Coal Combustion Residuals

Ash Pond Closure & Post-Closure Plan

FOR

ELMER SMITH STATION
OWENSBORO MUNICIPAL UTILITIES

4301 State Route 144
Owensboro, KY 42303

Original: October 17, 2016
Rev. 1: October 19, 2017
Rev. 2: October 14, 2022

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Revision History

- Revision 1 dated October 19th, 2017 added Production Environmental Engineer, Alex Conn, to the Facility Contacts listed under *Part 2: General Facility Information*. Also added in the revision was *Part 4: CCR Ash Pond Post Closure Plan*.
- Revision 2 dated October 14, 2022 updated the Closure Plan to include work completed and revision of plans moving forward including the plan to repurpose ponds for the storage of drinking water sludge following complete removal of CCR material.

INTRODUCTION

Purpose of the Plan (40 CFR 257.102)

This Coal Combustion Residual (CCR) Closure & Post-Closure Plan (Plan) has been prepared to meet the requirements of Owensboro Municipal Utilities and Title 40, Code of Federal Regulations, Part 257, subpart 102 (§ 257.102). This plan describes how closure of the Owensboro Municipal Utilities Elmer Smith Station (ESS) CCR surface impoundment (ash pond) will be effected. The purpose of this Plan is to provide a narrative of the closure procedures to be implemented and a milestone schedule and estimated dates by which closure activities will be completed.

Part 1: Plan Administration

1.1 Management Approval and Designated Person

Owensboro Municipal Utilities will update and implement this CCR Surface Impoundment Closure & Post-Closure Plan for the ESS in accordance with the relevant requirements in 40 CFR Part 257.

The Director of Production is the responsible for plan implementation and has the authority to commit the necessary resources to implement this Plan.

Authorized Facility Representative: Brad Howton

Title: Director of Production

Signature: Brad Howton

Date: 10/14/2022

1.2 Professional Engineer Certification (40 CFR 257.102(b)(4))

I hereby certify that I have reviewed all provided information for the facility, and being familiar with the provisions of 40 CFR Part 257, I attest that this CCR Closure and Post Closure Plan has been prepared in accordance with good engineering practices and meets the requirements of 40 CFR Part 257.102.

Engineer: Anthony P. Amicon

Signature:

Registration Number: 25590

State: Kentucky

Date: October 14, 2022

1.3 Accessibility of the CCR Ash Pond Closure Plan

1.3.1 Placement in Operating Records

In accordance with § 257.107(i)(4), a complete copy of this CCR Closure & Post-Closure Plan and any subsequent plan amendments are maintained in the warehouse storage area located at 4301 KY-144, Owensboro, KY 42303. The warehouse is available for access Monday through Friday 7:30 AM to 3:30 PM.

1.3.2 Publicly Accessible Internet Site Requirements

In accordance with § 257.105, OMU will post to the publicly accessible internet site the CCR Closure & Post-Closure Plan and subsequent amendments within 30 days of being placed in the operating record.

Part 2: General Facility Information

Facility Owner:	Owensboro Municipal Utilities
Facility Name:	Elmer Smith Station
Address:	4301 State Route 144 Owensboro KY, 42303 (270) 926-3200
Type:	Former coal-fired electric generating plant
Facility Contacts:	Brad Howton, Director of Production Work: (270) 926-3200 ext. 4310 Alex Conn, Production Environmental Engineer Work: (270) 926-3200 ext. 4322 Russ Evans, Production Technical Services Manager Work: (270) 926-3200 ext. 4114

2.1 Facility Description

2.1.1 Description of CCR material generation at OMU – Elmer Smith Station

Owensboro Municipal Utilities operated two coal-fired electric generating units. These units utilized an array of emission controls including but not limited to electrostatic precipitators and wet flue gas desulfurization units (WFGD). The operation of the plant produced bottom ash, fly ash, and synthetic gypsum; collectively known as CCR.

The boilers utilized at the ESS burned coal to generate steam, which was used to turn steam turbines to create electricity. During the combustion process, ash is produced. The ash that falls beneath the combustion zone is called "bottom ash" and was collected in a wet collection system and was sluiced (evacuated) into a series of ash settling basins where the ash laden water settles, and ash was then dredged into dewatering piles within the boundaries of the ash settling basin to dewater. The dewatered material was then removed

from the ponds and transported offsite for a variety of beneficial reuses, or shipment to an approved offsite landfill.

Ash that does not fall out to the bottom of the boiler and instead becomes entrained in the flue gas stream is called "fly ash" and is collected and sent to ash silos for storage until it was loaded and sent off site for beneficial reuse or landfilling. In addition to storage in the ash silos located at ESS, the ash could be conveyed in a wet system to the ash settling ponds, where the fly ash was temporarily stored and then removed with bottom ash.

Limestone slurry is a suspension of calcium carbonate in water and was used in the WFGD to reduce sulfur dioxide, particulate matter and other pollutants in the flue gas stream. The result of the reaction between the limestone slurry and sulfur dioxide is gypsum. Synthetic gypsum was conveyed in a covered belt conveyor to a covered building, where it was stored until it could be shipped offsite for beneficial use in the wallboard industry, or landfilled at an approved facility.

The Site Plan and Facility Diagram included in Appendix A shows the location and physical layout of the facility. The facility diagram marks the location and contents of each CCR storage area, settling basin, and transfer locations.

ESS is located on the Ohio River just east of Owensboro, Kentucky on State Route 144.

Part 3: CCR Ash Pond Closure Plan

3.1 CCR Ash Pond Closure Plan Contents (§ 257.102(b))

3.1.1 Narrative Description of How the CCR Unit Will Be Closed Through Removal of CCR (§ 257.102(b)(1)

a. Description of Ash Pond Operation

ESS has an incised ash pond consisting of three unlined cells of less than 10 acres total. Plant terminology refers to the cells as Pond 1, 2, and 3. Pond 1 was used for Unit 1 boiler slag; Pond 2 received all other ash, as well as water plant blowdown (lime softening sludge). Pond 3 received no ash directly and was used for final settling prior to discharge. All other plant discharges; coal pile runoff, FGD blowdown, roof and floor drains, etc. were also routed through the ponds.

ESS has no on site disposal capability. The pond was not intended for long term storage and as such, material was continuously removed from the cells. The ash pond cells were continually dredged and materials were allowed to dewater from piles within the boundary of the cell back into the ponds. Unsaleable products were then transported offsite for disposal at a municipal solid waste facility or for beneficial reuse.

Fly ash: Fly ash was collected dry via a hydroveyor conveying system to either of two storage silos. The #1 silo collected all dry Unit 1 fly ash and Unit 2 fly ash; #2 silo collected only Unit 2 fly ash. The #1 Silo conditioned ash via a pug mill for transport to off-site disposal. The #2 silo was primarily used to load pneumatic trucks for ash sales (also had pug mill capability). Fly ash was also able to be sluiced to the ash pond.

Boiler Slag/Bottom Ash: Unit 1 boiler slag was sluiced to the ash pond; it was typically segregated into Pond 1 for future sales. Unit 2 bottom ash was sluiced to Pond 2.

Pug conditioned fly ash, gypsum blowdown, and "off–spec" gypsum were also taken to a permitted offsite disposal site or for offsite beneficial use.

Unsaleable products were transported via truck offsite for disposal or beneficial reuse. Boiler slag was loaded onto barges for use as roofing material and sandblast grit or transported offsite for disposal. Typically between 100,000 and 150,000 tons of ash were sluiced to and subsequently removed from the pond annually.

Disposal for ESS was addressed through OMU's award of contracts for beneficial reuse and a contract for disposal at the Daviess County landfill. The county landfill is permitted under the municipal solid waste regulations and is exempt from 40 CFR 257. OMU had contracts with three vendors for beneficial use of gypsum, ash, and slag.

Unit 1 shut down generation on May 31, 2019 and Unit 2 shut down generation on May 29, 2020. Both units were retired June 1, 2020.

b. Events That Require Closure

40 CFR Part 257 contains provisions that triggered closure of the ESS ash pond:

1) Liner Design Criteria; § 257.71(a) and § 257.101(a)(1) – April 11, 2021

The pond is an unlined CCR surface impoundment as defined in § 257.71(a)(3). As stated in § 257.101(a)(1), by no later than April 11, 2021, existing unlined surface impoundments must cease receiving CCR and initiate closure in accordance with the requirements of §257.102.

2) Location Criteria; § 257.63 and § 257.101(a)(1) – April 17, 2019

The pond is located in a seismic impact zone as defined in § 257.63. § 257.101(b)(1) requires that a surface impoundment that has not demonstrated compliance with § 257.63 must cease accepting CCR within 6 months and initiate closure. OMU made this demonstration in the "Location Restriction Evaluation" dated October 2018 prepared by CEC requiring OMU to cease accepting CCR by April 2019. However, the requirement listed above related to § 257.101(a)(1) for unlined surface impoundments supersedes this requirement.

Because OMU did not comply with the alternate liner demonstration provisions specified in §257.71(d) or the alternate closure procedures specified in §257.103,

OMU must cease accepting CCR in the pond by the Liner Design Criteria closure trigger of April 2021.

c. Description of Closure Plan: Closure by Removal of CCR (§ 257.102(c))

OMU intends to close the surface impoundments by removal of all CCR from the pond area per section § 257.102(c).

It is estimated that 200,000 to 250,000 tons of CCR was contained within the pond at the time of closure. CCR removal activity was increased while the pond was still in operation. OMU removed CCR from the pond and decontaminated the adjacent areas by removing visible CCR. Removal of CCR remaining in the pond after cessation of receipt of CCR was expected to take 1 to 2 years.

d. Description of Closure Plan: Procedures for Closure by Removal of CCR (§ 257.102(b)(1)(ii))

CCR was removed from the pond using these procedures:

Flow to the pond was stopped and the pond was drained of free water via gravity and pumps as needed through the plant's Kentucky Pollutant Discharge Elimination System (KPDES) permitted outfall. Non-CCR flows to the pond such as roof drains and other discharges were re-routed through the plant's permitted KPDES outfalls and the KPDES permit were modified accordingly.

Ash was removed using track hoes by placing in discrete dewatering areas within the pond (similar to plant operating procedures). Dewatered ash was then loaded into trucks for removal offsite to the municipal solid waste facility or to approved beneficial use sites.

CCR was removed sequentially beginning with Pond 1 and ending with Pond 3. Removal of ash was expected to take between one and two years depending upon the quantity of CCR in the pond at the time closure is initiated. The actual duration was about one and a half years.

Visible CCR was removed such that only natural soil remains.

The pond was then graded to its original design contours, and the natural berm between Pond 1 and Pond 2 was removed to create a single larger pond to be repurposed for future use after removal of the CCR.

Groundwater monitoring will continue until concentrations do not exceed the groundwater protection standards established in section §257.95(h).

e. Description of Closure Plan: Estimate of maximum inventory of CCR ever on-site (§ 257.102(b)(1)(iv))

It is estimated that the maximum amount of CCR ever stored in the pond was 250,000 tons.

f. Description of Closure Plan: Schedule (§ 257.102(b)(1)(vi))

Milestone Schedule for Closure

Dewatering of pond	6 months after last receipt of CCR
CCR removal	1 to 2 years after last receipt of CCR
Decontamination of adjacent areas	6 months after CCR removed
Final grading	6 months after decontamination
Monitoring Natural Attenuation	1 to 2 years after final grading

Total cumulative estimated (maximum) time to complete closure - 5 years

The pond was required to cease accepting CCR in April 2021. In accordance with § 257.102(e), OMU was required to initiate closure no later than 30 days after removal of the known final volume of CCR for beneficial reuse. In accordance with § 257.102(f), OMU is required to complete closure within 5 years of initiating closure or May 2026. OMU completed CCR removal in March 2022, and CEC prepared the Closure by Removal Certification in May 2022.

g. Alternative Closure Requirements (§ 257.103)

OMU chose not to utilize the alternative closure requirements in § 257.103.

3.1.2 Amendments to the Closure Plan (§ 257.102(b)(3)

a. This Plan will be amended whenever:

i. There is a change in the operation of the CCR unit that would substantially affect the written plan in effect; or

ii. Before or after closure activities have commenced; or

iii. Unanticipated events necessitate a revision to the written closure plan.

b. If the written Plan is revised after closure activities have commenced, it will be amended no later than 30 days following the triggering event.

Part 4: CCR Ash Pond Post-Closure Plan

Pursuant to § 257.104(a)(2), "An owner or operator of a CCR unit that elects to close a CCR unit by removing CCR as provided by § 257.102(c) is not subject to the post-closure care criteria under this section". The following Post-Closure Plan has been written however to describe future planned uses for the property.

4.1 CCR Ash Pond Post-Closure Plan Contents (§ 257.104(d))

4.1.1 Planned Uses of the Property (§ 257.104(d)(1)(iii))

ESS plans to repurpose the CCR units as drinking water sludge lagoons. Former Pond 1 and Pond 2 are to be joined into one single pond, and former Pond 3 will be used as a finishing pond. The current outfall location is to remain unchanged. The lime sludge is not expected to cause significant changes to groundwater conditions.

4.2 Amendments to the Post-Closure Plan (§ 257.104(d)(3))

a. This Post-Closure Plan will be amended whenever:

   i. There is a change in the operation of the CCR unit that would substantially affect the written plan in effect; or

   ii. Before or after closure activities have commenced; or

   iii. Unanticipated events necessitate a revision; or,

   iv. Rule changes dictate revisions to the requirements for closure by removal units.

b. After post-closure activities have commenced, ESS will amend the Post-Closure Plan no later than 30 days following the triggering event.

APPENDIX A


Barge Loadout
Bottom Ash Settling Basins
Haul Road
Unit 1 Fly Ash Silo
Gypsum Stock out Building
Unit 2 Fly Ash Silo