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2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
POND 003
NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Associated Electric Cooperative, Inc.
Springfield, Missouri

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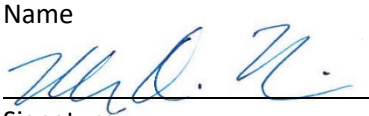

Signature

January 30, 2020
Date

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1. Introduction

This 2019 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses Pond 003 at the New Madrid Power Plant (NMPP), operated by the Associated Electric Cooperative, Inc. (AECI). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule effective 19 October 2015 (Rule) including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR), subsection § 257.90(e). The Annual Report documents the groundwater monitoring system for Pond 003 consistent with applicable sections of § 257.90 through 257.98, and describes activities conducted in the prior calendar year (2019) and documents compliance with the Rule. The specific requirements listed in § 257.90(e)(1)-(5) of the Rule are provided in Section 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

2. 40 CFR § 257.90 Applicability

2.1 40 CFR § 257.90(a)

All CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under §257.90 through 257.99, except as provided in paragraph (g) [Suspension of groundwater monitoring requirements] of this section.

AECI has installed and certified a groundwater monitoring system at Pond 003 at the NMPP. Pond 003 is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e) (Rule).

2.2 40 CFR § 257.90(e) – SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by §257.105(h)(1).

This Annual Report describes the monitoring completed and actions taken at the NMPP Pond 003 as required by the Rule. Groundwater sampling and analysis was conducted in accordance with requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 and § 257.95 is also provided in this report. This Annual Report documents the applicable groundwater-related activities completed in the calendar year 2019.

2.2.1 Status of the Groundwater Monitoring Program

Results of the detection monitoring statistical analyses completed in January 2018 identified statistically significant increased (SSI) concentration of Appendix III constituents in downgradient monitoring wells relative to concentrations observed in upgradient monitoring wells. No alternative source was identified for the SSI constituents. Accordingly, the groundwater monitoring program transitioned to assessment monitoring in May 2018, and AECI is currently implementing an assessment monitoring program. As discussed below, Appendix IV constituents were detected above groundwater protection standard (GWPS) for molybdenum during the October 2018 and March 2019 assessment monitoring sampling events. Therefore, a corrective measures assessment was initiated and completed in 2019.

2.2.2 Key Actions Completed

The 2018 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2019. Statistical analysis of analytical data from the October 2018 semi-annual assessment monitoring sampling event was completed in January 2019. A summary including the sample names, dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program of the NMPP Pond 003 is presented in Table I of this report. The statistical analyses indicated Appendix IV statistically significant levels (SSL) above the GWPS for molybdenum at monitoring wells MW-7, MW-8, MW-9, P-2, P-3, and P-5. AECI pursued an alternative source demonstration (ASD) in April 2019 to determine if a source other than the CCR unit caused the SSL, which was unsuccessful.

A semi-annual assessment monitoring event was completed in March 2019 for detected Appendix IV constituents identified from the May 2018 annual assessment monitoring sampling event. Statistical analysis was completed within 90 days of receipt of verified laboratory data for the March 2019 sampling event. Appendix IV SSLs were identified consistent with previous monitoring events. A summary of Appendix IV SSLs identified in the September 2018 and March 2019 assessment monitoring events are provided in Table II. Notifications documenting the identified SSLs have been entered into the facility's operating record in accordance with §257.95(g).

The determination of the nature and extent of the Appendix IV SSLs has been initiated pursuant to § 257.95(g). Fifteen additional groundwater monitoring wells were installed in August and September 2019 to assist with collecting additional groundwater data to define the nature and extent. Groundwater characterization of the nature and extent groundwater monitoring wells is ongoing.

In September 2019, a Corrective Measures Assessment (CMA) was completed consistent with the requirements of § 257.96. Following completion of the CMA, AECI held the required public meeting prior to selection of remedy on 14 November 2019 in Marston, Missouri.

An annual assessment monitoring sampling event was completed in June 2019 to identify detected Appendix IV constituents for subsequent semi-annual sampling events in August 2019 and March 2020. Groundwater protection standards for detected Appendix IV constituents were established. Semi-annual assessment monitoring was completed in August 2019 for detected Appendix IV constituents identified during the June 2019 annual monitoring event. Statistical analysis of the results from the August 2019 semi-annual assessment monitoring sampling event are due to be completed in January 2020 and will be reported in the next annual report.

2.2.3 Problems Encountered

No problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, or problems with analytical analysis) were encountered at the NMPP Pond 003 in 2019.

2.2.4 Actions to Resolve Problems

No problems were encountered at the NMPP Pond 003 in 2019; therefore, no actions to resolve problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2020 include completion of the 2019 Annual Groundwater Monitoring and Corrective Action Report, statistical analysis of assessment monitoring analytical data collected in August 2019, and conducting semi-annual assessment monitoring and subsequent statistical analysis. The continuation of the nature and extent investigation will continue into 2020. AECI is also completing additional steps of the corrective measures program including working towards a selection of remedy.

2.3 40 CFR § 257.90(e) – INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.3.1 40 CFR § 257.90(e)(1)

A map, aerial image, or diagram showing the CCR unit and all background (or up gradient) and down gradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for Pond 003 is included in this report as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report prepared for AECI, which was placed in the facility's operating record by 17 October 2017 as required by § 257.105(h)(2). As discussed in Section 2.3.2, monitoring wells installed to assist with the nature and extent at Pond 003 are presented in Figure 2.

2.3.2 40 CFR § 257.90(e)(2) – Monitoring System Changes

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

Fifteen monitoring wells were installed during 2019 to assist with the nature and extent investigation into Appendix IV SSLs for NMPP Pond 003. Installed nature and extent monitoring wells are presented in Figure 2. No monitoring wells were decommissioned during 2019.

2.3.3 40 CFR § 257.90(e)(3) – Summary of Sampling Events

In addition to all the monitoring data obtained under §257.90 through §257.98, a summary including the number of groundwater samples that were collected for analysis for each background and down gradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

In accordance with § 257.94(b), three independent assessment monitoring samples were collected from each background and downgradient monitoring well that are a part of the certified groundwater monitoring network in 2019. A summary including the sample names,

dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program of the NMPP Pond 003 is presented in Table I of this report.

In accordance with § 257.95(g), up to four independent nature and extent samples from each background, downgradient, and nature and extent monitoring well were collected in 2019 pursuant to § 257.95(g)(1)(iv). Nature and extent characterization at NMPP Pond 003 is ongoing. Analytical results associated with the nature and extent investigation collected in 2019 are reported in Table III.

2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

Statistical analyses of analytical data from October 2018 and March 2019 indicated Appendix IV SSLs above the GWPS for molybdenum at monitoring wells MW-7, MW-8, MW-9, P-2, P-3, and P-5. AECI pursued an ASD in April 2019 to determine if a source other than the CCR unit caused the SSL, which was unsuccessful.

NMPP Pond 003 began to characterize the nature and extent of molybdenum in groundwater in August 2018 pursuant to 40 CFR §257.95(g); monitoring efforts are ongoing. The NMPP Pond 003 remained in assessment monitoring during 2019.

2.3.5 40 CFR § 257.90(e)(5) – Other Requirements

Other information required to be included in the annual report as specified in §257.90 through §257.98.

This Annual Report documents activities conducted to comply with § 257.90 through 257.95 of the Rule. It is understood that there are supplemental references in § 257.90 through 257.98 that must be placed in the Annual Report. The following requirements include relevant and required information in the Annual Report for activities completed in calendar year 2019.

2.3.5.1 40 CFR § 257.94(d)(3) – Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater detection monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.2 40 CFR § 257.94(e)(2) – Detection Monitoring Alternate Source Demonstration

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under this section. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

A successful ASD for detection monitoring SSIs was not completed within 90 days for this unit; therefore, no demonstration or certification is applicable.

2.3.5.3 40 CFR § 257.95(c)(3) – Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater assessment monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.4 40 CFR § 257.95(d)(3) – Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An assessment monitoring program is currently being implemented at the CCR unit. Three rounds of assessment monitoring sampling were completed in 2019. Analytical results for both downgradient and upgradient wells are provided in Table I. The background concentrations (upper tolerance limits) and GWPSs established for the NMPP Pond 003 are included in Table IV.

2.3.5.5 40 CFR § 257.95(g)(3)(ii) – Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

No alternate source was identified for this unit; therefore, no certification is applicable.

2.3.5.6 40 CFR § 257.96(a) – Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

On 12 July 2019, AECI demonstrated the need for additional time beyond the regulatory time period of 90 days to complete the assessment of corrective measures due to site-specific conditions and the evaluation of remedial treatment alternatives in support of an informed CMA process. In the case of the assessment for Pond 003, the site has complex hydrogeology associated with groundwater flow directions. In addition, AECI is in the process of reviewing possible groundwater remedies. Discussions with experts regarding effectivity and implementation of critical steps in the treatment and remedy assessment process is ongoing. Given that there is no use of groundwater downgradient of the AECI site (i.e., between the subject CCR unit and the Mississippi River), the ultimate point of exposure is the Mississippi River. Furthermore, this condition is unlikely to pose an exposure concern in groundwater or the Mississippi River since there are no known receptors. Based on these site-specific

conditions and related groundwater treatment alternative evaluations in support of the assessment by AECI, the CCR Rule allows for a 60-day extension to complete the assessment of corrective measures process. The Demonstration and Certification of Need for 60-day Extension is provided in Attachment 1 of this report.

2.4 40 CFR § 257.90(f)

The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

In order to comply with the Rule recordkeeping requirements, the following actions must be completed:

- Pursuant to § 257.105(h)(1), this Annual Report must be placed in the facility's operating record.
- Pursuant to § 257.106(h)(1), notification must be sent to the relevant State Director and/or Tribal authority within 30 days of this Annual Report being placed on the facility's operating record [§ 257.106(d)].
- Pursuant to § 257.107(h)(1), this Annual Report must be posted to the AECI CCR website within 30 days of this Annual Report being placed on the facility's operating record [§ 257.107(d)].

TABLES

TABLE I
SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Upgradient								
		MW-16			B-123			B-126		
	Measure Point (TOC)	292.853			292.7			293.63		
	Sample Name	MW-16	MW-16	MW-16	B-123	B-123	B-123	B-126	B-126	B-126
	Sample Date	3/7/2019	6/5/2019	8/28/2019	3/7/2019	6/5/2019	8/28/2019	3/7/2019	6/5/2019	8/28/2019
Lab Data Reviewed and Accepted		4/15/2019	7/15/2019	11/9/2019	4/15/2019	7/15/2019	11/9/2019	4/15/2019	7/15/2019	11/9/2019
Depth to Water (ft btoc)		8.21	8.14	17.10	15.07	9.73	10.75	15.88	11.10	12.00
Temperature (Deg C)		16.60	18.31	17.98	15.92	16.43	16.69	16.23	17.85	17.31
Conductivity (µS/cm)		929	0.899	894	674	663	650	223	435	400
Turbidity (NTU)		9.9	22.6	24.1	32.0	160	33.2	185	263	152
Boron, Total (mg/L)		**0.078**	--	**0.046**	**0.048**	--	**0.025**	**0.023**	--	**0.024**
Calcium, Total (mg/L)		**130**	--	**120**	**79**	--	**78**	**29**	--	**56**
Chloride (mg/L)		**14**	--	**16**	<5.0	--	**2.8**	**1.2**	--	**2.7**
Fluoride (mg/L)		**1.71**	--	**1.69**	**0.620**	--	**0.602**	**0.543**	--	**0.507**
Sulfate (mg/L)		**85**	--	**73**	**31**	--	**28**	**11**	--	**24**
pH (su)		**7.08**	--	**7.19**	**7.53**	--	**7.51**	**7.22**	--	**7.10**
TDS (mg/L)		**570**	--	**520**	**370**	--	**340**	**180**	--	**280**
Antimony, Total		<0.0030	<0.0030	--	<0.0030	<0.0030	--	<0.0030	<0.0030	--
Arsenic, Total (mg/L)		**0.0023**	**0.0024**	**0.0024**	**0.0020**	**0.0079**	**0.0022**	**0.0043**	**0.0092**	**0.0051**
Barium, Total (mg/L)		**0.61**	**0.56**	**0.63**	**0.20**	**0.33**	**0.20**	**0.15**	**0.17**	**0.24**
Beryllium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Cadmium, Total (mg/L)		<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	**0.0098**	**0.0040**	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	**0.0030**	**0.0023**	**0.0018**
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0047**	**0.0018**	**0.0022**
Lithium, Total (mg/L)		**0.021**	**0.024**	**0.029**	**0.025**	**0.026**	**0.031**	<0.010	**0.010**	**0.015**
Molybdenum, Total (mg/L)		<0.0010	<0.0010	<0.0010	**0.0043**	**0.0042**	**0.0042**	<0.0010	<0.0010	<0.0010
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0010**
Thallium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Mercury, Total (mg/L)		<0.00020	<0.00020	--	<0.00020	<0.00020	--	<0.00020	<0.00020	--
Fluoride (mg/L)		**1.71**	**1.52**	**1.69**	**0.620**	**0.625**	**0.602**	**0.543**	**0.516**	**0.507**
Radium-226 & 228 Combined (pCi/L)		0.225 ± 0.901 (1.92)	**2.09 ± 1.02 (1.39)**	**3.08 ± 1.25 (1.67)**	0.594 ± 0.743 (1.38)	**2.18 ± 1.00 (0.950)**	1.76 ± 1.07 (1.83)	0.969 ± 1.09 (2.01)	1.55 ± 1.60 (2.93)	**2.20 ± 1.05 (1.25)**

TABLE I
SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient									
		MW-6			MW-7				MW-8		
	Measure Point (TOC)	300.270			301.501				310.628		
	Sample Name	MW-6	MW-6	MW-6	MW-7	POND 3 DUPLICATE	MW-7	MW-7	MW-8	MW-8	MW-8
	Sample Date	3/8/2019	6/7/2019	9/4/2019	3/8/2019	3/8/2019	6/7/2019	9/4/2019	3/8/2019	6/7/2019	9/3/2019
Lab Data Reviewed and Accepted		4/15/2019	8/2/2019	10/23/2019	4/15/2019	4/15/2019	8/2/2019	10/23/2019	4/19/2019	8/2/2019	10/23/2019
Depth to Water (ft btoc)		10.33	13.32	26.74	12.71	--	14.80	25.30	21.25	23.80	34.08
Temperature (Deg C)		17.29	19.42	17.51	18.64	--	19.53	19.69	16.67	18.47	18.61
Conductivity (µS/cm)		1063	956	642	1340	--	1355	1254	1358	1420	1435
Turbidity (NTU)		85.6	9.4	0.0	57.9	--	4.5	7.8	47.5	9.9	0.0
Boron, Total (mg/L)		**2.0**	--	**0.51**	**15**	**14**	--	**18**	**29**	--	**22**
Calcium, Total (mg/L)		**150**	--	**92**	**170**	**180**	--	**160**	**190**	--	**120**
Chloride (mg/L)		**17**	--	**11**	**15**	**16**	--	**15**	**6.0**	--	**7.2**
Fluoride (mg/L)		**0.430**	--	**0.495**	**0.414**	**0.487**	--	**0.55**	**0.311**	--	**0.408**
Sulfate (mg/L)		**150**	--	**62**	**480**	**460**	--	**420**	**380**	--	**380**
pH (su)		**7.05**	--	**7.29**	**7.12**	**7.42**	--	**7.11**	**7.18**	--	**7.18**
TDS (mg/L)		**680**	--	**380**	**960**	**950**	--	**900**	**1000**	--	**1000**
Antimony, Total		<0.0030	<0.0030	--	<0.0030	<0.0030	<0.0030	--	<0.0030	<0.0030	--
Arsenic, Total (mg/L)		<0.0010	<0.0010	<0.0010	**0.0032**	**0.0030**	**0.0031**	**0.0035**	**0.0080**	**0.0071**	**0.0048**
Barium, Total (mg/L)		**0.15**	**0.13**	**0.10**	**0.11**	**0.12**	**0.11**	**0.12**	**0.13**	**0.11**	**0.11**
Beryllium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Cadmium, Total (mg/L)		<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	**0.0011**	**0.001**	<0.00089	<0.00089	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		**0.0058**	**0.0041**	**0.0026**	**0.0029**	**0.0029**	**0.0033**	**0.004**	<0.00086	<0.00086	0.0016
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.017**	**0.022**	**0.018**	**0.025**	**0.023**	**0.039**	**0.031**	**0.018**	**0.033**	**0.027**
Molybdenum, Total (mg/L)		**0.013**	**0.0025**	**0.0110**	**2.7**	**2.8**	**2.6**	**2.4**	**1.1**	**1.5**	**0.9**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Mercury, Total (mg/L)		<0.00020	<0.00020	--	<0.00020	<0.00020	<0.00020	--	<0.00020	<0.00020	--
Fluoride (mg/L)		**0.430**	**0.394**	**0.495**	**0.414**	**0.487**	**0.464**	**0.550**	**0.311**	**0.330**	**0.408**
Radium-226 & 228 Combined (pCi/L)		1.53 ± 0.978 (1.63)	0.952 ± 0.738 (1.23)	0.322 ± 1.15 (2.19)	1.23 ± 0.995 (1.76)	1.52 ± 1.04 (1.77)	**2.07 ± 0.855 (0.706)**	1.54 ± 1.17 (1.89)	1.09 ± 1.19 (1.95)	**1.42 ± 0.675 (0.721)**	0.969 ± 0.982 (1.71)

TABLE I
SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient										
		MW-9			P-1					P-2		
	Measure Point (TOC)	310.237			313.350					309.838		
	Sample Name	MW-9	MW-9	MW-9	P-1	P-1	POND 3 DUPLICATE	P-1	Duplicate	P-2	P-2	P-2
	Sample Date	3/11/2019	6/7/2019	9/3/2019	3/7/2019	6/5/2019	6/5/2019	9/3/2019	9/3/2019	3/7/2019	6/5/2019	9/3/2019
Lab Data Reviewed and Accepted		4/24/2019	8/2/2019	10/23/2019	4/15/2019	7/15/2019	7/15/2019	10/23/2019	10/23/2019	4/15/2019	7/15/2019	10/23/2019
Depth to Water (ft btoc)		19.75	22.87	25.30	24.09	25.70	--	43.80	--	17.59	22.20	37.75
Temperature (Deg C)		17.48	18.37	18.94	18.38	20.64	--	20.92	--	18.31	20.16	20.12
Conductivity (µS/cm)		900	964	845	947	954	--	935.00	--	976	1021	1009
Turbidity (NTU)		23.2	5.6	0.0	35.7	10.9	--	0.0	--	40.3	6.1	0.0
Boron, Total (mg/L)		**3.0**	--	**2.2**	**1.5**	--	--	**2.1**	**1.9**	**2.5**	--	**3.4**
Calcium, Total (mg/L)		**120**	--	**110**	**140**	--	--	**120**	**140**	**130**	--	**130**
Chloride (mg/L)		**20**	--	**20**	**16**	--	--	**16**	**17**	**18**	--	**17**
Fluoride (mg/L)		**0.426**	--	**0.533**	**0.398**	--	--	**0.509**	**0.504**	**0.559**	--	**0.549**
Sulfate (mg/L)		**100**	--	**100**	**170**	--	--	**140**	**140**	**220**	--	**220**
pH (su)		**7.15**	--	**7.32**	**7.30**	--	--	**7.25**	**7.25**	**7.51**	--	**7.32**
TDS (mg/L)		**500**	--	**520**	**600**	--	--	**590**	**610**	**640**	--	**680**
Antimony, Total		<0.0030	<0.0030	--	<0.0030	<0.0030	<0.0030	--	--	<0.0030	<0.0030	--
Arsenic, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium, Total (mg/L)		**0.082**	**0.084**	**0.078**	**0.066**	**0.074**	**0.072**	**0.064**	**0.063**	**0.070**	**0.076**	**0.084**
Beryllium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	<0.0010	--	--	<0.0010	<0.0010	--
Cadmium, Total (mg/L)		<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.026**	**0.040**	**0.026**	**0.020**	**0.025**	**0.028**	**0.028**	**0.021**	**0.016**	**0.027**	**0.028**
Molybdenum, Total (mg/L)		**0.31**	**0.29**	**0.30**	**0.013**	**0.016**	**0.017**	**0.014**	**0.016**	**0.29**	**0.27**	**0.24**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	**0.0022**	**0.0044**	**0.0044**	<0.0010	<0.0010	**0.0016**	**0.0015**	**0.002**
Thallium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	<0.0010	--	--	<0.0010	<0.0010	--
Mercury, Total (mg/L)		<0.00020	<0.00020	--	<0.00020	<0.00020	<0.00020	--	--	<0.00020	<0.00020	--
Fluoride (mg/L)		**0.426**	**0.429**	**0.533**	**0.398**	**0.497**	**0.512**	**0.509**	**0.504**	**0.559**	**0.540**	**0.549**
Radium-226 & 228 Combined (pCi/L)		0.895 ± 0.914 (1.80)	**1.13 ± 0.711 (1.01)**	0.629 ± 0.872 (1.64)	0.733 ± 0.989 (1.85)	**1.22 ± 0.793 (1.13)**	**1.82 ± 1.10 (1.72)**	1.45 ± 0.907 (1.54)	0.448 ± 0.971 (1.79)	1.08 ± 0.967 (1.68)	0.728 ± 0.779 (1.39)	1.26 ± 0.884 (1.64)

TABLE I
SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient								
		P-3			P-4			P-5		
	Measure Point (TOC)	310.724			311.067			301.968		
	Sample Name	P-3	P-3	P-3	P-4	P-4	P-4	P-5	P-5	P-5
	Sample Date	3/7/2019	6/6/2019	9/3/2019	3/8/2019	6/6/2019	9/3/2019	3/8/2019	6/7/2019	9/4/2019
Lab Data Reviewed and Accepted		4/15/2019	7/15/2019	10/23/2019	4/15/2019	7/15/2019	10/23/2019	4/15/2019	8/2/2019	10/23/2019
Depth to Water (ft btoc)		17.28	23.00	37.85	17.30	23.38	39.75	13.87	15.54	24.96
Temperature (Deg C)		16.17	17.65	17.91	17.41	18.89	18.74	15.62	17.28	17.08
Conductivity (µS/cm)		1121	1195	1500	815	796	894	1267	1267	1237
Turbidity (NTU)		74.3	9.7	0.0	92.5	34.1	0.0	86.8	4.0	0.0
Boron, Total (mg/L)		**7.1**	--	**9.0**	**0.51**	--	**1.60**	**14**	--	**20**
Calcium, Total (mg/L)		**170**	--	**250**	**110**	--	**120**	**160**	--	**140**
Chloride (mg/L)		**18**	--	**15**	**21**	--	**20**	**8.9**	--	**4.1**
Fluoride (mg/L)		**0.449**	--	**0.530**	**0.320**	--	**0.396**	**0.312**	--	**0.326**
Sulfate (mg/L)		**140**	--	**270**	**78**	--	**71**	**310**	--	**290**
pH (su)		**7.36**	--	**7.17**	**7.37**	--	**7.26**	**7.13**	--	**6.80**
TDS (mg/L)		**720**	--	**1000**	**560**	--	**510**	**900**	--	**840**
Antimony, Total		<0.0030	<0.0030	--	<0.0030	<0.0030	--	<0.0030	<0.0030	--
Arsenic, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0056**	**0.0055**	**0.0064**
Barium, Total (mg/L)		**0.10**	**0.10**	**0.14**	**0.13**	**0.11**	**0.15**	**0.16**	**0.14**	**0.16**
Beryllium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Cadmium, Total (mg/L)		<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	**0.0018**
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.021**	**0.029**	**0.033**	**0.035**	**0.041**	**0.048**	**0.023**	**0.032**	**0.027**
Molybdenum, Total (mg/L)		**1.0**	**0.9**	**1.0**	**0.022**	**0.024**	**0.020**	**0.28**	**0.44**	**0.38**
Selenium, Total (mg/L)		**0.013**	**0.010**	**0.011**	**0.0020**	**0.0015**	**0.0014**	<0.0010	<0.0010	<0.0010
Thallium, Total (mg/L)		<0.0010	<0.0010	--	<0.0010	<0.0010	--	<0.0010	<0.0010	--
Mercury, Total (mg/L)		<0.00020	<0.00020	--	<0.00020	<0.00020	--	<0.00020	<0.00020	--
Fluoride (mg/L)		**0.449**	**0.454**	**0.530**	**0.320**	**0.435**	**0.396**	**0.312**	**0.315**	**0.326**
Radium-226 & 228 Combined (pCi/L)		0.668 ± 0.881 (1.75)	0.605 ± 0.743 (1.41)	1.12 ± 1.11 (1.97)	0.570 ± 0.887 (1.73)	1.34 ± 0.877 (1.43)	0.661 ± 0.808 (1.53)	1.72 ± 1.09 (1.91)	**2.67 ± 1.02 (1.11)**	1.50 ± 1.17 (1.98)

Notes:

The June 2019 sampling event was for Appendix IV constituents only. The August 2019 sampling event included Appendix IV constituents detected in the June 2019 sampling event, and all of the Appendix III constituents.

Radiological results are presented as activity plus or minus uncertainty with MDC.

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

TABLE II
SSL SUMMARY TABLE
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Constituent	Sampling Event	Well ID	Groundwater Protection Standard (mg/L)
Molybdenum	September 2018	MW-7	0.100
		MW-8	
		MW-9	
		P-2	
		P-3	
		P-5	
	March 2019	MW-7	
		MW-8	
		MW-9	
		P-2	
		P-3	
		P-5	

Notes:

mg/L = milligrams per liter

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Upgradient											
		MW-16				B-123				B-126			
	Measure Point (TOC)	292.853				292.7				293.63			
	Sample Name	MW-16	MW-16	MW-16	MW-16	B-123	B-123	B-123	B-123	B-126	B-126	B-126	B-126
	Sample Date	8/28/2019	10/3/2019	10/16/2019	11/9/2019	8/28/2019	10/4/2019	10/15/2019	11/6/2019	8/28/2019	10/4/2019	10/15/2019	11/6/2019
Lab Data Reviewed and Accepted		11/9/2019	11/19/2019	12/30/2019	1/10/2020	11/9/2019	11/19/2019	11/26/2019	12/31/2019	11/9/2019	11/19/2019	11/26/2019	12/31/2019
Depth to Water (ft btoc)		17.10	19.85	18.99	17.87	10.75	14.05	14.52	13.78	12.00	14.99	15.50	15.54
Temperature (Deg C)		17.98	17.76	17.37	17.36	16.69	16.44	16.45	16.29	17.31	17.18	16.97	16.17
Conductivity (µS/cm)		894	0.921	0.908	0.925	650	0.662	0.654	0.629	400	1.129	1.109	0.530
Turbidity (NTU)		24.1	4.8	2.4	4.0	33.2	255	15.3	9	152	45.2	17	34
Boron, Total (mg/L)		**0.046**	**0.210**	**0.065**	**0.056**	**0.025**	**0.043**	**0.052**	**0.079**	**0.024**	**0.037**	**0.041**	**0.050**
Calcium, Total (mg/L)		**120**	**130**	**130**	**120**	**78**	**83**	**83**	**80**	**56**	**140**	**140**	**67**
Chloride (mg/L)		**16**	**16**	**13**	**14**	**2.8**	**3.1**	**3.2**	**3.0**	**2.7**	**8.8**	**10**	**4.2**
Fluoride (mg/L)		**1.69**	**1.66**	**1.43**	**1.47**	**0.602**	**0.598**	**0.580**	**0.654**	**0.507**	**0.409**	**0.517**	**0.508**
Sulfate (mg/L)		**73**	**70**	**68**	**75**	**28**	**29**	**28**	**29**	**24**	**130**	**130**	**38**
pH (su)		**7.19**	**6.94**	**7.12**	**7.22**	**7.51**	**7.26**	**7.29**	**6.95**	**7.10**	**6.98**	**6.98**	**7.07**
TDS (mg/L)		**520**	**490**	**470**	**520**	**340**	**360**	**340**	**410**	**280**	**580**	**630**	**320**
Arsenic, Total (mg/L)		**0.0024**	**0.0022**	**0.0020**	**0.0024**	**0.0022**	**0.0011**	**0.0012**	**0.0018**	**0.0051**	**0.0049**	**0.0046**	**0.0043**
Barium, Total (mg/L)		**0.63**	**0.65**	**0.58**	**0.65**	**0.20**	**0.16**	**0.16**	**0.18**	**0.24**	**0.33**	**0.30**	**0.19**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.0020	<0.0020	<0.00086	<0.00086	<0.0020	<0.0020	<0.00086	**0.0018**	<0.0020	<0.0020	**0.0012**
Lead, Total (mg/L)		<0.0010	<0.0010	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0022**	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.029**	**0.025**	**0.026**	**0.026**	**0.031**	**0.027**	**0.028**	**0.026**	**0.015**	**0.021**	**0.022**	<0.020
Molybdenum, Total (mg/L)		<0.0010	<0.0010	**0.001**	<0.0010	**0.0042**	**0.0059**	**0.0040**	**0.0047**	<0.0010	<0.0010	**0.0032**	**0.0010**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0010**	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		**1.69**	**1.66**	**1.43**	**1.47**	**0.602**	**0.598**	**0.580**	**0.654**	**0.507**	**0.409**	**0.517**	**0.508**
Radium-226 & 228 Combined (pCi/L)		**3.08 ± 1.25 (1.67)**	0.0972 +/- 0.959 (2.11)	1.39 +/- 1.23 (2.08)	0.809 +/- 0.659 (0.955)	1.76 ± 1.07 (1.83)	0.0475 +/- 0.872 (1.97)	1.56 +/- 1.04 (1.82)	0.446 +/- 0.879 (1.79)	**2.20 ± 1.05 (1.25)**	0.884 +/- 1.10 (2.02)	0.563 +/- 1.05 (2.22)	**2.68 +/- 1.23 (1.80)**

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient											
		MW-6				MW-7				MW-8			
	Measure Point (TOC)	300.270				301.501				310.628			
	Sample Name	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8
	Sample Date	9/4/2019	10/3/2019	10/16/2019	11/9/2019	9/4/2019	10/4/2019	10/16/2019	11/9/2019	9/3/2019	10/4/2019	10/16/2019	11/6/2019
Lab Data Reviewed and Accepted		10/23/2019	11/19/2019	12/30/2019	1/10/2020	10/23/2019	11/19/2019	12/30/2019	1/10/2020	10/23/2019	11/19/2019	12/30/2019	12/31/2019
Depth to Water (ft btoc)		26.74	28.93	26.87	25.45	25.30	28.47	27.49	26.17	34.08	37.27	36.30	35.08
Temperature (Deg C)		17.51	17.53	17.20	17.13	19.69	19.44	19.13	18.89	18.61	17.81	17.72	17.16
Conductivity (µS/cm)		642	0.596	0.620	0.653	1254	1.276	1.381	1.461	1435	1.435	1.424	1.429
Turbidity (NTU)		0.0	2.0	1.7	3.3	7.8	17.3	3.9	6.3	0.0	12.4	1.4	4.8
Boron, Total (mg/L)		**0.51**	**0.16**	**0.22**	**0.19**	**18**	**15**	**18**	**18**	**22**	**17**	**18**	**17**
Calcium, Total (mg/L)		**92**	**86**	**89**	**89**	**160**	**180**	**190**	**190**	**120**	**220**	**220**	**230**
Chloride (mg/L)		**11**	**18**	**17**	**15**	**15**	**19**	**17**	**19**	**7.2**	**7.4**	**8.3**	**8.9**
Fluoride (mg/L)		**0.495**	**0.614**	**0.408**	**0.568**	**0.55**	**0.685**	**0.399**	**0.410**	**0.408**	**0.355**	**0.288**	**0.305**
Sulfate (mg/L)		**62**	**69**	**69**	**71**	**420**	**430**	**500**	**530**	**380**	**380**	**380**	**370**
pH (su)		**7.29**	**7.18**	**7.29**	**7.34**	**7.11**	**6.97**	**7.05**	**7.12**	**7.18**	**7.07**	**7.27**	**6.81**
TDS (mg/L)		**380**	**320**	**340**	**380**	**900**	**920**	**1000**	**1100**	**1000**	**920**	**1000**	**1000**
Arsenic, Total (mg/L)		<0.0010	<0.001	<0.001	<0.0010	**0.0035**	**0.0033**	**0.0034**	**0.0045**	**0.0048**	**0.0044**	**0.0044**	**0.0050**
Barium, Total (mg/L)		**0.10**	**0.078**	**0.075**	**0.087**	**0.12**	**0.12**	**0.11**	**0.13**	**0.11**	**0.098**	**0.089**	**0.10**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	**0.001**	**0.001**	<0.0010	**0.00091**	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		**0.0026**	<0.0020	<0.0020	**0.0020**	**0.004**	**0.0048**	**0.0033**	**0.0042**	0.0016	<0.0020	<0.0020	**0.0017**
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.018**	<0.020	<0.020	<0.020	**0.031**	**0.024**	**0.027**	**0.027**	**0.027**	**0.021**	**0.021**	**0.021**
Molybdenum, Total (mg/L)		**0.0110**	**0.0092**	**0.026**	**0.0067**	**2.4**	**2.4**	**2.4**	**2.3**	**0.9**	**0.93**	**0.94**	**0.93**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		**0.495**	**0.614**	**0.408**	**0.568**	**0.550**	**0.685**	**0.399**	**0.410**	**0.408**	**0.355**	**0.288**	**0.305**
Radium-226 & 228 Combined (pCi/L)		0.322 ± 1.15 (2.19)	1.52 +/- 0.956 (1.66)	0.915 +/- 0.958 (1.66)	0.950 +/- 0.813 (1.42)	1.54 ± 1.17 (1.89)	2.22 +/- 1.38 (2.36)	1.43 +/- 1.30 (2.26)	**1.60 +/- 0.874 (1.39)**	0.969 ± 0.982 (1.71)	0.341 +/- 1.12 (2.39)	1.03 +/- 1.06 (1.89)	1.32 +/- 0.848 (1.54)

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µ*S/cm = micro Siemens per centimeter*

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient												
		MW-9				P-1					P-2			
	Measure Point (TOC)	310.237				313.350					309.838			
	Sample Name	MW-9	MW-9	MW-9	MW-9	P-1	Duplicate	P-1	P-1	P-1	P-2	P-2	P-2	P-2
	Sample Date	9/3/2019	10/4/2019	10/16/2019	11/6/2019	9/3/2019	9/3/2019	10/2/2019	10/16/2019	11/9/2019	9/3/2019	10/2/2019	10/16/2019	11/9/2019
Lab Data Reviewed and Accepted		10/23/2019	11/19/2019	12/30/2019	12/31/2019	10/23/2019	10/23/2019	11/13/2019	12/30/2019	1/10/2020	10/23/2019	11/13/2019	12/30/2019	1/10/2020
Depth to Water (ft btoc)		25.30	38.30	36.31	34.73	43.80	--	43.71	40.02	40.53	37.75	40.20	36.44	34.58
Temperature (Deg C)		18.94	18.25	17.88	17.55	20.92	--	20.43	19.84	18.61	20.12	20.08	19.75	16.05
Conductivity (µS/cm)		845	0.863	0.846	0.850	935.00	--	0.911	0.902	0.946	1009	1.010	1.028	1.088
Turbidity (NTU)		0.0	10.9	1.0	3.3	0.0	--	0.0	0.40	6.10	0.0	0.6	1.2	6.5
Boron, Total (mg/L)		**2.2**	**2.4**	**2.7**	**2.5**	**2.1**	**1.9**	**1.8**	**2.0**	**1.7**	**3.4**	**3.1**	**3.0**	**2.7**
Calcium, Total (mg/L)		**110**	**120**	**120**	**110**	**120**	**140**	**130**	**130**	**130**	**130**	**140**	**150**	**140**
Chloride (mg/L)		**20**	**24**	**20**	**19**	**16**	**17**	**18**	**17**	**18**	**17**	**17**	**15**	**17**
Fluoride (mg/L)		**0.533**	**0.573**	**0.358**	**0.472**	**0.509**	**0.504**	**0.442**	**0.360**	**0.490**	**0.549**	**0.496**	**0.394**	**0.553**
Sulfate (mg/L)		**100**	**99**	**95**	**97**	**140**	**140**	**140**	**140**	**160**	**220**	**280**	**320**	**350**
pH (su)		**7.32**	**7.14**	**7.34**	**6.76**	**7.25**	**7.25**	**7.36**	**7.28**	**7.41**	**7.32**	**7.42**	**7.38**	**7.51**
TDS (mg/L)		**520**	**450**	**510**	**490**	**590**	**610**	**540**	**580**	**600**	**680**	**660**	**720**	**760**
Arsenic, Total (mg/L)		<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.0010
Barium, Total (mg/L)		**0.078**	**0.077**	**0.071**	**0.078**	**0.064**	**0.063**	**0.056**	**0.054**	**0.060**	**0.084**	**0.074**	**0.073**	**0.080**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.0020	<0.0020	<0.00086	<0.00086	<0.00086	<0.0020	<0.0020	<0.00086	<0.00086	<0.0020	<0.0020	<0.00086
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.026**	**0.028**	**0.029**	**0.029**	**0.028**	**0.021**	**0.022**	**0.023**	**0.024**	**0.028**	**0.021**	**0.020**	**0.020**
Molybdenum, Total (mg/L)		**0.30**	**0.29**	**0.30**	**0.30**	**0.014**	**0.016**	**0.014**	**0.014**	**0.018**	**0.24**	**0.26**	**0.26**	**0.25**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0016**	**0.002**	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		**0.533**	**0.573**	**0.358**	**0.472**	**0.509**	**0.504**	**0.442**	**0.360**	**0.490**	**0.549**	**0.496**	**0.394**	**0.553**
Radium-226 & 228 Combined (pCi/L)		0.629 ± 0.872 (1.64)	0.167 +/- 1.08 (2.32)	**1.04 +/- 0.783 (0.978)**	0.614 +/- 0.760 (1.52)	1.45 ± 0.907 (1.54)	0.448 ± 0.971 (1.79)	0.665 +/- 0.847 (1.63)	0.253 +/- 1.22 (2.67)	0.638 +/- 0.709 (1.10)	1.26 ± 0.884 (1.64)	0.926 +/- 0.875 (1.55)	0.493 +/- 1.01 (1.97)	**1.16 +/- 0.735 (0.971)**

Notes:

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Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC) .*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient											
		P-3				P-4				P-5			
	Measure Point (TOC)	310.724				311.067				301.968			
	Sample Name	P-3	P-3	P-3	P-3	P-4	P-4	P-4	P-4	P-5	P-5	P-5	P-5
	Sample Date	9/3/2019	10/2/2019	10/16/2019	11/9/2019	9/3/2019	10/2/2019	10/16/2019	11/9/2019	9/4/2019	10/2/2019	10/16/2019	11/9/2019
Lab Data Reviewed and Accepted		10/23/2019	11/13/2019	12/30/2019	1/10/2020	10/23/2019	11/13/2019	1/10/2020	12/31/2019	10/23/2019	11/13/2020	12/30/2019	1/10/2020
Depth to Water (ft btoc)		37.85	41.12	37.45	34.90	39.89	42.03	38.94	35.46	25.30	28.23	27.63	26.58
Temperature (Deg C)		17.91	17.38	17.13	16.54	18.74	18.25	18.02	17.32	17.08	17.29	16.91	16.33
Conductivity (µS/cm)		1500	1.340	1.216	1.266	894	0.797	0.715	0.704	1237	1.146	1.175	1.251
Turbidity (NTU)		0.0	1.4	0.8	2.9	0.0	0.3	1.1	2.8	0.0	3.2	3.8	4.6
Boron, Total (mg/L)		**9.0**	**7.3**	**10.0**	**9.0**	**1.60**	**0.48**	**0.46**	**0.54**	**20**	**13**	**14**	**14**
Calcium, Total (mg/L)		**250**	**230**	**210**	**200**	**120**	**110**	**97**	**87**	**140**	**150**	**150**	**150**
Chloride (mg/L)		**15**	**14**	**14**	**17**	**20**	**21**	**20**	**23**	**4.1**	**5.6**	**8.6**	**5.6**
Fluoride (mg/L)		**0.530**	**0.362**	**0.447**	**0.435**	**0.396**	**0.339**	**0.367**	**0.468**	**0.326**	**0.254**	<0.250	**0.291**
Sulfate (mg/L)		**270**	**240**	**190**	**190**	**71**	**77**	**84**	**90**	**290**	**240**	**250**	**300**
pH (su)		**7.17**	**7.20**	**7.15**	**7.30**	**7.26**	**7.36**	**7.38**	**7.54**	**6.80**	**6.82**	**6.90**	**7.06**
TDS (mg/L)		**1000**	**880**	**820**	**880**	**510**	**530**	**420**	**370**	**840**	**750**	**760**	**890**
Arsenic, Total (mg/L)		<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.0010	**0.0064**	**0.0056**	**0.0057**	**0.0062**
Barium, Total (mg/L)		**0.14**	**0.12**	**0.10**	**0.11**	**0.15**	**0.11**	**0.098**	**0.10**	**0.16**	**0.14**	**0.13**	**0.15**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)		<0.00086	<0.0020	<0.0020	<0.00086	<0.00086	<0.0020	<0.0020	<0.00086	**0.0018**	<0.0020	<0.0020	**0.0013**
Lead, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium, Total (mg/L)		**0.033**	**0.029**	**0.027**	**0.027**	**0.048**	**0.035**	**0.030**	**0.028**	**0.027**	**0.021**	**0.021**	**0.022**
Molybdenum, Total (mg/L)		**1.0**	**1.1**	**1.2**	**1.2**	**0.020**	**0.021**	**0.023**	**0.024**	**0.38**	**0.31**	**0.31**	**0.30**
Selenium, Total (mg/L)		**0.011**	**0.008**	**0.0064**	**0.015**	**0.0014**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		**0.530**	**0.362**	**0.447**	**0.435**	**0.396**	**0.339**	**0.367**	**0.468**	**0.326**	**0.254**	<0.250	**0.291**
Radium-226 & 228 Combined (pCi/L)		1.12 ± 1.11 (1.97)	1.28 +/- 0.927 (1.62)	0.797 +/- 0.954 (2.09)	0.420 +/- 0.851 (1.68)	0.661 ± 0.808 (1.53)	**0.889 +/- 0.976 (1.83)**	0.634 +/- 0.776 (1.43)	0.972 +/- 0.709 (1.31)	1.50 ± 1.17 (1.98)	**1.52 +/- 0.894 (1.51)**	0.783 +/- 1.08 (2.06)	**1.37 +/- 0.882 (1.07)**

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient								
		MW-7D			MW-19S			MW-20S		
	Measure Point (TOC)	302.070			293.870			293.560		
	Sample Name	MW-7D	MW-7D	MW-7D	MW-19S	MW-19S	MW-19S	MW-20S	MW-20S	MW-20S
	Sample Date	10/3/2019	10/15/2019	11/10/2019	10/4/2019	10/15/2019	11/15/2019	10/4/2019	10/15/2019	11/15/2019
Lab Data Reviewed and Accepted		11/19/2019	11/26/2019	1/10/2020	11/19/2019	11/26/2019	1/7/2020	11/19/2019	11/26/2019	1/7/2020
Depth to Water (ft btoc)		28.82	27.80	26.50	24.61	20.49	18.77	24.03	20.07	18.80
Temperature (Deg C)		24.15	20.26	16.94	17.91	19.70	15.96	18.56	16.88	15.62
Conductivity (µS/cm)		0.904	0.983	0.954	1.134	1.203	1.168	1.145	1.178	1.174
Turbidity (NTU)		186	131	98.0	93.1	503.0	45.7	68.5	164.0	50.7
Boron, Total (mg/L)		**7.8**	**9.9**	**7.8**	**0.83**	**0.92**	**0.90**	**2.1**	**2.3**	**2.2**
Calcium, Total (mg/L)		**110**	**130**	**120**	**170**	**200**	**170**	**170**	**180**	**170**
Chloride (mg/L)		**24**	**16**	**17**	**19**	**16**	**17**	**21**	**18**	**19**
Fluoride (mg/L)		**0.712**	**0.791**	**0.946**	**0.312**	**0.529**	**0.377**	**0.463**	**0.580**	**0.464**
Sulfate (mg/L)		**250**	**220**	**230**	**230**	**250**	**250**	**330**	**350**	**360**
pH (su)		**7.58**	**7.25**	**7.46**	**7.41**	**7.26**	**7.19**	**7.30**	**7.16**	**7.19**
TDS (mg/L)		**560**	**580**	**620**	**630**	**760**	**760**	**710**	**800**	**820**
Arsenic, Total (mg/L)		**0.0062**	**0.0068**	**0.0062**	**0.0033**	**0.0058**	<0.0010	**0.0031**	**0.0049**	**0.0030**
Barium, Total (mg/L)		**0.15**	**0.13**	**0.12**	**0.19**	**0.20**	**0.14**	**0.17**	**0.20**	**0.16**
Cadmium, Total (mg/L)		<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		**0.012**	**0.0081**	<0.0040	**0.006**	**0.011**	**0.0076**	<0.0040	**0.011**	<0.0040
Cobalt, Total (mg/L)		**0.0027**	**0.0022**	**0.0016**	<0.0020	**0.002**	**0.0014**	<0.0020	<0.0020	<0.00086
Lead, Total (mg/L)		**0.0039**	**0.0036**	**0.0027**	<0.0010	**0.0019**	<0.0010	<0.001	**0.0031**	<0.0010
Lithium, Total (mg/L)		**0.021**	**0.023**	**0.021**	**0.022**	**0.024**	**0.025**	**0.028**	**0.024**	**0.025**
Molybdenum, Total (mg/L)		**0.76**	**1**	**0.69**	**0.036**	**0.047**	**0.016**	**0.20**	**0.24**	**0.19**
Selenium, Total (mg/L)		<0.001	<0.0010	<0.0010	<0.001	<0.0010	**0.0014**	<0.001	<0.0010	<0.0010
Fluoride (mg/L)		**0.712**	**0.791**	**0.946**	**0.312**	**0.529**	**0.377**	**0.463**	**0.580**	**0.464**
Radium-226 & 228 Combined (pCi/L)		**1.83 +/- 1.17 (1.79)**	1.12 +/- 1.96 (3.92)	0.874 +/- 0.768 (1.44)	0.749 +/- 0.979 (1.71)	1.17 +/- 2.25 (4.59)	**0.978 +/- 0.912 (1.81)**	0.491 +/- 0.979 (2.01)	0.458 +/- 1.63 (3.70)	0.854 +/- 0.855 (1.60)

Notes:

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Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

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su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient								
		MW-20D			MW-21S			MW-21D		
	Measure Point (TOC)	293.450			289.900			289.950		
	Sample Name	MW-20D	MW-20D	MW-20D	MW-21S	MW-21S	MW-21S	MW-21D	MW-21D	MW-21D
	Sample Date	10/4/2019	10/15/2019	11/15/2019	10/4/2019	10/15/2019	11/10/2019	10/4/2019	10/15/2019	11/10/2019
Lab Data Reviewed and Accepted		11/19/2019	11/26/2019	1/7/2020	11/19/2019	11/26/2019	1/10/2020	11/19/2019	11/26/2019	1/10/2020
Depth to Water (ft btoc)		24.10	20.14	18.77	20.75	16.70	13.81	20.77	16.60	13.79
Temperature (Deg C)		18.67	18.78	16.28	16.24	15.28	14.83	17.40	16.53	15.10
Conductivity (µS/cm)		0.940	0.951	1.000	0.866	0.940	0.915	0.685	0.802	0.870
Turbidity (NTU)		392	161	10.0	308	320	99.0	165	344	99.8
Boron, Total (mg/L)		**2.1**	**2.4**	**2.5**	**1.3**	**1.1**	**1.4**	**2.3**	**2.6**	**2.9**
Calcium, Total (mg/L)		**140**	**140**	**140**	**150**	**160**	**140**	**96**	**120**	**120**
Chloride (mg/L)		**30**	**14**	**19**	**26**	**21**	**25**	**29**	**17**	**19**
Fluoride (mg/L)		**0.673**	**0.327**	**0.649**	**0.614**	**0.609**	**0.748**	**0.513**	**0.634**	**0.670**
Sulfate (mg/L)		**190**	**97**	**170**	**74**	**66**	**84**	**130**	**150**	**170**
pH (su)		**7.70**	**7.61**	**7.44**	**7.48**	**7.29**	**7.29**	**8.03**	**7.54**	**7.62**
TDS (mg/L)		**570**	**300**	**660**	**480**	**540**	**530**	**420**	**480**	**530**
Arsenic, Total (mg/L)		**0.0029**	**0.0022**	**0.0016**	**0.0047**	**0.0047**	**0.0013**	**0.0021**	**0.0038**	**0.0021**
Barium, Total (mg/L)		**0.16**	**0.10**	**0.097**	**0.13**	**0.15**	**0.10**	**0.13**	**0.16**	**0.13**
Cadmium, Total (mg/L)		<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		**0.0076**	**0.0058**	<0.0040	**0.014**	**0.016**	<0.0040	**0.0075**	**0.018**	<0.0040
Cobalt, Total (mg/L)		**0.0039**	<0.0020	<0.00086	**0.0051**	**0.0056**	**0.0016**	<0.0020	**0.0022**	<0.00086
Lead, Total (mg/L)		**0.0052**	**0.002**	<0.0010	**0.0051**	**0.0053**	<0.0010	**0.0025**	**0.0051**	<0.0010
Lithium, Total (mg/L)		**0.026**	<0.020	<0.020	**0.025**	<0.020	<0.020	**0.027**	**0.026**	**0.024**
Molybdenum, Total (mg/L)		**0.20**	**0.24**	**0.24**	**0.58**	**0.64**	**0.62**	**0.25**	**0.29**	**0.32**
Selenium, Total (mg/L)		<0.001	<0.0010	<0.0010	<0.001	**0.0011**	<0.0010	<0.001	<0.0010	<0.0010
Fluoride (mg/L)		**0.673**	**0.327**	**0.649**	**0.614**	**0.609**	**0.748**	**0.513**	**0.634**	**0.670**
Radium-226 & 228 Combined (pCi/L)		**1.91 +/- 1.06 (1.60)**	4.12 +/- 3.62 (6.92)	**0.679 +/- 0.774 (1.51)**	1.11 +/- 0.973 (1.66)	**4.58 +/- 3.48 (6.59)**	1.01 +/- 0.797 (1.26)	2.00 +/- 1.37 (2.39)	2.50 +/- 1.89 (3.42)	**1.47 +/- 0.838 (1.11)**

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient								
		MW-22S			MW-22D			MW-23S		
	Measure Point (TOC)	293.660			293.540			292.320		
	Sample Name	MW-22S	MW-22S	MW-22S	MW-22D	MW-22D	MW-22D	MW-23S	MW-23S	MW-23S
	Sample Date	10/4/2019	10/15/2019	11/10/2019	10/4/2019	10/15/2019	11/10/2019	10/3/2019	10/15/2019	11/15/2019
Lab Data Reviewed and Accepted		11/19/2019	11/26/2019	1/10/2020	11/19/2019	11/26/2019	1/10/2020	11/19/2019	11/26/2019	1/7/2020
Depth to Water (ft btoc)		24.83	20.08	17.57	24.78	20.50	17.57	23.72	18.80	16.67
Temperature (Deg C)		17.27	16.33	15.72	17.69	16.48	15.65	22.15	16.85	16.77
Conductivity (µS/cm)		0.694	1.165	1.144	1.200	0.679	0.682	1.209	0.980	1.022
Turbidity (NTU)		1569	117.4	99.6	2000	1332	99.8	73	64.7	53.5
Boron, Total (mg/L)		**3.4**	**3.0**	**4.0**	**4.5**	**5.1**	**4.0**	**0.52**	**0.46**	**0.54**
Calcium, Total (mg/L)		**230**	**200**	**160**	**110**	**97**	**81**	**180**	**140**	**140**
Chloride (mg/L)		**35**	**26**	**26**	**31**	**26**	**20**	**44**	**29**	**26**
Fluoride (mg/L)		**0.320**	**0.422**	**0.452**	**0.822**	**0.881**	**0.961**	**0.406**	**0.439**	**0.352**
Sulfate (mg/L)		**95**	**100**	**96**	**130**	**130**	**130**	**130**	**95**	**110**
pH (su)		**7.30**	**6.99**	**7.12**	**7.65**	**7.57**	**7.73**	**7.12**	**7.02**	**7.06**
TDS (mg/L)		**650**	**700**	**720**	**420**	**380**	**470**	**780**	**600**	**580**
Arsenic, Total (mg/L)		**0.033**	**0.021**	**0.0046**	**0.0087**	**0.0093**	**0.0044**	<0.001	**0.0035**	<0.0010
Barium, Total (mg/L)		**1.0**	**0.61**	**0.23**	**0.20**	**0.19**	**0.065**	**0.17**	**0.17**	**0.13**
Cadmium, Total (mg/L)		<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		**0.026**	**0.038**	<0.0040	**0.019**	**0.027**	<0.0040	<0.0040	**0.018**	<0.0040
Cobalt, Total (mg/L)		**0.012**	**0.012**	<0.00086	**0.013**	**0.012**	<0.00086	<0.0020	**0.0044**	<0.00086
Lead, Total (mg/L)		**0.031**	**0.019**	<0.0010	**0.030**	**0.027**	**0.0010**	**0.0016**	**0.0062**	<0.0010
Lithium, Total (mg/L)		**0.044**	**0.040**	<0.020	**0.029**	**0.028**	<0.020	**0.035**	**0.032**	**0.029**
Molybdenum, Total (mg/L)		**0.19**	**0.21**	**0.20**	**0.95**	**0.95**	**0.87**	**0.016**	**0.020**	**0.014**
Selenium, Total (mg/L)		**0.002**	**0.0017**	<0.0010	**0.0012**	**0.0014**	<0.0010	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		**0.320**	**0.422**	**0.452**	**0.822**	**0.881**	**0.961**	**0.406**	**0.439**	**0.352**
Radium-226 & 228 Combined (pCi/L)		**5.59 +/- 1.81 (2.12)**	**10.6 +/- 4.31 (6.22)**	**1.70 +/- 0.849 (1.10)**	**0.683 +/- 1.05 (2.02)**	**11.2 +/- 3.87 (4.91)**	1.18 +/- 0.803 (1.25)	0.789 +/- 1.01 (2.01)	1.01 +/- 1.58 (3.24)	0.866 +/- 0.845 (1.55)

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient											
		MW-24S				MW-24D				MW-25S			
	Measure Point (TOC)	300.660				300.670				299.350			
	Sample Name	MW-24S	MW-24S	MW-24S	MW-24S	MW-24D	MW-24D	MW-24D	MW-24D	MW-25S	MW-25S	MW-25S	MW-25S
	Sample Date	8/28/2019	10/3/2019	10/15/2019	11/13/2019	8/28/2019	10/3/2019	10/15/2019	11/13/2019	8/28/2019	10/3/2019	10/15/2019	11/13/2019
Lab Data Reviewed and Accepted		11/9/2019	11/19/2019	11/26/2019	1/6/2020	11/9/2019	11/19/2019	11/26/2019	1/6/2020	11/9/2019	11/19/2019	11/26/2019	1/6/2020
Depth to Water (ft btoc)		20.40	25.86	25.57	24.86	20.40	25.84	25.51	24.84	19.00	24.53	24.33	23.69
Temperature (Deg C)		16.70	24.80	16.57	15.46	16.50	22.62	16.20	18.14	16.90	22.05	16.34	14.98
Conductivity (µS/cm)		0.873	0.874	0.863	0.849	0.589	0.593	0.649	0.645	0.663	0.619	0.542	0.698
Turbidity (NTU)		4.5	212	132	99.6	9.68	256	427	100.0	6.5	260	363	97.8
Boron, Total (mg/L)		**0.18**	**0.12**	**0.11**	**0.11**	**0.14**	**0.099**	**0.11**	**0.11**	**0.094**	**0.34**	**0.52**	**0.075**
Calcium, Total (mg/L)		**110**	**130**	**120**	**82**	**81**	**98**	**100**	**120**	**50**	**33**	**39**	**61**
Chloride (mg/L)		**11**	**27**	**13**	**9.7**	**9.7**	**62**	**9.9**	**12**	**42**	**45**	**30**	**31**
Fluoride (mg/L)		<0.250	**0.298**	**0.360**	**0.315**	<0.250	<0.250	**0.346**	**0.309**	<0.250	**0.339**	<0.250	**0.336**
Sulfate (mg/L)		**88**	**53**	**54**	**42**	**41**	**43**	**39**	**52**	**110**	**91**	**86**	**100**
pH (su)		**7.15**	**7.21**	**7.30**	**7.24**	**7.17**	**7.80**	**7.19**	**7.44**	**6.79**	**6.86**	**6.81**	**6.98**
TDS (mg/L)		**520**	**480**	**470**	**360**	**330**	**380**	**360**	**490**	**380**	**380**	**380**	**400**
Arsenic, Total (mg/L)		**0.0075**	**0.012**	**0.0099**	**0.0034**	**0.0044**	**0.0052**	**0.0074**	**0.00694**	**0.0054**	<0.001	**0.005**	**0.0056**
Barium, Total (mg/L)		**0.30**	**0.30**	**0.25**	**0.14**	**0.17**	**0.20**	**0.25**	**0.25**	**0.30**	**0.084**	**0.22**	**0.35**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089	<0.00089	<0.0010	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	**0.0087**	**0.0058**	<0.0040	**0.0050**	**0.0094**	**0.021**	<0.0040	<0.0040	**0.0044**	**0.0085**	<0.0040
Cobalt, Total (mg/L)		<0.00086	**0.0035**	<0.0020	<0.00086	<0.00086	**0.0026**	**0.0062**	<0.00086	<0.00086	<0.0020	**0.003**	<0.00086
Lead, Total (mg/L)		<0.0010	**0.0091**	**0.0038**	<0.0010	<0.0010	**0.0061**	**0.011**	<0.0010	**0.0010**	<0.001	**0.0062**	**0.0013**
Lithium, Total (mg/L)		**0.023**	**0.027**	<0.020	<0.020	**0.016**	<0.020	**0.020**	<0.020	**0.015**	<0.020	<0.020	<0.020
Molybdenum, Total (mg/L)		**0.0020**	**0.0020**	**0.0014**	**0.011**	**0.012**	**0.0098**	**0.013**	**0.0012**	**0.0098**	**0.015**	**0.021**	**0.049**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Fluoride (mg/L)		<0.250	**0.298**	**0.360**	**0.315**	<0.250	<0.250	**0.346**	**0.309**	<0.250	**0.339**	<0.250	**0.336**
Radium-226 & 228 Combined (pCi/L)		**2.25 +/- 1.16 (1.29)**	**1.45 +/- 0.825 (1.24)**	**2.28 +/- 1.23 (2.01)**	0.496 +/- 0.814 (1.73)	0.0597 +/- 1.34 (2.66)	1.82 +/- 0.873 (1.21)	2.18 +/- 1.43 (2.42)	1.41 +/- 0.975 (1.66)	1.57 +/- 1.22 (2.05)	**7.37 +/- 1.89 (1.55)**	**3.51 +/- 1.77 (2.69)**	0.723 +/- 1.17 (2.32)

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE III
SUMMARY OF NATURE AND EXTENT ANALYTICAL RESULTS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Location		Downgradient									
		MW-25D				MW-26S			MW-26D		
	Measure Point (TOC)	299.250				298.960			298.920		
	Sample Name	MW-25D	MW-25D	MW-25D	MW-25D	MW-26S	MW-26S	MW-26S	MW-26D	MW-26D	MW-26D
	Sample Date	8/28/2019	10/3/2019	10/15/2019	11/13/2019	10/3/2019	10/15/2019	11/10/2019	10/3/2019	10/15/2019	11/10/2019
Lab Data Reviewed and Accepted		11/9/2019	11/19/2019	11/26/2019	1/6/2020	11/19/2019	11/26/2019	1/10/2020	11/19/2019	11/26/2019	1/10/2020
Depth to Water (ft btoc)		19.00	24.53	16.31	23.53	26.10	24.83	23.42	26.01	24.79	23.32
Temperature (Deg C)		16.50	23.12	16.31	14.98	24.34	20.31	18.33	25.27	20.67	18.33
Conductivity (µS/cm)		0.799	0.452	0.715	0.724	0.822	1.133	1.094	0.829	0.973	0.685
Turbidity (NTU)		3.3	53.9	313	999.0	57.7	60.7	76.7	249	222	99.0
Boron, Total (mg/L)		**1.6**	**8**	**0.55**	**0.89**	**5.7**	**11**	**8.8**	**5.9**	**5.4**	**3.7**
Calcium, Total (mg/L)		**87**	**140**	**52**	**78**	**120**	**140**	**140**	**120**	**130**	**80**
Chloride (mg/L)		**11**	**27**	**14**	**14**	**33**	**16**	**15**	**30**	**17**	**20**
Fluoride (mg/L)		**0.315**	**0.340**	<0.250	**0.453**	**0.690**	**0.685**	**0.781**	**0.865**	**0.857**	**1.12**
Sulfate (mg/L)		**100**	**69**	**76**	**83**	**230**	**320**	**280**	**210**	**240**	**140**
pH (su)		**7.06**	**7.28**	**7.05**	**6.95**	**7.36**	**7.04**	**7.10**	**7.46**	**7.24**	**7.47**
TDS (mg/L)		**460**	**270**	**270**	**480**	**600**	**740**	**760**	**560**	**560**	**410**
Arsenic, Total (mg/L)		**0.0038**	**0.0027**	**0.003**	**0.0038**	**0.0084**	**0.0037**	**0.0037**	**0.0094**	**0.0083**	**0.0049**
Barium, Total (mg/L)		**0.24**	**0.14**	**0.13**	**0.18**	**0.22**	**0.079**	**0.14**	**0.220**	**0.18**	**0.071**
Cadmium, Total (mg/L)		<0.00089	<0.0010	<0.0010	<0.00089	**0.0012**	<0.0010	<0.00089	**0.0012**	<0.0010	<0.00089
Chromium, Total (mg/L)		<0.0040	<0.0040	**0.0082**	<0.0040	**0.014**	<0.0040	<0.0040	**0.018**	**0.012**	<0.0040
Cobalt, Total (mg/L)		<0.00086	**0.0036**	<0.0020	<0.00086	**0.0065**	<0.0020	**0.0033**	**0.0071**	**0.0058**	<0.00086
Lead, Total (mg/L)		<0.0010	**0.0018**	**0.0019**	<0.0010	**0.014**	**0.0012**	<0.0010	**0.015**	**0.011**	<0.0010
Lithium, Total (mg/L)		**0.016**	**0.035**	<0.020	<0.020	**0.030**	**0.028**	**0.027**	**0.025**	**0.026**	<0.020
Molybdenum, Total (mg/L)		**0.079**	**1.2**	**0.031**	**0.053**	**0.97**	**2**	**1.3**	**0.97**	**0.91**	**0.61**
Selenium, Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0014**	<0.0010	<0.0010
Fluoride (mg/L)		**0.315**	**0.340**	<0.250	**0.453**	**0.690**	**0.685**	**0.781**	**0.865**	**0.857**	**1.12**
Radium-226 & 228 Combined (pCi/L)		1.23 +/- 1.13 (1.98)	**2.03 +/- 0.942 (1.21)**	1.84 +/- 1.65 (3.07)	0.563 +/- 0.953 (2.01)	**1.82 +/- 1.10 (1.74)**	1.46 +/- 2.26 (4.68)	0.949 +/- 0.925 (1.64)	0.608 +/- 0.924 (1.77)	2.17 +/- 1.89 (3.48)	0.728 +/- 0.869 (1.58)

Notes:

Radiological results are presented as activity plus or minus uncertainty with MDC.

Bold value: *Detection above laboratory reporting limit or minimum detectable concentration (MDC).*

µS/cm = micro Siemens per centimeter

ft btoc = feet below top of casing

Deg C = degrees Celsius

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

TABLE IV
BACKGROUND CONCENTRATIONS AND GROUNDWATER PROTECTION STANDARDS
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT - POND 003
NEW MADRID, MISSOURI

Constituent	Background Concentration (UTL)	Groundwater Protection Standard
Arsenic (mg/L)	0.0099	0.01*
Barium (mg/L)	0.8	2*
Chromium (mg/L)	0.0098	0.1*
Cobalt (mg/L)	0.005	0.006**
Fluoride (mg/L)	1.71	4.0*
Lead (mg/L)	0.0047	0.015*
Lithium (mg/L)	0.033	0.040**
Molybdenum (mg/L)	0.01	0.100**
Radium 226 & 228 (pCi/L)	0.0025	5*
Selenium (mg/L)	0.0012	0.05*

Notes:

** Value set equal to the maximum contaminant level.*

*** Value set based on regional screening levels.*

mg/L = milligrams per liter

pCi/L = picoCuries per liter

UTL = upper tolerance limit

FIGURES

LEGEND

- MONITORING WELL
- POND 003
- POND 004
- UTILITY WASTE LANDFILL (UWL) BOUNDARY

NOTE

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, 19 MAY 2016.

N

0 1,500 3,000

SCALE IN FEET

HALEY ALDRICH

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
MARSTON, MISSOURI

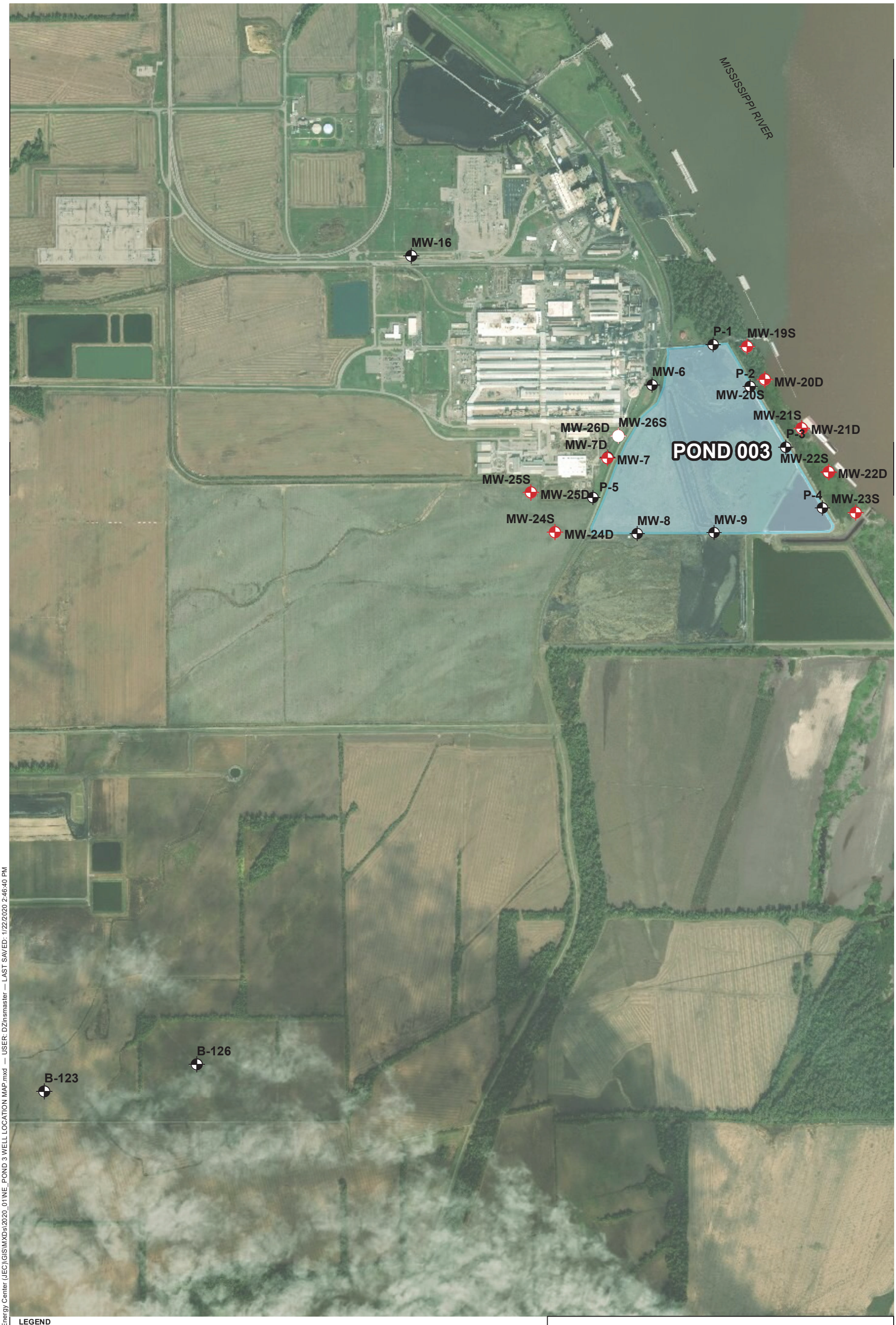
POND 003 MONITORING WELL LOCATION MAP

aeci

JANUARY 2020
SCALE: AS SHOWN

FIGURE 1

GIS FILE PATH: G:\Projects\AEC\New Madrid\GIS\MXDs\2019_11\POND 3 WELL LOCATION MAP.mxd — USER: DZinsmaster — LAST SAVED: 12/4/2019 1:50:31 PM



LEGEND

- NATURE & EXTENT MONITORING WELL
- COMPLIANCE MONITORING WELL
- POND 003

NOTE
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, 19 MAY 2016.

N

0 1,400 2,800
SCALE IN FEET

HALEY ALDRICH

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
MARSTON, MISSOURI

POND 003 NATURE AND EXTENT MONITORING WELL LOCATION MAP

aeci

JANUARY 2020
SCALE: AS SHOWN

FIGURE 2

GIS FILE PATH: G:\Projects\Westar\Jeffrey Energy Center (JEC)\GIS\MXDs\2020_01\NE_POND 3 WELL LOCATION MAP.mxd — USER: DZinsmaster — LAST SAVED: 1/22/2020 2:46:40 PM

ATTACHMENT 1

Pond 003 Corrective Measures Assessment – Demonstration and Certification of Need for 60-day Extension

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

12 July 2019
File No. 129342-016

SUBJECT: Pond 003 Corrective Measures Assessment
Demonstration and Certification of Need for 60-day Extension
Associated Electric Cooperative, Inc.
New Madrid Power Plant – New Madrid, MO

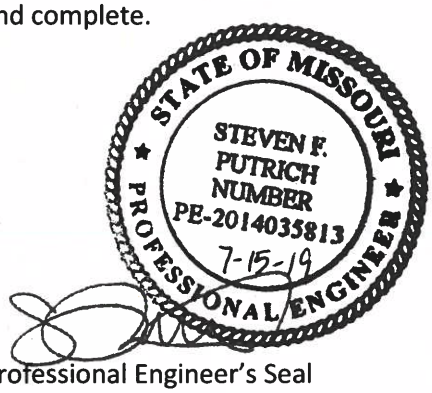
Associated Electric Cooperative, Inc. (AECI) operates a groundwater monitoring system for the coal combustion residuals (CCR) surface impoundment referred to as Pond 003 at the New Madrid Power Plant (NMPP) located in New Madrid, Missouri. This system is required for compliance monitoring under the United States Environmental Protection Agency (EPA) Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, set forth at Code of Federal Regulations Title 40 (40 CFR) Part 257 Subpart D (CCR Rule), effective 19 October 2015 along with subsequent revisions. As documented in the letter dated 14 February 2019, a statistically significant level of an Appendix IV constituent exceeding groundwater protection standards was detected. As such, an assessment of corrective measures (CMA) was initiated within 90 days.

Pursuant to §257.96(a) of the CCR Rule, I certify that AECI NMPP Pond 003 has demonstrated the need for additional time beyond the regulatory time period of 90 days to complete the assessment of corrective measures due to site-specific conditions and the evaluation of remedial treatment alternatives in support of an informed CMA process. In the case of the assessment for Pond 003, the site has complex hydrogeology associated with groundwater flow directions. In addition, AECI is in the process of reviewing possible groundwater remedies, and ongoing discussions with experts regarding effectivity and implementation of critical steps in the treatment and remedy assessment process. Given that there is no use of groundwater downgradient of the AECI site (i.e., between the subject CCR Unit and the Mississippi River), the ultimate point of exposure is the Mississippi River. Furthermore, this condition is unlikely to pose an exposure concern in groundwater or the Mississippi River since there are no known receptors. Based on these site-specific conditions and related groundwater treatment alternatives evaluations in support of the assessment by AECI, the CCR Rule allows for a 60-day extension to complete the assessment of corrective measures process.

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

Signed: _____
Certifying Engineer

Print Name: Steven F. Putrich
Missouri License No.: 2014035813
Title: Project Principal
Company: Haley & Aldrich, Inc.



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