



**Cardinal Power Plant
Units 1-3**

**Bottom Ash Pond Complex
South Pond Retrofit Plan**



**Revision 0
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Issue Purpose: Use
Project No.: 13770-005**

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1.0 INTRODUCTION & PURPOSE

Federal CCR Rule Reference: 40 CFR 257.102(k)

In accordance with 257.102(k)(2), this document is the written retrofit plan for the Bottom Ash Pond (BAP) Complex at the Cardinal Power Plant in Brilliant, Ohio.

The BAP Complex consists of two surface impoundments: the larger Bottom Ash Pond in the north (North Pond) and the smaller Recirculation Pond in the south (South Pond), together the two ponds are managed as a single Coal Combustion Residual (CCR) Unit. Both ponds are currently used to store and treat the station's bottom ash transport water and miscellaneous low-volume waste streams. In September 2016, American Electric Power prepared the initial written closure and post-closure plans for the BAP Complex. The 2016 closure plan stated that the BAP Complex (both South and North Ponds) would be closed by leaving CCR in place and installing a final cover system. Accordingly, the 2016 post-closure plan described the monitoring and maintenance activities that would be performed after the BAP Complex was closed.

Due to a forthcoming change in the operation of the BAP Complex, both initial closure and post-closure plans need to be amended. The Cardinal Operating Company, who operates the Cardinal Power Plant, intends to retrofit the South Pond and clean close the North Pond. An amendment of the initial closure plan is prepared for the North Pond. This document is written for the retrofit plan of the South Pond.

2.0 NARRATIVE DESCRIPTION

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(A)

Pursuant to the requirements of 40 CFR 257.102(k)(1), the Cardinal Operating Company has elected to retrofit the South Pond by performing the following major activities:

- Dewater the South Pond first, remove all CCR, including any contaminated soils and sediments, existing sheet piles and other obsolete existing components from the South Pond;
- Design and install a liner system that complies with the requirements in Section 257.72.

Note that the South Pond undergoing a retrofit remains subject to all other requirements of Part 257, Subpart D.

3.0 DESCRIPTION OF RETROFIT PROCEDURES

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(B)

Key procedures of the retrofit operation for the South Pond are described in the following paragraphs.

3.1 DEWATERING AND REMOVAL OF ALL CCR MATERIALS

Procedures to dewater the South Pond and remove all CCR materials are:

- Reduce the water level in both the South and North Ponds to facilitate the installation of temporary supply pipe through the central dike that divides the two ponds.
- Install the temporary supply pipe, associated header pipes and other necessary components, seal and restore the dike integrity. Connect the temporary supply pipe to the recirculation pumps.
- Dewater the South Pond. Temporary pumps located on the top of the perimeter dike will be used to transfer water from the South Pond to either the North Pond or the Ohio River through permitted Outfall 023. All water discharge will meet the requirements of the applicable National Pollutant Discharge Elimination System (NPDES) permit.
- When the South Pond is in a dry condition, remove all CCR material with conventional excavation and earthmoving equipment from the South Pond, transport to the Cardinal Power Plant's on-site CCR landfill, FAR I Landfill, for final disposal.
- Any contaminated soils and sediments will also be removed. Inspections of the clean subgrade will be performed and certified by a professional engineer.

3.2 DESIGN AND INSTALLATION OF LINER SYSTEM

Federal CCR Rule Reference: 40 CFR 257.72

In accordance with 257.72, a composite liner will be designed and certified in compliance with the requirements of 257.70(b). The liner will consist of two components: the upper component consisting of, at a minimum, a 30-mil geomembrane liner; and the lower component consisting of at least a 2-ft thick compacted clay layer with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. When HDPE is used for the geomembrane, the thickness shall be at least 60-mil. Other applicable design requirements from 257.70(b) will also be followed.

Existing obsolete pond components, such as sheet piles, pipes, etc., will be removed to an elevation that is at least 2 ft below the bottom of the liner elevation. The foundation soil or the base (including the 2-ft clay layer) of the liner system will be capable of providing support and resistance to prevent failure of the liner due to settlement, compression and uplift. Leveling and contour grading will be performed before the placement of the 2-ft clay layer. The HDPE geomembrane will be deployed, seamed, anchored and detailed by an experienced specialty contractor.

A construction quality assurance program will be implemented to verify the construction materials, methods and final product comply with the design drawings and specifications.

Upon the completion of the liner system, a certification will be obtained from a qualified professional engineer to certify the installation of the composite liner.

A protective layer will be placed over the liner to prevent damage from the future ash reclamation activities. A certification will then be obtained from a qualified professional engineer to certify the retrofit of the South Pond in compliance with 257.102(k)(2).

4.0 ESTIMATED MAXIMUM AMOUNT OF CCR REMOVAL

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(C)

The estimated maximum amount of CCR that will be removed from the South Pond is approximately 78 acre-ft as part of the retrofit operation.

5.0 ESTIMATED LARGEST AFFECTED AREA

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(D)

The retrofit operation will affect the entire area of the South Pond, which is approximately 8 acres.

6.0 RETROFIT SCHEDULE

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(E)

Table 1 lists the major milestone activities with their estimated schedule necessary to complete the retrofit operation of the South Pond.

Table 1 – Planning Level Schedule for Retrofit of South Pond

Milestone Activity	Estimated Duration	Estimated Completion Year ¹
Complete Engineering/Design	9 Months	2021
Obtain Ohio EPA Retrofit Permit to Install (PTI)	6 Months	2021
Complete Dewatering of the South Pond	3 Months	2021
Remove of All CCR Material and Any Contaminated Soils and Sediments (including Existing Pond Components)	2 Months	2021
Complete Grading and Liner Installation, including the Protective Layer	3 Months	2021
Obtain Certification for the Liner Completion by a Qualified PE	1 Month	2021
Obtain Certification of Completion of Retrofit by a Qualified PE	1 Month	2021

1. These dates are based on a preliminary schedule for demonstrative purposes and are subject to change.

7.0 CERTIFICATION

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iv)

This document meets the requirements for a written retrofit plan pursuant to 40 CFR 257.102(k)(2)(iv).

I certify that this document was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Ohio.

Certified By: Joseph P. Charles

Date: October 19, 2020

Seal:

