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REPORT ON
PERIODIC STRUCTURAL STABILITY ASSESSMENT
POND 003
NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Associated Electric Cooperative, Inc.
New Madrid, Missouri

File No. 129342-046
October 2021





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

15 October 2021
File No. 129342-046

Associated Electric Cooperative, Inc.
New Madrid Power Plant
P.O. Box 156
New Madrid, MO 63689

Attention: Mrs. Jenny Jones
Senior Environmental Analyst

Subject: Periodic Structural Stability Assessment
Pond 003
New Madrid Power Plant
New Madrid, MO

Mrs. Jones:

Enclosed please find our report on the Periodic Structural Stability Assessment (Assessment) for the Associated Electric Cooperative, Inc. (AECI) coal combustion residuals (CCR) surface impoundment referred to as Pond 003 located at the New Madrid Power Plant (NMPP) in New Madrid, Missouri.


This work was performed by Haley & Aldrich, Inc. (Haley & Aldrich) on behalf of AECI in accordance with the United States Environmental Protection Agency's CCR Rule effective 19 October 2015 including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR) §257.73(d).

The scope of our work consisted of the following: 1) obtain and review readily available reports, investigations, plans, and data pertaining to the Pond 003 surface impoundment; 2) visit the site to observe Pond 003; 3) evaluate whether the design, construction, operation, and maintenance of Pond 003 are consistent with recognized and generally accepted good engineering practices; and 4) prepare and submit this report presenting the results of our assessment including recommendations.

Associated Electric Cooperative, Inc. – New Madrid Power Plant
Structural Stability Assessment – Pond 003
15 October 2021
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Thank you for inviting us to complete this assessment and please feel free to contact us if you wish to discuss the contents of the report.

Sincerely yours,
HALEY & ALDRICH, INC.

A handwritten signature in black ink, appearing to read 'Steven F. Putrich', written over a horizontal line.

Steven F. Putrich, P.E.
Project Principal

Enclosures

Cc: Andy Lucas-Haley & Aldrich



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Executive Summary

This report summarizes the results of our Periodic Structural Stability Assessment for the Associated Electric Cooperative, Inc. (AECI) owned and operated Pond 003, including our site inspection of the unit. Pond 003 is an existing coal combustion residuals (CCR) surface impoundment, located at the New Madrid Power Plant (NMPP) in New Madrid, Missouri.

Our assessment was conducted in accordance with the United States Environmental Protection Agency's CCR Rule effective 19 October 2015 including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR) §257.73(d). The Initial Structural Stability Assessment for Pond 003 was completed on 16 October 2016.

The unit is located between the United States Army Corps of Engineers (USACE) Mississippi River Levee and the Mississippi River. The dike consists of an earthen embankment with a crest length of approximately 9,300 feet around the entire impoundment. The northern portion of the impoundment is incised, and the western portion is comprised of the USACE Mississippi River Levee. Therefore, the constructed dike is considered to be the approximately 5,000 ft of the east side of the unit and portions of the north and south sides. The dike embankment is approximately 10 to 20 feet in height and according to records and survey information; the embankment is constructed of locally sourced silty clays. The impoundment has a surface area of approximately 110 acres.

Pond 003 was constructed for the purpose of storing and managing CCR, coal pile runoff, and plant process water.

Dam Inspection Assessment and Recommendations

Based on conditions observed during our visual inspection of Pond 003, discussions with site personnel, a review of available documents, the following deficiencies were noted:

- Vegetation exceeding 6 in. in height on the upstream slope.
- Vegetation exceeding 6 in. in height on the downstream slope.
- Vegetation exceeding 6 in. in height within the riprap on the upstream slope.
- Vegetation exceeding 6 in. in height within the riprap on the downstream slope.
- Mature trees in the downstream area of the dam.
- Minor rutting on embankment crest from vehicle access.

Haley & Aldrich recommends the following actions:

- Cut/mow the embankments and routinely mow the embankment slopes (upstream and downstream) and downstream areas to maintain vegetation at a height of 6 in. or less.
- Monitor the mature trees downstream of Pond 003 for signs of decay and impact to the dike during the weekly and monthly inspections.
- Conduct a video inspection of outlet pipe from the drop inlet structures when flow is reduced to expose the downstream end of the pipe.
- Repair the rutting on the embankment crest. Additional gravel should be added as necessary.

Structural Stability Assessment

In accordance with 40 CFR §257.73(d), the owner or operator of a CCR surface impoundment must conduct initial and periodic structural stability assessments to determine whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices. The Initial Structural Stability Assessment for Pond 003 was completed on 16 October 2016.

Haley & Aldrich reviewed the provided pertinent information and inspected Pond 003 as described above. Based on our review of available information and observations during our inspection, we have concluded the following in accordance with 40 CFR §257.73(d):

1. §257.73(d)(1)(i) – Stable Foundations and Abutments:

Based on the review of available subsurface information, as-built records, survey data, and observations during the inspection, the impoundment was judged to have stable foundations and abutments.

2. §257.73(d)(1)(ii) – Adequate Slope Protection:

Based on observations during the site inspection, the top half of the upstream slope was covered by grassy vegetation (some of which exceeded 6-in. height). The bottom half of the upstream slope, including below the water line, consisted of riprap. The downstream slope of the eastern and southern portion of the dike was graded to an approximate slope of 3H:1V, or flatter towards the north. Slope was covered in healthy grass cover (some of which exceeded 6-in. height) and appeared to be regularly mowed. The bottom half of the downstream slope consisted of riprap. The southern portion of the impoundment shares a dike with an adjacent impoundment which was covered by grassy vegetation that appeared to be regularly mowed.

3. §257.73(d)(1)(iii) – Dikes Mechanically Compacted:

Although records on the construction of the Pond 003 are not available, the test borings and laboratory testing performed by Haley & Aldrich and others, the results indicate that the berm fill was mechanically compacted during construction.

4. §257.73(d)(1)(iv) – Height of Vegetation:

At the time of our impoundment inspection, portions of the north and east downstream slopes had vegetation taller than 6 inches in height. The taller vegetation (as high as 48-in.) was primarily observed within the riprap of the bottom half of the eastern embankment. On the upstream slopes, some vegetation was higher as well, some as high as 36 inches.

5. §257.73(d)(1)(v)(A) – Spillway Cover:

Pond 003 discharges through a concrete decant structure located at the southeastern end of the impoundment. Being a concrete structure, the structure is non-erodible and appears to be in good condition. There is no emergency spillway.

6. §257.73(d)(1)(v)(B) – Spillway Capacity:

The spillway capacity for the impoundment was modeled and calculated in accordance with §257.82 Hydrologic and Hydraulic Capacity Requirements for CCR surface impoundments under a separate cover. The report, model, and calculations are available on AECL's CCR compliance website.

7. §257.73(d)(1)(vi) – Hydraulic Structures Underlying or Passing Through Embankment:

Only limited portions of the intake and outlet structure was visible during our inspection. Regarding the 24-in. clay pipe, the pipe is buried below the dike and the downstream portion is submerged by the discharge channel. No signs of settlement or slope displacement above the pipe were observed.

8. §257.73(d)(1)(vii) – Inundation of Downstream Slopes:

The impoundment is located adjacent to the Mississippi River and has the potential to be inundated under higher than normal river elevations. Typically, the river has a gradual rise and fall over days and weeks, as opposed to a significant rapid drawdown on a much shorter timescale. To account for the unlikely event the Mississippi River experiences a significant low pool or sudden drawdown occurrence, a representative rapid drawdown review was considered to simulate the potential impact on the slopes. The results indicate that the impoundment will maintain adequate slope stability under this condition.

9. §257.73(d)(2) – Deficiencies and Recommendations:

The Structural Stability Assessment did not identify any structural stability deficiencies for Pond 003.

PREFACE

The assessment of the general condition of Pond 003 is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

The described condition of Pond 003 is based on observations of field conditions at the time of inspection and other data available. It is important to note that the condition of the structure depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the structure will continue to represent the condition of the structure at some point in the future.

CERTIFICATION

I certify that the Periodic Structural Stability Assessment for AECI's Pond 003 at the New Madrid Power Plant was conducted in accordance with the requirements of §257.73(d) of the USEPA's CCR Rule.

Signed: 
Certifying Engineer

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

Professional Engineer's Seal:



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1	Project Locus
2	Site Plan
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Description of Project

1.1 GENERAL

1.1.1 Authority

Haley & Aldrich, Inc. (Haley & Aldrich) has been contracted by Associated Electric Cooperative, Inc. (AECI) to perform the Periodic Structural Stability Assessment (Assessment) for the AECI Pond 003 coal combustion residuals (CCR) surface impoundment located at New Madrid Power Plant (NMPP) in New Madrid, Missouri. This work was completed in accordance with the United States Environmental Protection Agency's CCR Rule effective 19 October 2015 including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR) §257.73(d).

This report summarizes the results of our Periodic Structural Stability Assessment for the Pond 003 and its dikes, including our 19 July 2021 visual inspection of the unit.

1.1.2 Purpose of Work

The purpose of this assessment was to document whether the design, construction, operation, and maintenance of Pond 003 are consistent with recognized and generally accepted good engineering practices. The visual inspection is intended to identify signs of distress or malfunction of the existing CCR surface impoundment, should they exist. This report summarizes those findings and notes conditions observed that are disrupting or have the potential to disrupt the operation and safety of the surface impoundment.

The investigation is divided into four parts: 1) obtain and review readily available reports, investigations, plans and data pertaining to the Pond 003 surface impoundment; 2) perform a visual inspection of the surface impoundment dike; 3) evaluate whether the design, construction, operation, and maintenance of the impoundment and dike are consistent with generally accepted good engineering practices; and 4) prepare and submit this report presenting the results of our evaluation, including recommendations and remedial actions.

1.1.3 Definitions

To provide the reader a better understanding of the report, definitions of commonly used terms associated with dams/dikes are provided in Appendix C. Many of these terms may be included in this report. The terms are presented under common categories associated with surface impoundments which include: 1) orientation; 2) dam/dike components; 3) hazard potential classification; and 4) miscellaneous.

1.2 DESCRIPTION OF PROJECT

1.2.1 Location

Pond 003, also historically referred to as Slag Pond 1, Ash Pond 1, and the Unlined Ash Pond, is located at the NMPP in New Madrid, Missouri. The site is located about 3 miles east of Marston, Missouri. The Site is accessible from the west via State Highway EE (off US route 55) and from the north and south

from Levee Road. Pond 003 is located adjacent to the power plant, which is located at North latitude 36° 30.4' and West longitude 89° 33.5', as shown on the attached Project Locus in Figure 1. The impoundments can be accessed by vehicles from earthen access roads from the NMPP. Access to the site and dikes is restricted by full time security and barriers/fences at the plant.

1.2.2 Owner/Operator

Pond 003 is owned and maintained by Associated Electric Cooperative, Inc.

	Dam Owner/Caretaker
Name	AECI New Madrid Power Plant
Mailing Address	P.O. Box 156
Town, State, Zip	New Madrid, MO 63869
Contact	Dennis Cox
Title	Supervisor, Coal Plant Engineering
Email Address	dcox@aeci.org
Emergency Phone	911

1.2.3 Purpose of Pond 003

The NMPP is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 1200 Megawatts. Pond 003 was constructed in 1972 for the purpose of storing and managing CCR, coal pile runoff, and plant process water. Water discharges Pond 003 through NPDES Outfall 003.

1.2.4 Description of the Dam and Appurtenances

Pond 003 is located southeast of the NMPP as shown on Figure 2.

The unit is located between the United States Army Corps of Engineers (USACE) Mississippi River Levee and the Mississippi River. The dike consists of an earthen embankment with a crest length of approximately 9,300 feet around the entire impoundment. The northern portion of the impoundment is incised, and the western portion is comprised of the USACE Mississippi River Levee. Therefore, the constructed dike is considered to be the approximately 5,000 ft of the east side of the unit and portions of the north and south sides. The dike embankment is approximately 10 to 20 feet in height and according to records and survey information; the embankment is constructed of locally sourced silty clays.

The impoundment has a surface area of approximately 110 acres and the observed water level elevation was at approximately 298.6 feet NAVD88. A gravel access road is present on the dam crest at about El. 308. The upstream and downstream slopes are vegetated, and the upstream shoreline is protected with riprap. The bottom half of the downstream slope of the eastern embankment is also covered with riprap. Pond 003 embankments were designed with 3 horizontal on 1 vertical (3H:1V) upstream and downstream slopes.

CCR, coal pile runoff and plant process water are discharged into Pond 003 via three pipes located at the northern end of the impoundment. The discharged process water and CCR flow through a channel in the

stockpiled/settled ash. Discharges from the impoundment flow to a concrete decant structure with concrete stoplogs. A discharge pipe directs water through the dike and into a discharge channel which flows to the Mississippi River.

Pond 003 storage volume at the top of the dam is estimated to be about 1,700 acre-ft and the dam has a structural height of approximately 20 feet.

1.2.5 Standard Operational Procedures

The impoundment is operated and maintained by NMPP personnel. Operation of the impoundment includes using the stop logs at the drop inlet structures to regulate the water levels and removal/recovery of settled CCR for beneficial reuse. Maintenance of the dike includes regular mowing of the upstream and downstream slopes and removing vegetation from the riprap on upstream slopes. Weekly inspections are also completed.

The NMPP personnel monitor and inspect the dike according to a series of informal, unwritten and written protocols. These protocols include:

- Observation of the impoundment embankments during normal operation;
- Inspecting the slope protection, including the vegetation and riprap;
- Monitoring the water levels; and
- Historic semi-annual inspection of the impoundments by NMPP personnel (now completed weekly).

1.2.6 Hazard Potential Classification

The Initial Hazard Potential Classification was completed in 2016 and is available on AECI's CCR compliance website. In this assessment, it was determined that Pond 003 had a significant hazard potential.

The Periodic Hazard Potential Classification is outside the scope of this report in accordance with the applicable regulations. Results will be provided under separate cover.

1.3 PERTINENT ENGINEERING DATA

1.3.1 Drainage Area

Based on the original design documents and observations from the site visit, Pond 003 does not receive drainage from the surrounding areas, only the immediate access roads on top of the dike and direct precipitation. Water is directed to the impoundment from the NMPP operations (i.e. discharge of sluiced CCR, coal pile runoff, and plant process water).

1.3.2 Reservoir

Pond 003 has an estimated surface area of 110 acres and a storage volume of 1,700 acre-ft.

In general, the reservoir contains varying amounts of fly ash and boiler slag mixed with water. At some locations the CCR has settled, or has been staged, to levels above water levels and the dike.

The impoundment is located outside (on the river side) of the Mississippi River levee system. The elevation of the embankment crest of Pond 003 generally matches the elevation of the Mississippi River Levee.

1.3.3 Discharges from Pond 003

CCR, coal pile runoff, and plant process water discharges into Pond 003 and flows from the north end of the impoundment through an open channel within the footprint. CCR is separated from the water through settling and decanting and flows to a concrete drop inlet structure at the southeastern end of the impoundment. Decant water is directed to a discharge pipe extending through the dike and into a riprap and earth lined discharge channel which flows to the Mississippi River.

1.3.4 Relevant Elevations

Elevations referenced in this report are in feet and are based on the North American Vertical Datum of 1988 (NAVD88).

The low point on crest elevation is at approximate El. 307 and the normal pool is generally at El. 299.

A. Top of Dam	309
B. Normal Pool	299
C. Spillway Crest	307
D. Upstream Water at Time of Inspection	301
E. Spillway Type	Concrete Drop Inlet with VCP
F. Spillway Invert	El. 282.8

1.3.5 Design and Construction Records

Pond 003 was constructed in 1972 to create a sedimentation and storage basin for fly ash and boiler slag. The dam was designed by Burns & McDonnell in 1970-1971.

1.3.6 Operating Records

Written operational records have not been historically maintained for the impoundment prior to the CCR Rule. AECl has been completing weekly inspections per the CCR Rule and maintains an operating record for required information.

Inspection

2.1 VISUAL INSPECTION

On 19 July 2016, Haley & Aldrich completed a visual inspection of the Pond 003. The following paragraphs describe the conditions of the dikes observed during the inspection. In addition, refer to the photographs and checklist forms included in Appendices A and B, respectively for additional comments.

2.1.1 General Findings

2.1.1.1 *Upstream Slope*

CCR has been staged to an elevation above the dam crest to the west and north, and above the water level; consequently, much of the upstream slope could not be observed. At locations where the upstream slope was observed, the slope appeared uniform, at an approximate 3H:1V slope, or flatter and protected from erosion and wave action. The top half of the slope was covered by grassy vegetation, some of which was overgrown. The bottom half of the slope, including below the water line, consisted of riprap. Isolated areas of the riprap contained vegetation less than about 3 ft in height. Misalignments, depressions, ruts, bulging, erosion, burrows, or other signs of distress were not observed.

2.1.1.2 *Crest*

The crest of the western portion of the dike consists of a paved access road. This area of the dike crest also blends into the Mississippi River Levee crest. The crest of the eastern and southern portions of the dike consists of a gravel access road. The crest alignment appeared generally level, with no depressions, or irregularities observed. Isolated areas of rutting were observed on the gravel access road portion of the eastern and southern embankment crest. This minor rutting appeared to be caused by vehicle traffic during wet conditions. The crest elevation was at approximately El. 310. Settlement or misalignment was not observed.

2.1.1.3 *Downstream Slope*

The downstream slope of the dike was generally graded to an estimated slope of about 3H:1V and healthy grass vegetation covered much of the slope. The western portion of the dam was also part of the Mississippi River Levee and was covered with grass height of approximately 6-in. The grass appeared to be regularly mowed.

The bottom half of the downstream slope of the eastern embankment was covered in riprap. Grassy vegetation was observed within the riprap, some of which exceeded a height of 48-in.

The downstream slope of the eastern and southern portion of the dike was graded to an approximate slope of 3H:1V, or flatter towards the north. Slope was covered in healthy grass cover about 8 to 12 in. in height and appeared to be regularly mowed. The downstream slope at the western portion of the south side was shared with the Lined Pond to the south. The Lined Pond closure was completed in January 2021 and had final cover grades approximately equal to the crest elevation. Therefore, there was no downstream slope at this location to observe. This area between Pond 003 and the Lined Pond

was separated by an access road which is considered the western portion of the southern dam crest. The downstream slope consists of the Lined Pond which has a Hyperflex© bottom liner.

Misalignments, depressions, ruts, bulging, erosion, burrows, or other signs of distress were not observed.

2.1.1.4 *Spillway and Emergency Spillway*

Three (3) 10 in. HDPE pipes discharge CCR, coal pile runoff and plant process water into Pond 003. Decant water flows out of Pond 003 through a concrete drop outlet at the southern end of the pond. The water level in the impoundment is controlled by concrete stop logs. Water flows over the stoplogs and into a 24 in. diameter discharge pipe to and riprap and earth lined discharge channel that flows to the Mississippi River. The concrete drop inlet spillway appeared to have minor, isolated, concrete chips, and weathering. Minor, surficial rusting was observed on the stoplog removal winch and frame. The discharge pipe was below the water level during the time of the site visit and was not visible.

No other emergency spillway exists.

2.1.1.5 *Downstream Area*

Downstream of the eastern portion of the dike mature trees exist between the toe of the downstream slope of the dam and the Mississippi River (about 25 ft of the downstream toe of the dam). The wooded area is approximately 200-300-ft. wide. Wet or soft spots were not observed.

2.2 CARETAKER INTERVIEW

On the day of the inspection, Haley & Aldrich met with AECl personnel familiar with the operations, maintenance, and construction of Pond 003. Information provided by AECl personnel has been incorporated into this report.

2.3 OPERATION AND MAINTENANCE PROCEDURES

The impoundment is operated and maintained by NMPP personnel. Operation of the impoundment includes using the stop logs at the drop inlet structures to regulate the water levels and removal/recovery of settled CCR for beneficial reuse. Maintenance of the dike includes regular mowing of the upstream and downstream slopes and removing vegetation from the riprap on upstream slopes. Weekly inspections are also completed. A formal operations and maintenance plan does not exist for the unit.

2.4 EMERGENCY ACTION PLAN

A written Emergency Action Plan (EAP) for Pond 003 was completed on 17 April 2017 and details the site and directives during an emergency or potential risk. The site is staffed full time and heavy earthmoving construction equipment is at the site. A communications plan is in place for the Plant.

2.5 OVERTOPPING POTENTIAL

Inflow to the impoundment is plant water and direct precipitation; therefore, the overtopping potential of the dam is low based on management of water within the impoundment. Riprap has been installed on the upstream slope as well to provide protection.

Impoundment Inspection Assessment and Recommendations

3.1 ASSESSMENT

Based on conditions observed during our visual inspection of Pond 003, discussions with site personnel, a review of available documents, the following deficiencies were noted:

- Vegetation exceeding 6 in. in height on the upstream slope.
- Vegetation exceeding 6 in. in height on the downstream slope.
- Vegetation exceeding 6 in. in height within the riprap on the upstream slope.
- Vegetation exceeding 6 in. in height within the riprap on the downstream slope.
- Mature trees in the downstream area of the dam.
- Minor rutting on embankment crest from vehicle access.

3.2 RECOMMENDATIONS

Maintenance of the dike is required and should include cutting/mowing of vegetation on the dike and embankments for continued ability to adequately inspect the impoundment. Mowing of the vegetation should be completed as needed to maintain healthy grass cover at less than 6 in. in height in the current CCR Rule requirements. Herbicide should be sprayed in the riprap on the upstream and downstream slopes to prevent excessive vegetation, as needed. Additional evaluation of the outlet pipe is recommended as well to confirm integrity.

3.3 REMEDIAL MEASURES

We recommend the following remedial measures be undertaken:

- Cut/mow the embankments and routinely mow the embankment slopes (upstream and downstream) and downstream areas to maintain vegetation at a height of 6 in. or less.
- Remove vegetation from riprap on upstream and downstream slopes via herbicide or other corrective method.
- Monitor the mature trees downstream of Pond 003 for signs of decay and impact to the dike during the weekly and monthly inspections.
- Repair the rutting on the embankment crest. Additional gravel should be added as necessary.
- Conduct a video inspection of outlet pipe from the drop inlet structures when flow is reduced to expose the downstream end of the pipe.

Structural Stability Assessment

In accordance with 40 CFR §257.73(d), the owner or operator of a CCR surface impoundment must conduct initial and periodic structural stability assessments to determine whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices. The Initial Structural Stability Assessment for Pond 003 was completed on 16 October 2016.

Haley & Aldrich reviewed the provided pertinent information and inspected Pond 003 as described above. Based on our review of available information and observations during our inspection, we have concluded the following in accordance with 40 CFR §257.73(d):

1. §257.73(d)(1)(i) – Stable Foundations and Abutments:

Based on the review of available subsurface information, as-built records, survey data, and observations during the inspection, the impoundment was judged to have stable foundations and abutments.

2. §257.73(d)(1)(ii) – Adequate Slope Protection:

Based on observations during the site inspection, the top half of the upstream slope was covered by grassy vegetation (some of which exceeded 6-in. height). The bottom half of the upstream slope, including below the water line, consisted of riprap. The downstream slope of the eastern and southern portion of the dike was graded to an approximate slope of 3H:1V, or flatter towards the north. Slope was covered in healthy grass cover (some of which exceeded 6-in. height) and appeared to be regularly mowed. The bottom half of the downstream slope consisted of riprap. The southern portion of the impoundment shares a dike with an adjacent impoundment which was covered by grassy vegetation that appeared to be regularly mowed.

3. §257.73(d)(1)(iii) – Dikes Mechanically Compacted:

Although records on the construction of the Pond 003 are not available, the test borings and laboratory testing performed by Haley & Aldrich and others, the results indicate that the berm fill was mechanically compacted during construction.

4. §257.73(d)(1)(iv) – Height of Vegetation:

At the time of our impoundment inspection, portions of the north and east downstream slopes had vegetation taller than 6 inches in height. The taller vegetation (as high as 48-in.) was primarily observed within the riprap of the bottom half of the eastern embankment. On the upstream slopes, some vegetation was higher as well, some as high as 36 inches.

5. §257.73(d)(1)(v)(A) – Spillway Cover:

Pond 003 discharges through a concrete decant structure located at the southeastern end of the impoundment. Being a concrete structure, the structure is non-erodible and appears to be in good condition. There is no emergency spillway.

6. §257.73(d)(1)(v)(B) – Spillway Capacity:

The spillway capacity for the impoundment was modeled and calculated in accordance with §257.82 Hydrologic and Hydraulic Capacity Requirements for CCR surface impoundments under a separate cover. The report, model, and calculations are available on AECI's CCR compliance website.

7. §257.73(d)(1)(vi) – Hydraulic Structures Underlying or Passing Through Embankment:

Only limited portions of the intake and outlet structure was visible during our inspection. Regarding the 24-in. clay pipe, the pipe is buried below the dike and the downstream portion is submerged by the discharge channel. No signs of settlement or slope displacement above the pipe were observed.

8. §257.73(d)(1)(vii) – Inundation of Downstream Slopes:

The impoundment is located adjacent to the Mississippi River and has the potential to be inundated under higher than normal river elevations. Typically, the river has a gradual rise and fall over days and weeks, as opposed to a significant rapid drawdown on a much shorter timescale. To account for the unlikely event the Mississippi River experiences a significant low pool or sudden drawdown occurrence, a representative rapid drawdown review was considered to simulate the potential impact on the slopes. The results indicate that the impoundment will maintain adequate slope stability under this condition.

9. §257.73(d)(2) – Deficiencies and Recommendations:

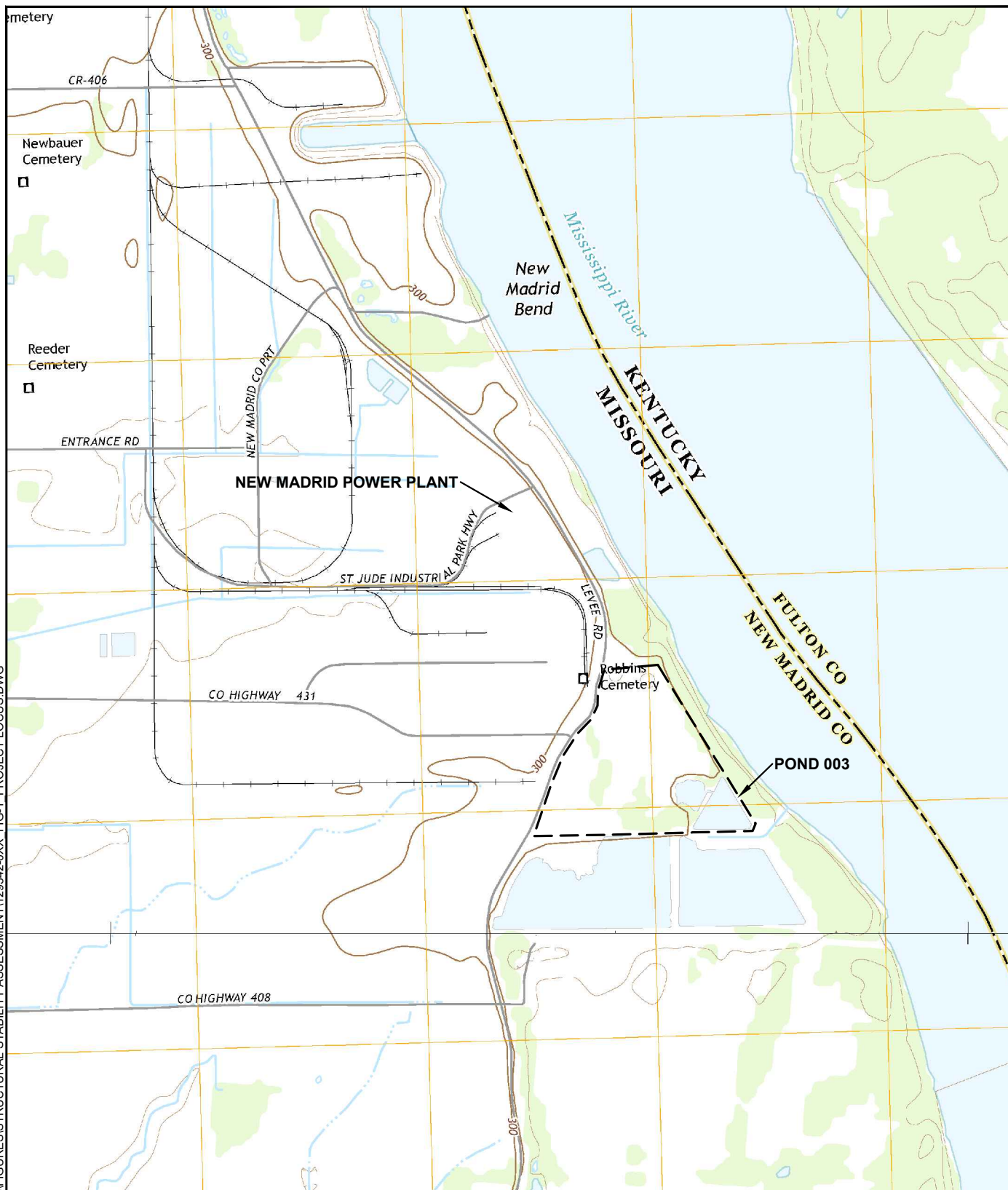
The Structural Stability Assessment did not identify any structural stability deficiencies for Pond 003.

AECI is performing a Periodic Safety Factor Assessment in accordance EPA's Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 40 CFR §257. The results of the Safety Factor Assessment will be provided under separate cover. The Initial Safety Factor Assessment was completed on 17 October 2016 and is available via AECI's CCR compliance website.

References

1. GZA GeoEnvironmental, Inc., "Round 7 Dam Assessment, Associated Electric Cooperative, Inc. New Madrid Power Plant Ash Pond 1 & 2 and Slag Pond 1 & 2 Impoundments," June 2011.

LUCAS, ANDY Printed: 8/4/2021 8:26 AM Layout: PROJECT LOCUS G:\129342_AECH\NMP\PCAD\POND 003\FIGURES\STRUCTURAL STABILITY ASSESSMENT\129342-0XX FIG-1 PROJECT LOCUS.DWG



MAPSOURCE: USGS
NEW MADRID, MO-KY
POINT PLEASANT, MO-TN-KY
2015



**HALEY
ALDRICH**

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
NEW MADRID, MO

POND 003 PROJECT LOCUS

APPROXIMATE SCALE: 1" = 2000'
JULY 2017

FIGURE 1

LUCAS, ANDY
G:\129342 AECL\NMPP\CAD\POND 003\FIGURES\STRUCTURAL STABILITY ASSESSMENT\129342-0XX FIG-2 SITE PLAN.DWG
Printed: 8/4/2021 8:27 AM Layout: SITE PLAN



LEGEND

— — — APPROXIMATE LIMITS OF POND 003

NOTES

1. AERIAL IMAGERY OBTAINED FROM GOOGLE EARTH PRO DATED 23 AUGUST 2017.



0 300 600
SCALE IN FEET

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NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

**POND 003
SITE PLAN**

SCALE: AS SHOWN
JULY 2021

FIGURE 2

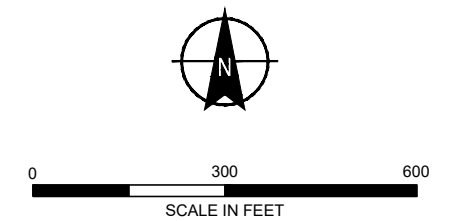


LEGEND

- APPROXIMATE LIMITS OF POND 003
- 1 PHOTO LOCATION/DIRECTION

NOTES

1. AERIAL IMAGERY OBTAINED FROM GOOGLE EARTH PRO DATED 23 AUGUST 2017.

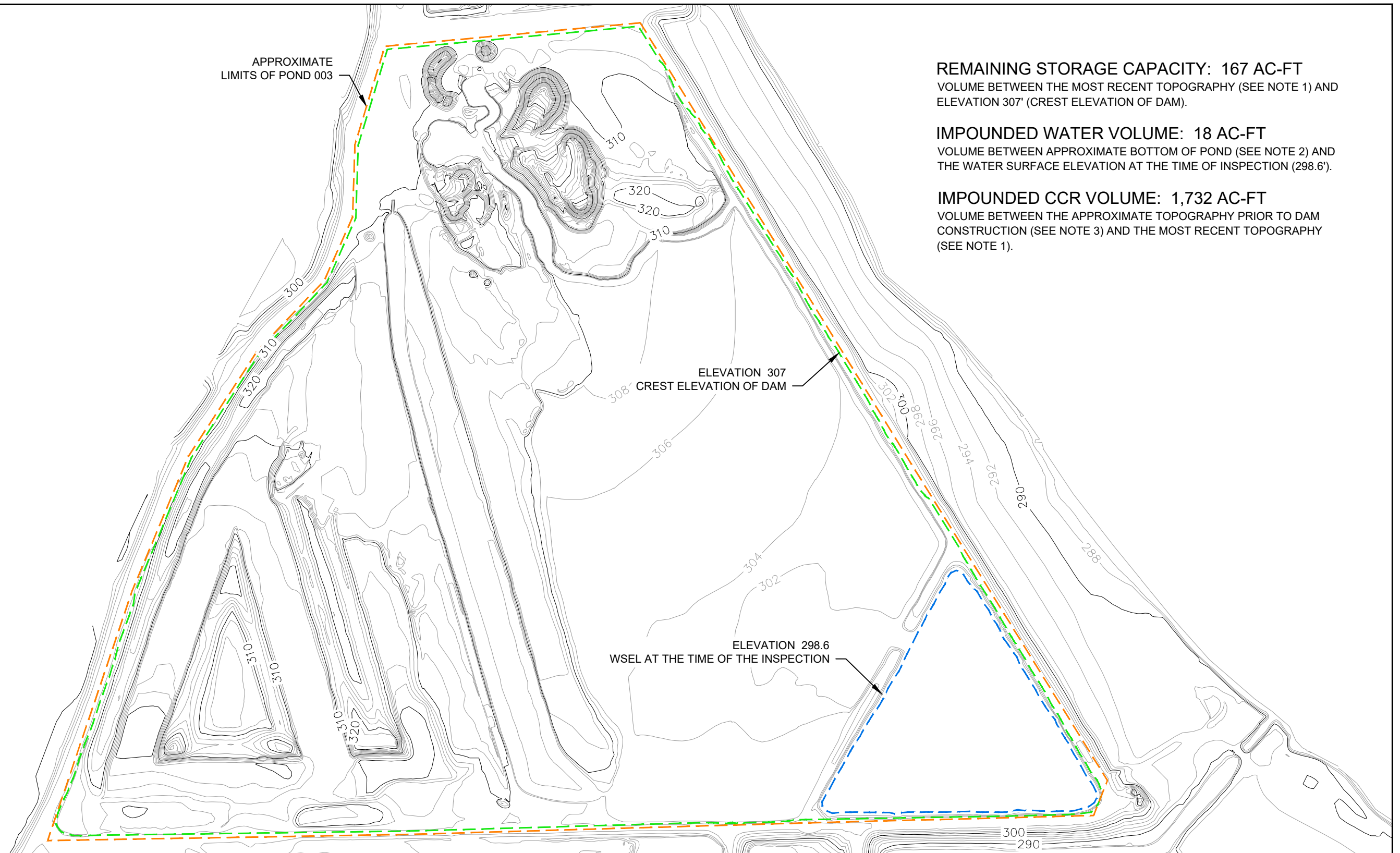


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NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

**POND 003
PHOTO LOCATION PLAN**

SCALE: AS SHOWN
JULY 2021



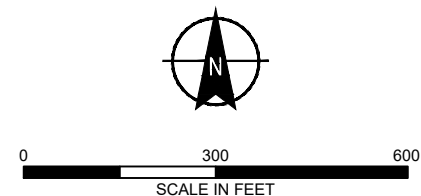
REMAINING STORAGE CAPACITY: 167 AC-FT
VOLUME BETWEEN THE MOST RECENT TOPOGRAPHY (SEE NOTE 1) AND ELEVATION 307' (CREST ELEVATION OF DAM).

IMPOUNDED WATER VOLUME: 18 AC-FT
VOLUME BETWEEN APPROXIMATE BOTTOM OF POND (SEE NOTE 2) AND THE WATER SURFACE ELEVATION AT THE TIME OF INSPECTION (298.6').

IMPOUNDED CCR VOLUME: 1,732 AC-FT
VOLUME BETWEEN THE APPROXIMATE TOPOGRAPHY PRIOR TO DAM CONSTRUCTION (SEE NOTE 3) AND THE MOST RECENT TOPOGRAPHY (SEE NOTE 1).

- LEGEND**
- ELEVATION 298.6' WSEL DURING INSPECTION
 - ELEVATION 307' CREST ELEVATION OF DAM
 - APPROXIMATE LIMITS OF POND 003

- NOTES**
1. EXISTING TOPOGRAPHY BASED ON LIDAR DATA RECEIVED FROM AECI CONDUCTED BY PICTOMETRY INTERNATIONAL CORP. AERIAL SURVEY CONDUCTED BETWEEN 4-8 OCTOBER 2014.
 2. CURRENT BATHYMETRIC DATA AND APPROXIMATE TOPOGRAPHY PRIOR TO TIME OF DAM CONSTRUCTION WAS UNAVAILABLE. BOTTOM OF POND APPROXIMATED AS ELEVATION 296.
 3. APPROXIMATE TOPOGRAPHY PRIOR TO TIME OF DAM CONSTRUCTION WAS USED FOR THE IMPOUNDED CCR VOLUME CALCULATION. THE TOPOGRAPHY WAS PROVIDED BY USGS 1971.



HALEY ALDRICH ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

**POND 003
STORAGE CAPACITY AND
IMPOUNDED CCR AND WATER
VOLUMES**

SCALE: AS SHOWN
AUGUST 2021

FIGURE 4

APPENDIX A

Photographs



Photograph No. 1
Pond 003
Downstream slope of embankment at northeast corner of unit



Photograph No. 2
Pond 003
Graveled access point to monitoring wells on downstream slope of eastern embankment



Photograph No. 3

Pond 003

Monitoring well located between eastern embankment of unit and Mississippi River



Photograph No. 4

Pond 003

Rutting on eastern embankment crest



Photograph No. 5
Pond 003
Vegetation in riprap on downstream slope of eastern embankment



Photograph No. 6
Pond 003
Access to monitoring wells between eastern embankment of unit and Mississippi River



Photograph No. 7
Pond 003
Vegetation on downstream slope of eastern embankment



Photograph No. 8
Pond 003
Vegetation and riprap on upstream slope of eastern embankment
Interior drainage channel at right



Photograph No. 9
Pond 003
Monitoring well on upstream slope of eastern embankment



Photograph No. 10
Pond 003
Riprap on upstream slope of southern portion of eastern embankment (ponding area)



Photograph No. 11
Pond 003
Downstream slope of southern embankment
Discharge channel at left



Photograph No. 12
Pond 003
Rutting in crest of eastern portion of southern embankment



Photograph No. 13
Pond 003
Outlet structure and Outfall 003 signage



Photograph No. 14
Pond 003
Outlet structure



Photograph No. 15
Pond 003
Interior access point from southern embankment



Photograph No. 16
Pond 003
Western embankment (USACE Army Corps of Engineers Levee)
Security fence and downstream slope at right



Photograph No. 17
Pond 003
Western embankment crest and upstream slope



Photograph No. 18
Pond 003
Cemetery near toe of downstream slope of western embankment



Photograph No. 19
Pond 003
Vegetated stockpiled ash interior to unit



Photograph No. 20
Pond 003
Three inlet pipes interior to unit near northwest corner of unit
One pipe (left) actively sluicing

APPENDIX B

Inspection Checklist

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Pond 003</u>	STATE ID #: <u>MO-0001171</u>
REGISTERED: (YES/NO) <u>No</u>	NID ID #: <u>N/A</u>
STATE SIZE CLASSIFICATION: <u>N/A</u>	STATE HAZARD CLASSIFICATION: <u>Significant</u>
	CHANGE IN HAZARD CLASSIFICATION REQUESTED?: (YES/NO) <u>No</u>
<u>DAM LOCATION INFORMATION</u>	
CITY/TOWN: <u>New Madrid</u>	COUNTY/STATE: <u>New Madrid/Missouri</u>
DAM LOCATION: <u>41 St. Jude Industrial, Marston, MO</u> (street address if known)	ALTERNATE DAM NAME: <u>N/A</u>
USGS QUAD.: <u>New Madrid, MO-KY</u>	LAT.: <u>36°30'28"</u> LONG.: <u>89°33'27"</u>
DRAINAGE BASIN: <u>N/A</u>	RIVER: <u>Mississippi River</u>
IMPOUNDMENT NAME(S): <u>Unlined Ash Pond (003 Pond)</u>	
<u>GENERAL DAM INFORMATION</u>	
TYPE OF DAM: <u>Earthen Incised and Bermed</u>	OVERALL LENGTH (FT): <u>9300</u>
PURPOSE OF DAM: <u>Sedimentation and Storage Basin</u>	NORMAL POOL STORAGE (ACRE-FT): _____
YEAR BUILT: <u>1972</u>	MAXIMUM POOL STORAGE (ACRE-FT): <u>1707</u>
STRUCTURAL HEIGHT (FT): <u>20</u>	EL. NORMAL POOL (FT): <u>298.9</u>
HYDRAULIC HEIGHT (FT): <u>8</u>	EL. MAXIMUM POOL (FT): <u>307.0 (minimum crest elevation)</u>
RESERVOIR SURFACE AREA (ACRES): <u>110</u>	WINTER DRAWDOWN (FT BELOW NORMAL POOL) <u>0.0</u>
PUBLIC ROAD ON CREST: <u>No</u>	DRAWDOWN VOL. (AC-FT) <u>0.0</u>
PUBLIC BRIDGE OVER SPILLWAY: <u>No</u>	

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>
<u>INSPECTION SUMMARY</u>		
DATE OF INSPECTION: <u>July 19, 2021</u>		DATE OF PREVIOUS INSPECTION: <u>January 15, 2021</u>
TEMPERATURE/WEATHER: <u>82° Cloudy</u>	ARMY CORPS PHASE I: (YES/NO) _____ If YES, date _____	
CONSULTANT: <u>Haley & Aldrich, Inc.</u>	PREVIOUS ALT. PHASE I: (YES/NO) _____ If YES, date _____	
BENCHMARK/DATUM: <u>NAVD88</u>		
OVERALL PHYSICAL		
CONDITION OF DAM: <u>Satisfactory</u>	DATE OF LAST REHABILITATION: <u>N/A</u>	
SPILLWAY CAPACITY: <u>N/A</u>		
EL. POOL DURING INSP.: _____	<u>298.6</u>	EL. TAILWATER DURING INSP.: <u>285</u>
<u>PERSONS PRESENT AT INSPECTION</u>		
<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>
<u>Andy Lucas</u>	<u>Senior Engineer</u>	<u>Haley & Aldrich, Inc.</u>
<u>Matthew Krakora</u>	<u>Staff Engineer</u>	<u>Haley & Aldrich, Inc.</u>
<u>Dennis Cox</u>	<u>Supervisor, Coal Plant Eng.</u>	<u>AECI</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>	
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>	
OWNER: ORGANIZATION	<u>Associated Electric Cooperative, Inc.</u>	CARETAKER: ORGANIZATION	<u>Associated Electric Cooperative, Inc.</u>
NAME/TITLE	<u>Mr. Dennis Cox</u>	NAME/TITLE	<u>Mr. Dennis Cox</u>
STREET	<u>P.O. Box 156</u>	STREET	<u>P.O. Box 156</u>
TOWN, STATE, ZIP	<u>New Madrid, MO 63869</u>	TOWN, STATE, ZIP	<u>New Madrid, MO 63869</u>
PHONE	<u> </u>	PHONE	<u> </u>
EMERGENCY PH. #	<u> </u>	EMERGENCY PH. #	<u> </u>
FAX	<u> </u>	FAX	<u> </u>
EMAIL	<u> </u>	EMAIL	<u> </u>
OWNER TYPE	<u>Private</u>		
PRIMARY SPILLWAY TYPE		<u>Decant Structure</u>	
SPILLWAY LENGTH (FT)		<u>N/A</u>	
AUXILIARY SPILLWAY TYPE		<u>N/A</u>	
NUMBER OF OUTLETS		<u>One</u>	
TYPE OF OUTLETS		<u>One Decant</u>	
DRAINAGE AREA (SQ MI)		<u>0.17</u>	
HAS DAM BEEN BREACHED OR OVERTOPPED? (YES/NO):		<u>No</u>	
FISH LADDER (LIST TYPE IF PRESENT)		<u>N/A</u>	
DOES CREST SUPPORT PUBLIC ROAD? (YES/NO)		<u>No</u>	
PUBLIC BRIDGE WITHIN 50' OF DAM? (YES/NO):		<u>No</u>	
		IF YES, PROVIDE DATE(S) <u> </u>	
		IF YES, ROAD NAME: <u> </u>	
		IF YES, ROAD/BRIDGE NAME: <u> </u>	
		MHD BRIDGE NO. (IF APPLICABLE) <u> </u>	

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
EMBANKMENT (CREST)					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel access road, western crest was paved levee road	X		
	2. SURFACE CRACKING	None observed	X		
	3. SINKHOLES, ANIMAL BURROWS	None observed	X		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	None observed	X		
	5. HORIZONTAL ALIGNMENT	None observed	X		
	6. RUTS AND/OR PUDDLES	Isolated areas of minor rutting from vehicle access			X
	7. VEGETATION (PRESENCE/CONDITION)	None observed	X		
	8. ABUTMENT CONTACT	N/A			
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
EMBANKMENT (D/S SLOPE)					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)				
	2. SEEPAGE	None observed	X		
	3. SLIDE, SLOUGH, SCARP	None observed	X		
	4. EMB.-ABUTMENT CONTACT	N/A			
	5. SINKHOLE/ANIMAL BURROWS	None observed	X		
	6. EROSION	None observed	X		
	7. UNUSUAL MOVEMENT	None observed	X		
	8. VEGETATION (PRESENCE/CONDITION)	Areas of long grassy vegetation and woody vegetation near embankment toe			X
ADDITIONAL COMMENTS: <u>Grassy vegetation within riprap should be sprayed with herbicide.</u> <u>Woody vegetation near toe of slope should be monitored.</u> 					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
EMBANKMENT (U/S SLOPE)					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed			
	2. SLOPE PROTECTION TYPE AND COND.	Areas with riprap in good condition	X		
	3. SINKHOLE/ANIMAL BURROWS	None observed	X		
	4. EMB.-ABUTMENT CONTACT	None observed	X		
	5. EROSION	None observed	X		
	6. UNUSUAL MOVEMENT	None observed	X		
	7. VEGETATION (PRESENCE/CONDITION)	Grassed. Areas of vegetation exceeding 6-in. on eastern embankment			X
ADDITIONAL COMMENTS: <u>The majority of the upstream slope has ash stockpiled to an elevation equal to the embankment crest and could not be inspected.</u> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div>					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
INSTRUMENTATION					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	P-1 through P-5	X		
	2. OBSERVATION WELLS	Various monitoring wells at perimeter of unit	X		
	3. STAFF GAGE AND RECORDER	None present	X		
	4. WEIRS	None present	X		
	5. INCLINOMETERS	None present	X		
	6. SURVEY MONUMENTS	None present	X		
	7. DRAINS	None present	X		
	8. FREQUENCY OF READINGS	Quarterly	X		
	9. LOCATION OF READINGS	Facility's operating record	X		
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
DOWNSTREAM AREA					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S AREA	1. ABUTMENT LEAKAGE	None present	X		
	2. FOUNDATION SEEPAGE	None present	X		
	3. SLIDE, SLOUGH, SCARP	None present	X		
	4. WEIRS	None present	X		
	5. DRAINAGE SYSTEM	None present	X		
	6. INSTRUMENTATION	Monitoring wells	X		
	7. VEGETATION	Grass. Woody vegetation between east embankment and Mississippi River	X		
	8. ACCESSIBILITY	Gravel and paved access road along crest. Full time security and fence	X		
	9. DOWNSTREAM HAZARD DESCRIPTION	None present	X		
	10. DATE OF LAST EAP UPDATE	April 17, 2017			
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
PRIMARY SPILLWAY					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Decant structure	X		
	WEIR TYPE	Concrete stoplogs in decant structure	X		
	SPILLWAY CONDITION	Fair	X		
	TRAINING WALLS	None present	X		
	SPILLWAY CONTROLS AND CONDITION	None present	X		
	UNUSUAL MOVEMENT	None present	X		
	APPROACH AREA	Fair	X		
	DISCHARGE AREA	Fair	X		
	DEBRIS	None present	X		
	WATER LEVEL AT TIME OF INSPECTION	298.6	X		
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
OUTLET WORKS					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
OUTLET WORKS	TYPE	Outlet unable to be inspected. Downstream submerged in unlined creek.	X		
	INTAKE STRUCTURE	Decant structure with stoplogs	X		
	TRASHRACK	N/A	X		
	PRIMARY CLOSURE	N/A	X		
	SECONDARY CLOSURE	N/A	X		
	CONDUIT	N/A	X		
	OUTLET STRUCTURE/HEADWALL	Fair	X		
	EROSION ALONG TOE OF DAM	None	X		
	SEEPAGE/LEAKAGE	None	X		
	DEBRIS/BLOCKAGE	None	X		
	UNUSUAL MOVEMENT	None	X		
	DOWNSTREAM AREA	Regularly mowed grassy vegetation. Creek is riprap lined	X		
	MISCELLANEOUS				
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Pond 003</u>		STATE ID #: <u>MO-0001171</u>			
INSPECTION DATE: <u>July 19, 2021</u>		NID ID #: <u>N/A</u>			
UNDERLYING HYDRAULIC STRUCTURES/PIPES					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
UNDERLYING HYDRAULIC STRUCTURES /PIPES	TYPE	Outlet pipe unable to be inspected	X		
	INLET	N/A	X		
	CONDUIT	Outlet pipe unable to be inspected	X		
	OUTLET STRUCTURE/HEADWALL	Fair	X		
	EROSION ALONG STRUCTURE	None present	X		
	SEEPAGE/LEAKAGE	None present	X		
	DEBRIS/BLOCKAGE	None present	X		
	UNUSUAL MOVEMENT	None present	X		
	DOWNSTREAM AREA	None present	X		
	MISCELLANEOUS				
ADDITIONAL COMMENTS: <u>Outlet pipe unable to be inspected. Downstream end of outlet was submerged in unlnied creek to Mississippi River.</u> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-top: 5px;"></div>					

Note: Use additional sheets for additional outlets.

APPENDIX C

Definitions

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions, refer to the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, the Department of the Interior Bureau of Reclamation, or the Federal Emergency Management Agency.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate there from including but not be limited to spillways; reservoirs and their rims; low level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

Size Classification

Large – structure with a height greater than 40 feet or a storage capacity greater than 1,000 acre-feet.

Intermediate – structure with a height between 15 and 40 feet or a storage capacity of 50 to 1,000 acre-feet.

Small – structure with a height between 6 and 15 feet and a storage capacity of 15 to 50 acre-feet.

Non-Jurisdictional – structure less than 6 feet in height and having a storage capacity of less than 15 acre-feet.

Hazard Classification

(In the event the impoundment should fail, the following would occur):

Less Than Low Hazard Potential - Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

Low Hazard Potential - Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

Significant Hazard Potential - Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

High Hazard Potential - Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

General

EAP – Emergency Action Plan - Shall mean a predetermined plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam break.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet

Height of Dam – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the crest of the dam.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Condition Rating

Unsafe - Major structural, operational, and maintenance deficiencies exist under normal operating conditions.

Poor - Significant structural, operation and maintenance deficiencies are clearly recognized for normal loading conditions.

Fair - Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters.

Satisfactory - Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.

Good - No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF.