Associated Electric Cooperative Inc.

A Touchstone Energy® Cooperative

New Madrid CCR Surface Impoundment

Pond 004

Disposal of Coal Combustion Residuals (CCR) from
Electric Utilities Final Rule Structural Integrity Criteria for
Existing CCR Surface Impoundments

Emergency Action Plan

This Emergency Action Plan is written in accordance with
40 CFR Part 257.73(a)(3)(i)(A) through (E) and (a)(3)(iv)

April 17, 2017

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Project ID: 129342-004

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Pond 004
Emergency Action Plan

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1.0 CCR Surface Impoundment Emergency Action Plan Introduction

The final rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities became effective on 19 October 2015. The new rule establishes technical requirements for CCR landfills and surface impoundments under subtitle D of the Resource Conservation and Recovery Act (RCRA). Per 40 CFR Part 257.73(a)(3)(i), any surface impoundment that has been listed as having a significant hazard potential must have an Emergency Action Plan (EAP). The purpose of this EAP is to reduce the risk to human life and minimize property damage during an unusual or emergency event at the New Madrid Power Plant CCR surface impoundments. This EAP will prepare the facility personnel for a surface impoundment failure event.

Associated Electric Cooperative Inc. (AECI) has developed and will implement this EAP in the event an impoundment failure occurs at their New Madrid Power Plant CCR Surface Impoundment – Pond 004 (Pond 004) (see Figures 1 and 2). In addition, this plan is written in accordance, and to comply, with 40 CFR Part 257.73(a)(3)(i). This EAP provides step-by-step instructions to those individuals at the plant level on how to respond to an emergency situation. The plan includes notification lists, maps of the CCR surface impoundment, and emergency response procedures. The main goal of this EAP is to offer a quick and effective reference for personnel at the facility in case such an emergency should occur.

1.1 Notification Procedure

This EAP provides general guidance for recognizing and characterizing an emergency situation occurring at the impoundment. The impoundment owner/plant manager should act quickly to evaluate the situation and then follow the notification procedures according to the corresponding level of emergency.

1.2 Potential Impacted Area

The Flood Inundation Map for Pond 004 (Figure 3) indicates the potential areas that may be affected if the impoundment should fail. Based on the flood inundation mapping, the potentially affected areas include uninhabited farm land to the south and west, and the AECI power plant property to the west. No other structures or buildings have been identified in this inundation area.

1.3 Directions to Impoundment

A map with directions to the site for emergency personnel is shown on Figure 4 - Map and Directions from New Madrid, Missouri to Pond 004.

Pond 004 (latitude/longitude: 36°30’52”/89°33’34”) is accessible from the plant site along a gravel access road present on the crest (Figure 4).

Directions from New Madrid:

Head southwest on US HWY 61 towards Interstate 55 (I-55)
Merge onto I-55 South toward Portageville
Take exit 40 for State Hwy EE toward Marston/St. Jude Road.
Continue on State Hwy EE. Turn left at the railroad tracks.
Follow the road to the east taking a slight left turn near the power plant.

Turn right onto Levee Road.
Take Levee Road south to Pond 004.

2.0 Pond 004 Physical Description and Structural Integrity Hazard Potential Classification

2.1 Physical Description

Pond 004 is a ring dike comprised of a slag dewatering pond which was constructed approximately 33 years ago. The impoundment was built as a sedimentation and storage basin for boiler slag. The Pond 004 operator has general maintenance and repair procedures in place, and there are no known occurrences of structural instability of Pond 004.

The watershed in which Pond 004 is located is the Little River Ditches Watershed (USGS No. 08020204) that is approximately 2,608 square miles in size. Pond 004 is an above-grade ring dike and does not receive any overland flow from the surrounding areas. Discharges from the impoundment flow to a concrete drip inlet structure with concrete stoplogs located in the southeast corner of Pond 004. A discharge pipe directs water through the dike into the Mississippi River as shown on Figure 2.

Pond 004 is located approximately 200 feet west of the Mississippi River. Pond 004 embankments were constructed from native silty clay with a 4H:1V (horizontal:vertical) upstream slope and 2.5H:1V downstream slope and a crest height of approximately 20 feet.

Maximum depths of impounded water and CCR are approximately 5 to 10 feet and approximately 20 feet, respectively, with a corresponding water elevation of 302 feet above mean sea level (MSL).

The storage capacity of Pond 004 (per the original surface impoundment design with a 10-acre footprint) is approximately 94,000 cubic yards. The volume of CCR material currently stored is approximately 54,000 cubic yards.

The above depths, elevations, storage capacity and impounded volumes are based on: 1) available measured water surface elevations; 2) survey conducted 4-8 October 2014 by Pictometry International Corporation; 3) topography provided by USGS 1971; and 4) *Initial Annual CCR Surface Impoundment PE Inspection Pond 004* report dated January 2016 by Haley & Aldrich, Inc.

Water and CCR are discharged into the impoundment via four 10-inch diameter pipelines located at the northern end of the impoundment. The discharged water and CCR flow through a channel in the stockpiled/settled ash.

2.2 Hazard Potential Classification

Based on the criteria of 40 CFR Part 257.73 *Structural integrity criteria for existing CCR surface impoundments*, the determination has been made that Pond 004 meets the classification of a significant hazard potential CCR surface impoundment (defined as a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other

concerns). This classification is based on the high probability that failure of the embankment could result in environmental damage extending beyond the boundaries of the New Madrid Power Plant and the possibility of power generation interruption.

3.0 Safety Emergency Recognition and Prevention

3.1 Emergency Definitions and CCR Surface Impoundment Potential Risk

Imminent/Actual Failure: Description: Impending or actual sudden release of water and/or boiler slag caused by an accident to, or failure of, CCR surface impoundment structures.

Example: Failure of a segment of the perimeter dike by seepage and/or slope instability.

Potential Hazard - Description: Potential for sudden release of water and/or boiler slag caused by an accident to, or failure of, CCR surface impoundment structures. Actions taken during such potentially hazardous events may prevent or mitigate failure. Even if failure is inevitable, in potential hazard situations, more time is generally available than in the imminent/actual failure emergency situation to issue warnings and/or take mitigative actions.

Pond 004 contains 94,000 cubic yards of water and CCR material (54,000 cubic yards of CCR and 40,000 cubic yards of water) based on data from the *Initial Annual CCR Surface Impoundment PE Inspection Pond 004* report dated January 2016 by Haley & Aldrich, Inc. If the impoundment were to break on the east side, the material in the impoundment would flow into the Mississippi River. If the impoundment were to break on any of the remaining sides of the Pond 004 impoundment, the majority of the material would inundate approximately 500 feet around the Pond 004 perimeter. This includes part of the power plant and/or power plant property. Preventative measures to avoid an impoundment failure include visual inspections as detailed below.

3.2 Site and Impoundment Condition Surveillance

Pond 004 has oversight by facility personnel and/or their designees to check Pond 004 at a maximum interval of seven days per 40 CFR Part 257.83(a)(i). The impoundment is inspected for erosion, wash outs, the presence of water near the impoundment toe, and other indicators of potential impoundment failure. In addition to these checks, a wildlife trapper has been retained to conduct inspections of the impoundment for animal burrows. Repairs are made as animal burrows are noted.

3.3 Detection and Monitoring Devices

There are no piezometers installed in Pond 004 for stability monitoring.

4.0 Notification Procedures

4.1 Notification Sequence

In the event of a failure at Pond 004, general guidance for determining the emergency level is provided below, as well as the appropriate contacts for each level. This information should be used as a general guide for recognizing and characterizing the type of emergency situation

occurring at the impoundment. Per the instructions of local emergency services personnel, 911 should be contacted[1] during emergency situations; all pertinent emergency services will be contacted by 911 personnel. Appropriate parties will be notified based on the nature and severity of the incident as determined by the incident commander/designee assigned by AECI. This applies to both emergency conditions, "Imminent Failure" and "Potential Hazard" as previously defined.

If failure is imminent or has occurred, notification and mitigation procedures are a top priority. The incident commander/designee, in conjunction with the internal emergency coordination services department, is responsible for this determination. If the chain of notification is altered/broken, order needs to be reestablished immediately to ensure that every party is notified as required.

Guidance for Determining the Emergency Level

Level 1 Emergency - Nonemergency, unusual event, slow to develop

- **Contact:** Control Room Operator / Incident Commander
- Reservoir elevation at emergency spillway crest or spillway is flowing with no active erosion.
- New seepage areas with clear discharge in or near the impoundment.
- New cracks in the embankment less than ¼-inch wide without seepage.
- Visual movement/slippage of the embankment slope.
- Measurable earthquake felt or reported on or within 50 miles of the impoundment.
- Damage (vandalism/sabotage) to impoundment or appurtenances with no impacts to the functioning of the impoundment.
- Modification (vandalism/sabotage) to the impoundment or appurtenances that could adversely impact the functioning of the impoundment.

Level 2 Emergency - Potential impoundment failure situation, rapidly developing

- **Contact:** Control Room Operator / Incident Commander
- Spillway flowing with active gully erosion.
- New seepage areas with cloudy discharge or increasing flow rate.
- New cracks in the embankment greater than ¼-inch wide with seepage.
- New cracks in the embankment greater than ¼-inch but less than 6-inches without seepage.
- Observation of new sinkhole in impoundment area, on embankment, or downstream of impoundment.
- Cracks in the embankment with seepage.
- Earthquake resulting in visible damage to the impoundment or appurtenances.
- Verified bomb threat that, if carried out, could result in damage to the impoundment.
- Damage to impoundment (vandalism/sabotage) or appurtenances that has resulted in seepage flow.

[1] This procedure should be re-evaluated at each annual face-to-face meeting described in Section 6.

Level 3 Emergency - Urgent; impoundment failure imminent or is in progress

- **Contact:** Control Room Operator / Incident Commander; 911
- Spillway flowing with an advancing headcut that is threatening the control section.
- Water from the reservoir is flowing over the top of the impoundment (not just auxiliary/emergency spillway).
- A whirlpool is observed in the reservoir.
- Seepage that is obviously eroding soil from within the embankment or rapidly increasing in flow rate.
- Rapidly enlarging sinkhole.
- Sudden or rapidly progressing slides of the embankment slopes.
- Earthquake resulting in uncontrolled release of water from the impoundment.
- Detonated bomb that has resulted in damage to the dam or appurtenances.
- Damage to impoundment (vandalism/sabotage) or appurtenances that has resulted in uncontrolled water release.

4.2 Modes of Communication with Responsible Persons

The primary modes of communication with responsible persons are landline telephones and cell phones. If someone cannot be contacted for any reason, then an alternate person performing the position will be contacted. If land-line telephones or cell phones are out of order, an alternate mode of communication listed below will be used:

- Two-way radios
- Gaitronics System
- Paging System
- Deliver in person
- Satellite Radiotelephone

AECI uses landlines and cell phones for routine communication purposes. If needed, other parties have equipment and personnel available to aid with communication with the local police/sheriff and county emergency management personnel.

4.3 Notification of Potentially Affected Residents and Businesses

The incident commander/designee at the New Madrid Station will determine who to notify in the case of an imminent or actual Pond 004 failure.

Note inundation mapping indicates neither loss of human life nor buildings/structures is anticipated in the event of an actual failure (Level 3 Emergency).

4.4 Notification Responsibilities

The incident commander/designee will ensure proper notifications are made. Calling 911 will

allow the dispatcher to send out all appropriate emergency response personnel as requested and/or needed for the particular incident. The New Madrid County Emergency Management Service has a code red phone calling system, which can be activated to assist with any necessary notifications and appropriate responses.

5.0 Emergency Operations and Repair

The objective of the emergency operations and repair is to prevent or reduce the impact of an impending sudden release of water and/or boiler slag. It should be anticipated that this work may need to be performed during adverse conditions and will require various supplies and resources. The primary methods of mitigating potential impact are: regulating the flow, minimizing flooding potential, and coordinating emergency repairs. Ensure that all personnel undertaking emergency repair and mitigation activities are using proper safety precautions. Any of these activities that may cause bodily harm/loss of life to these personnel should not be attempted.

5.1 Response During Adverse Conditions

Appropriate contractors will be utilized to assist the incident commander/designee with any mitigative actions being taken. The objectives of the mitigative actions are to minimize the impact of any event that has occurred. AECI maintains contractors for assistance with emergency events for the plant.

Requests for assistance can be made to the County and State emergency offices and/or AECI's preferred environmental response contractors/consultants to assist with the incident and make recommendations to AECI concerning the equipment and materials needed to mitigate the incident.

6.0 Annual Face to Face Meeting with Local Emergency Responders

An annual face to face meeting will be held with local emergency responders per 40 CFR Part 257.73 (a)(3)(E). The meeting will be held whether or not an incident occurred during the previous year. If an incident did occur, the annual meeting date may be moved to discuss the incident soon after it occurs. If no incidents have occurred, an annual meeting will be held to inform the local emergency responders about the CCR surface impoundment EAP and the role they would play in assisting the facility. In addition, the meeting will cover general information about the CCR surface impoundment. The potential risks the CCR surface impoundment may pose will be explained, as well as the preventative measures the plant is taking to avoid these potential issues. Documentation of the annual face-to-face meeting will be recorded and placed in the operating record for Pond 004. Table 1 provides contact information for the internal emergency coordinators and external emergency response agencies that should be included in these meetings.

Table 1 - New Madrid CCR Surface Impoundment EAP Notification List

Agency / Organization	Principal Contact	Address	Primary Phone Number	Alternate Phone Number
Internal Emergency Coordinators				
Control Room Operator / Incident Commander			(573) 643-2211	(573) 643-6239 (security desk)
Emergency Response Agencies				
New Madrid County Emergency Management System	Jim Harris	560 Mott St. P.O. Box 602 New Madrid, MO 63869	911	(573)748-7635 (office)
New Madrid County Sheriff's Department	Main Line	#2 Courthouse Square New Madrid, MO 63869	(573) 748-2516	
Ambulance County Emergency Medical Service	Dispatch	340 US HWY 61 New Madrid, MO 63869	911	
Missouri Delta Medical Center	Main Line	1008 N. Main St. Sikeston, MO 63801	(573) 471-1600	
Pemiscot Memorial Hospital	Main Line	US Highway 61 & Reed St. Hayti, MO 63869	(573) 359-1372	
New Madrid Fire Department	Jim Harris (Chief)	560 Mott St. P.O. Box 96 New Madrid, MO 63869	911	
New Madrid Police Department	Joey Higgerson (Chief) Brandon Hanner (Assistant Chief)	540 Mott St. New Madrid, MO 63869	911	(573) 748-2167
National Response Center (NRC)	Main Line	2703 Martin Luther King Jr Ave SE Washington DC 20593	1-800-424-8802	
Missouri Emergency Response Commission (MERC)	Main Line	2302 Militia Drive PO Box 116 Jefferson City, MO 65102	(573) 526-9249	1-800-750-1014
Missouri Department of Natural Resources, Environmental Emergency Response	Main Line	Environmental Services Program PO Box 176 Jefferson City, MO 65102	(573) 634-2436	
U.S. Coast Guard – 8th District; St. Louis, MO	Main Line	100 Arsenal St. St. Louis, MO 63118	(314) 771-4325	
U.S. Army Corps of Engineers – Memphis District	Main Line	167 N. Main St. Room B-202 Memphis, TN 38103	(901) 544-4109	

Professional Engineer Certification [Per 40 CFR Part 257.73)
New Madrid CCR Surface Impoundment Pond 004 Emergency Action Plan

I hereby certify that myself or an agent under my review has prepared this Emergency Action Plan (Plan), and being familiar with the provisions of the final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA), attest that this Plan has been prepared in accordance with good engineering practices and meets the intent of 40 CFR Part 257.73. To the best of my knowledge and belief, the information contained in this Plan is true, complete, and accurate.

Steven F. Putrich, P.E.

State of Missouri License No. 2014035813

4-17-2017

Date

FIGURES

LEGEND

CCR SURFACE IMPOUNDMENT

N

0 500 1,000

SCALE IN FEET

AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

NEW MADRID CCR SURFACE IMPOUNDMENT
POND 004 EMERGENCY ACTION PLAN
AECI NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

AERIAL PHOTO MAP OF THE AECI NEW MADRID POWER PLANT AND CCR SURFACE IMPOUNDMENTS

APRIL 2017

FIGURE 1

GIS FILE PATH: G:\406\16_New_Madrid_Power_Plant\GIS\Maps\2017_03\129342_004_0001_AERIAL_PHOTO_MAP_OF_AECI_NM.mxd — USER: craumann — LAST SAVED: 4/10/2017 9:18:41 AM

LEGEND

CCR SURFACE IMPOUNDMENT

N

0 200 400

SCALE IN FEET

AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

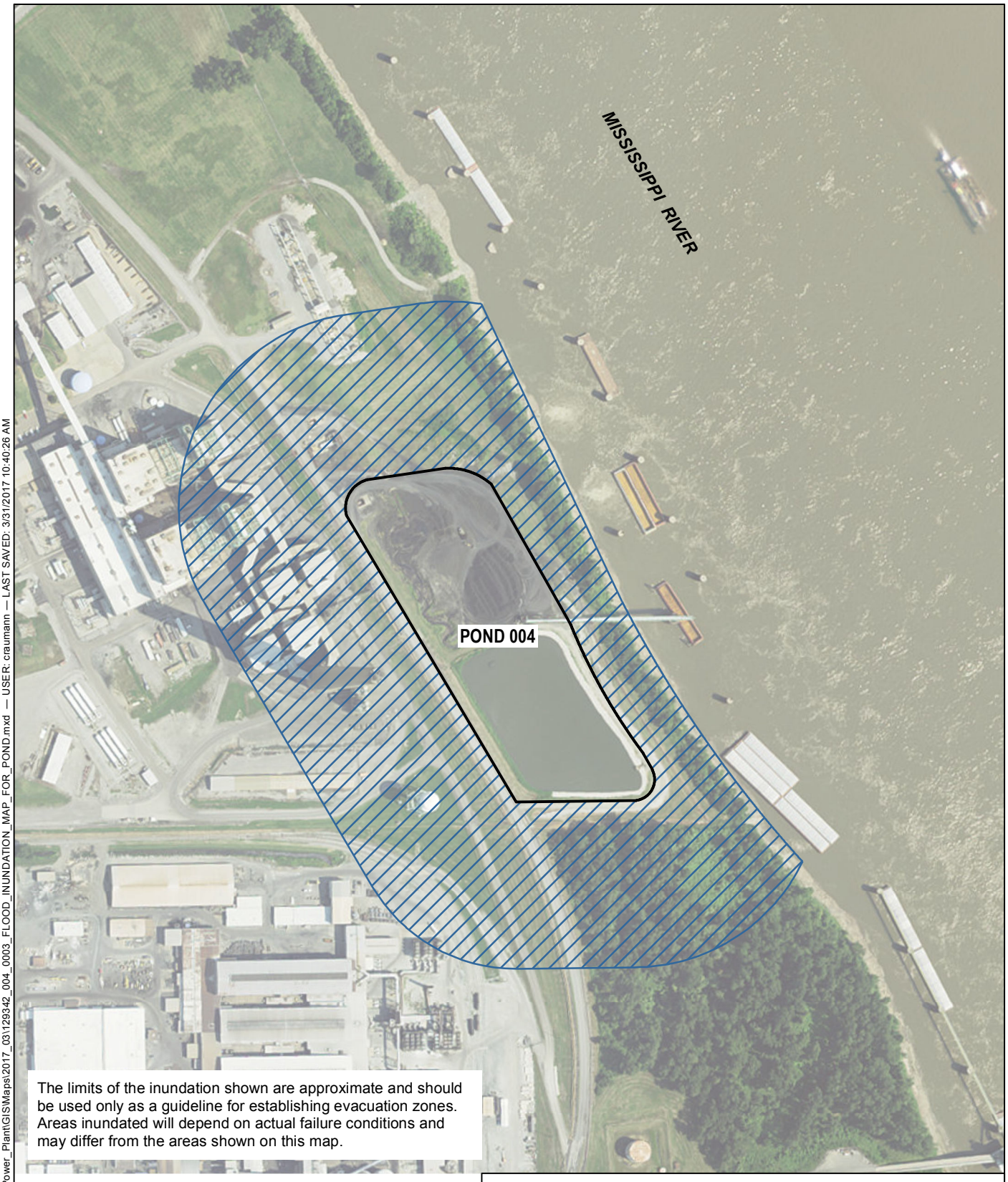
NEW MADRID CCR SURFACE IMPOUNDMENT
POND 004 EMERGENCY ACTION PLAN
AECI NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

AERIAL PHOTO MAP OF POND 004

MARCH 2017

FIGURE 2

GIS FILE PATH: G:\406\16_New_Madrid_Power_Plant\GIS\Maps\2017_03\129342_004_0002_AERIAL_PHOTO_MAP_OF_POND.mxd — USER: craumann — LAST SAVED: 3/31/2017 10:31:09 AM



The limits of the inundation shown are approximate and should be used only as a guideline for establishing evacuation zones. Areas inundated will depend on actual failure conditions and may differ from the areas shown on this map.

LEGEND

ESTIMATED LIMITS OF INUNDATION

CCR SURFACE IMPOUNDMENT

N

0 200 400

SCALE IN FEET

AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

NEW MADRID CCR SURFACE IMPOUNDMENT
POND 004 EMERGENCY ACTION PLAN
AECI NEW MADRID POWER PLANT
NEW MADRID, MISSOURI

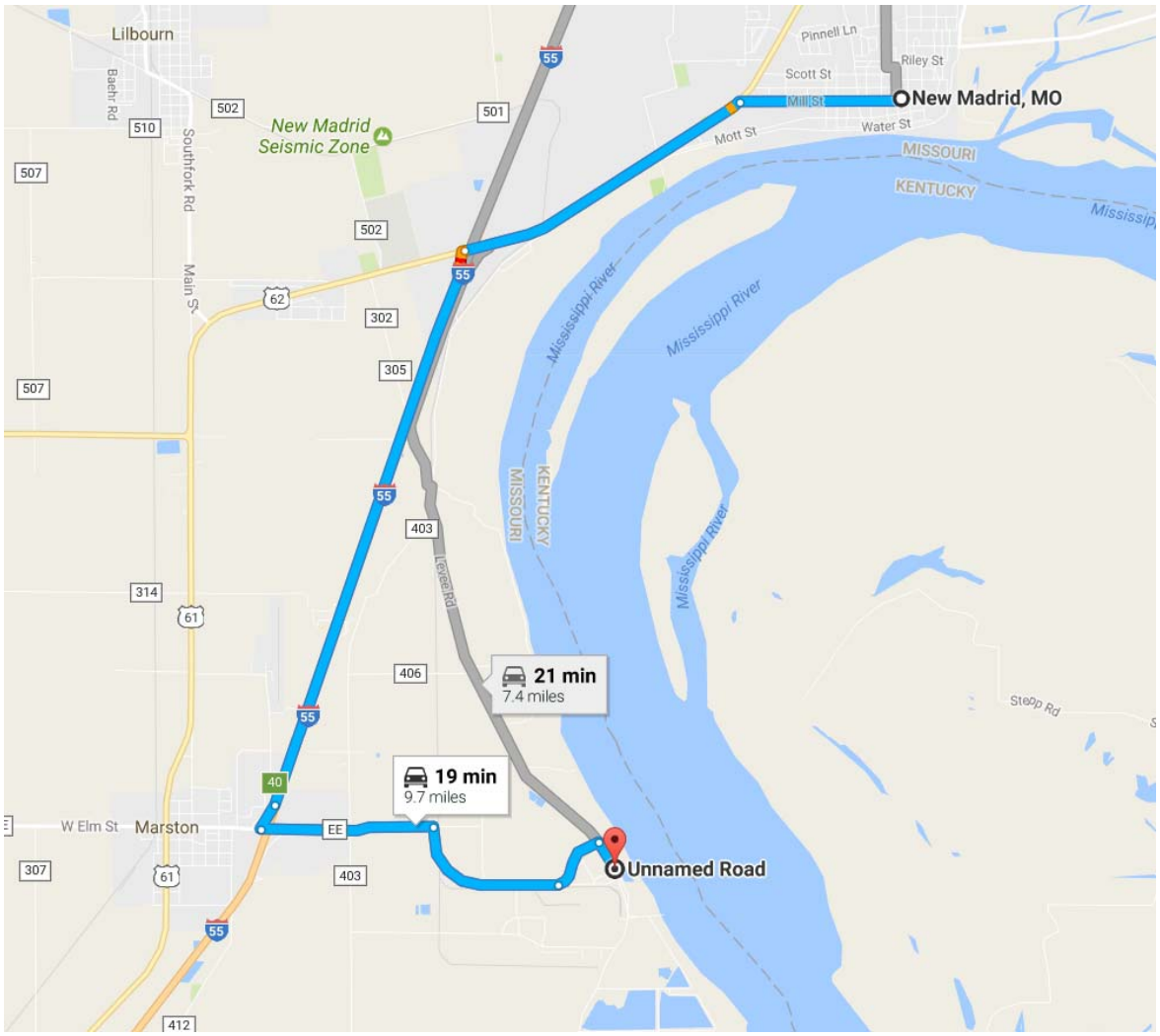
POND 004 FLOOD INUNDATION MAP

MARCH 2017

FIGURE 3

GIS FILE PATH: G:\40616_New_Madrid_Power_Plant\GIS\Maps\2017_03\129342_004_0003_FLOOD_INUNDATION_MAP_FOR_POND.mxd — USER: craumann — LAST SAVED: 3/31/2017 10:40:26 AM

Figure 4 – Map and Directions from New Madrid, Missouri to Pond 004



Directions from New Madrid:

Head southwest on US HWY 61 towards Interstate 55.
Merge onto I-55 S toward Portageville.
Take exit 40 for State Hwy EE toward Marston/St. Jude Road.
Continue on State Hwy EE. Turn left at the railroad tracks.
Follow the road to the east taking a slight left turn near the power plant.
Turn right onto Levee Road.
Take Levee Road south to Pond 004.