



Closure Plan for the Green Station CCR Surface Impoundment



Your Touchstone Energy[®] Cooperative 

Big Rivers Electric Corporation
Robert D. Green Generating Station

Coal Combustion Residual Rule Compliance



Closure Plan for the Green Station CCR Surface Impoundment

Prepared for

**Big Rivers Electric Corporation
Robert D. Green Generating Station
Roberts, Kentucky**

**Revision 3
6/20/2022**

Prepared by

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Kansas City, Missouri**

INDEX AND CERTIFICATION

Big Rivers Electric Corporation Closure Plan for the Green Station CCR Surface Impoundment

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Certification

I hereby certify, as a Professional Engineer in the State of Kentucky, that the information in this document was assembled under my direct supervisory control. This report is not intended or represented to be suitable for reuse by Big Rivers Electric Corporation or others without specific verification or adaptation by the Engineer.


Matthew D. Bleything, P.E. Kentucky License
#37673

Date: 6/20/22

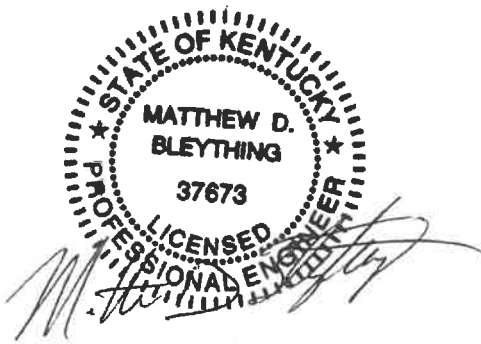


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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
BREC	Big Rivers Electric Corporation
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FGD	Flue Gas Desulfurization
KAR	Kentucky Administrative Regulations
KDWM	Kentucky Division of Waste Management
KPDES	Kentucky Pollution Discharge Elimination System
KDOW	Kentucky Department of Water
RCRA	Resource Conservation and Recovery Act
U.S.C.	United States Code

1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residuals (CCR) Rule to regulate the disposal of coal combustion residual materials generated at coal-fired units. The rule is administered as part of the Resource Conservation and Recovery Act (RCRA, 42 United States Code [U.S.C.] §6901 et seq.), using the Subtitle D approach.

Big Rivers Electric Corporation (BREC) is subject to the CCR Rule and as such must develop a Closure Plan per 40 Code of Federal Regulations (CFR) §257.102. This document serves as BREC's Closure Plan for the Green Station (Green) CCR Surface Impoundment (Ash Pond).

According to §257.102(b)(1), the Closure Plan must contain the following:

- A description of how the CCR unit will be closed.
 - For in-place closure: A description of the final cover system, the methods for installing the final cover system, and the methods for achieving compliance with the standards outlined in §257.102(d).
 - For closure by removal: A description of the procedures to remove the CCR and decontaminate the CCR unit as outlined in §257.102(c).
- An estimate of the maximum amount of material ever stored in the CCR unit over its active life.
- An estimate of the largest area of the CCR unit ever requiring a final cover as required by §257.102(d) at any time during the CCR unit's active life.
- A schedule for completing closure activities, including the anticipated year of closure and major milestones for permitting and construction activities.

The seal on this report certifies that this document meets the requirements of 40 CFR §257.102(b). This closure plan is in addition to, not in place of, any other applicable site permits, environmental standards, or work safety practices.

The Ash Pond will not be subject to a Post-Closure Plan per §257.104(a)(2) as the impoundment will be closed through removal of the CCR pursuant to §257.102(c).

The closure completion date as presented in this Closure Plan matches the complete Green Station Closure Extension Demonstration (November 2020) that was prepared in response to 40 CFR §257.103(f)(2).

1.1 Impoundment Description

Green is an electric generating station near Robards, Kentucky. The plant consists of Unit 1 and Unit 2 which are respectively 250MW and 242MW (gross) units commercialized in 1979 and 1981 respectively. The plant ceased coal-fired operations of the boilers on April 4, 2022. The boilers have been converted for the combustion of natural gas for the production of power. The plant historically utilized the Ash Pond to manage the CCR and non-CCR wastestreams. The Ash Pond was constructed when the plant was built and has been in service for the life of the plant. The CCR wastestreams that were managed in the Ash Pond included sluiced bottom ash, economizer ash and Flue Gas Desulfurization (FGD) wastewater. All fly ash was handled dry. The various non-CCR wastewaters routed to the Ash Pond originate from the Unit 1 and 2 boiler sumps, metal cleaning wastes, clarifier blowdown, bottom ash hopper seal water, miscellaneous drains including roof drains, landfill leachate, and various stormwater sources. A site plan is included in Appendix A.

1.1.1 CCR Inventory and Extent

Depth of impounded water and CCR is 3 feet and 18 feet (at respective locations of maximum impounded water and CCR depths). Elevation of impounded water and CCR is 396 feet and 400 feet, respectively, above mean sea level. These approximate depths and respective elevations are based on the most recent (October 2018) flight derived topographic contours and bathymetric survey data.

The remaining storage capacity is approximately 230,000 cubic yards (if CCR can be placed to the elevation of the current water surface). This volume was calculated based on the maximum allowable storage volume and the current volume of CCR stored in the facility based on the most recent bathymetric survey.

The approximate volume of CCR currently stored in the Ash Pond is 1,000,000 cubic yards. The maximum storage capacity is 1,230,000 cubic yards. This volume was calculated based on the most recent bathymetric survey, and the best available as-built data for the construction prior to placement of CCR.

1.2 Closure Method

The Ash Pond will be closed through removal of CCR. CCR will be excavated from the Ash Pond to the bottom elevation shown on the original construction drawings. The CCR will be dewatered, removed, and hauled to the on-site CCR landfill for final placement. Construction of several wells or well-points may be required around the pond for water management prior to and during CCR removal. Once the CCR is removed from the Ash Pond, the existing pond will be repurposed as a non-CCR Wastewater Pond. No

additional modifications are expected, and the pond will continue to operate within current KPDES limits at the existing Outfall 009.

To facilitate the pond closure, the existing non-CCR wastestreams will need to be managed. The pond water level will be lowered as much as feasible after ceasing receipt of CCR, prior to the construction contractor coming on site. When the construction contractor begins construction, the remaining non-CCR wastestreams will be managed using a series of temporary berms, ditches, and pumps to divert non-CCR wastestreams to other locations. Additionally, wells, well points and other means of water management may be employed by the construction contractor. Dewatering operations will be in accordance with KDOW, KPDES Permit requirements. The sequencing of construction and means and methods for the water management will be determined by the construction contractor once a contract is finalized with BREC.

When the CCR removal is complete and the new Wastewater Pond is in service, all remaining stormwater and non-CCR wastestreams will continue to be managed in the new pond and will continue to discharge through the existing KPDES outlet. The contractor will then finalize construction by seeding and stabilizing the remaining disturbed areas.

Visual observations will be conducted by a qualified third party Professional Engineer and KDWM representatives to verify that the CCR material has been removed from the impoundment consistent with 401 KAR 46:110 Section 9 and 40 CFR 257.102(c). BREC does not plan to perform sampling or analysis to confirm CCR removal. A projected schedule will be provided to KDWM once a construction contractor is selected to allow for inspection of ongoing work by KDWM representatives. Additional waste to be removed includes utility waste such as incidental soil, rock, or other materials excavated as a part of the CCR removal. Incidental materials may remain commingled with the CCR during transportation and disposal in the onsite CCR Landfill(s).

Once all CCR material has been removed, groundwater monitoring will be conducted as indicated in Section 1.2.2 to confirm CCR removal and decontamination has been completed pursuant to §257.102(c) of the CCR Rule.

1.2.1 Closure Schedule

According to §257.101 of the CCR Rule, closure of the existing impoundment must commence no later than 6 months following the date on which a closure event is triggered, or no later than 30 days following the last known receipt of CCR or non-CCR wastewater by the impoundment. The plant ceased coal-fired operations of the boilers on April 4, 2022. However, the Ash Pond will continue to manage non-CCR

wastestreams. The closure project documents have been finalized and construction anticipated to begin in June 2022.

The estimated closure schedule is as follows:

Mobilization	July 2022
Pond Dewatering	July 2022 – August 2023
Removal of CCR	July 2022 – August 2023
Winter Shutdown	December 2022 – March 2023
Finished Surfacing and Demobilization	August 2023 – September 2023
Deadline to complete removal of CCR	October 17, 2023

1.2.2 Closure Completion

When BREC has removed the CCR from the impoundment, certified by a third-party Professional Engineer and inspected by KDWM, BREC will submit a construction progress report for acceptance under 401 KAR 46:110.

Groundwater monitoring will continue pursuant to 401 KAR 46:110 Section 8 and the CCR rule, 40 CFR 257.94, until such time that the CCR has been removed, as certified by a Professional Engineer and a CPR accepted by KDWM. It should be noted that the Green Ash Pond has remained in Detection Monitoring since the pond has been regulated under 40 CFR 257.

At the conclusion of closure by removal and cessation of the detection monitoring program, BREC will submit to the KDWM-Solid Waste Branch for review and approval, a groundwater monitoring well abandonment plan meeting the requirements of 401 KAR 6:350 for abandonment of the said Ash Pond groundwater monitoring well network. A subsequent CPR documenting the monitoring well abandonments will be submitted to KDWM for review. Once the well abandonment CPR is accepted, a permit revision will be issued reflecting the acceptance of the CPR by KDWM and the termination of the CCR Surface impoundment activity.

Within 30 days of completion of closure of the impoundment, BREC must prepare a notification of closure of the impoundment and place it in the facility's CCR Operating Record and on BREC's CCR public website. This notification shall include certification by a Professional Engineer in the State of Kentucky verifying that closure has been completed in accordance with this Closure Plan and the requirements of §257.102.

2.0 REVISIONS AND AMENDMENTS

The initial Closure Plan was placed in the CCR Operating Record on October 11, 2016. If the Closure Plan is revised, the written Closure Plan will be amended no later than 30 days following the triggering event. Additionally, the written Closure Plan will be amended at least 60 days prior to a planned change in the operation of the Impoundment, or no later than 60 days after an unanticipated event. The initial Closure Plan and any amendment will be certified by a qualified professional engineer in the State of Kentucky for meeting the requirements of §257.102 of the CCR Rule. All amendments and revisions must be placed on the CCR public website within a reasonable amount of time following placement in the facility's CCR Operating Record. A record of revisions made to this document is included in Section 3.0 of this document.

3.0 RECORD OF REVISIONS AND UPDATES

Date	Revisions Made	By Whom
10/11/2016	Initial Issue	Associated Engineers, Inc.
09/13/2017	Revision 1	Associated Engineers, Inc.
11/24/2020	Revision 2 – Updated schedule and added detail to closure method	Burns & McDonnell
06/17/2022	Revision 3 – Updated closure method to closure by removal	Burns & McDonnell

APPENDIX A - SITE PLAN



FOR PERMITTING
PURPOSES ONLY

REG-GREEN STATION
CCR & ELG COMPLIANCE PROJECT
ASH POND CLOSURE SITE PLAN
PROJECT NUMBER 132721
CONTRACT SK-C001
REV. DATE 12/17/2021
DRAWN BY J. RIDDER
CHECKED BY A

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ELECTRIC CORPORATION
New Technology Energy Customers
ROBERT D. GREEN STATION
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To submit J. RIDDER

NO.	DATE	BY	JOB	DESCRIPTION

REVISED: 10/18/22
DATE: 10/18/22
BY: JCR
JOB: ISSUED FOR PERMITTING
DESCRIPTION: CLOSURE OF ASH POND AT REG-GREEN STATION
PROJECT: CCR & ELG COMPLIANCE PROJECT
DRAWN BY: J. RIDDER
CHECKED BY: A



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