MEMORANDUM

16 October 2016
File No. 40616-108

SUBJECT: History of Construction
Associated Electric Cooperative, Inc.
New Madrid Power Plant – Pond 004
New Madrid, MO

Haley & Aldrich, Inc. (Haley & Aldrich) has assisted Associated Electric Cooperative, Inc. (AECI) with compiling the history of construction in accordance with §257.73(c)(1) for the existing coal combustion residuals (CCR) surface impoundment known as Pond 004 at the New Madrid Power Plant (NMPP). This document addresses the requirements of the US Environmental Protection Agency’s (EPA’s) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 40 CFR Part 257 (CCR Rule) effective 19 October 2015. To the extent feasible, AECI has provided documentation supporting the history of construction. Information on the history of construction of Pond 004 is presented in the following sections.

§257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Owner: Associated Electric Cooperative, Inc.
2814 South Golden Avenue
P.O. Box 754
Springfield, Missouri 65807

Name of CCR Unit: Pond 004 (Referred to as “Slag Pond 2 Impoundment” and “Slag Dewatering Pond” in the past)

§257.73(c)(1)(ii): The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.

Latitude: 36°30’52”
Longitude: 89°33’34”
The general location of the facility is provided in Appendix A.
§257.73(c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

Pond 004 is used for settling and temporary wet storage of bottom ash and boiler slag sluiced from the NMPP. This unit is primarily used when maintenance and repair of sluice lines to Pond 003 occur.

§257.73(c)(1)(iv): The name and size in acres of the watershed within which the CCR unit is located.

USGS Watershed Name: Little River Ditches Watershed 08020204
Unit-specific Watershed Area: 10 acres

The watershed area, which includes only the impoundment area itself, is based on the most recent site topography, provided by AECI and conducted by Pictometry International Corporation between October 4-8, 2014. It should be noted that the drainage area was determined as part of the Inflow Flood Control System Plan required by §257.83 of the CCR Rule which is provided under separate cover.

§257.73(c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

Information regarding the physical and engineering properties of the foundation and abutment materials on which the CCR unit was constructed is not readily available. Supplemental investigation of engineering properties is being conducted under structural stability analyses of §257.73 which will be provided under separate cover.

§257.73(c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

The type, size, range, and physical engineering properties of the materials of each zone of the Pond 004 were discussed on pages 2 and 4-6 of “Final Report, Round 7 Dam Assessment” by GZA GeonEnvironmental, Inc., dated 3 June 2011, from which an excerpt is provided as Appendix B.

Information on the method of site preparation and construction of Pond 004 is not readily available.

Pond 004 was constructed circa 1984.
§257.73(c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the
design, construction, operation and maintenance of the CCR unit, detailed dimensional drawings of the
CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all
zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument
locations, and slope protection, in addition to the normal operating pool surface elevation and the
maximum pool surface elevation following peak discharge from the inflow design flood, the expected
maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade
features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Drawings which include the information stated above are not available.

§257.73(c)(1)(viii): a description of the type, purpose, and location of existing instrumentation.

Pond 004 does not have existing instrumentation.

§257.73(c)(1)(ix): area-capacity curves for the CCR unit.

Original design area-capacity curves for Pond 004 are not readily available. It should be noted
that updated area-capacity curves for the impoundment are being developed as part of the
Inflow Flood Control System Plan required by §257.83 of the CCR Rule which will be provided
under separate cover.

§257.73(c)(1)(x): a description of each spillway and diversion design features and capacities and
calculations used in their determination.

Discharges from the impoundment flow to a concrete drop outlet structure with concrete
stoplogs. It should be noted that updated calculations for the outlet structure are being
developed as part of the Inflow Flood Control System Plan required by §257.83 of the CCR Rule
which will be provided under separate cover. No emergency spillway exists on the unit.

§257.73(c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and
repair of the CCR unit.

Information on the construction specifications and provisions for surveillance, maintenance, and
repair of the CCR unit are not readily available.
§257.73(c)(1)(xii): any record or knowledge of structural instability of the CCR unit.

There are no records or knowledge of structural instability associated with Pond 004.
APPENDIX A
Site Locus
APPENDIX B
Excerpts from:
Final Report, Round 7 Dam Assessment, Associated Electric Cooperative, Inc.
New Madrid Power Plant, Ash Pond 1 & 2 and Slag Pond 1 & 2 Impoundments
By GZA GeoEnvironmental, Dated June 2011
FINAL REPORT
ROUND 7 DAM ASSESSMENT
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
ASH POND 1 & 2 AND SLAG POND 1 & 2 IMPOUNDMENTS
NEW MADRID COUNTY, MISSOURI

June 3, 2011

PREPARED FOR:
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

PREPARED BY:
GZA GeoEnvironmental, Inc.
19500 Victor Parkway, Suite 300
Livonia, MI 48152
GZA File No. 01.0170142.20
1.2 Description of Project

1.2.1 Location

The NMPP is located about three miles east of the city of Marston in New Madrid County, Missouri. The Site is accessible from the west via State Highway EE and from the north and south from Levee Road. The NMPP CCW impoundments are located near the power plant, which is located at latitude 36° 30’ 56” North and longitude 89° 33’ 47” West. A Site locus of the impoundments and surrounding area is shown in Figure 1. An aerial photograph of the impoundments and surrounding area is provided as Figure 2. The impoundments can be accessed by vehicles from earthen access roads from the NMPP.

1.2.2 Owner/Caretaker

The CCW impoundments are owned and operated by AECI.

<table>
<thead>
<tr>
<th>Name</th>
<th>Dam Owner/Caretaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mailing Address</td>
<td>Associated Electric Cooperative, Inc.</td>
</tr>
<tr>
<td>City, State, Zip</td>
<td>New Madrid Power Plant</td>
</tr>
<tr>
<td>Contact</td>
<td>2814 S. Golden, P.O. Box 754</td>
</tr>
<tr>
<td>Title</td>
<td>Springfield, Missouri 65801-0754</td>
</tr>
<tr>
<td>E-Mail</td>
<td>Duane Highley, P.E.</td>
</tr>
<tr>
<td>Daytime Phone</td>
<td>Director, Power Production</td>
</tr>
<tr>
<td>Emergency Phone</td>
<td><a href="mailto:duanehighley@aeci.org">duanehighley@aeci.org</a></td>
</tr>
<tr>
<td></td>
<td>(573) 643-2211</td>
</tr>
<tr>
<td></td>
<td>911 / (573) 379-0451 (Yard Superintendent Cell)</td>
</tr>
</tbody>
</table>

1.2.3 Purpose of the Impoundments

The NMPP is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 1200 Megawatts. Unit 1 was constructed in 1972 while Unit 2 was constructed in 1977. Four earthen embankment CCW impoundments known as Ash Pond 1 (AP1) Impoundment, Slag Pond 1 (SP1) Impoundment, Ash Pond 2 (AP2) Impoundment, and Slag Pond 2 (SP2) Impoundment were constructed for the purpose of storing CCW waste and discharging plant wastewater.

The AP1 Impoundment and SP1 Impoundment were constructed in 1972 and function as sedimentation and storage basins for fly ash and boiler slag, respectively. The SP2 Impoundment was constructed in 1984 and functions as a sedimentation and storage basin for boiler slag. The AP2 Impoundment was constructed in 1994 and functions as a sedimentation and storage basin for fly ash. The impoundments are located outside (on the river side) of the Mississippi River levee system. The top of embankment elevation of the AP1 Impoundment,
the embankment slopes. To maintain positive downward pressure, water can be pumped from the MUW Pond to the AP2 Impoundment via two 18-inch diameter pipelines located on the downstream slope of the eastern embankment. The transfer pumps are manually controlled in the Pump Control Building on the crest of the eastern embankment.

The AP2 Impoundment embankments were designed with 3H:1V upstream and downstream slopes without rip-rap or other protection against wave action erosion\textsuperscript{11}. The downstream slope of the western and southern embankments was generally designed to be vegetated with grass. There are three groundwater monitoring wells (P-6 through P-8) located along the eastern and southern embankments of the AP2 Impoundment.

1.2.7 Description of the Slag Pond 2 Impoundment and Appurtenances

Based on information provided by the NMPP personnel, the SP2 Impoundment was designed by Burns and McDonnell of Kansas City, Missouri. No construction documentation was available for the impoundment but a survey drawing from December of 2005 was provided by AECI. The following description of the SP2 Impoundment is based on the available survey drawing, the March 24, 2009 Response, and information provided by NMPP personnel.

The SP2 Impoundment is located east of the NMPP and north of the AP1 Impoundment and the SP1 Impoundment as shown on Figure 2. Most of the northern portion of the SP2 Impoundment is filled with fly ash that has settled in-place or has been stockpiled in the impoundment. The northern portion of the impoundment is used as a processing area for recovered ash. Water and fly ash are discharged into the SP2 Impoundment via four pipelines located on the northern portion of the impoundment. The discharged water and ash flow through an approximately 3 foot deep channel into an ash delta that is maintained by removal of settled fly ash. Clarified water from the SP2 Impoundment is discharged to the Mississippi River through a decant structure located near the southeast portion of the impoundment. The pond water elevation is maintained by stop logs in the decant structure. The ash that is removed from the channel is dewatered and stockpiled in the SP2 Impoundment as shown on Figure 3 until it is recycled or transported to the dry ash landfill.

The SP2 Impoundment consists of an earthfill embankment with a crest length of approximately 3,000 feet and a general height (from the lowest toe elevation to the crest of the impoundment) of approximately 20 feet. The impoundment is unlined and the embankments were constructed from native silty clays. The impoundment has a surface area of approximately 4 acres at a water level elevation of 299 feet MSL and the stockpiled ash occupies approximately 18 percent of the storage capacity. A gravel access road is present on the crest of the impoundment. The crest elevation of the impoundment is approximately 302 feet MSL which appears to be below the elevation of the Mississippi River levee system.\textsuperscript{12} Based on information provided by NMPP, the impoundment has not experienced damage from flooding of the Mississippi River.

The SP2 Impoundment embankments appeared to be designed with 4 horizontal on 1 vertical (4H:1V) upstream slopes and 2.5 horizontal on 1 vertical (2.5H:1V) downstream slopes based on Geotechnology, Inc. report “Global Stability Evaluation, Slag Pond 1 And Ash Pond 2, AECI New Madrid Power Generating Facility, New Madrid County, Missouri”, dated July 31, 2009.

\textsuperscript{11} Elevations of all impoundments are estimated from topographic contours provided in AECI drawing titled: “Fly Ash Pond Improvement Plan View W/Contours”, dated 1989.
slopes without rip-rap or other protection against wave action erosion on the upstream slopes. The downstream slopes were generally designed to be vegetated with grass. There are no survey monuments or other instrumentation associated with this impoundment.

1.2.8 Operations and Maintenance

The impoundments are operated and maintained by NMPP personnel. Operation of the impoundments includes operation of the stop logs in the SP2 Impoundment decant structure, as well as removal of settled ash from the AP1 Impoundment and the SP2 Impoundment. Maintenance of the impoundments includes regular (annual) mowing of the applicable downstream slopes.

Operation and maintenance of the NMPP facility, including the impoundments, is regulated by the EPA under the NPDES Permit No. MO-0001171. Based on the March 24, 2009 Response, the State of Missouri does not perform inspections of the impoundments or regulate the impoundments.

The NMPP personnel monitor the impoundments according to a series of informal and written protocols. These protocols include:

- Informal observation of the impoundment embankments during normal operations at impoundments; and,
- Semi-annual inspection of the impoundments by NMPP personnel.

1.2.9 Size Classification

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U.S. Army Corps of Engineers (COE) criteria. Based on the maximum height of 12 feet and a storage volume of approximately 570 acre-feet, it is GZA’s opinion that the AP1 Impoundment is considered a Small sized structure. Based on the maximum height of 20 feet and a storage volume of 14 acre-feet, it is GZA’s opinion that the SP2 Impoundment is also classified as a Small sized structure. According to guidelines established by the U.S. Army COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures. The maximum impoundment height and storage volume was based on information provided by the NMPP.

Based on the maximum height of 20 feet and a storage volume of 1,137 acre-feet, it is GZA’s opinion that the SP1 Impoundment is considered an Intermediate sized structure. Based on the maximum height of 20 feet and a storage volume of 1,351 acre-feet, it is GZA’s opinion that the AP2 Impoundment is considered an Intermediate sized structure. According to guidelines established by the U.S. Army COE, dams with a storage volume between 1,000 and 50,000 acre-feet and/or a height between 40 and 100 feet are classified as Intermediate sized structures. The maximum impoundment height and storage volume was based on information provided by the NMPP.

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13 Slopes estimated by GZA from survey drawing generated by Smith & Co. titled “Pond at Outfall 004” and dated December 30, 2005.