



Your Touchstone Energy® Cooperative 

Green CCR Surface Impoundment

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)*

January 4, 2017

Prepared By:



Project ID: 16-0137A

Green CCR Surface Impoundment 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 From Electric Utilities was published in the Federal Register on April 17, 2015. The new rule establishes technical requirements for CCR landfills and surface impoundments under subtitle D of the Resource Conservation and Recovery Act. 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. The purpose of the “Surface Impoundment Emergency Action Plan (EAP)” is to develop an EAP that will allow the facility and staff to be prepared for a surface impoundment failure event.

Big Rivers Electric Corporation is developing and implementing an EAP (or plan) in the event a dam failure occurs at their Sebree Generating Station Green CCR Surface Impoundment (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 action situation. The plan includes notification lists, maps of the CCR surface impoundment, and response procedures. The main goal of the EAP is to offer a quick and effective reference for the staff at the facility in the case such an emergency should occur.

2.0 CCR Surface Impoundment Physical Description and Structural Integrity Hazard Potential Classification

2.1 Physical Description

The Green CCR Surface Impoundment has been in place for 40 plus years. The CCR surface impoundment operator has general maintenance and repair procedures in place as determined necessary. There are no known occurrences of structural instability of the CCR surface impoundment.

The CCR surface impoundment is used for the placement of coal combustion residual material; currently slurried bottom ash. The immediate watershed that drains to the CCR surface impoundment, and in which the CCR surface impoundment is considered to be located, is unnamed and 54.13 acres in size. The unnamed watershed discharges from the CCR impoundment and is routed to the Green River.

The CCR surface impoundment is a combined incised/earthen embankment structure. Embankments form the west, south and east sides of the impoundment and the north side is incised. The original terrain on which the impoundment was constructed consisted of small stream valleys draining eastward to the Green River. Most of the central portion of the south dike was constructed on a subdued ridge and the toe of the outboard slope intersected a lower drainage area. The Green River is located approximately 400 feet east of the structure. The west dike is generally less than five feet in height and the south dike reaches a maximum height of 19.5 feet. The east dike reaches a maximum height of approximately eight feet and is buttressed with a secondary parallel embankment that serves as a 40-foot

wide roadway. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well-drained soils on nearly level to sloping uplands. Bottom ash has been placed above the normal pool along the inboard side, essentially creating reclaimed land.

Depths of impounded water and CCR are 14.0 feet and 50.6 feet (at respective locations of maximum impounded water and CCR depths). Corresponding elevations of impounded water and CCR are 393.6 feet and 410.6 feet, respectively, above mean sea level.

The CCR impoundment storage capacity (if CCR can be placed to the elevation of the spillway) and the volume of impounded water are each approximately 160,445 cubic yards. The volume of CCR material is approximately 856,680 cubic yards.

The above depths, elevations, storage capacity and volumes are based on: 1) available measured water surface elevations, 2) 2016 flight derived topographic contours and bathymetric survey data, and 3) best available as-built design data for the impoundment prior to placement of CCR material (i.e. the Burns and Roe, Inc. Engineering and Consultants June 30, 1978 design plans provided by Big Rivers Electric Corporation).

The impoundment discharge consists of two corrugated steel pipes, each 30 inches in diameter. The pipe intakes are through a concrete common headwall collection structure.

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 the Green CCR Surface Impoundment 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). The determination is based on the high probability that failure of the embankment could result in environmental damage extending beyond the boundaries of the Big Rivers Electric Corporation Sebree Generating Station (see Figure 3).

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 bottom and fly ash caused by an accident to, or failure of, CCR surface impoundment structures.

Examples: (1) Failure of a segment of the perimeter dam by seepage and/or slope instability, or (2) Failure of a segment of the perimeter dam by erosion or overtopping

Potential Hazard - Description: Potential for sudden release of water and/or bottom and fly ash 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 situations more time generally is available than in the imminent/actual failure emergency situation to issue warnings and/or take mitigative actions.

The Green CCR Surface Impoundment contains approximately 1,017,125 cubic yards of water and CCR material based on 2016 data. If the dam were to break on the south side, the material in the impoundment would flow into a drainage ditch that reports directly to the Green river. If the dam were to break on any of the remaining sides of the CCR surface impoundment, then the majority of the material would most likely only affect the facility itself. The CCR surface impoundment is located adjacent to the Green CCR Landfill access road and a failure of the dam would be quickly noticed due to its location. Preventative measures to avoid a dam failure include visual inspections as detailed below.

3.2 Site and Dam Condition Surveillance

The Green CCR Surface Impoundment has oversight by facility personnel including the performance environmental specialist, the chemical engineer and the laboratory technicians. The performance environmental specialist, chemical engineer and/or their designee check the CCR Surface Impoundment dam at a maximum interval of seven days per 40 CFR Part 257.83(a)(i). The dam is inspected for erosion, wash outs, the presence of water around the dam, and other indicators of potential dam failure. In addition to these checks, a wildlife trapper has been retained to conduct inspections of the dam for animal burrows. Repairs are made if animal burrows are noted.

3.3 Detection and Monitoring Devices

Piezometers are installed on the Green CCR Surface Impoundment dam and are checked monthly. Groundwater monitoring wells have also been installed around the perimeter of the CCR Surface Impoundment and are being monitored in accordance with 40 CFR Part 257.90. A pool stage staff gauge is installed in the impoundment and water surface elevation is measured monthly.

4.0 Notification Procedures

4.1 Notification Sequence

Notification lists are provided as Tables 1 and 2 at the end of this plan. Table 1 provides contact information for the environmental coordinators and outside emergency response agencies. Table 2 provides contact information for residents/businesses. The tables apply to both emergency conditions; “Imminent Failure” and “Potential Hazard,” as previously

defined. Appropriate parties will be notified based on the nature and severity of the incident as determined by the incident commander/designee. In the event of a failure at the Green CCR Surface Impoundment the main concern would be the impoundment spilling into the drainage ditch which flows into the Green river. If failure is imminent or has occurred, notification and mitigation procedures are a top priority particularly for a potentially hazardous situation. The incident commander/designee, in conjunction with the environmental department, is responsible for this determination. If the chain of notification is altered, participants are encouraged to reestablish the order to ensure that every party is notified as needed.

4.2 Modes of Communication with Responsible Persons

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

- Use two-way radio
- Use Gaitronics System
- Use Paging System
- Deliver in person

Big Rivers Electric Corporation uses 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 Sebree Station will determine who to notify, including any affected residents and/or businesses, in the case of an imminent or actual CCR surface impoundment dam failure.

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 Henderson County Emergency Management Service has a code red phone calling system, which can be activated to assist with any necessary notifications and appropriate responses.

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. Big Rivers Electric Corporation personnel can contact Summit Environmental Services, LLC and Associated Engineers, Inc. to assist with emergency events.

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 bottom and fly ash. 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.

5.1 Response During Adverse Conditions

Requests for assistance can be made to the county and state emergency offices and/or environmental response contractors/consultants including Summit Environmental Services, LLC and Associated Engineers, Inc. (contact information provided below) to assist with the incident and make recommendations to Big Rivers Electric Corporation concerning the equipment and materials needed to mitigate the incident.

| <u>Company</u> | <u>Address</u> | <u>Phone Number</u> |
|------------------------------------|--|---------------------|
| Summit Environmental Services, LLC | 2125 Glenview Drive Evansville, IN 47720 | 1 (877) 421-1744 |
| Associated Engineers, Inc. | 2740 North Main Street Madisonville, KY 42431 | (270) 821-7732 |

6.0 Annual Face to Face Meeting with Local Emergency Responders

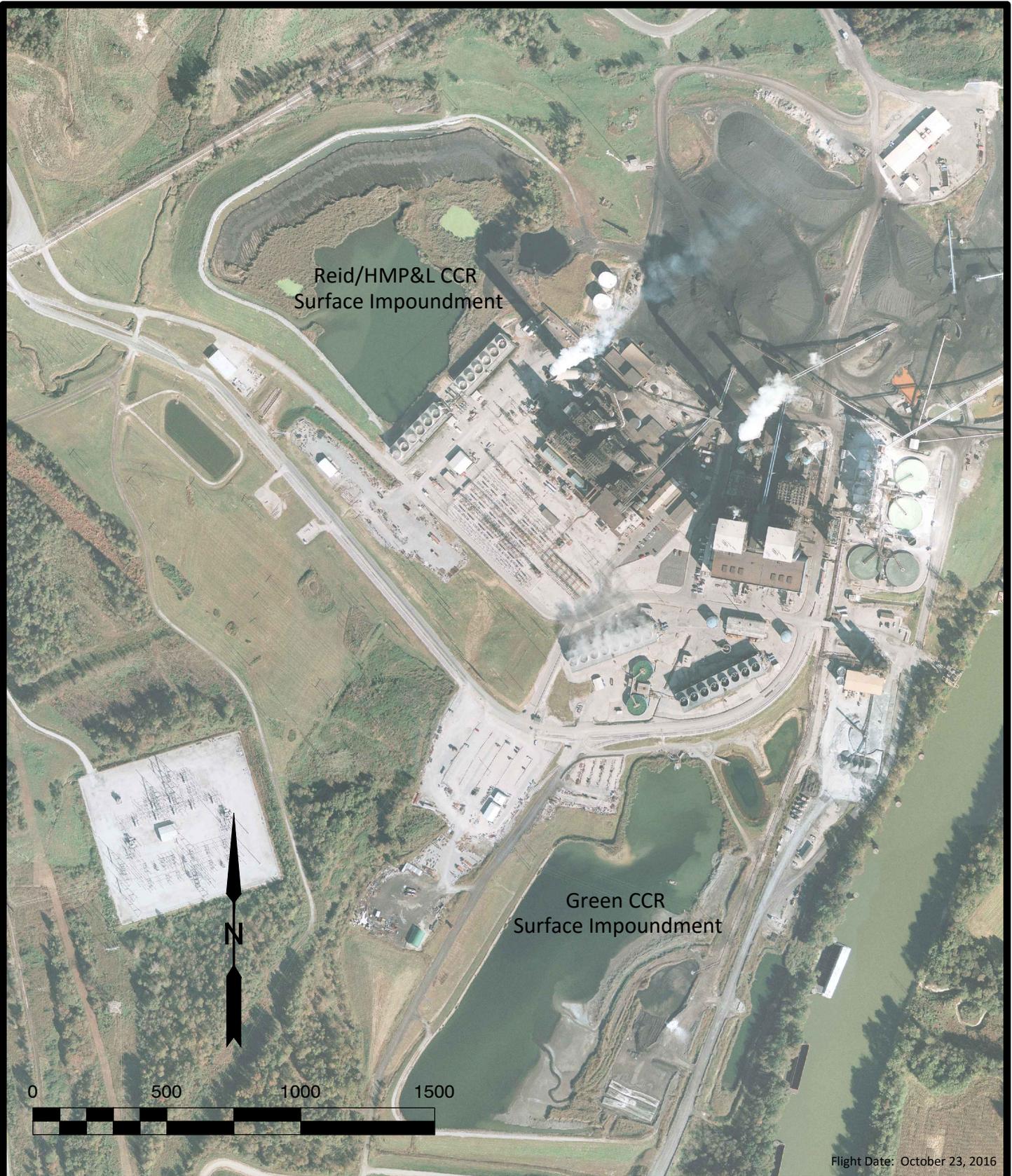
An annual face to face meeting will be held with local emergency responders per 40 CFR Part 257.73 (a)(3)(E). The meeting will be held whether or not an incident occurred the previous year. If an incident did occur, the annual meeting date may be moved to discuss the incident soon after it occurs. If 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 the Green CCR Surface Impoundment.

Table 1

| Green CCR Surface Impoundment EAP Notification List | |
|--|----------------------------------|
| Emergency Coordinators | Phone Number |
| Environmental Coordinators | |
| Primary Environmental Coordinator: | |
| Director, Environmental Services: Tom Shaw | Office Phone: (270) 844-6031 |
| | Cell Phone: (270) 993-1602 |
| Secondary Environmental Coordinator: | |
| Manager, Environmental Services: Samantha Howard | Office Phone: (270) 844-6027 |
| | Cell Phone: (270) 314-6733 |
| Emergency Response Agencies | |
| Henderson County Emergency Management System | 911 or (270) 831-1235 |
| Henderson County Fire Department | (270) 831-1270 |
| Henderson City/County Rescue Squad | (270) 826-2168 |
| Henderson County Sheriff's Department | (270) 826-2713 |
| Ambulance City County Emergency Medical Service | (270) 826-6558 |
| Methodist Hospital | (270) 827-7700 |
| Deaconess Hospital | (812) 450-5000 |
| Webster County Emergency Management System | 911 or (270) 639-8000 |
| Sebree Fire Department | (270) 835-7501 |
| Webster County Sheriff's Department | (270) 639-5067 |
| National Response Center (NRC) | 1 (800) 424-8802 |
| Kentucky Emergency Response Commission (KERC) | 1 (800) 564-7815 |
| Kentucky Department of Fish and Wildlife | 1 (800) 25-ALERT (25378) |
| U.S. Coast Guard - Owensboro, KY | (502) 582-6474 or (270) 685-0650 |
| U.S. Army Corps of Engineers - Newburgh, IN | (812) 853-0472 |

Table 2

| Resident/Business Notification List | |
|--|---------------------|
| Resident/Business | Phone Number |
| Century Aluminum | (270) 521-7811 |
| AMG Aluminum | (270) 521-6681 |
| Tyson Foods Feed Mill | (270) 835-7654 |
| Tyson Foods Production | (270) 521-4000 |
| Columbia Sportswear | (270) 521-8000 |



Flight Date: October 23, 2016

Figure 1 - Aerial Photo Map of Big Rivers Electric Corporation Sebree Generating Station and CCR Surface Impoundments

| | |
|-------------|------------|
| Job Number: | 16-0137A |
| Date: | 12/08/2016 |
| Scale: | AS SHOWN |
| Drawn By: | A.E.I. |



2740 North Main St. • Madisonville, KY 42431
 Phone: (270) 821-7732 • Fax: (270) 821-7789
www.associatedengineers.com



Flight Date: October 23, 2016

Figure 2 - Aerial Photo Map of
Green CCR Surface Impoundment

| | |
|-------------|------------|
| Job Number: | 16-0137A |
| Date: | 12/08/2016 |
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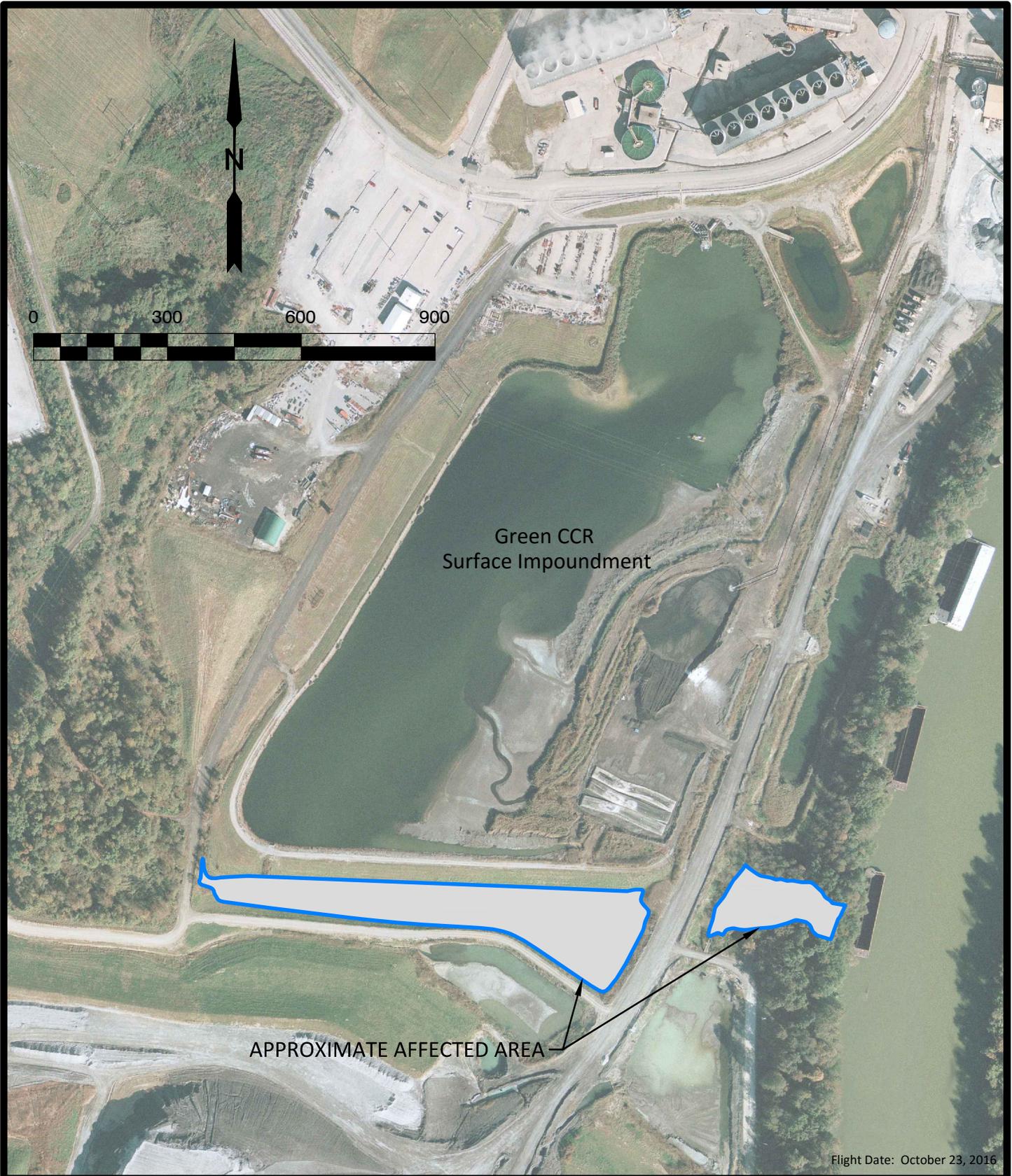


Figure 3 - Affected Downstream Area of Green CCR Surface Impoundment

| | |
|-------------|------------|
| Job Number: | 16-0137A |
| Date: | 12/08/2016 |
| Scale: | AS SHOWN |
| Drawn By: | A.E.I. |

**Professional Engineer Certification [Per 40 CFR Part 257.73]
Green CCR Surface Impoundment 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.



David A. Lamb P.E.
State of Kentucky License No. 17822



Date: 1-10-2017