

2019 ANNUAL GROUNDWATER MONITORING  
AND CORRECTIVE ACTION REPORT  
POND 004  
NEW MADRID POWER PLANT  
NEW MADRID, MISSOURI

by Haley & Aldrich, Inc.  
Cleveland, Ohio


for Associated Electric Cooperative, Inc.  
Springfield, Missouri

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Mark Nicholls, PG  
Name  
  
Signature

Senior Hydrogeologist  
Title  
January 30, 2020  
Date

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## 1. Introduction

This 2019 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses Pond 004 at the New Madrid Power Plant (NMPP), operated by the Associated Electric Cooperative, Inc. (AECI). This Annual Report was developed in accordance with the United States 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 004 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 004 at the NMPP. Pond 004 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 monitoring completed and actions taken at the NMPP Pond 004 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 analysis 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.

#### 2.2.2 Key Actions Completed

The 2018 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2019. Statistical analysis was completed in January 2019 on analytical data from the

September 2018 assessment monitoring sampling event. The statistical analysis did not identify any Appendix IV statistically significant levels (SSL).

A semi-annual assessment monitoring sampling 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, and no Appendix IV SSLs were identified.

An annual assessment monitoring sampling event was completed in June 2019 to identify detected Appendix IV constituents for subsequent semi-annual sampling events. Groundwater protection standards for detected Appendix IV constituents were established or updated at this time. 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 September 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 004 in 2019.

### 2.2.4 Actions to Resolve Problems

No problems were encountered at the NMPP Pond 004 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 semi-annual assessment monitoring and subsequent statistical analyses, and annual assessment monitoring.

## 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 the NMPP Pond 004 is included in this report as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report prepared for AECL, which was placed in the facility's operating record by 17 October 2017 as required by § 257.105(h)(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;***

No monitoring wells were installed or 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 from each background and downgradient monitoring well were collected in 2019. A summary including the sample names, dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program for the NMPP Pond 004 is presented in Table I of this report.

### **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***

The assessment monitoring program was established in June 2018 to meet the requirements of 40 CFR § 257.95. The NMPP Pond 004 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.***

This unit is in assessment monitoring; therefore, no detection monitoring alternate source 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 groundwater protection standards established for the NMPP Pond 004 are included in Table II.



**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.***

Statistical analyses of assessment monitoring samples collected in September 2018 and March 2019 did not identify any Appendix IV SSLs exceeding the established groundwater protection standards; therefore, no assessment monitoring alternative source demonstration is applicable. The NMPP Pond 004 remains in assessment monitoring.

**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.***

Statistical analyses of assessment monitoring samples collected in September 2018 and March 2019 did not identify any Appendix IV SSLs exceeding the established groundwater protection standards; therefore, this criterion is not applicable.

**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**

SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING

ASSOCIATED ELECTRIC COOPERATIVE, INC.

NEW MADRID POWER PLANT - POND 004

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	4/19/2019	8/8/2019	11/9/2019	4/19/2019	8/8/2019	11/9/2019	4/19/2019	8/8/2019	11/9/2019
Depth to Water (ft btoc)	8.21	8.14	16.92	15.07	9.73	16.20	15.88	11.10	17.80
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	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)	<b>0.078</b>	--	<b>0.046</b>	<b>0.048</b>	--	<b>0.025</b>	<b>0.023</b>	--	<b>0.024</b>
Calcium, Total (mg/L)	<b>130</b>	--	<b>120</b>	<b>79</b>	--	<b>78</b>	<b>29</b>	--	<b>56</b>
Chloride (mg/L)	<b>14</b>	--	<b>16</b>	<5.0	--	<b>2.8</b>	<b>1.2</b>	--	<b>2.7</b>
Fluoride (mg/L)	<b>1.71</b>	--	<b>1.69</b>	<b>0.620</b>	--	<b>0.602</b>	<b>0.543</b>	--	<b>0.507</b>
Sulfate (mg/L)	<b>85</b>	--	<b>73</b>	<b>31</b>	--	<b>28</b>	<b>11</b>	--	<b>24</b>
pH (su)	<b>7.08</b>	--	<b>7.19</b>	<b>7.53</b>	--	<b>7.51</b>	<b>7.22</b>	--	<b>7.10</b>
TDS (mg/L)	<b>570</b>	--	<b>520</b>	<b>370</b>	--	<b>340</b>	<b>180</b>	--	<b>280</b>
Antimony, Total (mg/L)	<0.0030	<0.0030	--	<0.0030	<0.0030	--	<0.0030	<0.0030	--
Arsenic, Total (mg/L)	<b>0.0023</b>	<b>0.0024</b>	<b>0.0024</b>	<b>0.0020</b>	<b>0.0079</b>	<b>0.0022</b>	<b>0.0043</b>	<b>0.0092</b>	<b>0.0051</b>
Barium, Total (mg/L)	<b>0.61</b>	<b>0.56</b>	<b>0.63</b>	<b>0.20</b>	<b>0.33</b>	<b>0.20</b>	<b>0.15</b>	<b>0.17</b>	<b>0.24</b>
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	<b>0.0098</b>	<b>0.0040</b>	<0.0040
Cobalt, Total (mg/L)	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<0.00086	<b>0.0030</b>	<b>0.0023</b>	<b>0.0018</b>
Lead, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<b>0.0047</b>	<b>0.0018</b>	<b>0.0022</b>
Lithium, Total (mg/L)	<b>0.021</b>	<b>0.024</b>	<b>0.029</b>	<b>0.025</b>	<b>0.026</b>	<b>0.031</b>	<0.010	<b>0.010</b>	<b>0.015</b>
Molybdenum, Total (mg/L)	<0.0010	<0.0010	<0.0010	<b>0.0043</b>	<b>0.0042</b>	<b>0.0042</b>	<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	<b>0.0010</b>
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)	<b>1.71</b>	<b>1.52</b>	<b>1.69</b>	<b>0.620</b>	<b>0.625</b>	<b>0.602</b>	<b>0.543</b>	<b>0.516</b>	<b>0.507</b>
Radium-226 & 228 Combined (pCi/L)	0.225 ± 0.901 (1.92)	<b>2.09 ± 1.02 (1.39)</b>	<b>3.08 ± 1.25 (1.67)</b>	0.594 ± 0.743 (1.38)	<b>2.18 ± 1.00 (0.950)</b>	<b>1.76 ± 1.07 (1.83)</b>	0.969 ± 1.09 (2.01)	1.55 ± 1.60 (2.93)	<b>2.20 ± 1.05 (1.25)</b>

TABLE I  
SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING  
ASSOCIATED ELECTRIC COOPERATIVE, INC.  
NEW MADRID POWER PLANT - POND 004  
NEW MADRID, MISSOURI

Location	Downgradient										
	MW-10				MW-11			MW-12			
Measure Point (TOC)	297.806				295.32			297.968			
Sample Name	MW-10	POND 4 DUPLICATE	MW-10	MW-10	MW-11	MW-11	MW-11	MW-12	MW-12	MW-12	Duplicate
Sample Date	3/8/2019	3/8/2019	6/10/2019	8/29/2019	3/11/2019	6/10/2019	8/29/2019	3/11/2019	6/10/2019	8/29/2019	8/29/2019
Lab Data Reviewed and Accepted	4/10/2019	4/10/2019	7/19/2019	10/4/2019	4/10/2019	7/19/2019	10/4/2019	4/10/2019	7/19/2019	10/4/2019	10/4/2019
Depth to Water (ft btoc)	6.20	--	10.10	26.35	4.73	8.10	24.51	6.70	9.50	26.20	--
Temperature (Deg C)	17.60	--	18.60	18.91	17.18	19.52	29.22	18.81	19.67	19.92	--
Conductivity (µS/cm)	987	--	1058	962	1278	1271	920	1031	1030	974	--
Turbidity (NTU)	60.3	--	16.3	11.4	159	30.9	11.2	29.7	13.5	13.7	--
Boron, Total (mg/L)	<b>0.36</b>	<b>0.35</b>	--	<b>0.37</b>	<b>0.61</b>	--	<b>0.38</b>	<b>0.30</b>	--	<b>0.63</b>	<b>0.33</b>
Calcium, Total (mg/L)	<b>140</b>	<b>140</b>	--	<b>140</b>	<b>200</b>	--	<b>140</b>	<b>130</b>	--	<b>210</b>	<b>140</b>
Chloride (mg/L)	<b>7.6</b>	<b>8.2</b>	--	<b>5.7</b>	<b>9.9</b>	--	<b>6.6</b>	<b>14</b>	--	<b>14</b>	<b>16</b>
Fluoride (mg/L)	<b>0.627</b>	<b>0.579</b>	<b>0.564</b>	<0.250	<b>0.554</b>	--	<b>1.90</b>	<b>0.838</b>	<b>0.811</b>	<b>0.474</b>	<b>0.436</b>
Sulfate (mg/L)	<b>110</b>	<b>100</b>	--	<b>95</b>	<b>190</b>	--	<b>110</b>	<b>160</b>	--	<b>140</b>	<b>140</b>
pH (su)	<b>6.97</b>	<b>7.00</b>	--	<b>7.38</b>	<b>6.93</b>	--	<b>8.03</b>	<b>7.12</b>	--	<b>7.40</b>	<b>6.83</b>
TDS (mg/L)	<b>550</b>	<b>540</b>	--	<b>540</b>	<b>770</b>	--	<b>370</b>	<b>640</b>	--	<b>560</b>	<b>550</b>
Antimony, Total (mg/L)	<0.0030	<0.0030	<0.0030	--	<0.0030	<0.0030	--	<0.0030	<0.0030	--	--
Arsenic, Total (mg/L)	<b>0.0056</b>	<b>0.0054</b>	<b>0.0030</b>	<b>0.0017</b>	<b>0.0044</b>	<b>0.0019</b>	<b>0.0016</b>	<b>0.0033</b>	<b>0.0031</b>	<0.0010	<b>0.0031</b>
Barium, Total (mg/L)	<b>0.16</b>	<b>0.16</b>	<b>0.15</b>	<b>0.13</b>	<b>0.75</b>	<b>0.31</b>	<b>0.13</b>	<b>0.16</b>	<b>0.13</b>	<b>0.30</b>	<b>0.15</b>
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	--	--
Chromium, Total (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	<b>0.0077</b>	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cobalt, Total (mg/L)	<b>0.0012</b>	<b>0.0014</b>	<b>0.0011</b>	<b>0.0023</b>	<b>0.0047</b>	<b>0.0033</b>	<b>0.0021</b>	<0.00086	<0.00086	<b>0.0039</b>	<0.00086
Lead, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<b>0.0080</b>	<b>0.0012</b>	<0.0010	<b>0.0014</b>	<0.0010	<b>0.0016</b>	<0.0010
Lithium, Total (mg/L)	<b>0.013</b>	<b>0.012</b>	<b>0.018</b>	<b>0.026</b>	<b>0.020</b>	<b>0.024</b>	<b>0.026</b>	<b>0.021</b>	<b>0.029</b>	<b>0.037</b>	<b>0.028</b>
Molybdenum, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<b>0.0053</b>	<b>0.0039</b>	<0.0010	<b>0.0018</b>	<b>0.0018</b>	<b>0.0040</b>	<b>0.0024</b>
Selenium, Total (mg/L)	<0.0010	<0.0010	<0.0010	--	<b>0.0019</b>	<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	--	<b>0.00023</b>	<0.00020	--	<0.00020	<0.00020	--	--
Fluoride (mg/L)	<b>0.627</b>	<b>0.579</b>	<b>0.564</b>	<0.250	<b>0.554</b>	<b>0.512</b>	<b>1.90</b>	<b>0.838</b>	<b>0.811</b>	<b>0.474</b>	<b>0.436</b>
Radium-226 & 228 Combined (pCi/L)	1.21 ± 0.858 (1.56)	<b>1.80 ± 1.05 (1.41)</b>	0.506 ± 0.601 (1.14)	0.431 ± 0.928 (1.86)	0.996 ± 0.916 (1.59)	1.38 ± 0.924 (1.39)	0.781 ± 1.11 (2.15)	0.701 ± 0.758 (1.08)	<b>1.50 ± 0.813 (1.00)</b>	0.664 ± 1.07 (2.02)	1.54 ± 1.09 (1.97)

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING**  
 ASSOCIATED ELECTRIC COOPERATIVE, INC.  
 NEW MADRID POWER PLANT - POND 004  
 NEW MADRID, MISSOURI

Location	Downgradient									
	MW-13			MW-14			MW-15			
Measure Point (TOC)	304.045			298.008			298.777			
Sample Name	MW-13	MW-13	POND 4 DUPLICATE	MW-13	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15
Sample Date	3/11/2019	6/7/2019	6/7/2019	8/29/2019	3/11/2019	6/7/2019	8/29/2019	3/11/2019	6/7/2019	8/29/2019
Lab Data Reviewed and Accepted	4/24/2019	7/19/2019	7/19/2019	10/4/2019	4/24/2019	7/19/2019	10/4/2019	4/24/2019	7/19/2019	10/4/2019
Depth to Water (ft btoc)	12.08	16.30	--	34.04	5.72	9.98	28.50	6.45	10.75	28.38
Temperature (Deg C)	14.74	22.36	--	17.17	14.42	17.37	16.88	15.39	17.86	16.40
Conductivity (µS/cm)	805	646	--	749	611	581	632	451	453	485
Turbidity (NTU)	98.0	17.7	--	9.7	134	11.2	10.1	16.9	7.6	11.3
Boron, Total (mg/L)	<b>0.094</b>	--	--	<b>0.090</b>	<b>0.094</b>	--	<b>0.097</b>	<b>0.36</b>	--	<b>0.30</b>
Calcium, Total (mg/L)	<b>130</b>	--	--	<b>120</b>	<b>83</b>	--	<b>90</b>	<b>48</b>	--	<b>56</b>
Chloride (mg/L)	<b>20</b>	--	--	<b>24</b>	<b>16</b>	--	<b>21</b>	<b>18</b>	--	<b>20</b>
Fluoride (mg/L)	<b>0.296</b>	<b>0.462</b>	--	<b>0.441</b>	<b>0.891</b>	<b>1.070</b>	<b>0.657</b>	<b>0.326</b>	<b>0.519</b>	<b>0.452</b>
Sulfate (mg/L)	<b>69</b>	--	--	<b>71</b>	<b>36</b>	--	<b>48</b>	<b>48</b>	--	<b>47</b>
pH (su)	<b>7.72</b>	--	--	<b>7.61</b>	<b>7.75</b>	--	<b>7.58</b>	<b>7.35</b>	--	<b>7.62</b>
TDS (mg/L)	<b>480</b>	--	--	<b>380</b>	<b>340</b>	--	<b>520</b>	<b>240</b>	--	<b>260</b>
Antimony, Total (mg/L)	<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	<b>0.0020</b>	<b>0.0018</b>	<b>0.0022</b>
Barium, Total (mg/L)	<b>0.18</b>	<b>0.14</b>	<b>0.14</b>	<b>0.18</b>	<b>0.082</b>	<b>0.083</b>	<b>0.10</b>	<b>0.086</b>	<b>0.085</b>	<b>0.11</b>
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	--
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)	<b>0.0010</b>	<b>0.0013</b>	<b>0.0013</b>	<b>0.00086</b>	<b>0.0017</b>	<b>0.0013</b>	<b>0.0014</b>	<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
Lithium, Total (mg/L)	<0.010	<b>0.011</b>	<b>0.010</b>	<b>0.018</b>	<0.010	<b>0.013</b>	<b>0.017</b>	<0.010	<b>0.010</b>	<b>0.015</b>
Molybdenum, Total (mg/L)	<b>0.0013</b>	<b>0.0012</b>	<b>0.0013</b>	<b>0.0015</b>	<b>0.0028</b>	<b>0.0021</b>	<b>0.0016</b>	<0.0010	<b>0.0012</b>	<b>0.0013</b>
Selenium, Total (mg/L)	<b>0.0012</b>	<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)	<b>0.296</b>	<b>0.462</b>	<b>0.458</b>	<b>0.441</b>	<b>0.891</b>	<b>1.07</b>	<b>0.657</b>	<b>0.326</b>	<b>0.519</b>	<b>0.452</b>
Radium-226 & 228 Combined (pCi/L)	1.43 ± 1.03 (1.83)	<b>1.67 ± 0.853 (1.00)</b>	<b>1.47 ± 0.790 (0.940)</b>	0.665 ± 1.09 (2.12)	<b>1.14 ± 0.745 (1.13)</b>	<b>1.60 ± 0.845 (1.15)</b>	0.862 ± 1.09 (2.05)	<b>1.20 ± 0.650 (0.718)</b>	1.33 ± 1.05 (1.63)	0.408 ± 0.937 (1.95)

**Notes:**

The June 2019 sampling event was for Appendix IV constituents only. The September 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**  
**BACKGROUND CONCENTRATIONS AND GROUNDWATER PROTECTION STANDARDS**  
 ASSOCIATED ELECTRIC COOPERATIVE, INC.  
 NEW MADRID POWER PLANT - POND 004  
 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



**FIGURE**



GIS FILE PATH: G:\Projects\AECI\New Madrid\GIS\MXDs\2019\_11\POND 4 WELL LOCATION MAP\_REV1.mxd — USER: DZinsmaster — LAST SAVED: 1/10/2020 8:05:39 AM

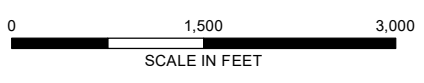


**LEGEND**

-  MONITORING WELL
-  POND 004

**NOTE**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, 29 OCTOBER 2018.



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

**POND 004 MONITORING WELL  
LOCATION MAP**



JANUARY 2020  
SCALE: AS SHOWN

**FIGURE 1**