18 17:22	
Sodium	ug/L	<157	500	157	05/25/18 17:22	

LABORATORY CONTROL SAMPLE: 2160166

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1020	102	85-115	
Boron	ug/L	1000	952	95	85-115	
Calcium	ug/L	10000	10100	101	85-115	
Iron	ug/L	10000	10400	104	85-115	
Lithium	ug/L	1000	1020	102	85-115	
Magnesium	ug/L	10000	9960	100	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	9980	100	85-115	
Sodium	ug/L	10000	9820	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2160167 2160168

Parameter	Units	60271032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	12.5	1000	1000	968	1010	96	100	70-130	4	20	
Boron	ug/L	<12.5	1000	1000	906	943	90	94	70-130	4	20	
Calcium	ug/L	15300	10000	10000	24000	25100	87	99	70-130	5	20	
Iron	ug/L	11.4J	10000	10000	9770	10300	98	103	70-130	5	20	
Lithium	ug/L	<4.6	1000	1000	955	997	96	100	70-130	4	20	
Magnesium	ug/L	8290	10000	10000	17100	17800	88	95	70-130	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2160167 2160168

Parameter	Units	60271032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	1.6J	1000	1000	947	988	95	99	70-130	4	20	
Molybdenum	ug/L	<0.90	1000	1000	960	994	96	99	70-130	3	20	
Potassium	ug/L	351J	10000	10000	9800	10300	95	99	70-130	5	20	
Sodium	ug/L	14400	10000	10000	22900	23800	85	95	70-130	4	20	

MATRIX SPIKE SAMPLE: 2160169

Parameter	Units	60271048011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	311	1000	1310	100	70-130	
Boron	ug/L	68.7J	1000	996	93	70-130	
Calcium	ug/L	124000	10000	130000	68	70-130	M1
Iron	ug/L	6820	10000	16600	98	70-130	
Lithium	ug/L	41.8	1000	1070	103	70-130	
Magnesium	ug/L	23500	10000	31600	80	70-130	
Manganese	ug/L	258	1000	1200	95	70-130	
Molybdenum	ug/L	2.8J	1000	997	99	70-130	
Potassium	ug/L	3800	10000	13700	99	70-130	
Sodium	ug/L	5170	10000	14800	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 453311 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

METHOD BLANK: 2456036 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.50	1.0	0.50	06/11/18 20:25	

LABORATORY CONTROL SAMPLE: 2456037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	50	51.8	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2456038 2456039

Parameter	Units	60271048009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	34.0	50	50	86.0	85.6	104	103	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2456040 2456041

Parameter	Units	60271048012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	29.5	50	50	82.2	81.5	105	104	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 527976 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60271048001, 60271048002, 60271048010, 60271048011, 60271048014

METHOD BLANK: 2162949 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048010, 60271048011, 60271048014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	05/31/18 10:30	

LABORATORY CONTROL SAMPLE: 2162950

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	508	102	90-110	

SAMPLE DUPLICATE: 2162951

Parameter	Units	60271033003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	436	449	3	10	

SAMPLE DUPLICATE: 2162952

Parameter	Units	60271048010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	457	453	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 528561 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048012, 60271048013, 60271048015

METHOD BLANK: 2165227 Matrix: Water
Associated Lab Samples: 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048012, 60271048013, 60271048015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	06/04/18 18:00	

LABORATORY CONTROL SAMPLE: 2165228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	498	100	90-110	

SAMPLE DUPLICATE: 2165231

Parameter	Units	60271046003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	472	468	1	10	

SAMPLE DUPLICATE: 2165232

Parameter	Units	60271048007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	352	351	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 527157 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60271048001, 60271048002

METHOD BLANK: 2159302 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/24/18 17:29	

LABORATORY CONTROL SAMPLE: 2159303

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	100	80-120	

SAMPLE DUPLICATE: 2159304

Parameter	Units	60270840009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	770	773	0	10	

SAMPLE DUPLICATE: 2159305

Parameter	Units	60271006002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1410	1410	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 527158 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

METHOD BLANK: 2159306 Matrix: Water
Associated Lab Samples: 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/25/18 16:04	

LABORATORY CONTROL SAMPLE: 2159307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 2159308

Parameter	Units	60271048010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	519	518	0	10	

SAMPLE DUPLICATE: 2159309

Parameter	Units	60271046005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5690	5570	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 528264 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

METHOD BLANK: 2163956 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/02/18 08:41	
Fluoride	mg/L	<0.063	0.20	0.063	06/02/18 08:41	
Sulfate	mg/L	<0.24	1.0	0.24	06/02/18 08:41	

LABORATORY CONTROL SAMPLE: 2163957

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	2.4	97	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163958 2163959

Parameter	Units	60271048001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.3	5	5	16.6	16.8	105	109	90-110	1	15	
Fluoride	mg/L	0.25	2.5	2.5	2.7	2.8	97	103	90-110	5	15	
Sulfate	mg/L	1.6	5	5	6.7	6.9	101	105	90-110	3	15	

MATRIX SPIKE SAMPLE: 2163960

Parameter	Units	60271048002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.37	2.5	2.9	100	90-110	

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QUALITY CONTROL DATA

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 528385 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048009, 60271048010, 60271048011, 60271048013

METHOD BLANK: 2164750 Matrix: Water
Associated Lab Samples: 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048009, 60271048010, 60271048011, 60271048013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/04/18 08:18	
Sulfate	mg/L	<0.24	1.0	0.24	06/04/18 08:18	

LABORATORY CONTROL SAMPLE: 2164751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2164752 2164753

Parameter	Units	60271048003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	402	250	250	667	655	106	101	90-110	2	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-1D **Lab ID: 60271048001** Collected: 05/21/18 14:20 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.853 ± 0.474 (0.178) C:NA T:86%**	pCi/L	06/13/18 19:45	13982-63-3	
Radium-228	EPA 904.0	**1.13 ± 0.513 (0.877) C:73% T:82%**	pCi/L	06/06/18 14:47	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-2D **Lab ID: 60271048002** Collected: 05/21/18 16:10 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.184 ± 0.400 (0.738) C:NA T:92%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**1.33 ± 0.478 (0.684) C:79% T:89%**	pCi/L	06/06/18 14:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-3D **Lab ID: 60271048003** Collected: 05/22/18 09:55 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.241 ± 0.472 (0.848) C:NA T:91%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**0.289 ± 0.324 (0.678) C:80% T:88%**	pCi/L	06/06/18 14:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-4D **Lab ID: 60271048004** Collected: 05/22/18 14:15 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.270 ± 0.496 (0.884) C:NA T:79%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**1.30 ± 0.569 (0.980) C:78% T:81%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-5D **Lab ID: 60271048005** Collected: 05/22/18 12:55 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.143 ± 0.653 (1.05) C:NA T:41%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**0.558 ± 0.422 (0.835) C:83% T:79%**	pCi/L	06/06/18 14:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-6D **Lab ID: 60271048006** Collected: 05/22/18 11:15 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.713 ± 0.466 (0.477) C:NA T:86%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**0.874 ± 0.409 (0.697) C:77% T:91%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-7D **Lab ID: 60271048007** Collected: 05/22/18 10:25 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.483 ± 0.413 (0.560) C:NA T:90%**	pCi/L	06/13/18 20:01	13982-63-3	
Radium-228	EPA 904.0	**0.788 ± 0.416 (0.745) C:76% T:87%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-8D **Lab ID: 60271048008** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.509 ± 0.555 (0.874) C:NA T:86%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**0.527 ± 0.395 (0.777) C:77% T:81%**	pCi/L	06/06/18 14:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-9D **Lab ID: 60271048009** Collected: 05/22/18 15:15 Received: 05/23/18 03:30 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 ± 0.435 (0.647) C:NA T:81%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**0.213 ± 0.318 (0.686) C:78% T:78%**	pCi/L	06/06/18 14:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-BMW-1D **Lab ID: 60271048010** Collected: 05/21/18 11:45 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.86 ± 0.733 (0.472) C:NA T:86%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**1.90 ± 0.596 (0.812) C:85% T:81%**	pCi/L	06/06/18 14:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-BMW-2D **Lab ID: 60271048011** Collected: 05/21/18 09:35 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0588 ± 0.268 (0.433) C:NA T:91%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**0.331 ± 0.327 (0.670) C:75% T:87%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-DUP-1 **Lab ID: 60271048012** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.766 ± 0.508 (0.592) C:NA T:86%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**0.511 ± 0.393 (0.780) C:79% T:83%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-DUP-2 **Lab ID: 60271048013** Collected: 05/22/18 09:00 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.222 ± 0.436 (0.798) C:NA T:73%**	pCi/L	06/13/18 20:14	13982-63-3	
Radium-228	EPA 904.0	**0.593 ± 0.335 (0.604) C:80% T:88%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-FB-1 **Lab ID: 60271048014** Collected: 05/21/18 16:10 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0674 ± 0.396 (0.810) C:NA T:85%**	pCi/L	06/13/18 20:28	13982-63-3	
Radium-228	EPA 904.0	**0.00713 ± 0.290 (0.671) C:80% T:91%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-FB-2 **Lab ID: 60271048015** Collected: 05/22/18 12:45 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.327 ± 0.301 (0.177) C:NA T:91%**	pCi/L	06/13/18 20:28	13982-63-3	
Radium-228	EPA 904.0	**0.265 ± 0.339 (0.721) C:76% T:88%**	pCi/L	06/06/18 14:48	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-9D MS **Lab ID: 60271048016** Collected: 05/22/18 15:15 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**123 %REC +/- NA (NA) C:NA T:NA**	pCi/L	06/13/18 20:28	13982-63-3	
Radium-228	EPA 904.0	**98.69 % REC ± NA (NA) C:NA T:NA**	pCi/L	06/06/18 14:49	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Sample: L-UMW-9D MSD **Lab ID: 60271048017** Collected: 05/22/18 15:15 Received: 05/23/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**110 %REC 11.18 RPD +/- NA (NA) C:NA T:NA**	pCi/L	06/13/18 20:28	13982-63-3	
Radium-228	EPA 904.0	**118.77 % REC 18.47 RPD ± NA (NA) C:NA T:NA**	pCi/L	06/06/18 14:49	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 300523 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015, 60271048016, 60271048017

METHOD BLANK: 1470765 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015, 60271048016, 60271048017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.201 ± 0.307 (0.182) C:NA T:86%	pCi/L	06/13/18 19:45	

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 LEC BOTTOM ASH
Pace Project No.: 60271048

QC Batch: 299916 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015, 60271048016, 60271048017

METHOD BLANK: 1468104 Matrix: Water
Associated Lab Samples: 60271048001, 60271048002, 60271048003, 60271048004, 60271048005, 60271048006, 60271048007, 60271048008, 60271048009, 60271048010, 60271048011, 60271048012, 60271048013, 60271048014, 60271048015, 60271048016, 60271048017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.00390 ± 0.348 (0.808) C:80% T:76%	pCi/L	06/06/18 14:47	

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 LEC BOTTOM ASH
Pace Project No.: 60271048

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-O	Pace Analytical Services - Ormond Beach
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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 LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271048001	L-UMW-1D	EPA 200.7	527333	EPA 200.7	527375
60271048002	L-UMW-2D	EPA 200.7	527333	EPA 200.7	527375
60271048003	L-UMW-3D	EPA 200.7	527333	EPA 200.7	527375
60271048004	L-UMW-4D	EPA 200.7	527333	EPA 200.7	527375
60271048005	L-UMW-5D	EPA 200.7	527333	EPA 200.7	527375
60271048006	L-UMW-6D	EPA 200.7	527333	EPA 200.7	527375
60271048007	L-UMW-7D	EPA 200.7	527333	EPA 200.7	527375
60271048008	L-UMW-8D	EPA 200.7	527333	EPA 200.7	527375
60271048009	L-UMW-9D	EPA 200.7	527333	EPA 200.7	527375
60271048010	L-BMW-1D	EPA 200.7	527333	EPA 200.7	527375
60271048011	L-BMW-2D	EPA 200.7	527333	EPA 200.7	527375
60271048012	L-UMW-DUP-1	EPA 200.7	527333	EPA 200.7	527375
60271048013	L-UMW-DUP-2	EPA 200.7	527333	EPA 200.7	527375
60271048014	L-UMW-FB-1	EPA 200.7	527333	EPA 200.7	527375
60271048015	L-UMW-FB-2	EPA 200.7	527333	EPA 200.7	527375
60271048001	L-UMW-1D	EPA 200.8	453311	EPA 200.8	453330
60271048002	L-UMW-2D	EPA 200.8	453311	EPA 200.8	453330
60271048003	L-UMW-3D	EPA 200.8	453311	EPA 200.8	453330
60271048004	L-UMW-4D	EPA 200.8	453311	EPA 200.8	453330
60271048005	L-UMW-5D	EPA 200.8	453311	EPA 200.8	453330
60271048006	L-UMW-6D	EPA 200.8	453311	EPA 200.8	453330
60271048007	L-UMW-7D	EPA 200.8	453311	EPA 200.8	453330
60271048008	L-UMW-8D	EPA 200.8	453311	EPA 200.8	453330
60271048009	L-UMW-9D	EPA 200.8	453311	EPA 200.8	453330
60271048010	L-BMW-1D	EPA 200.8	453311	EPA 200.8	453330
60271048011	L-BMW-2D	EPA 200.8	453311	EPA 200.8	453330
60271048012	L-UMW-DUP-1	EPA 200.8	453311	EPA 200.8	453330
60271048013	L-UMW-DUP-2	EPA 200.8	453311	EPA 200.8	453330
60271048014	L-UMW-FB-1	EPA 200.8	453311	EPA 200.8	453330
60271048015	L-UMW-FB-2	EPA 200.8	453311	EPA 200.8	453330
60271048001	L-UMW-1D	EPA 903.1	300523		
60271048002	L-UMW-2D	EPA 903.1	300523		
60271048003	L-UMW-3D	EPA 903.1	300523		
60271048004	L-UMW-4D	EPA 903.1	300523		
60271048005	L-UMW-5D	EPA 903.1	300523		
60271048006	L-UMW-6D	EPA 903.1	300523		
60271048007	L-UMW-7D	EPA 903.1	300523		
60271048008	L-UMW-8D	EPA 903.1	300523		
60271048009	L-UMW-9D	EPA 903.1	300523		
60271048010	L-BMW-1D	EPA 903.1	300523		
60271048011	L-BMW-2D	EPA 903.1	300523		
60271048012	L-UMW-DUP-1	EPA 903.1	300523		
60271048013	L-UMW-DUP-2	EPA 903.1	300523		
60271048014	L-UMW-FB-1	EPA 903.1	300523		
60271048015	L-UMW-FB-2	EPA 903.1	300523		
60271048016	L-UMW-9D MS	EPA 903.1	300523		
60271048017	L-UMW-9D MSD	EPA 903.1	300523		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271048001	L-UMW-1D	EPA 904.0	299916		
60271048002	L-UMW-2D	EPA 904.0	299916		
60271048003	L-UMW-3D	EPA 904.0	299916		
60271048004	L-UMW-4D	EPA 904.0	299916		
60271048005	L-UMW-5D	EPA 904.0	299916		
60271048006	L-UMW-6D	EPA 904.0	299916		
60271048007	L-UMW-7D	EPA 904.0	299916		
60271048008	L-UMW-8D	EPA 904.0	299916		
60271048009	L-UMW-9D	EPA 904.0	299916		
60271048010	L-BMW-1D	EPA 904.0	299916		
60271048011	L-BMW-2D	EPA 904.0	299916		
60271048012	L-UMW-DUP-1	EPA 904.0	299916		
60271048013	L-UMW-DUP-2	EPA 904.0	299916		
60271048014	L-UMW-FB-1	EPA 904.0	299916		
60271048015	L-UMW-FB-2	EPA 904.0	299916		
60271048016	L-UMW-9D MS	EPA 904.0	299916		
60271048017	L-UMW-9D MSD	EPA 904.0	299916		
60271048001	L-UMW-1D	SM 2320B	527976		
60271048002	L-UMW-2D	SM 2320B	527976		
60271048003	L-UMW-3D	SM 2320B	528561		
60271048004	L-UMW-4D	SM 2320B	528561		
60271048005	L-UMW-5D	SM 2320B	528561		
60271048006	L-UMW-6D	SM 2320B	528561		
60271048007	L-UMW-7D	SM 2320B	528561		
60271048008	L-UMW-8D	SM 2320B	528561		
60271048009	L-UMW-9D	SM 2320B	528561		
60271048010	L-BMW-1D	SM 2320B	527976		
60271048011	L-BMW-2D	SM 2320B	527976		
60271048012	L-UMW-DUP-1	SM 2320B	528561		
60271048013	L-UMW-DUP-2	SM 2320B	528561		
60271048014	L-UMW-FB-1	SM 2320B	527976		
60271048015	L-UMW-FB-2	SM 2320B	528561		
60271048001	L-UMW-1D	SM 2540C	527157		
60271048002	L-UMW-2D	SM 2540C	527157		
60271048003	L-UMW-3D	SM 2540C	527158		
60271048004	L-UMW-4D	SM 2540C	527158		
60271048005	L-UMW-5D	SM 2540C	527158		
60271048006	L-UMW-6D	SM 2540C	527158		
60271048007	L-UMW-7D	SM 2540C	527158		
60271048008	L-UMW-8D	SM 2540C	527158		
60271048009	L-UMW-9D	SM 2540C	527158		
60271048010	L-BMW-1D	SM 2540C	527158		
60271048011	L-BMW-2D	SM 2540C	527158		
60271048012	L-UMW-DUP-1	SM 2540C	527158		
60271048013	L-UMW-DUP-2	SM 2540C	527158		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC BOTTOM ASH
Pace Project No.: 60271048

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271048014	**L-UMW-FB-1**	SM 2540C	527158		
60271048015	**L-UMW-FB-2**	SM 2540C	527158		
60271048001	**L-UMW-1D**	EPA 300.0	528264		
60271048002	**L-UMW-2D**	EPA 300.0	528264		
60271048002	**L-UMW-2D**	EPA 300.0	528385		
60271048003	**L-UMW-3D**	EPA 300.0	528264		
60271048003	**L-UMW-3D**	EPA 300.0	528385		
60271048004	**L-UMW-4D**	EPA 300.0	528264		
60271048004	**L-UMW-4D**	EPA 300.0	528385		
60271048005	**L-UMW-5D**	EPA 300.0	528264		
60271048005	**L-UMW-5D**	EPA 300.0	528385		
60271048006	**L-UMW-6D**	EPA 300.0	528264		
60271048006	**L-UMW-6D**	EPA 300.0	528385		
60271048007	**L-UMW-7D**	EPA 300.0	528264		
60271048007	**L-UMW-7D**	EPA 300.0	528385		
60271048008	**L-UMW-8D**	EPA 300.0	528264		
60271048009	**L-UMW-9D**	EPA 300.0	528264		
60271048009	**L-UMW-9D**	EPA 300.0	528385		
60271048010	**L-BMW-1D**	EPA 300.0	528264		
60271048010	**L-BMW-1D**	EPA 300.0	528385		
60271048011	**L-BMW-2D**	EPA 300.0	528264		
60271048011	**L-BMW-2D**	EPA 300.0	528385		
60271048012	**L-UMW-DUP-1**	EPA 300.0	528264		
60271048013	**L-UMW-DUP-2**	EPA 300.0	528264		
60271048013	**L-UMW-DUP-2**	EPA 300.0	528385		
60271048014	**L-UMW-FB-1**	EPA 300.0	528264		
60271048015	**L-UMW-FB-2**	EPA 300.0	528264		

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Sample Condition Upon Receipt

WO# : 60271048

60271048

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

JLS

Cooler Temperature (°C): **As-read** 3.6 17.1 / 18.2 **Corr. Factor** +1.0 **Corrected** 4.6 18.8 / 19.7

Date and initials of person examining contents: JBS 1/23

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	Reactions not on ice
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? (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: _____ 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 2

Section A Required Client Information:

Company:	Golder Associates
Address:	820 South Main Street, Suite 100
	St Charles, MO 63301
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
	Ryan Feldmann
Purchase Order No.:	Bottom
Project Name:	Ameren Labadie Energy Center ~~Fly Ash~~
Project Number:	153-1406.0001D

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: 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*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226+228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N	N		60271048
1	L-UMW-1D	WT	G			5/21/18	1420		4	1		3							✓	✓	✓	✓	✓		BP2U BP3N (2) BP1N
2	L-UMW-2D	WT	G			"	1610																		
3	L-UMW-3D	WT	G			5/22/18	0955																		
4	L-UMW-4D	WT	G				1415																		
5	L-UMW-5D	WT	G				1255																		
6	L-UMW-6D	WT	G			"	1115																		
7	L-UMW-7D	WT	G			5/22/18	1025																		
8	L-UMW-8D	WT	G			5/22/18	0900																		
9	L-UMW-9D	WT	G			5/22/18	1515		12	3		9													(5) BP2U (3) BP3N (6) BP1N
10	L-BMW-1D	WT	G			5/21/18	1145		4	1		3													BP2U BP3N (4) BP1N
11	L-BMW-2D	WT	G			"	0935																		
12	L-UMW-DUP-1	WT	G			5/22/18	—																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*EPA 200.7: B, Ca, Mn, Mg, Fe, Na, K, Ba, Li, Mo	Golder	5/22/18	1720		5/22/18	17:35				
EPA 200.8: As		5/22/18	1800		5/23	0730	4.6	Y	Y	Y
							18.8	N	Y	Y
							19.7	N	Y	Y
							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: Ryan Feldmann

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/22/18

*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.

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:	820 South Main Street, Suite 100
	St Charles, MO 63301
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, Ryan Feldmann
Purchase Order No.:	Bottom
Project Name:	Ameren Labadie Energy Center - ~~Fly~~ Ash
Project Number:	153-1406.0001D

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	Radium 226+228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		
1	L-UMW-DUP-2	WT	G			5/22/18	—		4	1		3							✓	✓	✓	✓	✓		60271048 BP2U
2	L-UMW-FB-1	WT	G			5/21/18	1610		1	1		1							✓	✓	✓	✓	✓		BP3S
3	L-UMW-FB-2	WT	G			5/22/18	1245		1	1		1							✓	✓	✓	✓	✓		(2)BPN
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																						

003 004 005

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Mn, Mg, Fe, Na, K, Ba, Li, Mo EPA 200.8: As	Golder	5/22/18	1720		5/22/18	17:35	1.5	N	Y	Y
		5/22/18	180		5/23	0730	1.7	N	Y	Y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Ryan Feldmann
SIGNATURE of SAMPLER: (MM/DD/YY): 5/22/18

MEMORANDUM

DATE August 20, 2018 **Project No.** 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Samantha DiCenso **EMAIL samantha_dicenso@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCPA – AMEREN GROUNDWATER – DATA PACKAGE 60271048

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

- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as a diluted result (D).
- When analytes exceeded the recovery criteria for the MS/MSD of a sample, the sample result was qualified as an estimated value (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 Manager: J. Ingram
Project Name: Ameren Groundwater
Project Number: 1531406
Reviewer: S. DiCenzo
Validation Date: 8/13/18

Laboratory: Pace Analytical
SDG #: 60271048
Analytical Method (type and no.): Metals 200.7 & 200.8, Alkalinity 2320B, TDS 2540C, Anions 300.0, Rad 903.1 & 904.0
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-9D MS, L-UMW-9D 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?	☑	☐	☐	5/21/18 & 5/22/18
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, 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?	☑	☐	☐	See notes
g) Were any matrix problems noted?	☑	☐	☐	See notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☑	☐	
b) Were analytes detected in the field blank(s)?	☑	☐	☐	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)?	☑	☐	☐	L-UMW-8D : L-UMW-DUP-1 L-UMW-7D : L-UMW-DUP-2
b) Were field dup. precision criteria met (note RPD)?	☑	☑	☐	~~max RPD: 48%~~ (<20%) Rads
c) Were lab duplicates analyzed (note original and duplicate samples)?	☑	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

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

Comments/Notes:

Dilution: chloride
L-UMW-2D [x2]
L-UMW-4D [x2]
L-UMW-6D [x2]
L-UMW-9D [x2]

sulfate
L-UMW-2D [x20]
L-UMW-3D [x50]
L-UMW-4D [x20]
L-UMW-5D [x20]
L-UMW-6D [x50]
L-UMW-7D [x50]
L-BMW-1D [x5]
L-BMW-2D [x2]
L-UMW-DUP-2 [x50]

MS/MSD: Calcium below %Rec in MS associated with L-BMW-2D

Blanks: L-UMW-FB-1 : L-UMW-2D
L-UMW-FB-2 : L-UMW-5D
L-UMW-FB-1 : Boron 18.4 J mg/L (sample > 10x PQL)
L-UMW-FB-1 : Ra-228 0.327

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-UMW-2D	Chloride	27.8	D	Analyzed at a dilution
"	Sulfate	219	D	"
L-UMW-3D	Sulfate	402	D	"
L-UMW-4D	Chloride	21.2	D	"
"	Sulfate	328	D	"
L-UMW-5D	Sulfate	280	D	"
L-UMW-6D	Chloride	21.9	D	"
"	Sulfate	496	D	"
L-UMW-7D	Sulfate	420	D	"
L-UMW-9D	Chloride	20.7	D	"
L-BMW-1D	Sulfate	41.2	D	"
L-BMW-2D	Sulfate	34.7	D	"
L-UMW-DUP-2	Sulfate	418	D	"
L-BMW-2D	Calcium	124000	J	MS/MSD outside QC limits
L-UMW-7D	Radium-228	0.788	J	RPD exceeded limits; Result > MDC
L-UMW-DUP-1	"	~~0.766~~ 0.511	J	" "

Signature: _____ Date: 8/20/18

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

January 24, 2019

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

RE: Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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: Samples list trimmed.
REV-1A, 1/24/19: Project name revised.

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
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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
Pace Project No.: 60286215

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60286215001	**L-UMW-1D**	Water	11/07/18 13:35	11/08/18 04:02
60286215002	**L-UMW-2D**	Water	11/07/18 14:40	11/08/18 04:02
60286215003	**L-UMW-7D**	Water	11/07/18 14:45	11/08/18 04:02
60286215004	**L-UMW-8D**	Water	11/07/18 10:55	11/08/18 04:02
60286215005	**L-UMW-9D**	Water	11/07/18 09:30	11/08/18 04:02
60286215006	**L-BMW-1D**	Water	11/07/18 10:45	11/08/18 04:02
60286215007	**L-BMW-2D**	Water	11/07/18 11:40	11/08/18 04:02
60286215008	**L-UMW-DUP-1**	Water	11/07/18 08:00	11/08/18 04:02
60286215009	**L-UMW-DUP-2**	Water	11/07/18 08:00	11/08/18 04:02
60286215010	**L-UMW-FB-1**	Water	11/07/18 14:30	11/08/18 04:02
60286215011	**L-UMW-5D**	Water	11/08/18 15:30	11/09/18 03:12
60286215012	**L-UMW-FB-2**	Water	11/08/18 15:15	11/09/18 03:12
60286215023	**L-UMW-3D**	Water	11/09/18 12:15	11/10/18 06:25
60286215024	**L-UMW-4D**	Water	11/09/18 09:15	11/10/18 06:25
60286215025	**L-UMW-6D**	Water	11/09/18 10:35	11/10/18 06:25
60286215028	**L-UMW-7D MS**	Water	11/07/18 14:45	11/08/18 04:02
60286215029	**L-UMW-7D MSD**	Water	11/07/18 14:45	11/08/18 04:02

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60286215001	**L-UMW-1D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215002	**L-UMW-2D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215003	**L-UMW-7D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215004	**L-UMW-8D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K

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

SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286215005	**L-UMW-9D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215006	**L-BMW-1D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215007	**L-BMW-2D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215008	**L-UMW-DUP-1**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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 LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	LDF	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
60286215009	**L-UMW-DUP-2**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215010	**L-UMW-FB-1**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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	LDF	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
60286215011	**L-UMW-5D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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
60286215012	**L-UMW-FB-2**	EPA 200.7	JGP	10	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	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
60286215023	**L-UMW-3D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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
60286215024	**L-UMW-4D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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
60286215025	**L-UMW-6D**	EPA 200.7	JGP	10	PASI-K
		EPA 200.8	JDH	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

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60286215028	**L-UMW-7D MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60286215029	**L-UMW-7D MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-1D **Lab ID: 60286215001** Collected: 11/07/18 13:35 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	**588**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:18	7440-39-3	
Boron	**1260**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:18	7440-42-8	
Calcium	**159000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:18	7440-70-2	
Iron	**18300**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:18	7439-89-6	
Lithium	**32.6**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:18	7439-93-2	
Magnesium	**40700**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:18	7439-95-4	
Manganese	**428**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:18	7439-96-5	
Molybdenum	**1.2J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:18	7439-98-7	
Potassium	**7610**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:18	7440-09-7	
Sodium	**34600**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:18	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**69.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 17:39	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**548**	mg/L	20.0	4.9	1		11/16/18 18:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**556**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**17.4**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.91**	mg/L	0.20	0.012	1		11/10/18 12:29		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**16.0**	mg/L	1.0	0.29	1		11/25/18 22:13	16887-00-6	
Fluoride	**0.21**	mg/L	0.20	0.19	1		11/25/18 22:13	16984-48-8	
Sulfate	**81.9**	mg/L	10.0	2.4	10		11/25/18 22:27	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.94**	mg/L	0.10	0.050	1		11/14/18 16:31	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-2D **Lab ID: 60286215002** Collected: 11/07/18 14:40 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	**105**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:24	7440-39-3	
Boron	**1620**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:24	7440-42-8	
Calcium	**90700**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:24	7440-70-2	
Iron	**2590**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:24	7439-89-6	
Lithium	**21.9**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:24	7439-93-2	
Magnesium	**19200**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:24	7439-95-4	
Manganese	**290**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:24	7439-96-5	
Molybdenum	**40.9**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:24	7439-98-7	
Potassium	**7290**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:24	7440-09-7	
Sodium	**69200**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:24	7440-23-5	
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 17:41	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**222**	mg/L	20.0	4.9	1		11/16/18 18:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1080**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**2.5**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.042J**	mg/L	0.20	0.012	1		11/10/18 13:32		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**24.1**	mg/L	5.0	1.4	5		11/22/18 01:30	16887-00-6	
Fluoride	**0.42**	mg/L	0.20	0.19	1		11/25/18 22:41	16984-48-8	
Sulfate	**187**	mg/L	20.0	4.8	20		11/22/18 01:46	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.21**	mg/L	0.10	0.050	1		11/14/18 13:32	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-7D **Lab ID: 60286215003** Collected: 11/07/18 14:45 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	**121**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:27	7440-39-3	
Boron	**8310**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:27	7440-42-8	
Calcium	**220000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:27	7440-70-2	
Iron	**11900**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:27	7439-89-6	
Lithium	**25.0**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:27	7439-93-2	
Magnesium	**28100**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:27	7439-95-4	
Manganese	**2110**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:27	7439-96-5	
Molybdenum	**231**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:27	7439-98-7	
Potassium	**6910**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:27	7440-09-7	
Sodium	**76500**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:27	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**20.7**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:17	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**358**	mg/L	20.0	4.9	1		11/16/18 19:12		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1020**	mg/L	5.0	5.0	1		11/13/18 06:46		D6,L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**11.8**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.094J**	mg/L	0.20	0.012	1		11/14/18 15:34		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**14.5**	mg/L	1.0	0.29	1		11/25/18 22:55	16887-00-6	
Fluoride	**0.29**	mg/L	0.20	0.19	1		11/25/18 22:55	16984-48-8	
Sulfate	**568**	mg/L	50.0	12.0	50		11/22/18 02:35	14808-79-8	M1
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.23**	mg/L	0.10	0.050	1		11/14/18 16:39	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-8D **Lab ID: 60286215004** Collected: 11/07/18 10:55 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	**446**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:33	7440-39-3	
Boron	**437**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:33	7440-42-8	
Calcium	**128000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:33	7440-70-2	
Iron	**21800**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:33	7439-89-6	
Lithium	**31.4**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:33	7439-93-2	
Magnesium	**32000**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:33	7439-95-4	
Manganese	**890**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:33	7439-96-5	
Molybdenum	**15.5J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:33	7439-98-7	
Potassium	**5090**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:33	7440-09-7	
Sodium	**21800**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:33	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**24.3**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:22	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**434**	mg/L	20.0	4.9	1		11/16/18 19:23		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**667**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**17.9**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**3.9**	mg/L	0.20	0.012	1		11/10/18 12:20		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**11.3**	mg/L	1.0	0.29	1		11/25/18 23:24	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.19	1		11/25/18 23:24	16984-48-8	
Sulfate	**62.2**	mg/L	10.0	2.4	10		11/25/18 23:38	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.71**	mg/L	0.10	0.050	1		11/14/18 16:41	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-9D **Lab ID: 60286215005** Collected: 11/07/18 09:30 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	**500**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:35	7440-39-3	
Boron	**113**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:35	7440-42-8	
Calcium	**114000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:35	7440-70-2	
Iron	**22700**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:35	7439-89-6	
Lithium	**16.4**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:35	7439-93-2	
Magnesium	**31600**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:35	7439-95-4	
Manganese	**349**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:35	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:35	7439-98-7	
Potassium	**4120**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:35	7440-09-7	
Sodium	**13800**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:35	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**34.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:23	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**441**	mg/L	20.0	4.9	1		11/16/18 19:29		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**541**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**20.9**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**1.8**	mg/L	0.20	0.012	1		11/10/18 12:13		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**20.7**	mg/L	5.0	1.4	5		11/26/18 00:35	16887-00-6	
Fluoride	**0.21**	mg/L	0.20	0.19	1		11/25/18 23:52	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		11/25/18 23:52	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.76**	mg/L	0.10	0.050	1		11/14/18 16:42	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
Pace Project No.: 60286215

Sample: L-BMW-1D **Lab ID: 60286215006** Collected: 11/07/18 10:45 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	**1160**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:40	7440-39-3	
Boron	**92.2J**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:40	7440-42-8	
Calcium	**132000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:40	7440-70-2	
Iron	**10600**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:40	7439-89-6	
Lithium	**29.6**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:40	7439-93-2	
Magnesium	**30600**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:40	7439-95-4	
Manganese	**610**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:40	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:40	7439-98-7	
Potassium	**4560**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:40	7440-09-7	
Sodium	**9800**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:40	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.90J**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:25	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**440**	mg/L	20.0	4.9	1		11/16/18 19:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**550**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**10.1**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.46**	mg/L	0.20	0.012	1		11/10/18 12:20		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**11.2**	mg/L	1.0	0.29	1		11/26/18 00:49	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.19	1		11/26/18 00:49	16984-48-8	
Sulfate	**34.9**	mg/L	5.0	1.2	5		11/26/18 01:03	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.48**	mg/L	0.10	0.050	1		11/14/18 16:44	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-BMW-2D **Lab ID: 60286215007** Collected: 11/07/18 11:40 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	**309**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:42	7440-39-3	
Boron	**78.5J**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:42	7440-42-8	
Calcium	**120000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:42	7440-70-2	
Iron	**6570**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:42	7439-89-6	
Lithium	**39.3**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:42	7439-93-2	
Magnesium	**24800**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:42	7439-95-4	
Manganese	**258**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:42	7439-96-5	
Molybdenum	**2.0J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:42	7439-98-7	
Potassium	**3850**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:42	7440-09-7	
Sodium	**6220**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:42	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**33.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:26	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**373**	mg/L	20.0	4.9	1		11/16/18 19:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**427**	mg/L	5.0	5.0	1		11/13/18 06:46		D6,L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**6.4**	mg/L	0.050		1		11/26/18 10:55	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 12:20		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**6.3**	mg/L	1.0	0.29	1		11/26/18 01:17	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.19	1		11/26/18 01:17	16984-48-8	
Sulfate	**31.9**	mg/L	5.0	1.2	5		11/26/18 01:32	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.26**	mg/L	0.10	0.050	1		11/14/18 16:45	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-DUP-1 **Lab ID: 60286215008** Collected: 11/07/18 08:00 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	**456**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:44	7440-39-3	
Boron	**418**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:44	7440-42-8	
Calcium	**130000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:44	7440-70-2	
Iron	**22100**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:44	7439-89-6	
Lithium	**31.7**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:44	7439-93-2	
Magnesium	**32700**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:44	7439-95-4	
Manganese	**904**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:44	7439-96-5	
Molybdenum	**15.7J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:44	7439-98-7	
Potassium	**5200**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:44	7440-09-7	
Sodium	**21900**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**24.5**	ug/L	1.0	0.065	1	11/12/18 00:00	11/14/18 18:28	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**446**	mg/L	20.0	4.9	1		11/16/18 19:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**456**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**20.1**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**2.0**	mg/L	0.20	0.012	1		11/10/18 12:11		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**11.3**	mg/L	1.0	0.29	1		11/26/18 01:46	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.19	1		11/26/18 01:46	16984-48-8	
Sulfate	**63.9**	mg/L	10.0	2.4	10		11/26/18 02:00	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.70**	mg/L	0.10	0.050	1		11/14/18 16:49	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-DUP-2 **Lab ID: 60286215009** Collected: 11/07/18 08:00 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	**581**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:51	7440-39-3	
Boron	**1250**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:51	7440-42-8	
Calcium	**158000**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:51	7440-70-2	
Iron	**18000**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:51	7439-89-6	
Lithium	**30.0**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:51	7439-93-2	
Magnesium	**40500**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:51	7439-95-4	
Manganese	**424**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:51	7439-96-5	
Molybdenum	**1.6J**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:51	7439-98-7	
Potassium	**7500**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:51	7440-09-7	
Sodium	**33800**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:51	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**76.8**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 14:33	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**547**	mg/L	20.0	4.9	1		11/16/18 19:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**895**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**17.4**	mg/L	0.050		1		11/26/18 10:55	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.57**	mg/L	0.20	0.012	1		11/10/18 12:12		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**16.0**	mg/L	1.0	0.29	1		11/26/18 02:14	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.19	1		11/26/18 02:14	16984-48-8	
Sulfate	**84.2**	mg/L	5.0	1.2	5		11/26/18 02:29	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.99**	mg/L	0.10	0.050	1		11/14/18 16:50	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-FB-1 **Lab ID: 60286215010** Collected: 11/07/18 14:30 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	**<1.5**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:53	7440-39-3	
Boron	**<12.5**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:53	7440-42-8	
Calcium	**54.2J**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:53	7440-70-2	
Iron	**11.5J**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:53	7439-89-6	
Lithium	**<4.6**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:53	7439-93-2	
Magnesium	**21.9J**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:53	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:53	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:53	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:53	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:53	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	11/15/18 11:26	11/16/18 14:36	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/16/18 20:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**402**	mg/L	5.0	5.0	1		11/13/18 06:46		L2
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.012J**	mg/L	0.050		1		11/26/18 10:55	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 13:32		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.34J**	mg/L	1.0	0.29	1		11/26/18 13:39	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/26/18 13:39	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		11/26/18 13:39	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/14/18 16:51	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-5D **Lab ID: 60286215011** Collected: 11/08/18 15:30 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	**60.0**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:55	7440-39-3	
Boron	**5130**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:55	7440-42-8	
Calcium	**63200**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:55	7440-70-2	
Iron	**28.3J**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:55	7439-89-6	
Lithium	**12.9**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:55	7439-93-2	
Magnesium	**77.4**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:55	7439-95-4	
Manganese	**8.2**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:55	7439-96-5	B
Molybdenum	**151**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:55	7439-98-7	
Potassium	**12200**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:55	7440-09-7	
Sodium	**67400**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:55	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**16.1**	ug/L	1.0	0.065	1	11/15/18 11:26	11/16/18 14:46	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**53.6**	mg/L	20.0	4.9	1		11/16/18 20:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**708**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		11/26/18 10:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.046J**	mg/L	0.20	0.012	1		11/10/18 15:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.0**	mg/L	1.0	0.29	1		11/24/18 19:28	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/24/18 19:28	16984-48-8	
Sulfate	**269**	mg/L	20.0	4.8	20		11/24/18 19:44	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.068J**	mg/L	0.10	0.050	1		11/15/18 10:28	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-FB-2 **Lab ID: 60286215012** 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	**62.6**	ug/L	5.0	1.5	1	11/12/18 18:25	11/20/18 21:57	7440-39-3	
Boron	**5380**	ug/L	100	12.5	1	11/12/18 18:25	11/20/18 21:57	7440-42-8	
Calcium	**66600**	ug/L	200	53.5	1	11/12/18 18:25	11/20/18 21:57	7440-70-2	
Iron	**35.7J**	ug/L	50.0	6.1	1	11/12/18 18:25	11/20/18 21:57	7439-89-6	
Lithium	**17.7**	ug/L	10.0	4.6	1	11/12/18 18:25	11/20/18 21:57	7439-93-2	
Magnesium	**80.7**	ug/L	50.0	14.0	1	11/12/18 18:25	11/20/18 21:57	7439-95-4	
Manganese	**9.8**	ug/L	5.0	0.73	1	11/12/18 18:25	11/20/18 21:57	7439-96-5	B
Molybdenum	**158**	ug/L	20.0	0.90	1	11/12/18 18:25	11/20/18 21:57	7439-98-7	
Potassium	**12900**	ug/L	500	79.3	1	11/12/18 18:25	11/20/18 21:57	7440-09-7	
Sodium	**70900**	ug/L	500	157	1	11/12/18 18:25	11/20/18 21:57	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	11/15/18 11:26	11/16/18 14:48	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/16/18 20:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**14.0**	mg/L	5.0	5.0	1		11/14/18 13:57		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.036J**	mg/L	0.050		1		11/26/18 10:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/10/18 15:46		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.29**	mg/L	1.0	0.29	1		11/24/18 20:00	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/24/18 20:00	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		11/24/18 20:00	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 10:31	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-3D **Lab ID: 60286215023** Collected: 11/09/18 12:15 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	**82.2**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 13:53	7440-39-3	
Boron	**9300**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 13:53	7440-42-8	
Calcium	**84400**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 13:53	7440-70-2	
Iron	**64.8**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 13:53	7439-89-6	
Lithium	**13.4**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 13:53	7439-93-2	
Magnesium	**5160**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 13:53	7439-95-4	
Manganese	**113**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 13:53	7439-96-5	
Molybdenum	**206**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 13:53	7439-98-7	
Potassium	**9650**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 13:53	7440-09-7	
Sodium	**75600**	ug/L	500	157	1	11/26/18 18:00	11/27/18 13:53	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.7**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:03	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**44.8**	mg/L	20.0	4.9	1		11/17/18 21:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**600**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.065**	mg/L	0.050		1		11/30/18 15:46	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 13:52		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.6**	mg/L	1.0	0.29	1		11/26/18 22:14	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/26/18 22:14	16984-48-8	
Sulfate	**350**	mg/L	50.0	12.0	50		11/26/18 23:02	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.24**	mg/L	0.10	0.050	1		11/15/18 11:16	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-4D **Lab ID: 60286215024** Collected: 11/09/18 09:15 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	**81.5**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 13:57	7440-39-3	
Boron	**4970**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 13:57	7440-42-8	
Calcium	**61200**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 13:57	7440-70-2	
Iron	**271**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 13:57	7439-89-6	
Lithium	**33.2**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 13:57	7439-93-2	
Magnesium	**8660**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 13:57	7439-95-4	
Manganese	**277**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 13:57	7439-96-5	
Molybdenum	**107**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 13:57	7439-98-7	
Potassium	**8470**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 13:57	7440-09-7	
Sodium	**114000**	ug/L	500	157	1	11/26/18 18:00	11/27/18 13:57	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.16J**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:09	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**56.0**	mg/L	20.0	4.9	1		11/17/18 21:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1040**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.19**	mg/L	0.050		1		11/30/18 15:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.078J**	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	**21.2**	mg/L	2.0	0.58	2		12/01/18 20:16	16887-00-6	
Fluoride	**0.49**	mg/L	0.20	0.19	1		11/26/18 23:18	16984-48-8	
Sulfate	**366**	mg/L	50.0	12.0	50		11/26/18 23:34	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.19**	mg/L	0.10	0.050	1		11/15/18 11:18	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-6D **Lab ID: 60286215025** Collected: 11/09/18 10:35 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	**114**	ug/L	5.0	1.5	1	11/26/18 18:00	11/27/18 13:59	7440-39-3	
Boron	**15500**	ug/L	100	12.5	1	11/26/18 18:00	11/27/18 13:59	7440-42-8	
Calcium	**97200**	ug/L	200	53.5	1	11/26/18 18:00	11/27/18 13:59	7440-70-2	
Iron	**729**	ug/L	50.0	6.1	1	11/26/18 18:00	11/27/18 13:59	7439-89-6	
Lithium	**5.2J**	ug/L	10.0	4.6	1	11/26/18 18:00	11/27/18 13:59	7439-93-2	
Magnesium	**5910**	ug/L	50.0	14.0	1	11/26/18 18:00	11/27/18 13:59	7439-95-4	
Manganese	**495**	ug/L	5.0	0.73	1	11/26/18 18:00	11/27/18 13:59	7439-96-5	
Molybdenum	**591**	ug/L	20.0	0.90	1	11/26/18 18:00	11/27/18 13:59	7439-98-7	
Potassium	**18200**	ug/L	500	79.3	1	11/26/18 18:00	11/27/18 13:59	7440-09-7	
Sodium	**89600**	ug/L	500	157	1	11/26/18 18:00	11/27/18 13:59	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**15.4**	ug/L	1.0	0.065	1	11/23/18 15:05	11/26/18 16:11	7440-38-2	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**58.8**	mg/L	20.0	4.9	1		11/20/18 11:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**669**	mg/L	5.0	5.0	1		11/15/18 14:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.67**	mg/L	0.050		1		11/30/18 15:46	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**0.056J**	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	**21.2**	mg/L	2.0	0.58	2		11/27/18 00:06	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		11/26/18 23:50	16984-48-8	
Sulfate	**433**	mg/L	50.0	12.0	50		11/27/18 00:22	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 11:19	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 554744 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012

METHOD BLANK: 2275800 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	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	
Iron	ug/L	<6.1	50.0	6.1	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	
Boron	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	9880	99	85-115	
Iron	ug/L	10000	9670	97	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	
Boron	ug/L		1000	1000	15100	15200	125	139	70-130	1	20	M1
Calcium	ug/L		10000	10000	315000	316000	142	156	70-130	0	20	M1
Iron	ug/L		10000	10000	35100	35000	97	97	70-130	0	20	
Lithium	ug/L	31.0	1000	1000	981	966	95	94	70-130	1	20	
Magnesium	ug/L		10000	10000	66600	67000	101	105	70-130	1	20	
Manganese	ug/L		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	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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
Potassium	ug/L		10000	10000	17600	17700	99	100	70-130	1	20	
Sodium	ug/L		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	
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	
Iron	ug/L	11900	10000	10000	21500	21300	96	94	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	
Boron	ug/L	113	1000	1120	101	70-130	
Calcium	ug/L	114000	10000	124000	98	70-130	
Iron	ug/L	22700	10000	32300	96	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	
Potassium	ug/L	4120	10000	13800	97	70-130	
Sodium	ug/L	13800	10000	23800	100	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556876 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60286215023, 60286215024, 60286215025

METHOD BLANK: 2284987 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024, 60286215025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	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	
Iron	ug/L	<6.1	50.0	6.1	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	
Boron	ug/L	1000	979	98	85-115	
Calcium	ug/L	10000	9940	99	85-115	
Iron	ug/L	10000	10000	100	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	
Boron	ug/L	9300	1000	10400	112	70-130	
Calcium	ug/L	84400	10000	94400	100	70-130	
Iron	ug/L	64.8	10000	10100	101	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	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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	
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	
Iron	ug/L	368	10000	10000	10400	10300	100	100	70-130	0	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
Pace Project No.: 60286215

QC Batch: 554584 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286215001, 60286215002

METHOD BLANK: 2275036 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002

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 LCPA
Pace Project No.: 60286215

QC Batch: 554585 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008

METHOD BLANK: 2275041 Matrix: Water
Associated Lab Samples: 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/14/18 18:14	

LABORATORY CONTROL SAMPLE: 2275042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.6	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2275043 2275044

Parameter	Units	60286215003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	20.7	40	40	61.3	60.5	101	99	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 555338 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286215009, 60286215010, 60286215011, 60286215012

METHOD BLANK: 2278064 Matrix: Water
Associated Lab Samples: 60286215009, 60286215010, 60286215011, 60286215012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	0.072J	1.0	0.065	11/16/18 14:08	

LABORATORY CONTROL SAMPLE: 2278065

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	40.1	100	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
Arsenic	ug/L	3.9	40	40	41.1	41.1	93	93	70-130	0	20	

MATRIX SPIKE SAMPLE: 2278068

Parameter	Units	60286261004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	0.59	40	40.8	100	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556679 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60286215023, 60286215024, 60286215025

METHOD BLANK: 2283974 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024, 60286215025

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	11/26/18 16:00	

LABORATORY CONTROL SAMPLE: 2283975

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.4	98	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
Arsenic	ug/L	1.7	40	40	41.3	41.2	99	99	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA &E
Pace Project No.: 60286215

QC Batch: 555675 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286215001, 60286215002

METHOD BLANK: 2279679 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/16/18 16:02	

LABORATORY CONTROL SAMPLE: 2279680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	507	101	90-110	

SAMPLE DUPLICATE: 2279681

Parameter	Units	60286398006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	101	101	0	10	

SAMPLE DUPLICATE: 2279682

Parameter	Units	60286349012 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	630	637	1	10	

SAMPLE DUPLICATE: 2280829

Parameter	Units	60286214001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L		328	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 555761 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012

METHOD BLANK: 2280113 Matrix: Water
Associated Lab Samples: 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012

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
Pace Project No.: 60286215

QC Batch: 555811 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286215023, 60286215024

METHOD BLANK: 2280687 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024

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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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556192 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60286215025

METHOD BLANK: 2282069 Matrix: Water
Associated Lab Samples: 60286215025

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
Pace Project No.: 60286215

QC Batch: 555016 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010

METHOD BLANK: 2276777 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/13/18 06:59	

LABORATORY CONTROL SAMPLE: 2276778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	2000	918	46	80-120	L2

SAMPLE DUPLICATE: 2276779

Parameter	Units	60286215003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1020	677	41	10	D6

SAMPLE DUPLICATE: 2276780

Parameter	Units	60286215007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	427	544	24	10	D6

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 555031 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286215011, 60286215012

METHOD BLANK: 2276914 Matrix: Water
Associated Lab Samples: 60286215011, 60286215012

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
Pace Project No.: 60286215

QC Batch: 555353 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60286215023, 60286215024, 60286215025

METHOD BLANK: 2278151 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024, 60286215025

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
Pace Project No.: 60286215

QC Batch: 554530 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286215001, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009

METHOD BLANK: 2274461 Matrix: Water
Associated Lab Samples: 60286215001, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 12:07	H6

LABORATORY CONTROL SAMPLE: 2274462

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

SAMPLE DUPLICATE: 2274464

Parameter	Units	60285787001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	1.8	1.7	4	20	H6

SAMPLE DUPLICATE: 2274465

Parameter	Units	60285787003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.32	0.28	13	20	H6

SAMPLE DUPLICATE: 2274466

Parameter	Units	60286214001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L		13.6	1	20	H6

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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: 60286215002, 60286215010, 60286215023, 60286215024, 60286215025

METHOD BLANK: 2274532 Matrix: Water
Associated Lab Samples: 60286215002, 60286215010, 60286215023, 60286215024, 60286215025

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
Pace Project No.: 60286215

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: 60286215011, 60286215012

METHOD BLANK: 2274674 Matrix: Water
Associated Lab Samples: 60286215011, 60286215012

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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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 554796 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60286215003

METHOD BLANK: 2275913 Matrix: Water
Associated Lab Samples: 60286215003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/14/18 15:33	H6

LABORATORY CONTROL SAMPLE: 2275914

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	101	90-110	H6

SAMPLE DUPLICATE: 2275915

Parameter	Units	60286215003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.094J	0.10J		20	H6

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556563 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215002, 60286215003

METHOD BLANK: 2283534 Matrix: Water
Associated Lab Samples: 60286215002, 60286215003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.31J	1.0	0.29	11/21/18 18:56	
Sulfate	mg/L	<0.24	1.0	0.24	11/21/18 18:56	

LABORATORY CONTROL SAMPLE: 2283535

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	
Sulfate	mg/L	5	4.6	91	90-110	

MATRIX SPIKE SAMPLE: 2283538

Parameter	Units	60286215003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	568	250	739	68	90-110	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556691 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215011, 60286215012

METHOD BLANK: 2284087 Matrix: Water
Associated Lab Samples: 60286215011, 60286215012

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
Pace Project No.: 60286215

QC Batch: 556718 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009

METHOD BLANK: 2284553 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/25/18 17:57	
Fluoride	mg/L	<0.19	0.20	0.19	11/25/18 17:57	
Sulfate	mg/L	<0.24	1.0	0.24	11/25/18 17:57	

LABORATORY CONTROL SAMPLE: 2284554

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Fluoride	mg/L	2.5	2.6	105	90-110	
Sulfate	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2284555 2284556

Parameter	Units	60286214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L		5	5	21.1	21.6	95	104	90-110	2	15	E
Fluoride	mg/L		2.5	2.5	3.0	3.2	114	121	90-110	6	15	M1
Sulfate	mg/L		500	500	1430	1420	90	88	90-110	1	15	M1

MATRIX SPIKE SAMPLE: 2284557

Parameter	Units	60286215003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	14.5	5	19.5	100	90-110	
Fluoride	mg/L	0.29	2.5	2.9	104	90-110	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556826 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215023, 60286215024, 60286215025

METHOD BLANK: 2284823 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024, 60286215025

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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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 556901
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215010

METHOD BLANK: 2285072
Matrix: Water
Associated Lab Samples: 60286215010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/26/18 10:01	
Fluoride	mg/L	<0.19	0.20	0.19	11/26/18 10:01	
Sulfate	mg/L	<0.24	1.0	0.24	11/26/18 10:01	

LABORATORY CONTROL SAMPLE: 2285073

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	2.3	92	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 557819 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60286215024

METHOD BLANK: 2288548 Matrix: Water
Associated Lab Samples: 60286215024

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	12/01/18 16:31	

LABORATORY CONTROL SAMPLE: 2288549

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10	9.6	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2288550 2288551

Parameter	Units	60286569009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	<0.29	5	5	4.4	4.4	89	88	90-110	1	15	M1

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 554773 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010

METHOD BLANK: 2275875 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/14/18 16:24	

LABORATORY CONTROL SAMPLE: 2275876

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	2.0	98	90-110	

MATRIX SPIKE SAMPLE: 2275877

Parameter	Units	60286214003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L		2	2.7	90	90-110	

MATRIX SPIKE SAMPLE: 2278555

Parameter	Units	60286215005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.76	2	2.6	90	90-110	

SAMPLE DUPLICATE: 2275878

Parameter	Units	60286215003 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	0.23	0.25	9	10	

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 554982 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286215011, 60286215012

METHOD BLANK: 2276684 Matrix: Water
Associated Lab Samples: 60286215011, 60286215012

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
Pace Project No.: 60286215

QC Batch: 554983 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60286215023, 60286215024, 60286215025

METHOD BLANK: 2276689 Matrix: Water
Associated Lab Samples: 60286215023, 60286215024, 60286215025

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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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-1D **Lab ID: 60286215001** Collected: 11/07/18 13:35 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.20 ± 0.545 (0.163) C:NA T:88%**	pCi/L	12/06/18 20:58	13982-63-3	
Radium-228	EPA 904.0	**3.13 ± 0.793 (0.717) C:72% T:81%**	pCi/L	12/06/18 12:32	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-2D **Lab ID: 60286215002** Collected: 11/07/18 14:40 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.239 ± 0.332 (0.554) C:NA T:85%**	pCi/L	12/06/18 20:58	13982-63-3	
Radium-228	EPA 904.0	**1.60 ± 0.653 (0.986) C:67% T:58%**	pCi/L	12/06/18 12:32	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-7D **Lab ID: 60286215003** Collected: 11/07/18 14:45 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.740 ± 0.598 (0.870) C:NA T:86%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**0.634 ± 0.471 (0.900) C:67% T:61%**	pCi/L	12/06/18 12:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-8D **Lab ID: 60286215004** Collected: 11/07/18 10:55 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.708 ± 0.584 (0.843) C:NA T:83%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**1.02 ± 0.551 (0.980) C:71% T:63%**	pCi/L	12/06/18 12:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-9D **Lab ID: 60286215005** Collected: 11/07/18 09:30 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.565 ± 0.512 (0.755) C:NA T:86%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**1.19 ± 0.602 (1.05) C:64% T:69%**	pCi/L	12/06/18 12:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-BMW-1D **Lab ID: 60286215006** Collected: 11/07/18 10:45 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**2.35 ± 0.752 (0.384) C:NA T:98%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**1.79 ± 0.595 (0.757) C:68% T:73%**	pCi/L	12/06/18 12:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-BMW-2D **Lab ID: 60286215007** Collected: 11/07/18 11:40 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.424 ± 0.396 (0.562) C:NA T:92%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**0.689 ± 0.444 (0.839) C:66% T:83%**	pCi/L	12/06/18 12:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-DUP-1 **Lab ID: 60286215008** Collected: 11/07/18 08:00 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.415 ± 0.352 (0.436) C:NA T:85%**	pCi/L	12/06/18 21:12	13982-63-3	
Radium-228	EPA 904.0	**1.35 ± 0.492 (0.702) C:69% T:85%**	pCi/L	12/06/18 12:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-DUP-2 **Lab ID: 60286215009** Collected: 11/07/18 08:00 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.929 ± 0.544 (0.625) C:NA T:90%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**2.11 ± 0.588 (0.642) C:81% T:91%**	pCi/L	12/07/18 15:46	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-FB-1 **Lab ID: 60286215010** Collected: 11/07/18 14:30 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.111 ± 0.266 (0.515) C:NA T:91%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**0.158 ± 0.387 (0.864) C:73% T:77%**	pCi/L	12/07/18 15:46	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-5D **Lab ID: 60286215011** Collected: 11/08/18 15:30 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	**0.437 ± 0.327 (0.169) C:NA T:88%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**0.214 ± 0.357 (0.777) C:77% T:83%**	pCi/L	12/06/18 11:04	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-FB-2 **Lab ID: 60286215012** Collected: 11/08/18 15:15 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	**0.308 ± 0.321 (0.453) C:NA T:82%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**0.393 ± 0.364 (0.739) C:75% T:86%**	pCi/L	12/06/18 11:04	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-3D **Lab ID: 60286215023** Collected: 11/09/18 12:15 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	**0.495 ± 0.347 (0.168) C:NA T:84%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**-0.160 ± 0.317 (0.769) C:73% T:88%**	pCi/L	12/06/18 11:04	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-4D **Lab ID: 60286215024** Collected: 11/09/18 09:15 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	**0.800 ± 0.429 (0.155) C:NA T:89%**	pCi/L	12/06/18 21:26	13982-63-3	
Radium-228	EPA 904.0	**0.275 ± 0.425 (0.920) C:73% T:88%**	pCi/L	12/06/18 11:05	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-6D **Lab ID: 60286215025** Collected: 11/09/18 10:35 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	**0.567 ± 0.376 (0.171) C:NA T:86%**	pCi/L	12/06/18 21:43	13982-63-3	
Radium-228	EPA 904.0	**0.420 ± 0.339 (0.673) C:78% T:91%**	pCi/L	12/06/18 11:05	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-7D MS **Lab ID: 60286215028** Collected: 11/07/18 14:45 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**103.94 %REC ± NA (NA) C:NA T:NA**	pCi/L	12/06/18 21:43	13982-63-3	
Radium-228	EPA 904.0	**88.66 %REC ± NA (NA) C:NA T:NA**	pCi/L	12/06/18 12:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Sample: L-UMW-7D MSD **Lab ID: 60286215029** Collected: 11/07/18 14:45 Received: 11/08/18 04:02 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**102.15 %REC 1.74 RPD ± NA (NA) C:NA T:NA**	pCi/L	12/06/18 21:43	13982-63-3	
Radium-228	EPA 904.0	**90.47 %REC 2.02 RPD ± NA (NA) C:NA T:NA**	pCi/L	12/06/18 12:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 321152 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215028, 60286215029

METHOD BLANK: 1566304 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215028, 60286215029

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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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 321153 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60286215011, 60286215012, 60286215023, 60286215024, 60286215025

METHOD BLANK: 1566305 Matrix: Water
Associated Lab Samples: 60286215011, 60286215012, 60286215023, 60286215024, 60286215025

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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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 321138 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012, 60286215023, 60286215024, 60286215025, 60286215028, 60286215029

METHOD BLANK: 1566284 Matrix: Water
Associated Lab Samples: 60286215001, 60286215002, 60286215003, 60286215004, 60286215005, 60286215006, 60286215007, 60286215008, 60286215009, 60286215010, 60286215011, 60286215012, 60286215023, 60286215024, 60286215025, 60286215028, 60286215029

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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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

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

METHOD BLANK: 1566289 Matrix: Water
Associated Lab Samples:

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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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

QC Batch: 321154 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60286215009, 60286215010

METHOD BLANK: 1566306 Matrix: Water
Associated Lab Samples: 60286215009, 60286215010

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
Pace Project No.: 60286215

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.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286215001	**L-UMW-1D**	EPA 200.7	554744	EPA 200.7	554814
60286215002	**L-UMW-2D**	EPA 200.7	554744	EPA 200.7	554814
60286215003	**L-UMW-7D**	EPA 200.7	554744	EPA 200.7	554814
60286215004	**L-UMW-8D**	EPA 200.7	554744	EPA 200.7	554814
60286215005	**L-UMW-9D**	EPA 200.7	554744	EPA 200.7	554814
60286215006	**L-BMW-1D**	EPA 200.7	554744	EPA 200.7	554814
60286215007	**L-BMW-2D**	EPA 200.7	554744	EPA 200.7	554814
60286215008	**L-UMW-DUP-1**	EPA 200.7	554744	EPA 200.7	554814
60286215009	**L-UMW-DUP-2**	EPA 200.7	554744	EPA 200.7	554814
60286215010	**L-UMW-FB-1**	EPA 200.7	554744	EPA 200.7	554814
60286215011	**L-UMW-5D**	EPA 200.7	554744	EPA 200.7	554814
60286215012	**L-UMW-FB-2**	EPA 200.7	554744	EPA 200.7	554814
60286215023	**L-UMW-3D**	EPA 200.7	556876	EPA 200.7	556951
60286215024	**L-UMW-4D**	EPA 200.7	556876	EPA 200.7	556951
60286215025	**L-UMW-6D**	EPA 200.7	556876	EPA 200.7	556951
60286215001	**L-UMW-1D**	EPA 200.8	554584	EPA 200.8	554713
60286215002	**L-UMW-2D**	EPA 200.8	554584	EPA 200.8	554713
60286215003	**L-UMW-7D**	EPA 200.8	554585	EPA 200.8	554714
60286215004	**L-UMW-8D**	EPA 200.8	554585	EPA 200.8	554714
60286215005	**L-UMW-9D**	EPA 200.8	554585	EPA 200.8	554714
60286215006	**L-BMW-1D**	EPA 200.8	554585	EPA 200.8	554714
60286215007	**L-BMW-2D**	EPA 200.8	554585	EPA 200.8	554714
60286215008	**L-UMW-DUP-1**	EPA 200.8	554585	EPA 200.8	554714
60286215009	**L-UMW-DUP-2**	EPA 200.8	555338	EPA 200.8	555405
60286215010	**L-UMW-FB-1**	EPA 200.8	555338	EPA 200.8	555405
60286215011	**L-UMW-5D**	EPA 200.8	555338	EPA 200.8	555405
60286215012	**L-UMW-FB-2**	EPA 200.8	555338	EPA 200.8	555405
60286215023	**L-UMW-3D**	EPA 200.8	556679	EPA 200.8	556837
60286215024	**L-UMW-4D**	EPA 200.8	556679	EPA 200.8	556837
60286215025	**L-UMW-6D**	EPA 200.8	556679	EPA 200.8	556837
60286215001	**L-UMW-1D**	EPA 903.1	321138		
60286215002	**L-UMW-2D**	EPA 903.1	321138		
60286215003	**L-UMW-7D**	EPA 903.1	321138		
60286215004	**L-UMW-8D**	EPA 903.1	321138		
60286215005	**L-UMW-9D**	EPA 903.1	321138		
60286215006	**L-BMW-1D**	EPA 903.1	321138		
60286215007	**L-BMW-2D**	EPA 903.1	321138		
60286215008	**L-UMW-DUP-1**	EPA 903.1	321138		
60286215009	**L-UMW-DUP-2**	EPA 903.1	321138		
60286215010	**L-UMW-FB-1**	EPA 903.1	321138		
60286215011	**L-UMW-5D**	EPA 903.1	321138		
60286215012	**L-UMW-FB-2**	EPA 903.1	321138		
60286215023	**L-UMW-3D**	EPA 903.1	321138		
60286215024	**L-UMW-4D**	EPA 903.1	321138		
60286215025	**L-UMW-6D**	EPA 903.1	321138		
60286215028	**L-UMW-7D MS**	EPA 903.1	321138		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286215029	L-UMW-7D MSD	EPA 903.1	321138		
60286215001	L-UMW-1D	EPA 904.0	321152		
60286215002	L-UMW-2D	EPA 904.0	321152		
60286215003	L-UMW-7D	EPA 904.0	321152		
60286215004	L-UMW-8D	EPA 904.0	321152		
60286215005	L-UMW-9D	EPA 904.0	321152		
60286215006	L-BMW-1D	EPA 904.0	321152		
60286215007	L-BMW-2D	EPA 904.0	321152		
60286215008	L-UMW-DUP-1	EPA 904.0	321152		
60286215009	L-UMW-DUP-2	EPA 904.0	321154		
60286215010	L-UMW-FB-1	EPA 904.0	321154		
60286215011	L-UMW-5D	EPA 904.0	321153		
60286215012	L-UMW-FB-2	EPA 904.0	321153		
60286215023	L-UMW-3D	EPA 904.0	321153		
60286215024	L-UMW-4D	EPA 904.0	321153		
60286215025	L-UMW-6D	EPA 904.0	321153		
60286215028	L-UMW-7D MS	EPA 904.0	321152		
60286215029	L-UMW-7D MSD	EPA 904.0	321152		
60286215001	L-UMW-1D	SM 2320B	555675		
60286215002	L-UMW-2D	SM 2320B	555675		
60286215003	L-UMW-7D	SM 2320B	555761		
60286215004	L-UMW-8D	SM 2320B	555761		
60286215005	L-UMW-9D	SM 2320B	555761		
60286215006	L-BMW-1D	SM 2320B	555761		
60286215007	L-BMW-2D	SM 2320B	555761		
60286215008	L-UMW-DUP-1	SM 2320B	555761		
60286215009	L-UMW-DUP-2	SM 2320B	555761		
60286215010	L-UMW-FB-1	SM 2320B	555761		
60286215011	L-UMW-5D	SM 2320B	555761		
60286215012	L-UMW-FB-2	SM 2320B	555761		
60286215023	L-UMW-3D	SM 2320B	555811		
60286215024	L-UMW-4D	SM 2320B	555811		
60286215025	L-UMW-6D	SM 2320B	556192		
60286215001	L-UMW-1D	SM 2540C	555016		
60286215002	L-UMW-2D	SM 2540C	555016		
60286215003	L-UMW-7D	SM 2540C	555016		
60286215004	L-UMW-8D	SM 2540C	555016		
60286215005	L-UMW-9D	SM 2540C	555016		
60286215006	L-BMW-1D	SM 2540C	555016		
60286215007	L-BMW-2D	SM 2540C	555016		
60286215008	L-UMW-DUP-1	SM 2540C	555016		
60286215009	L-UMW-DUP-2	SM 2540C	555016		
60286215010	L-UMW-FB-1	SM 2540C	555016		
60286215011	L-UMW-5D	SM 2540C	555031		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286215012	L-UMW-FB-2	SM 2540C	555031		
60286215023	L-UMW-3D	SM 2540C	555353		
60286215024	L-UMW-4D	SM 2540C	555353		
60286215025	L-UMW-6D	SM 2540C	555353		
60286215001	L-UMW-1D	SM 3500-Fe B#4	556803		
60286215002	L-UMW-2D	SM 3500-Fe B#4	556803		
60286215003	L-UMW-7D	SM 3500-Fe B#4	556803		
60286215004	L-UMW-8D	SM 3500-Fe B#4	556803		
60286215005	L-UMW-9D	SM 3500-Fe B#4	556803		
60286215006	L-BMW-1D	SM 3500-Fe B#4	556803		
60286215007	L-BMW-2D	SM 3500-Fe B#4	556803		
60286215008	L-UMW-DUP-1	SM 3500-Fe B#4	556803		
60286215009	L-UMW-DUP-2	SM 3500-Fe B#4	556803		
60286215010	L-UMW-FB-1	SM 3500-Fe B#4	556803		
60286215011	L-UMW-5D	SM 3500-Fe B#4	556806		
60286215012	L-UMW-FB-2	SM 3500-Fe B#4	556806		
60286215023	L-UMW-3D	SM 3500-Fe B#4	557770		
60286215024	L-UMW-4D	SM 3500-Fe B#4	557770		
60286215025	L-UMW-6D	SM 3500-Fe B#4	557770		
60286215001	L-UMW-1D	SM 3500-Fe B#4	554530		
60286215002	L-UMW-2D	SM 3500-Fe B#4	554544		
60286215003	L-UMW-7D	SM 3500-Fe B#4	554796		
60286215004	L-UMW-8D	SM 3500-Fe B#4	554530		
60286215005	L-UMW-9D	SM 3500-Fe B#4	554530		
60286215006	L-BMW-1D	SM 3500-Fe B#4	554530		
60286215007	L-BMW-2D	SM 3500-Fe B#4	554530		
60286215008	L-UMW-DUP-1	SM 3500-Fe B#4	554530		
60286215009	L-UMW-DUP-2	SM 3500-Fe B#4	554530		
60286215010	L-UMW-FB-1	SM 3500-Fe B#4	554544		
60286215011	L-UMW-5D	SM 3500-Fe B#4	554558		
60286215012	L-UMW-FB-2	SM 3500-Fe B#4	554558		
60286215023	L-UMW-3D	SM 3500-Fe B#4	554544		
60286215024	L-UMW-4D	SM 3500-Fe B#4	554544		
60286215025	L-UMW-6D	SM 3500-Fe B#4	554544		
60286215001	L-UMW-1D	EPA 300.0	556718		
60286215002	L-UMW-2D	EPA 300.0	556563		
60286215002	L-UMW-2D	EPA 300.0	556718		
60286215003	L-UMW-7D	EPA 300.0	556563		
60286215003	L-UMW-7D	EPA 300.0	556718		
60286215004	L-UMW-8D	EPA 300.0	556718		
60286215005	L-UMW-9D	EPA 300.0	556718		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCPA
Pace Project No.: 60286215

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60286215006	**L-BMW-1D**	EPA 300.0	556718		
60286215007	**L-BMW-2D**	EPA 300.0	556718		
60286215008	**L-UMW-DUP-1**	EPA 300.0	556718		
60286215009	**L-UMW-DUP-2**	EPA 300.0	556718		
60286215010	**L-UMW-FB-1**	EPA 300.0	556901		
60286215011	**L-UMW-5D**	EPA 300.0	556691		
60286215012	**L-UMW-FB-2**	EPA 300.0	556691		
60286215023	**L-UMW-3D**	EPA 300.0	556826		
60286215024	**L-UMW-4D**	EPA 300.0	556826		
60286215024	**L-UMW-4D**	EPA 300.0	557819		
60286215025	**L-UMW-6D**	EPA 300.0	556826		
60286215001	**L-UMW-1D**	EPA 365.4	554773		
60286215002	**L-UMW-2D**	EPA 365.4	554773		
60286215003	**L-UMW-7D**	EPA 365.4	554773		
60286215004	**L-UMW-8D**	EPA 365.4	554773		
60286215005	**L-UMW-9D**	EPA 365.4	554773		
60286215006	**L-BMW-1D**	EPA 365.4	554773		
60286215007	**L-BMW-2D**	EPA 365.4	554773		
60286215008	**L-UMW-DUP-1**	EPA 365.4	554773		
60286215009	**L-UMW-DUP-2**	EPA 365.4	554773		
60286215010	**L-UMW-FB-1**	EPA 365.4	554773		
60286215011	**L-UMW-5D**	EPA 365.4	554982		
60286215012	**L-UMW-FB-2**	EPA 365.4	554982		
60286215023	**L-UMW-3D**	EPA 365.4	554983		
60286215024	**L-UMW-4D**	EPA 365.4	554983		
60286215025	**L-UMW-6D**	EPA 365.4	554983		

REPORT OF LABORATORY ANALYSIS

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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 ☐ 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

Temperature should be above freezing to 6°C 0.4/0.5/2.3 0.5/0.6/2.4

Date and initials of person examining contents: 11-8-18 HF JLS

Chain of Custody present:	☑Yes ☐No ☐N/A	ms/msD- L-umw7-D
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 Date: 11/9/18

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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.

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

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*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N	N		
1	L-UMW-1D	WT	G			11/7/18	1335		6	2	1	3							✓	✓	✓	✓	✓	2BP2U	2BP1N	BP3N	BP3S
2	L-UMW-2D	WT	G			11/7/18	1440		6	2	1	3							✓	✓	✓	✓	✓	↓	↓	↓	↓
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 (3L)	WT	G			11/7/18	1445		6	2	1	3							✓	✓	✓	✓	✓	2BP2U	2BP1N	BP3N	BP3S
8	L-UMW-8D	WT	G			11/7/18	1055		6	2	1	3							✓	✓	✓	✓	✓	↓	↓	↓	↓
9	L-UMW-9D	WT	G			11/7/18	0930		6	2	1	3							✓	✓	✓	✓	✓				
10	L-BMW-1D	WT	G			11/7/18	1045		6	2	1	3							✓	✓	✓	✓	✓				
11	L-BMW-2D	WT	G			11/7/18	1140		6	2	1	3							✓	✓	✓	✓	✓				
12	L-AM-1S	WT	G																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As	Golder /	11/7/18	1735	Stacy Fowler PASI	11.8.18	0402

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.0	Y	Y	Y
2.3			
0.5			
0.6			
2.4			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneid

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.

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:	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	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001D (COC #1)	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
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	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	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						6																
2	L-UMW-DUP-1	WT	G			11/7/18	—		6	2	1	3							✓	✓	✓	✓	✓	2BP2U 2BP1N BP3N BP3S	078
3	L-UMW-DUP-2	WT	G			11/7/18	—		6	2	1	3							✓	✓	✓	✓	✓		094
4	L-UMW-FB-1	WT	G			11/7/18	1430		6	2	1	3							✓	✓	✓	✓	✓		410
5	L-UMW-FB-2	WT	G																						
6	L-UMW-MS-1	WT	G			11/7/18	1445		6	2	1	3							✓	✓	✓	✓	✓	2BP2U BP1N(2) BP3N BP3S	
7	L-UMW-MSD-1	WT	G			11/7/18	1445		6	2	1	3							✓	✓	✓	✓	✓		
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	Golder / Eric Schneider	11/7/18	1735	Harry Fowler PASI	11-8-18	0402	1.0 2.3 0.5 0.6 2.4	Y	Y	Y
							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 Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/07/18

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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? (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: _____

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)

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-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 RA226 RA228 RA226 (2) RA228	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
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As		11/9/18	1430		11/9/18	1432
		11/9/18	1700		11/10/18	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
3.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy J Goodridge

SIGNATURE of SAMPLER: Tommy J Goodridge 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

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Pace Analytical™ www.pacelabs.com

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

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 Good / Golder	11/9/18	1430	[illegible] (FedEx)	11/9/18	1430				
	[illegible] FedEx	11/9/18	1700	[illegible]	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 Good

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.

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical™ www.pacelabs.com

Page: 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 #	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*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-AM-1D	WT	G			11/9/18	1245		6	2	1	3							N	✓	✓	✓	✓	✓	✓		
2	L-UMW-DUP-1	WT	G																N								
3	L-UMW-DUP-2	WT	G																N								
4	L-UMW-FB-1	WT	G																N								
5	L-UMW-FB-2	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: Fe, Mg, Mn, K, Na		11/9/18	1430	FACS	11/9/18	1430	
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl	FACS	11/9/18	1700		11/10	0830	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tommy Golder

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

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical™ www.pacelabs.com

Page: 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 #	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*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			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	PACE	11/9/18	1430	
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl	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

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	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001D (COC #1)	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	Radium 226	Radium 228	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																		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	Tommy Goodwin / Golder	11/9/18	1430	[illegible] / FACS	11/9/18	1430	
*EPA 200.8: As	[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.

COC #83

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

Cooler Temperature (°C): As-read 2.7,2.5 Corr. Factor +0.0 Corrected 2.7,2.5

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: _____ Date: _____

11/8/18

CHAIN-OF-CUSTODY / Analytical Request Document

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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 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): Metals* N; CCR App IV Metals**+Hg N; Alkalinity N; Total Phosphorus N; Ferrous Iron N; Ferric Iron 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*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./Lab I.D. (60286298 60286215, 11/9/18)
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			11/8/18	1530		6	2	1	3						/		/	/	/	/		2BPLU BP3N BP3S 2BP1N -001 (11/9/18)
6	L-UMW-6D	WT	G																						
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																						

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: Fe, Mg, Mn, K, Na	[illegible] / Golder	11/8/18	1735	[illegible] Pace	11/9/18	0312	2.7	Y	Y	Y
**EPA 200.7: Be, Co, Pb; **EPA 200.8: Sb, Cd, Cr, Se, Tl							2.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

11/9/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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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)

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-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			11/8/18	1530		6	2	1	3							/	/	/	/	/		-0011
6	L-UMW-6D	WT	G																							
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																							

HMW 11/9/18
~~0286278~~
0286215

Pace Project No./ Lab I.D.

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	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.

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 2 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 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 (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)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Metals* (N)	CCR App IV Metals**+Hg (N)	Alkalinity (N)	Total Phosphorus (N)	Ferrous Iron (N)	Ferric Iron (N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-AM-1D	WT	G																							
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			11/18/18	1515		6	2	1	3							/		/	/	/	/		2BP2U BP3N BP3S 2BP1N -002
6		WT	G																							
7		WT	G																							
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

Pace Project No./ Lab I.D.: 60286215 ~~60286298~~ AMW 11/9/18

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: Fe, Mg, Mn, K, Na	[signature] / Golder	11/8/18	1735	[signature] pasi	11/9/18	0312	2.7	Y	Y	Y
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl							2.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

CHAIN-OF-CUSTODY / Analytical Request Document

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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	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0001D (COC #1)	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	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Analysis Test Y/N																		N	N	N	N	N		
1	L-AM-1D	WT	G																						60286215
2	L-UMW-DUP-1	WT	G																						~~60286298~~ AMW 11/9/18
3	L-UMW-DUP-2	WT	G																						
4	L-UMW-FB-1	WT	G																						
5	L-UMW-FB-2	WT	G			11/8/18	1515		6	2	1	3							1	1	1	1	1		-002
6		WT	G																						
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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	AMW / 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)

11/7/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 2

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:	153-1406.0001 (COC #2)	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	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*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-UMW-1D	WT	G			11/7/18	1335		6	2	1	3						Y	/		/	/	/	/		60286215-013
2	L-UMW-2D	WT	G			11/7/18	1440		6	2	1	3						Y	/		/	/	/	/		-014
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			11/7/18	1445		6	2	1	3						Y	/		/	/	/	/		-015
8	L-UMW-8D	WT	G				1055																			-016
9	L-UMW-9D	WT	G				0930																			-017
10	L-BMW-1D	WT	G				1045																			-018
11	L-BMW-2D	WT	G				1140																			-019
12	L-AM-1S	WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Fe, Mg, Mn, K, Na	[signature] / Golder	11/8/18	1735				
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl							

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):				

11/7/14

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:	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

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*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-AM-1D	WT	G																							
2	L-UMW-DUP-1	WT	G			11/7/14	—		6	2	1	3							1		1	1	1	1		-020
3	L-UMW-DUP-2	WT	G			11/7/14	—		1	1	1	1							1		1	1	1	1		-021
4	L-UMW-FB-1	WT	G			11/7/14	1430		1	1	1	1							1		1	1	1	1		-022
5	L-UMW-FB-2	WT	G																							
6	L-UMW-MS-1	WT	G			11/7/14	1445		6	2	1	3							1		1	1	1	1		-015
7	L-UMW-MSD-1	WT	G			11/7/14	1445		1	1	1	1							1		1	1	1	1		
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Fe, Mg, Mn, K, Na	Golder	11/8/14	1735				
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Cr, Se, Tl							

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 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 60286215

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

- The metal analysis (EPA 200.7) for L-UMW-FB-2 was incorrect and not used for the validation of the corresponding field sample (L-UMW-5D). The other analyses for L-UMW-FB-2 appeared to be accurate and were used to validate L-UMW-5D.
- 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 compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the PQL and less than ten times the blank results the results were recorded at the result value and qualified as estimates (J).
- When a sample or field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).
- When a compound was detected in a sample corresponding to a lab control sample that was outside the allowed range for percent recovery and/or percent difference the results were recorded at the detection value and qualified as estimates (J).

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Ballwin, Missouri, USA 63021

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - LEC-LCPA - Nov 2018 - NTE
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406
Validation Date: 1/7/19

Laboratory: Pace Analytical
SDG #: 60286215
Analytical Method (type and no.): Metals(200.7+200.8), Hg(7470), Ra(903.1+904.0), Alk(2320B), TDS(2540C), Fe^{2+}(3500), Anions(300.0), P(36
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-UMW-DUP-1, L-UMW-DUP-2, L-UMW-FB-1, 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?	☒	☐	☐	11/7 - 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?	☐	☒	☐	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)?	☒	☐	☐	[01-12] Mn(1.8), As[09-12](0.072),
b) Were analytes detected in the field blank(s)?	☒	☐	☐	[23-25] Mn(0.80),
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	FB-1: Ca(54.2), Fe(11.5), Mg(21.5), Fe^{3+}(0.012), Cl^-(6.34
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	FB-2: Metals(200.7) N/A, TDS(14.0), Fe^{3+}(0.036),

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?	☒ (H)	☒	☐	TDS [01-10]

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ L-UMW-8D DUP-2@ L-~~UMW~~-1D
	☒	☐	☐	FB-1@ L-UMW-2D FB-2@ L-UMW-5D
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	DUP-1: TDS(37.6), Fe^{2+}(64.4), Ra-228(28)
c) Were lab duplicates analyzed (note original and duplicate samples)?				DUP-2: Mo(28), TDS(47), Fe^{2+}(46), Ra-226(26), Ra-228(3
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	SO_4^{2-}, Cl^-, F^-
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	Cl^-, F^-, SO_4^{2-}
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
All Samples	Ferrous Iron (Fe^{2+})	—	J/UJ	Analyzed outside hold time
L-UMW-1D	TDS	556	J	LCS outside limits; Result > MDL
↓	Radium-226 (Ra-226)	1.20	J	RPD exceeded limits; Result > MDC
↓	Radium-228 (Ra-228)	3.13	J	↓ ↓
L-UMW-DUP-2	Ra-226	0.929	J	
↓	Ra-228	2.11	J	
↓	TDS	895	J	LCS outside limits; Results > MDL
L-UMW-2D	TDS	1080	J	↓ ↓
L-UMW-7D	TDS	1020	J	
L-UMW-8D	TDS	667	J	
↓	Ra-228	1.02	J	RPD exceeded limits; Result > MDC
L-UMW-DUP-1	Ra-228	1.35	J	↓ ↓
↓	TDS	456	J	LCS ~~exceeded~~ limits; Result > MDL
L-UMW-9D	TDS	541	J	↓ ↓
L-BMW-1D	TDS	550	J	
L-BMW-2D	TDS	427	J	
L-UMW-FB-1	TDS	402	J	
L-UMW-5D	Manganese (Mn)	8.2	J	Detected in Method Blank; ~~PQL~~ < Result < 10×B
L-UMW-FB-2	↓	9.8	J	↓ ↓

Signature: Tommy J. Goodin Date: 1/7/19

APPENDIX C

Assessment Monitoring Statistical Evaluation

TECHNICAL MEMORANDUM

DATE October 11, 2018 **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

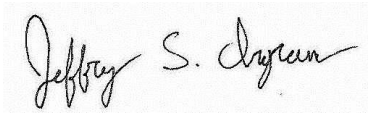
This Technical Memorandum provides the results of the Assessment Monitoring Statistical Evaluation for the LCPA Surface Impoundment at the Labadie Energy Center located in Franklin County Missouri. Included in this memorandum is a brief summary of constituents that are present at a Statistically Significant Level (SSL), an updated 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**).

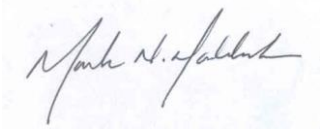
SSLs were calculated using the methods and procedures outlined in the Groundwater Monitoring Plan's (GMP) Statistical Analysis Plan (SAP). No outliers were removed prior to calculation of the confidence intervals. A summary of SSLs at corresponding well(s) is as follows:

- 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/SCP/MNH

Enclosures:
Table 1 – LCPA Groundwater Protection Standards
Appendix A – Sanitas Confidence Interval Statistical Output

Golder Associates Inc.
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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

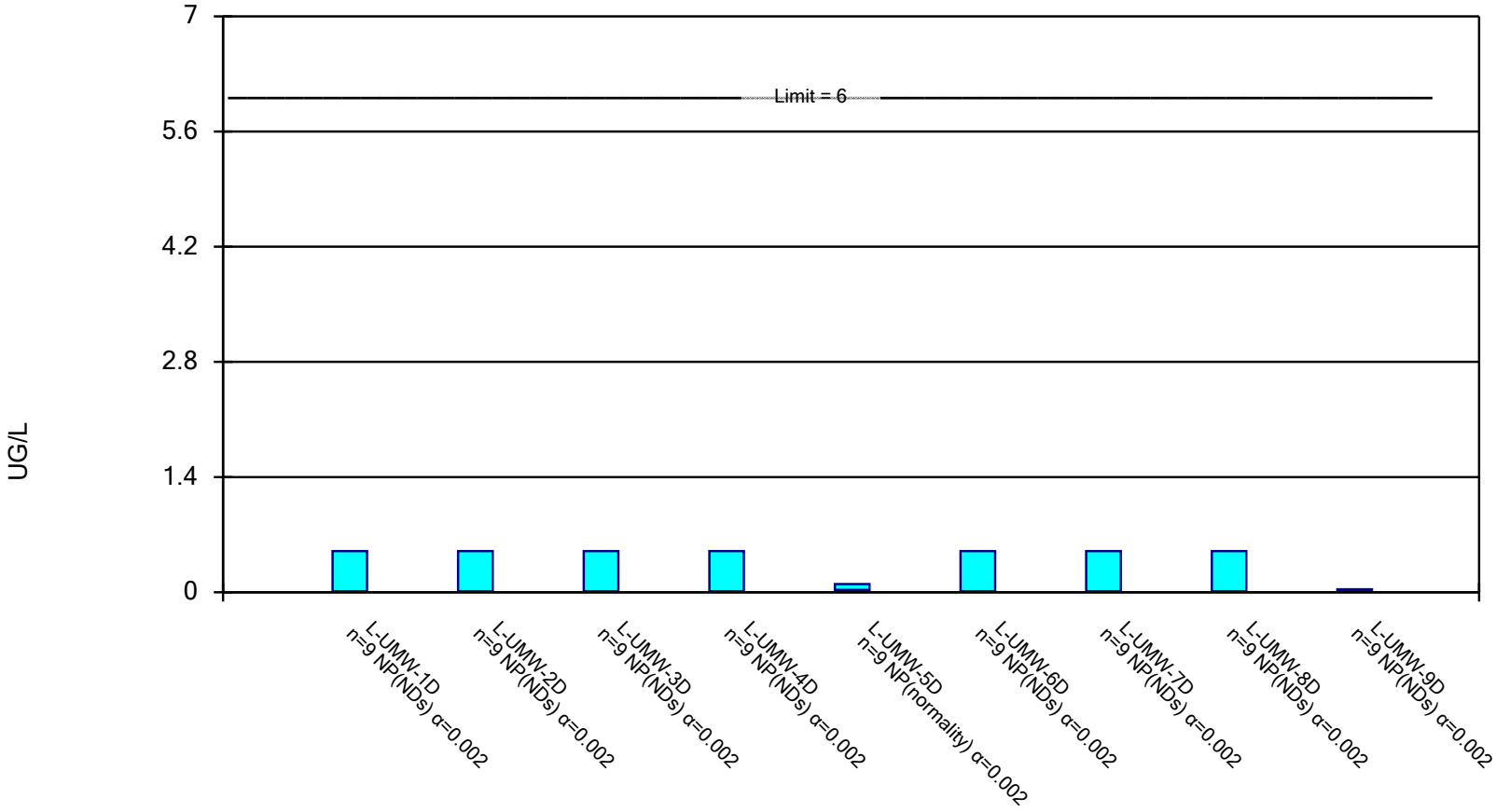
1. µg/L - micrograms per liter
2. mg/L - milligrams per liter
3. pCi/L - picocuries per liter
4. MCL - Maximum Contaminant Level. MCLs from United States Environmental Protection Agency (USEPA) 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012. http://water.epa.gov/drink/contaminants/index.cfm.
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 C

Sanitas Confidence Interval Statistical Output

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

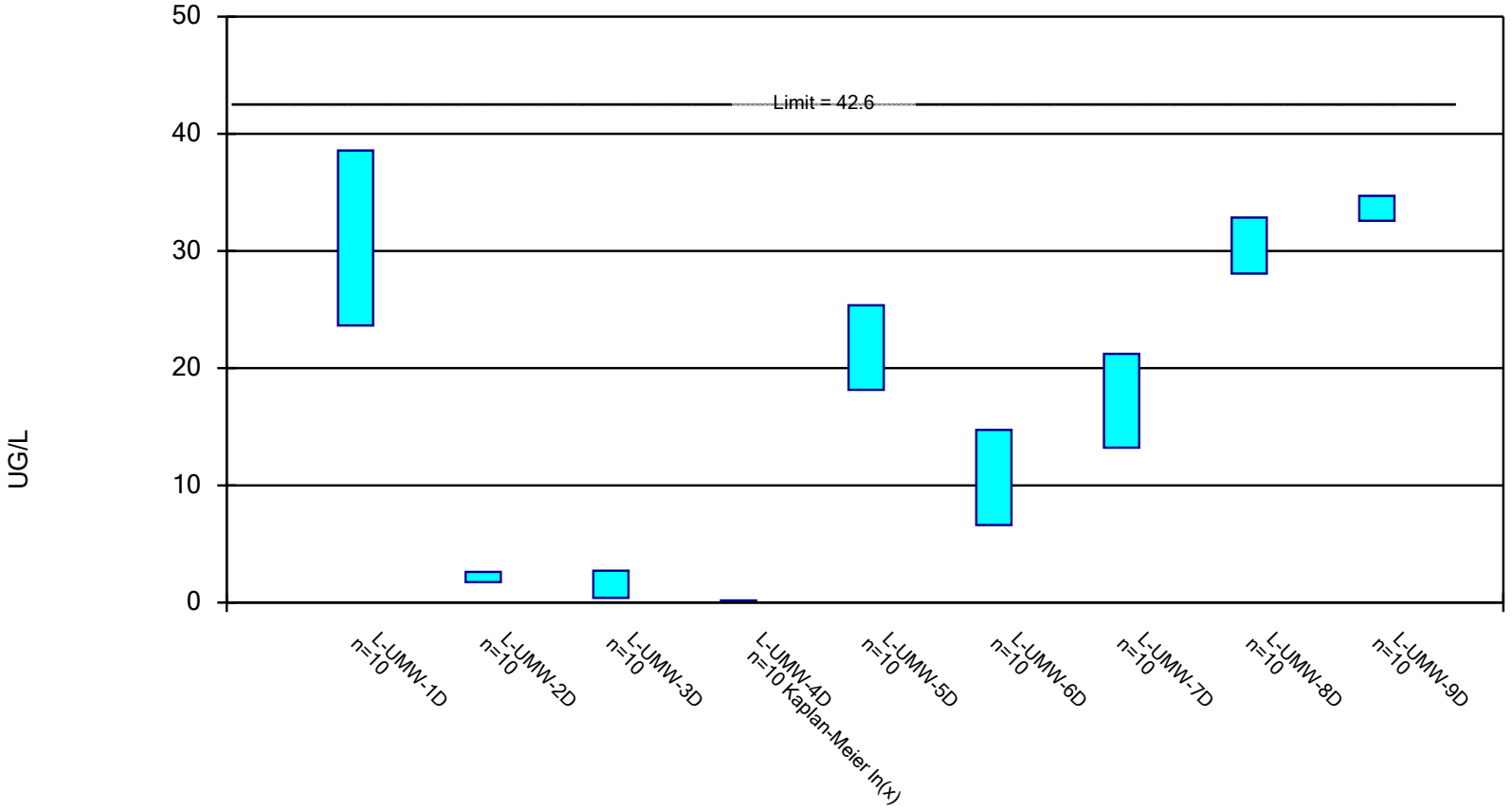


Constituent: ANTIMONY, TOTAL Analysis Run 10/9/2018 1:09 PM

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: ARSENIC, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric Confidence Interval

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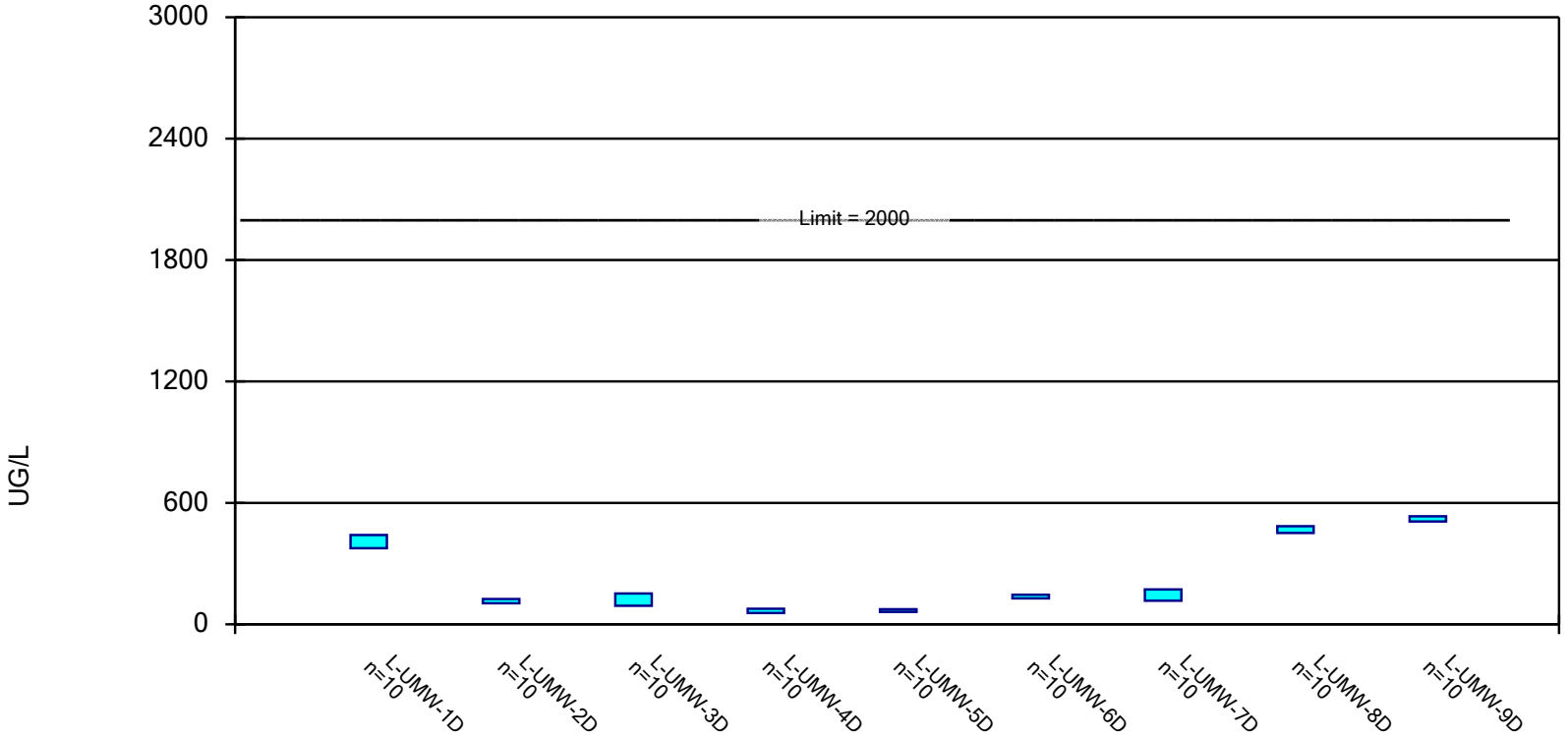
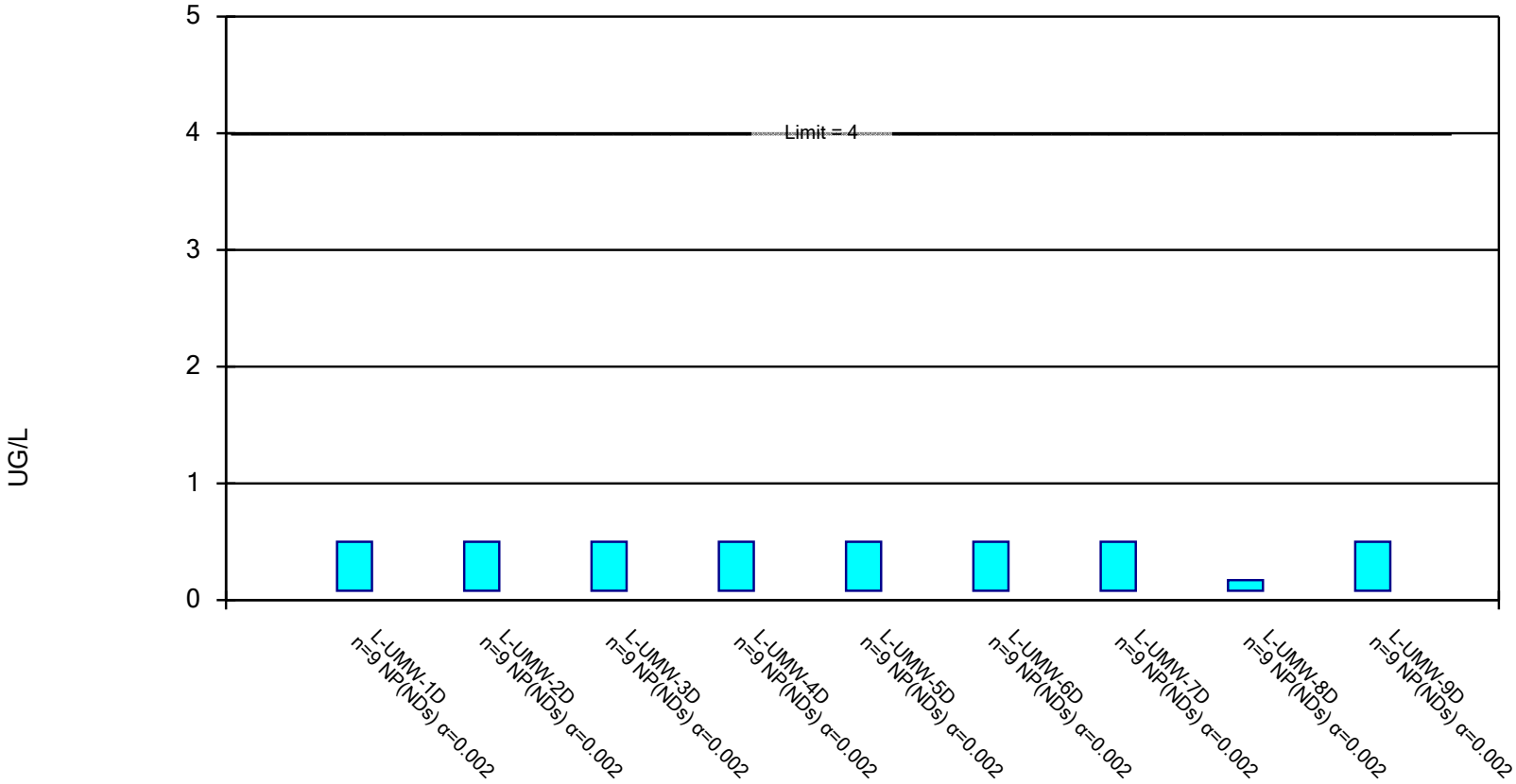


Constituent: BARIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

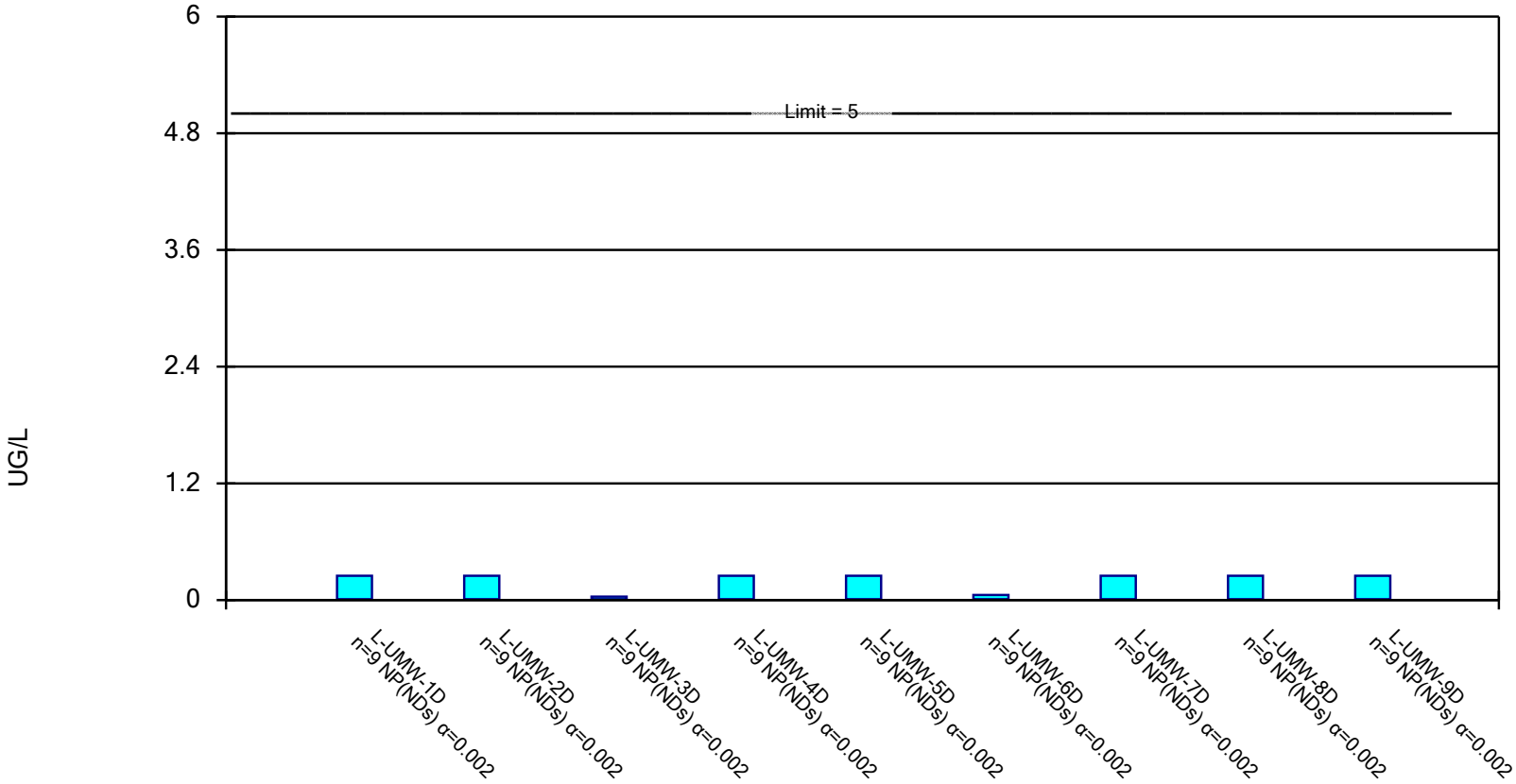


Constituent: BERYLLIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

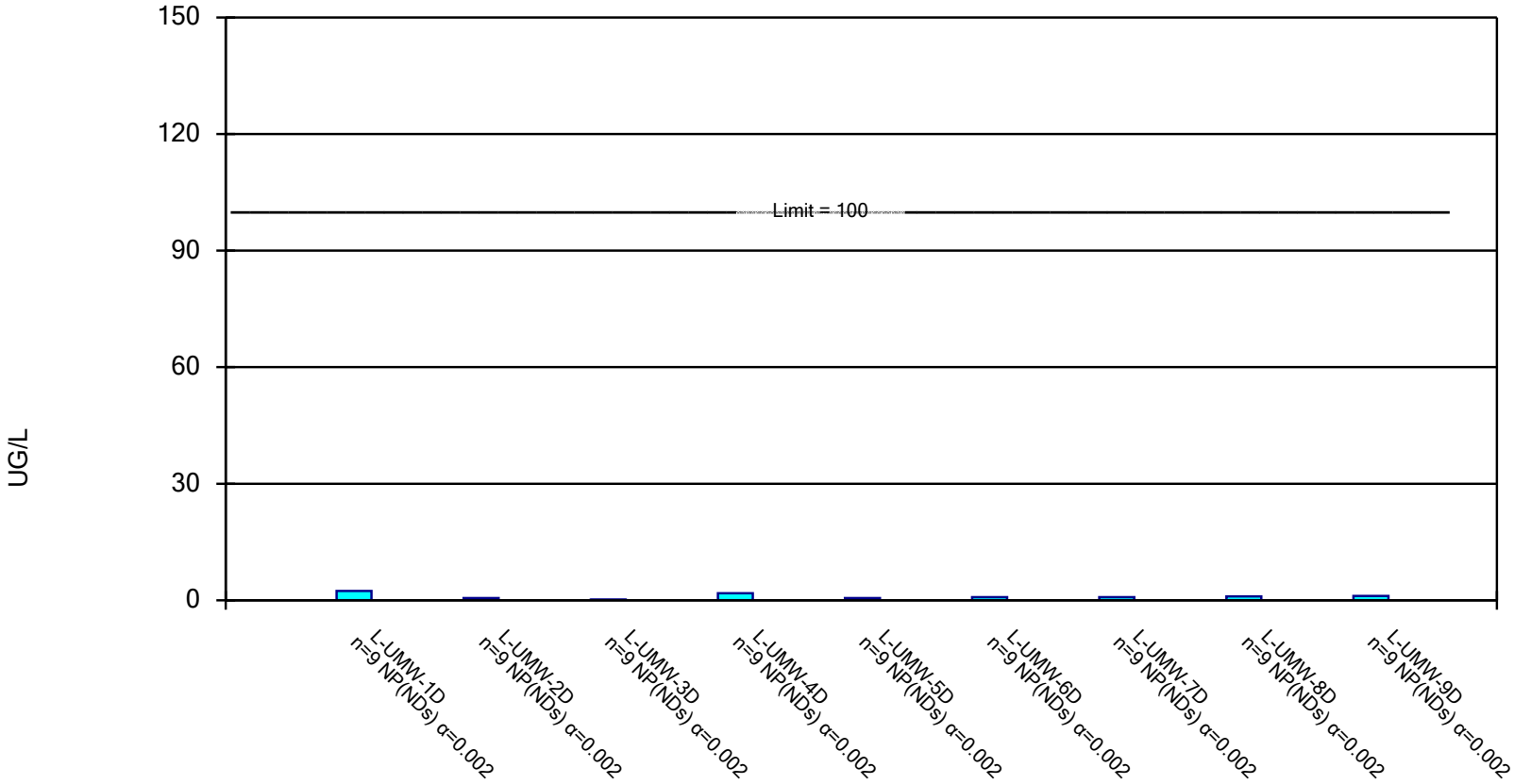


Constituent: CADMIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: CHROMIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

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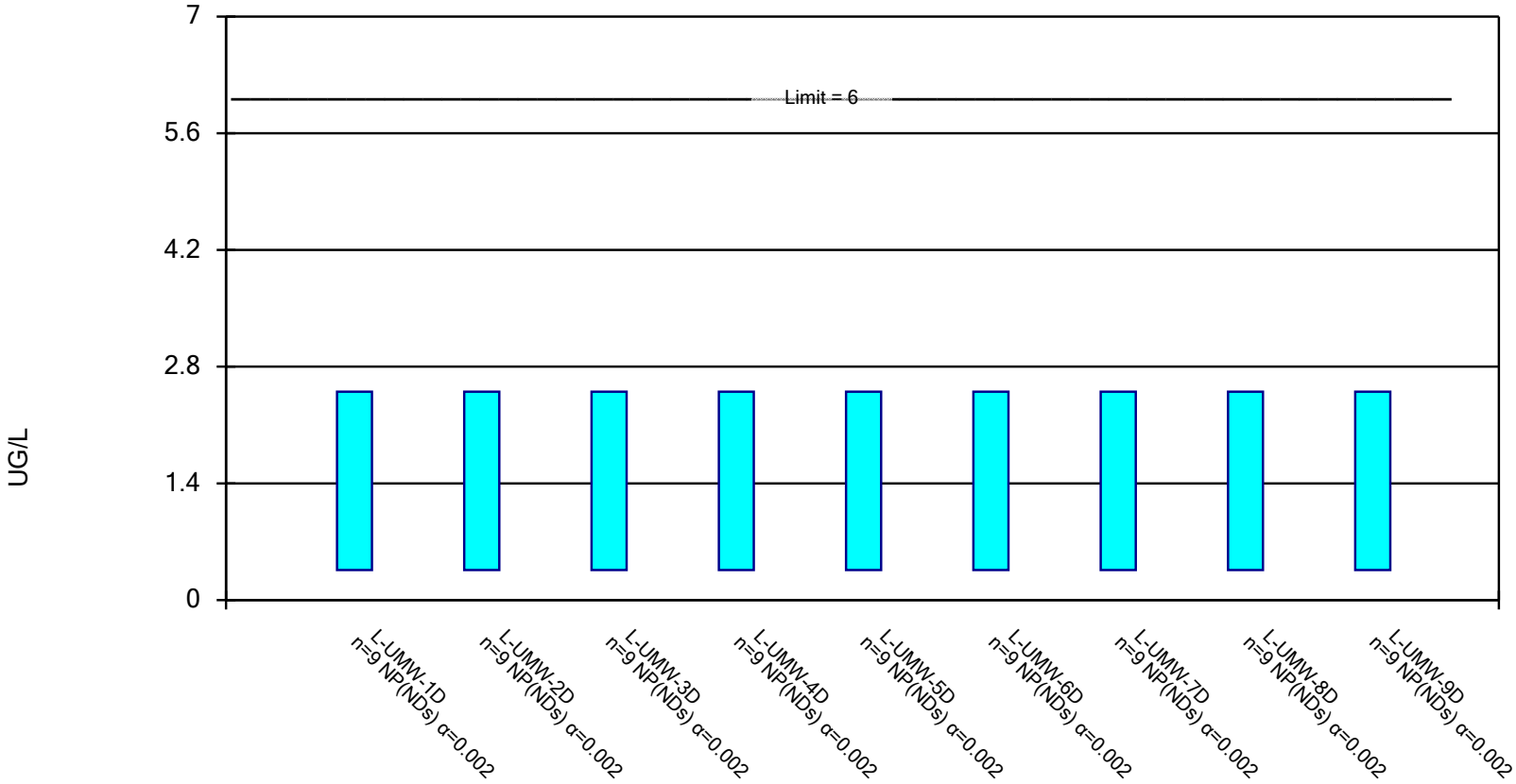

Constituent: COBALT, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

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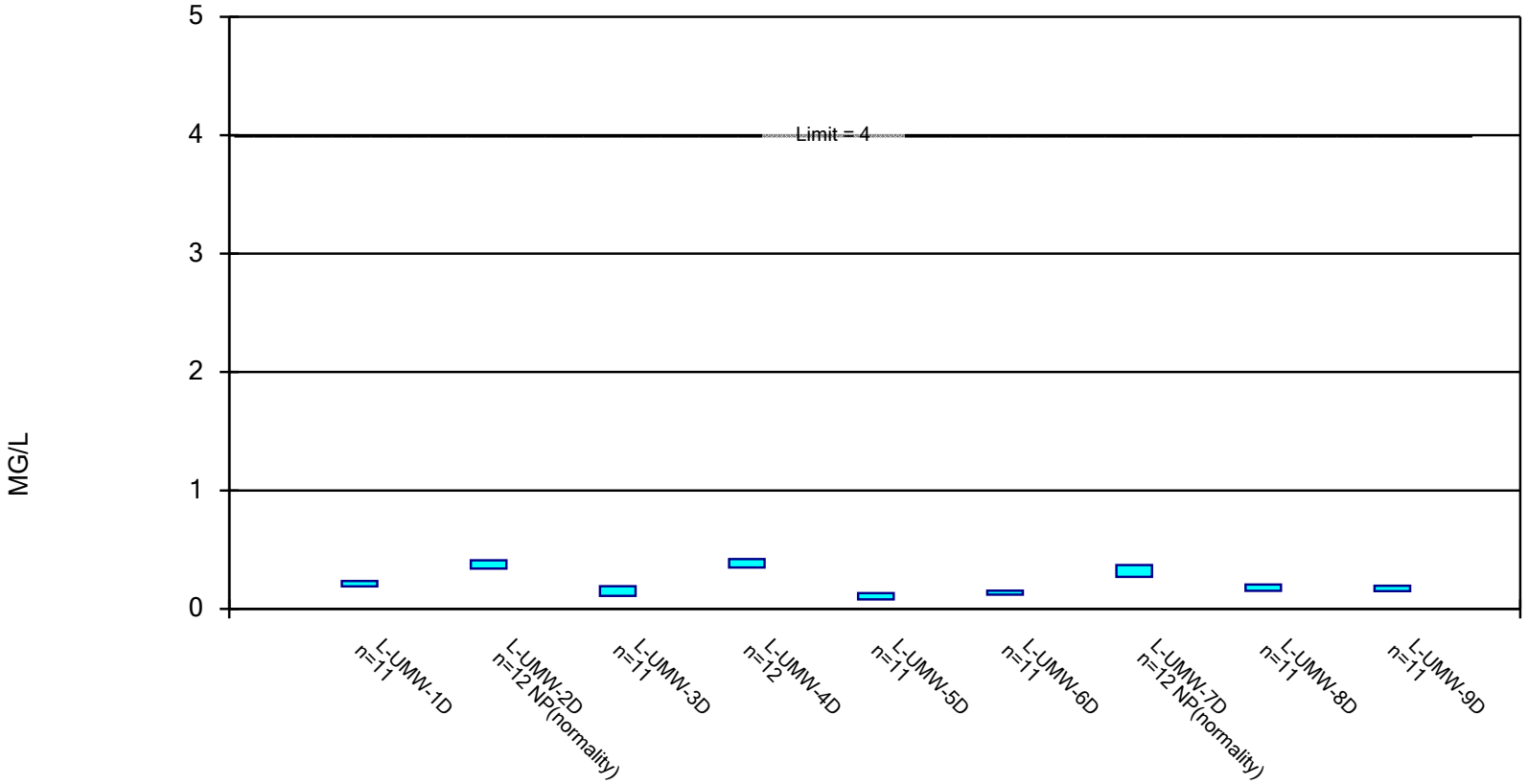
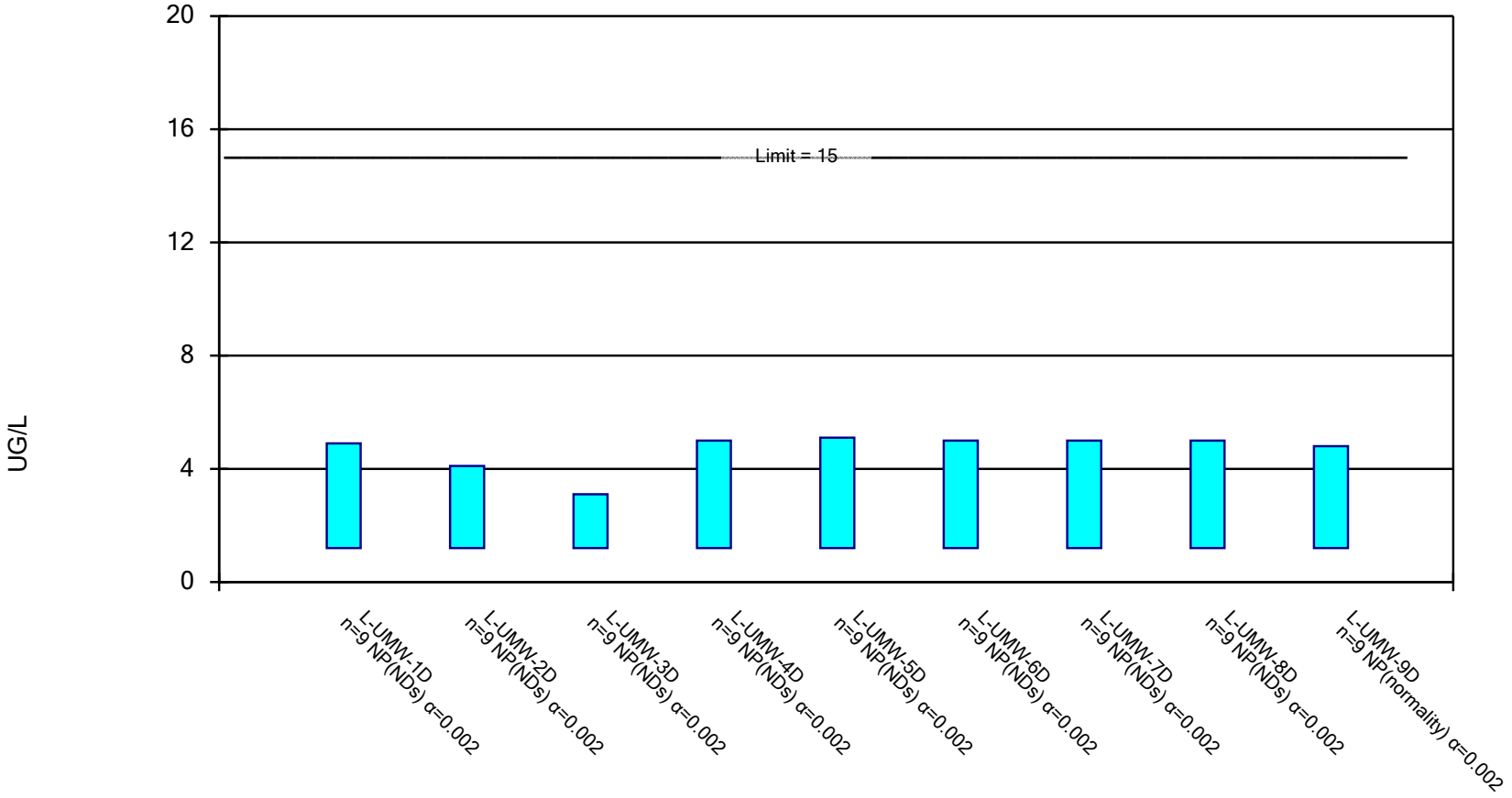


Constituent: FLUORIDE, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

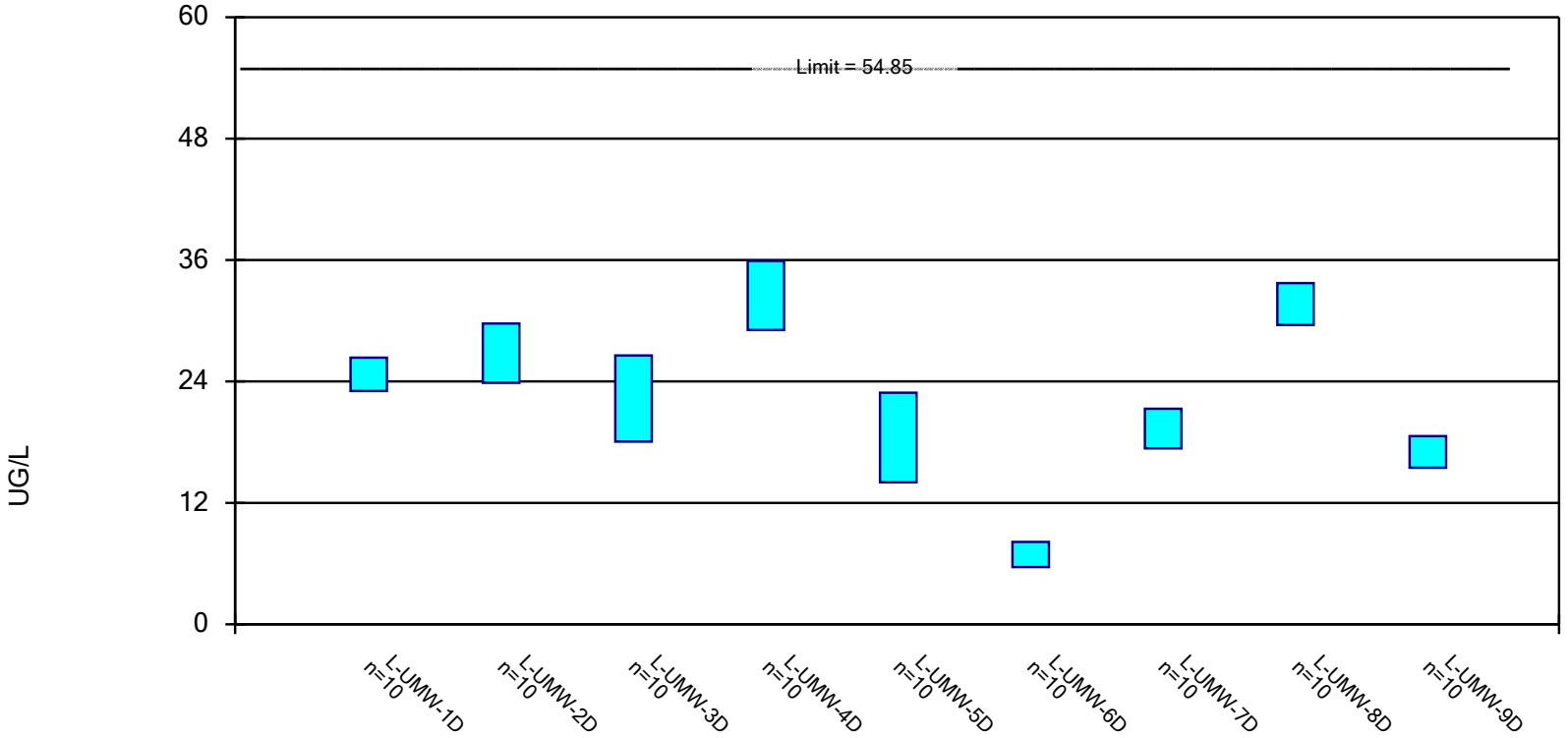


Constituent: LEAD, TOTAL Analysis Run 10/9/2018 1:09 PM

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.

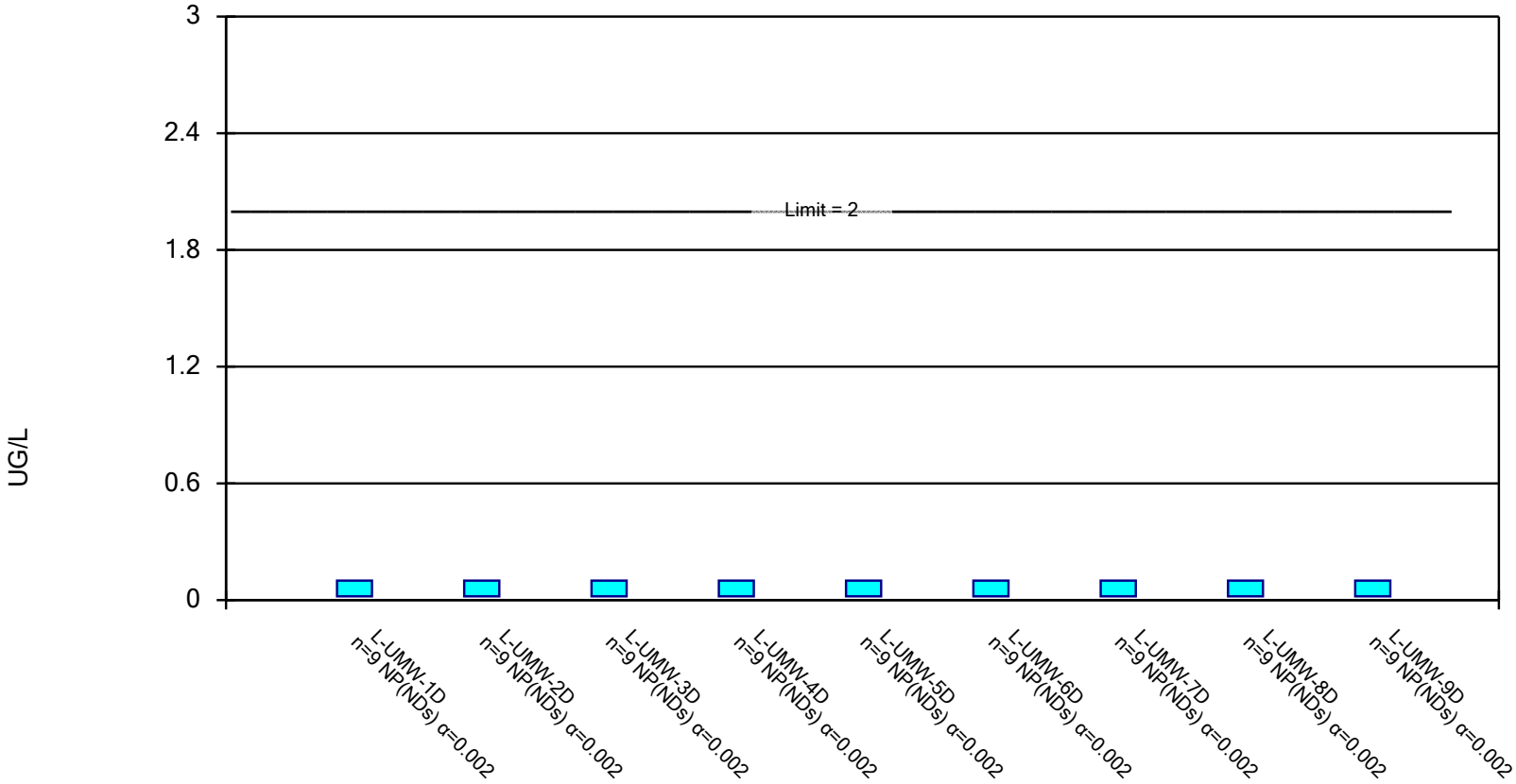


Constituent: LITHIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

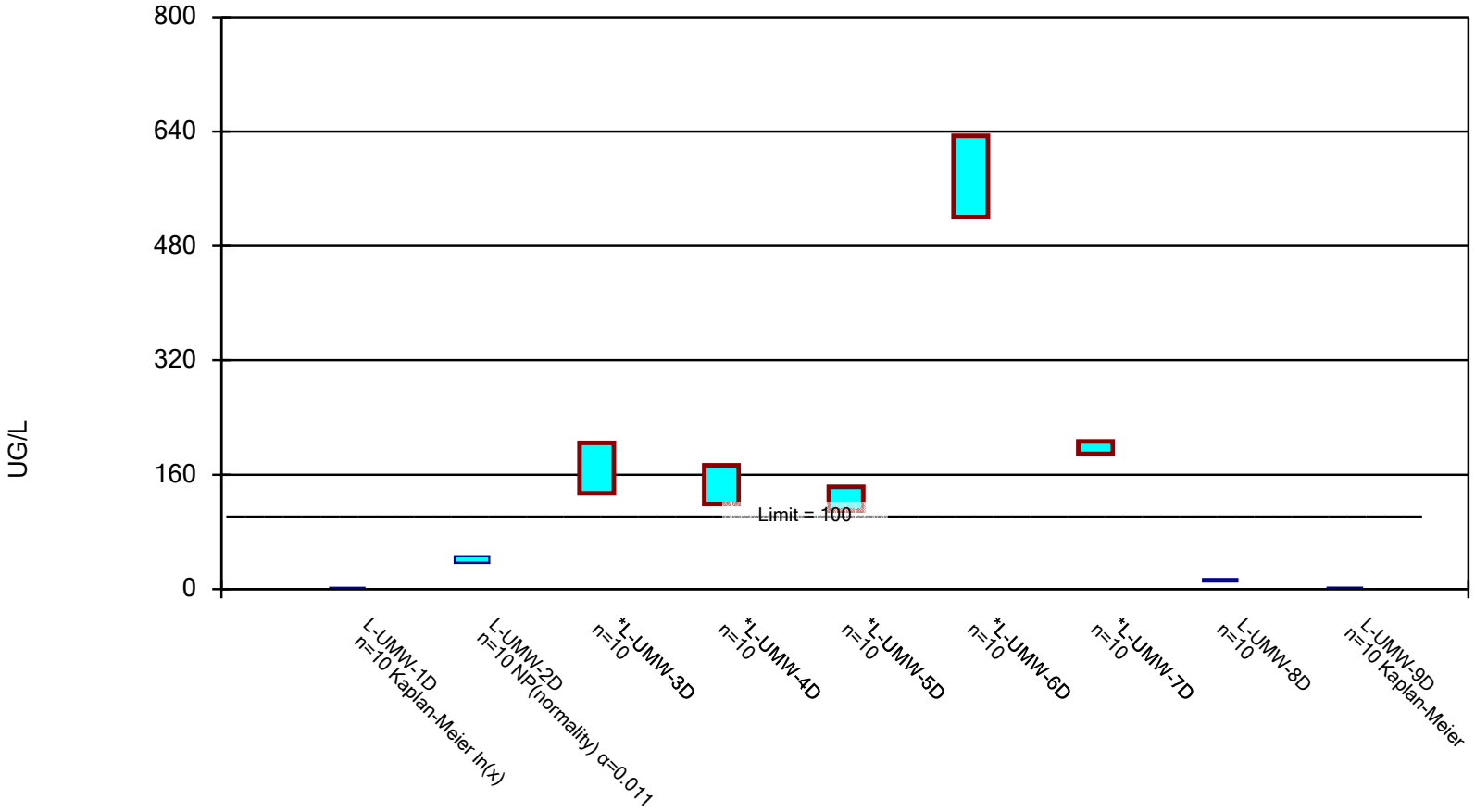


Constituent: MERCURY, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

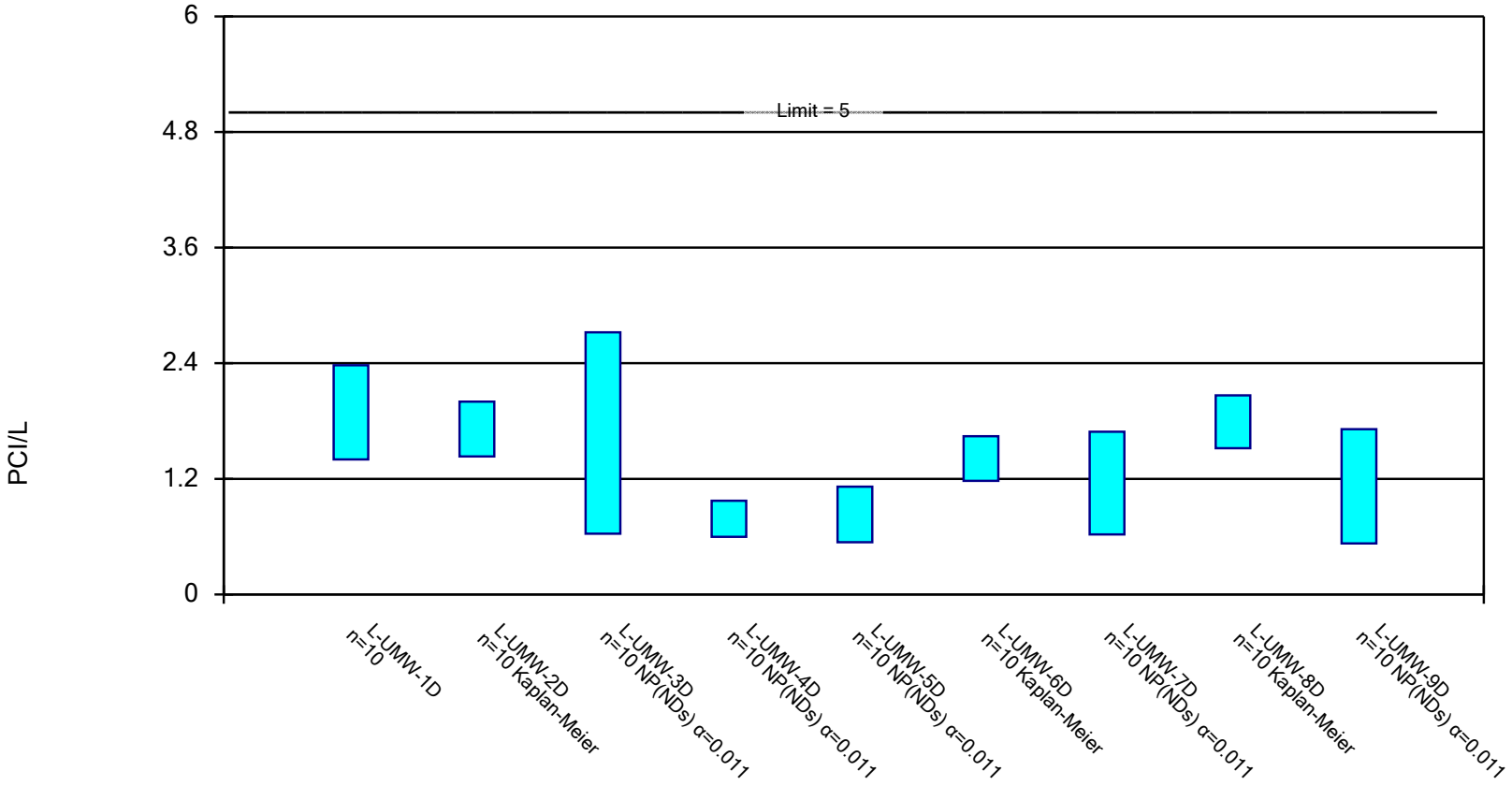


Constituent: MOLYBDENUM, TOTAL Analysis Run 10/9/2018 1:09 PM

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.

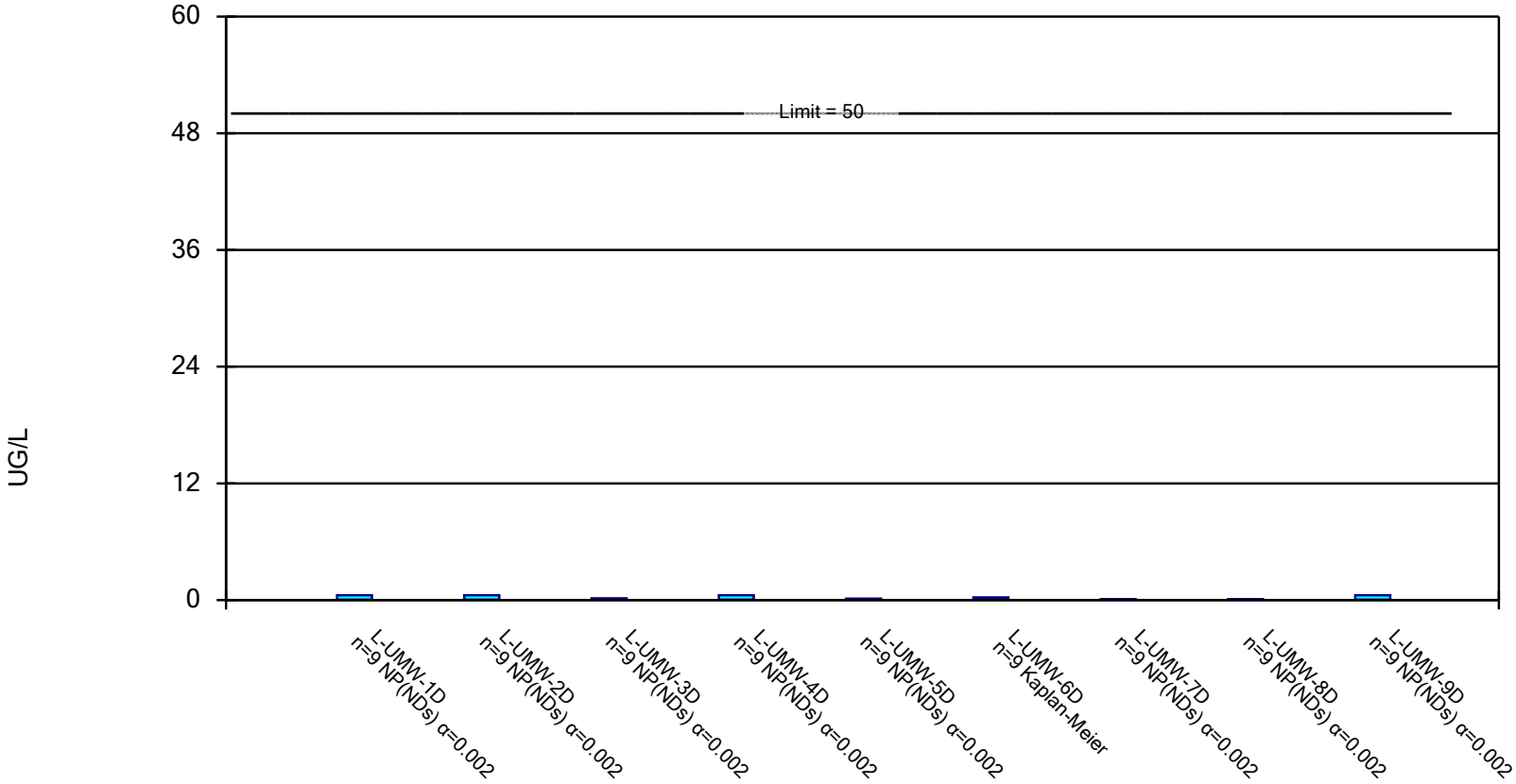


Constituent: Radium [226 + 228] Analysis Run 10/9/2018 1:09 PM

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.

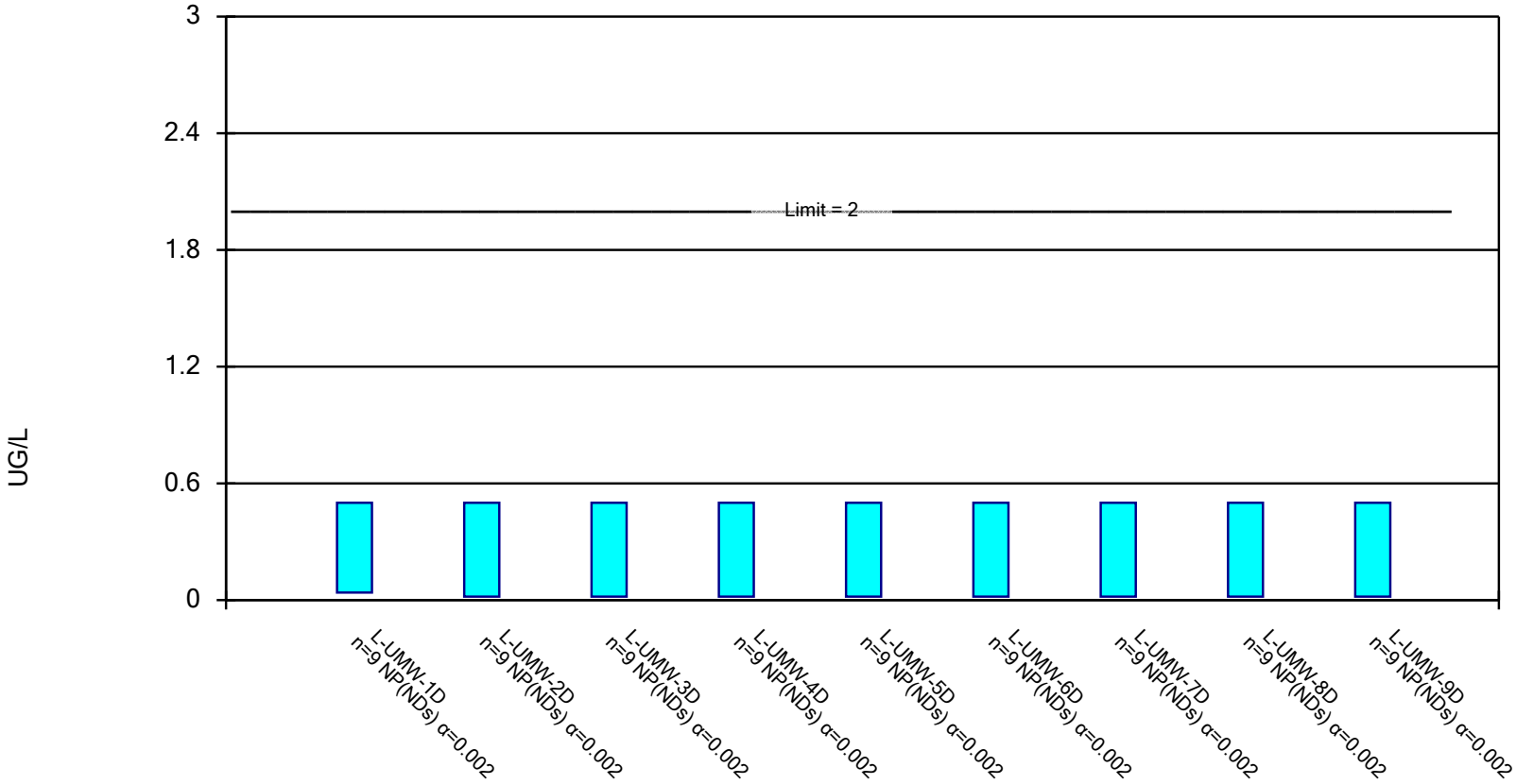


Constituent: SELENIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: THALLIUM, TOTAL Analysis Run 10/9/2018 1:09 PM

Labadie E.C. Client: Ameren Data: LEC DATA (STATS)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 10/9/2018, 1:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
ANTIMONY, TOTAL (UG/L)	L-UMW-1D	0.5	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-2D	0.5	0.013	6	No	9	100	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-3D	0.5	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-4D	0.5	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-5D	0.1	0.029	6	No	9	33.33	No	0.002	NP (normality)
ANTIMONY, TOTAL (UG/L)	L-UMW-6D	0.5	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-7D	0.5	0.013	6	No	9	100	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-8D	0.5	0.013	6	No	9	100	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	L-UMW-9D	0.035	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ARSENIC, TOTAL (UG/L)	L-UMW-1D	38.58	23.64	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-2D	2.617	1.743	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-3D	2.721	0.397	42.6	No	10	10	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-4D	0.1756	0.08551	42.6	No	10	40	ln(x)	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-5D	25.37	18.15	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-6D	14.73	6.611	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-7D	21.22	13.22	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-8D	32.85	28.07	42.6	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	L-UMW-9D	34.7	32.58	42.6	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-1D	441.5	376.1	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-2D	125	103.6	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-3D	152.1	91.28	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-4D	77.05	55.45	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-5D	74.13	61.31	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-6D	146.1	128.3	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-7D	172.2	116.4	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-8D	484.4	451.2	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	L-UMW-9D	533.3	507.7	2000	No	10	0	No	0.01	Param.
BERYLLIUM, TOTAL (UG/L)	L-UMW-1D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-2D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-3D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-4D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-5D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-6D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-7D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-8D	0.17	0.08	4	No	9	88.89	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	L-UMW-9D	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-1D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-2D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-3D	0.036	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-4D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-5D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-6D	0.052	0.009	5	No	9	77.78	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-7D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-8D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	L-UMW-9D	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-1D	2.4	0.027	100	No	9	66.67	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-2D	0.56	0.027	100	No	9	55.56	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-3D	0.17	0.027	100	No	9	88.89	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-4D	1.8	0.027	100	No	9	55.56	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-5D	0.58	0.027	100	No	9	66.67	No	0.002	NP (NDs)

Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 10/9/2018, 1:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
CHROMIUM, TOTAL (UG/L)	L-UMW-6D	0.8	0.027	100	No	9	55.56	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-7D	0.81	0.027	100	No	9	55.56	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-8D	1	0.027	100	No	9	55.56	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	L-UMW-9D	1.1	0.027	100	No	9	66.67	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-1D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-2D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-3D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-4D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-5D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-6D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-7D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-8D	2.5	0.36	6	No	9	88.89	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	L-UMW-9D	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
FLUORIDE, TOTAL (MG/L)	L-UMW-1D	0.2348	0.1907	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-2D	0.41	0.34	4	No	12	0	No	0.01	NP (normality)
FLUORIDE, TOTAL (MG/L)	L-UMW-3D	0.1918	0.11	4	No	11	9.091	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-4D	0.4205	0.3495	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-5D	0.1334	0.08008	4	No	11	9.091	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-6D	0.154	0.1206	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-7D	0.37	0.27	4	No	12	0	No	0.01	NP (normality)
FLUORIDE, TOTAL (MG/L)	L-UMW-8D	0.2058	0.1524	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	L-UMW-9D	0.1951	0.1503	4	No	11	0	No	0.01	Param.
LEAD, TOTAL (UG/L)	L-UMW-1D	4.9	1.2	15	No	9	55.56	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-2D	4.1	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-3D	3.1	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-4D	5	1.2	15	No	9	100	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-5D	5.1	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-6D	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-7D	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-8D	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	L-UMW-9D	4.8	1.2	15	No	9	44.44	No	0.002	NP (normality)
LITHIUM, TOTAL (UG/L)	L-UMW-1D	26.35	23.05	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-2D	29.73	23.87	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-3D	26.56	18.06	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-4D	35.92	29.08	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-5D	22.89	14.03	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-6D	8.14	5.66	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-7D	21.29	17.39	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-8D	33.72	29.58	54.85	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	L-UMW-9D	18.6	15.48	54.85	No	10	0	No	0.01	Param.
MERCURY, TOTAL (UG/L)	L-UMW-1D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-2D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-3D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-4D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-5D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-6D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-7D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-8D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	L-UMW-9D	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	L-UMW-1D	1.721	0.6854	100	No	10	30	ln(x)	0.01	Param.

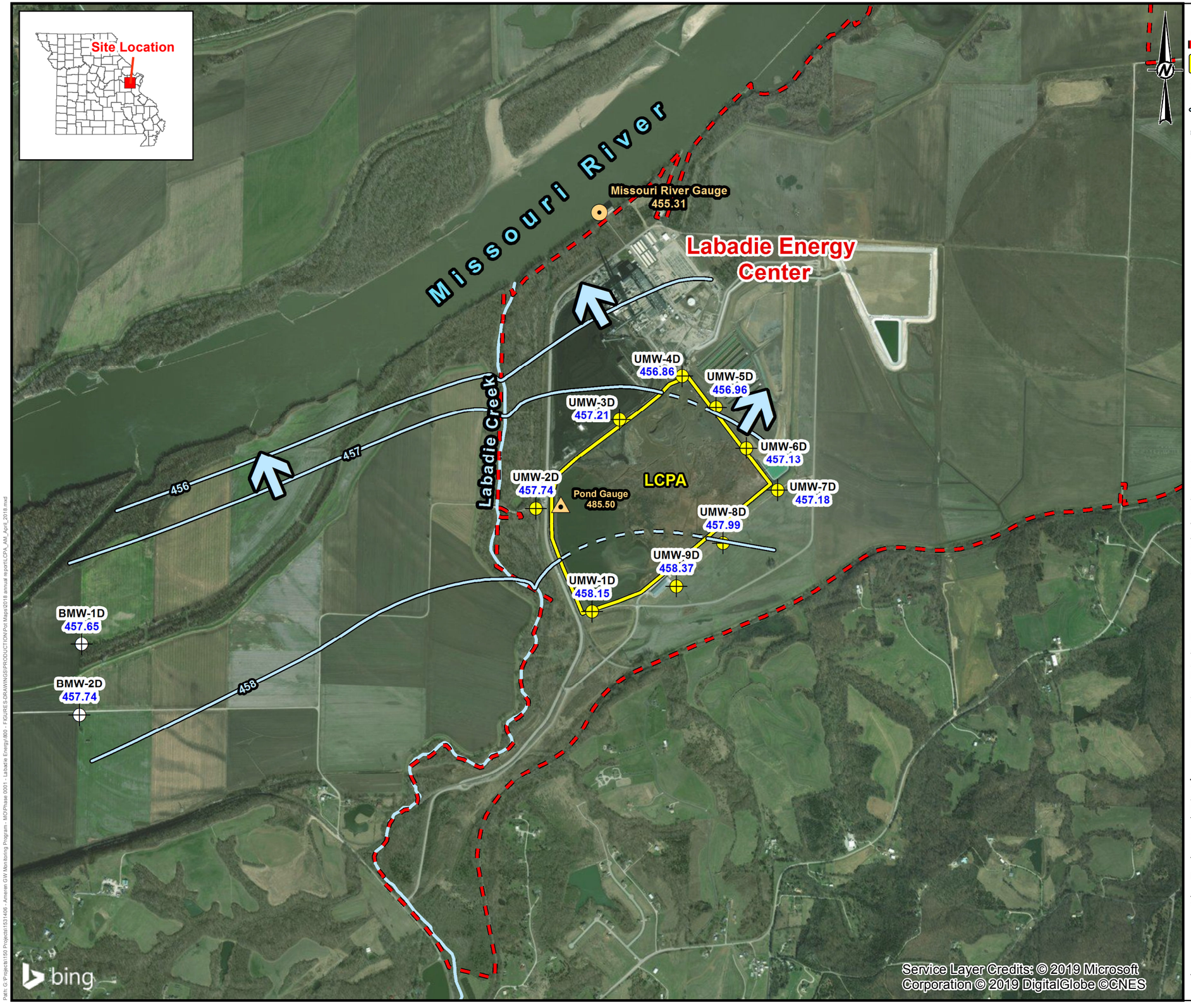
Confidence Interval

Labadie E.C. Client: Ameren Data: LEC DATA (STATS) Printed 10/9/2018, 1:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
MOLYBDENUM, TOTAL (UG/L)	L-UMW-2D	45.9	36.9	100	No	10	0	No	0.011	NP (normality)
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-3D**	**204.5**	**134.1**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-4D**	**173.2**	**119**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-5D**	**143.1**	**109.9**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-6D**	**634.1**	**520.3**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**L-UMW-7D**	**206.4**	**189.2**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	L-UMW-8D	14.05	10.75	100	No	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	L-UMW-9D	1.964	0.7013	100	No	10	20	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-1D	2.378	1.402	5	No	10	10	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-2D	2.001	1.433	5	No	10	30	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-3D	2.721	0.63	5	No	10	60	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-4D	0.973	0.5985	5	No	10	80	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-5D	1.118	0.542	5	No	10	90	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-6D	1.642	1.179	5	No	10	50	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-7D	1.689	0.623	5	No	10	80	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	L-UMW-8D	2.067	1.518	5	No	10	30	No	0.01	Param.
Radium [226 + 228] (PCI/L)	L-UMW-9D	1.716	0.529	5	No	10	80	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-1D	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-2D	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-3D	0.19	0.043	50	No	9	55.56	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-4D	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-5D	0.15	0.09	50	No	9	66.67	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-6D	0.2754	0.182	50	No	9	22.22	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	L-UMW-7D	0.091	0.043	50	No	9	77.78	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-8D	0.09	0.043	50	No	9	88.89	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	L-UMW-9D	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-1D	0.5	0.039	2	No	9	77.78	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-2D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-3D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-4D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-5D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-6D	0.5	0.018	2	No	9	88.89	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-7D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-8D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	L-UMW-9D	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)

APPENDIX D

Potentiometric Surface Maps



LEGEND

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

Groundwater Elevation Contours

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

Ground/Surface Water Measurement Locations

- Background Monitoring Well
- LCPA - Bottom Ash Surface Impoundment Monitoring Well
- Missouri River Gauge
- LCPA - Bottom Ash Surface Impoundment Gauge
- Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED ONSITE BY GOLDER.
3. GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 13 AND FEBRUARY 11, 2016.
4. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
5. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
6. POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

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 1,500 3,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
LCPA POTENTIOMETRIC SURFACE MAP - APRIL 9, 2018

CONSULTANT
GOLDER

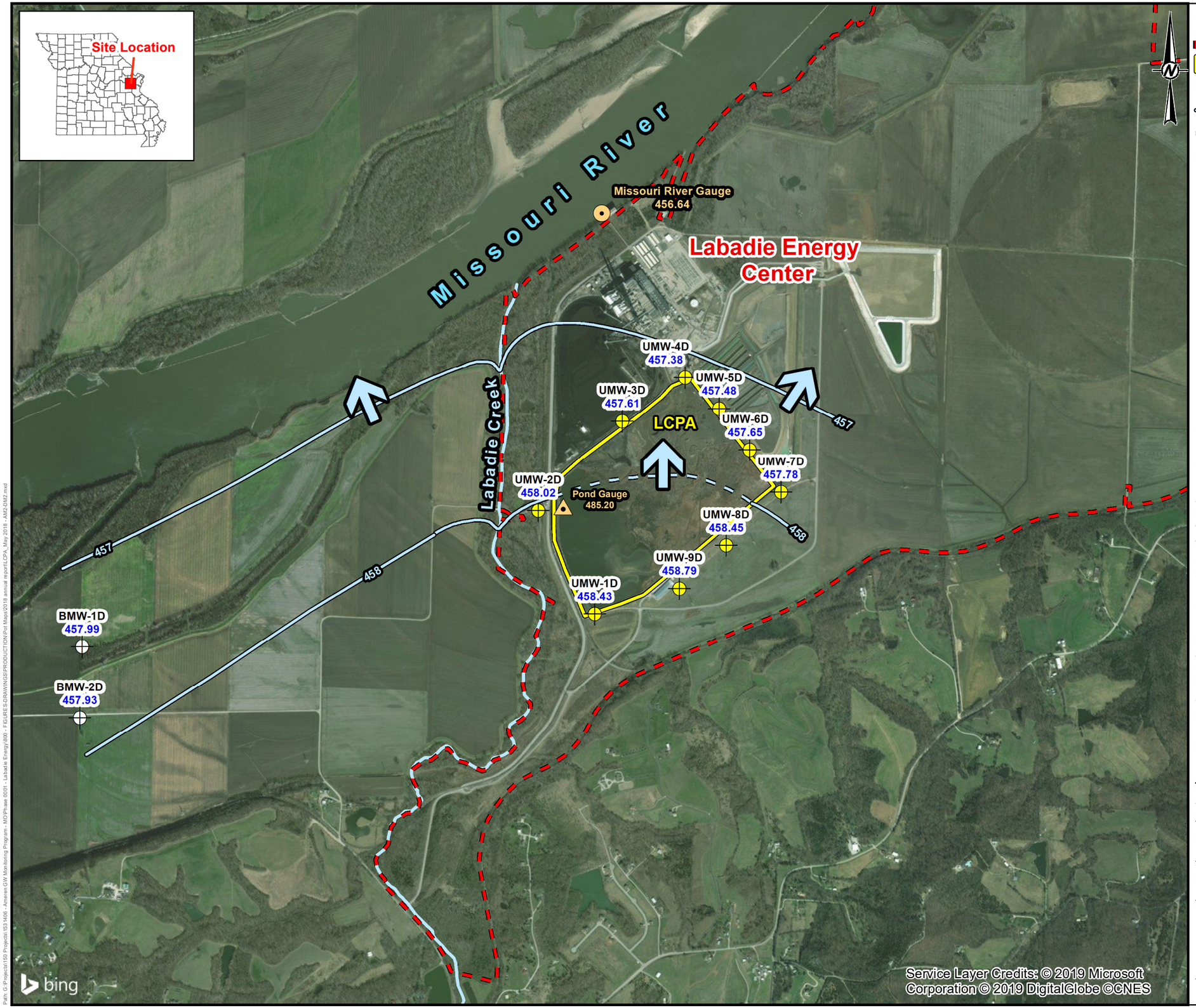
YYYY-MM-DD	2018-09-12
PREPARED	EFT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No.
153-1406

FIGURE
C1

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

Path: G:\Projects\153\Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\Pot Maps\2018 annual report\LCPA_AM_April_2018.mxd



LEGEND

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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 1,500 3,000
Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
LCPA POTENTIOMETRIC SURFACE MAP - MAY 21, 2018

CONSULTANT
GOLDER

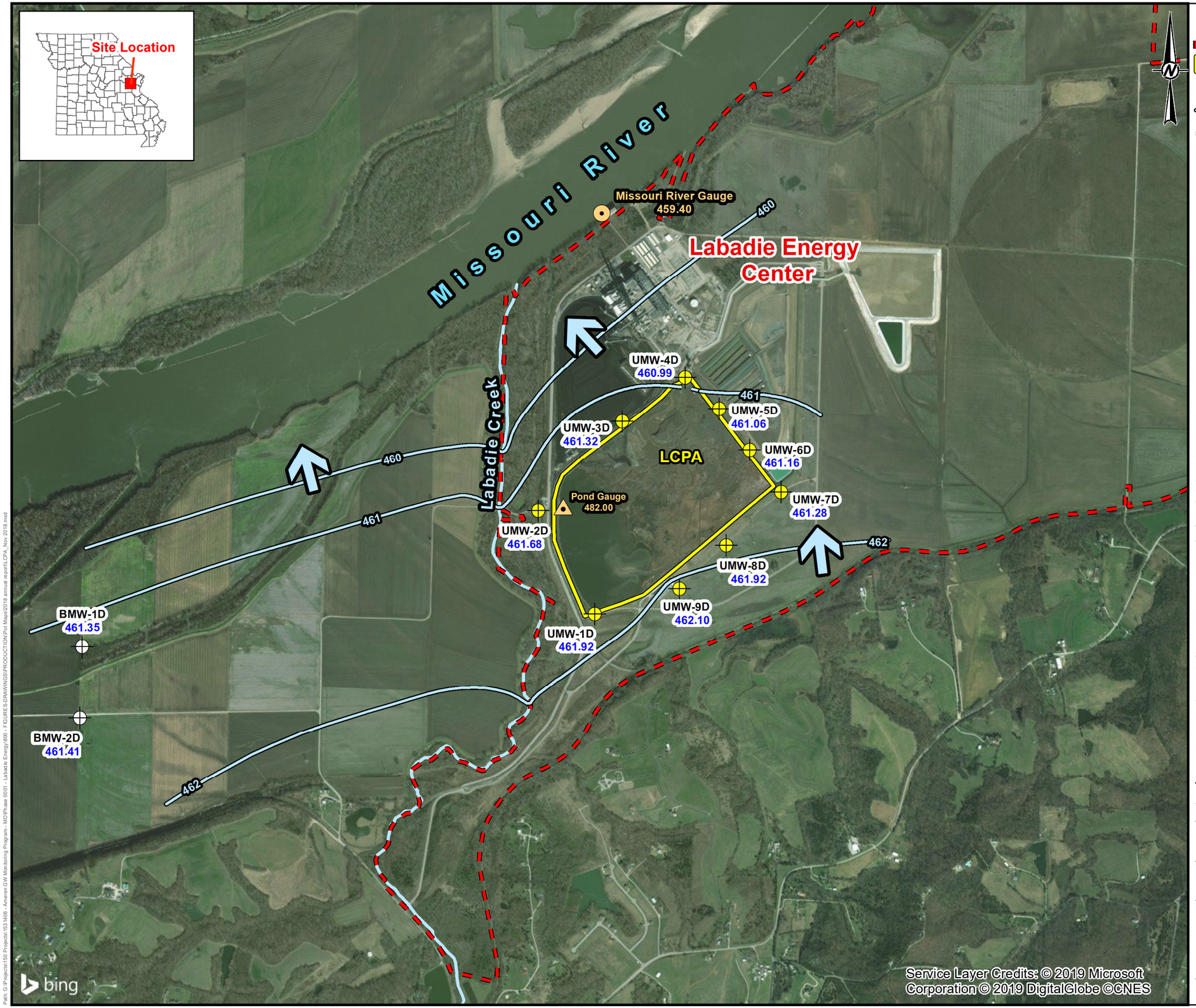
YYYY-MM-DD	2018-12-20
PREPARED	EFT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No.
153-1406

FIGURE
C2

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

Path: G:\Projects\153 Projects\153-1406 - Ameren GW Monitoring Program - MO\Phase 0001 - Labadie Energy\800 - FIGURES-DRAWINGS\PRODUCTION\Plot Maps\2018 annual report\LCPA_May 2018 - AM2-DM2.mxd



LEGEND

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

Groundwater Elevation Contours

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REFERENCES

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3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,500 3,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
LCPA POTENTIOMETRIC SURFACE MAP - NOVEMBER 7, 2018

CONSULTANT
GOLDER

YYYY-MM-DD	2019-12-20
PREPARED	EFT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No.
153-1406

FIGURE
C3

golder.com