Closure Plan for the North & South CCR Surface Impoundments

MidAmerican Energy Company

Walter Scott, Jr. Energy Center

Coal Combustion Residual Rule Compliance

Revision 1
3/10/2020

Closure Plan for the North & South CCR Surface Impoundments

Prepared for

MidAmerican Energy Company
Walter Scott, Jr. Energy Center
Council Bluffs, Iowa

Revision 1
3/10/2020

Prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

INDEX AND CERTIFICATION

MidAmerican Energy Company
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Report Index

Certification

I hereby certify, as a Professional Engineer in the State of Iowa, 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 MidAmerican Energy Company or others without specific verification or adaptation by the Engineer.

Matthew D. Bleything, P.E. (IA #23144)

Date: 3/10/2020

Matthew D. Bleything
License Number 23129

My license renewal date is December 31, 2020
Pages or sheets covered by this seal: As noted above.

TABLE OF CONTENTS

Page No.

LIST OF FIGURES

Page No.

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
cm/sec	centimeters per second
EPA	Environmental Protection Agency
MEC	MidAmerican Energy Company
RCRA	Resource Conservation and Recovery Act
USACE	United State Army Corps of Engineers
U.S.C.	United States Code
WSEC	Walter Scott, Jr. Energy Center

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.

In June 2016, a United States Court of Appeals granted a settlement between the utility industry and environmental groups that removed the effects of the "early closure" provisions for inactive surface impoundments under the EPA's CCR Rule. MidAmerican Energy Company (MEC) is subject to the CCR Rule. As such, MEC must develop a Closure Plan for the inactive CCR surface impoundment at Walter Scott, Jr. Energy Center (WSEC) per 40 Code of Federal Regulations (CFR) §257.102. This document serves as MEC's updated Closure Plan for the North & South Impoundments.

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 in accordance 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.

2.0 DETAILS OF CLOSURE

2.1 Impoundment Description

WSEC is located on the east bank of the Missouri River in Council Bluffs, Iowa. WSEC has two CCR surface impoundments which includes the North Impoundment and the Sth Impoundment. This CCR closure plan outlines the plan to consolidate CCR material from the North Impoundment and South Impoundment and place the combined CCR material above the seasonal high groundwater table in a section of the North Impoundment.

The North Impoundment was no longer receiving CCR material when the initial CCR Rule became effective in 2015. Please note the current North Impoundment Closure Plan presented within this document serves as an addendum to the previous "Notification of Intent to Initiate Closure of Inactive North CCR Surface Impoundment" (Burns & McDonnell, 2015).

The South Impoundment is located on the southeast side of the WSEC plant site, immediately west of Interstate 29 (see Appendix A). The Impoundment ceased receipt of CCR and non-CCR wastewater on July 31, 2018 and is now an inactive impoundment. This document serves as an update to the original "Closure Plan for Walter Scott, Jr. Energy Center South CCR Impoundment" (Burns & McDonnell, 2016).

2.1.1 CCR Inventory and Extent

The original footprint of the North Impoundment covers approximately 171 acres and is segregated by a rail line that runs north to south. The area to the east of the rail line is approximately 149 acres. The impoundment contains bottom ash, economizer ash and fly ash, with the west portion and east perimeter comprised mainly of solidified fly ash and the south portion comprised mostly of bottom ash and economizer ash. The area to the west of the rail is approximately 22 acres. Geotechnical borings performed during the summer of 2015 indicate the presence of CCR material (west of the rail) only within the most southern section, which occupies approximately 7 acres. Based on the revised closure plan intent, all ash will be consolidated in approximately 120 acres of the North Impoundment and a final cover system will be placed over the consolidated ash.

The maximum storage capacity of the North Impoundment is roughly 2,488.0 acre-feet. This volume is also an estimate of the maximum inventory of material that could potentially be stored in the impoundment over its active life.

The South Impoundment at its maximum extents is approximately 133 acres in size. A railroad line runs north and south through the Impoundment, along the western edge. Prior to construction of the railroad, the active portion of the existing Impoundment was 133 acres. The area that is enclosed by the railroad embankment is approximately 120 acres. This estimated area is the largest area of the Impoundment that would ever require a final cover system. The Impoundment is surrounded by a perimeter dike of varying elevations, with a minimum top elevation of 978.0 feet.

The maximum design capacity of the South Impoundment is roughly 2,056,000 cubic yards (CY). This volume is also an estimate of the maximum inventory of material that could potentially be stored in the Impoundment over its active life.

2.2 Closure Method

The rule allows for CCR Units to be closed through removal of CCR or by leaving CCR material in-place. The current design plan has been modified from the initial issue of the North Impoundment closure plan to be a partial closure by removal and a partial closure by leaving CCR in place. The CCR will be removed in its entirety in the south and west 29 acres of the North Impoundment as well as the 7 acres west of the rail line that contains CCR. This material will be consolidated into the northeast 120 acres of the impoundment.

Additionally, the CCR in the northeast 120 acres will be removed from the groundwater table and relocated so that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table). The CCR material will be consolidated and covered as described in Section 2.2.1.

The CCR material in the South Impoundment will be excavated and relocated to the North Impoundment, at which time the South Impoundment will be closed by removal of CCR in accordance with 40 CFR 257.102(c). CCR removal will be verified by visual methods and confirmed with topographical survey data in comparison with the Impoundment bottom design surfaces.

The south side of the Pony Creek levee that is adjacent to the South Impoundment will require installation of a seepage stability blanket consisting of sand fill in an area approximately 15 feet deep by 400 feet wide. The sand fill will increase the structural stability directly behind the levee. The seepage stability blanket will extend from the east side of the Impoundment to the west side, adjacent to the existing bridge over Pony Creek that leads to the southern plant entrance road.

The total amount of CCR material to be excavated and relocated from the South Impoundment to the North CCR Impoundment is approximately 840,000 cubic yards. Decontamination will be verified by continued monitoring of groundwater and closure will be complete when groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 257.95(h) for constituents listed in appendix IV of the CCR Rule. When the CCR material is relocated to the North CCR Impoundment, the relocated material will be covered with a geomembrane cap in accordance with 40 CFR 257.102(d).

Closure activities will require drainage (unwatering of free water and dewatering of entrained water) to allow for stabilization of the existing CCR material, placement of fill, and installation of a final cover system over the CCR material to minimize erosion and infiltration. Unwatering activities have been and will continue to be performed throughout construction, as necessary, to manage surface water and storm water runoff. The current, in-place closure design for the North Impoundment is covered in more detail in the following sections.

2.2.1 Final Cover System

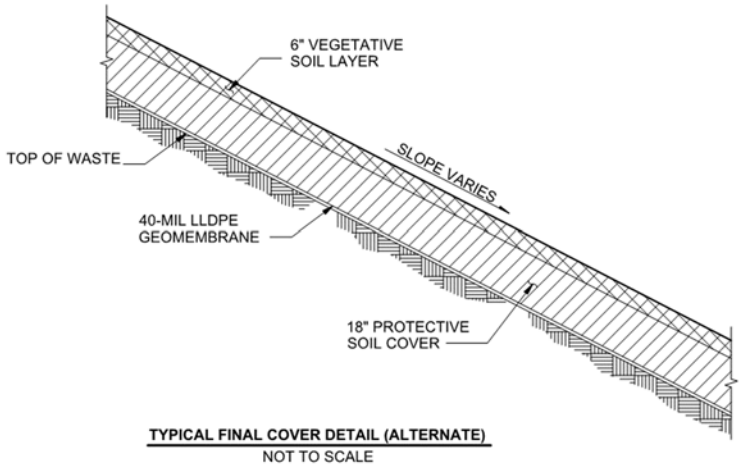
Pursuant to §257.102(d)(3)(i), the final cover system must be designed and constructed to meet the following criteria:

- Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ centimeters per second (cm/sec), whichever is less.
- The infiltration of liquids through the closed CCR unit must be minimized by use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- The erosion of the final cover system must be minimized by use of an erosion layer that contains a minimum of six inches of earthen material capable of sustaining native plant growth.
- The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.
- The owner or operator may select an alternative final cover system design, provided the alternative final cover system meets the above requirements.

Because the North Impoundment lacks a bottom liner system and the natural subsoils present are sands, the cover system was designed to meet the permeability limit of 1×10^{-5} cm/sec noted in the CCR Rule.

An alternative final cover system, as shown in Figure 2-1, will be utilized over the remaining CCR in the North Impoundment, in lieu of a typical clay final cover system. This alternative system uses a geomembrane component to achieve the minimum permeability requirements of the CCR Rule, rather than relying on the permeability of the 18-inches of clay infiltration material.

Figure 2-1: Alternative Final Cover System



The South Impoundment will be closed by removal; therefore, it will not require a final cover system. The Impoundment will not be backfilled. When complete, the Impoundment will not have a discharge, which is the same as its current condition. Stormwater will be contained within the Impoundment and there will be no constructed outfalls.

2.2.1.1 Geometry and Stormwater Management

The geometry and stormwater management controls of the closed impoundment will allow the CCR unit to meet the following requirements as outlined in §257.102(d) of the CCR Rule:

- Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.

- Prevent future impoundment of water.
- Provide for slope stability to protect against sloughing or movement of the final cover system.

The final closure system grade will slope at a minimum of 2.0 percent over the capped CCR surface to prevent the collection of standing water and limit the velocity of storm water runoff to reduce the potential for soil erosion. Intermediate swales will be utilized to limit the maximum overland flow distance, thereby limiting the chance for ponding water, as well as limiting the infiltration of run-off. The intermediate swales will collect area runoff and convey it to culverts which discharge through the existing levee. The period for greatest soil erosion will be immediately after placement of the topsoil material, before vegetation is established. Manufactured erosion control products, as well as a seed mix containing quick-growth seed varieties, will aid in erosion prevention during this timeframe.

2.2.1.2 Integrity of the Final Cover

Settling and subsidence of the final cover system is expected to be minimal. Settlement would potentially be caused by consolidation of the CCR material, general fill material, or underlying natural subsoils under new loads from construction activities; however, this settlement will likely occur during site grading activities and is expected to be minimal after the cover is installed. General fill and relocated CCR material from within the impoundment will be installed in a controlled manner to minimize post-fill installation settlement. The underlying natural subsoils at the site are not prone to long-term settlement.

2.2.2 Final Cover Schedule

According to §257.101 of the CCR Rule, closure of the existing, unlined 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. A notification of intent to initiate closure of the inactive North Impoundment was placed in the facility's CCR Operating Record and on MEC's CCR public website on October 16, 2015. Pre-closure construction activities occurred in the fourth quarter of 2015. Pre-closure construction activities consisted of rerouting existing inflow pipes and importing of sand fill to aid in future closure construction grading activities. Closure construction for the inactive North Impoundment commenced in October of 2015. In 2018, MEC submitted the initial written Closure Plan in response to the removal of the "early closure" provisions for inactive surface impoundments under the EPA's original issue of CCR Rule.

The estimated closure schedule is as follows:

Initial Closure Construction:	October 2015 – December 2018
Updated Closure Construction:	December 2019 – January 2024
Earthwork and import of offsite fill material	March 2020 – October 2022
Relocate South Impoundment CCR to North Impoundment	March 2022 – November 2022
Import/place general fill material	March 2020 – October 2022
Complete drainage culverts	June 2022 – July 2022
Install final cover system	March 2023 – September 2023
Seeding	August 2023 – October 2023
Deadline target to complete closure	January 2024

2.2.2.1 Closure Completion

The federal CCR rule requires that closure of the multi-unit impoundment be completed within five years of commencing closure activities. The rule also allows the timeframe for completing closure of the CCR unit to be extended by multiple two-year extensions if MEC can substantiate the factual circumstances demonstrating the need for the extension. The current closure activities have been greatly affected by the required permitting efforts with the U.S. Corps of Engineers (USACE). The USACE and the local sponsors are responsible for the integrity of the levee system that abuts the North Impoundment on the west and south sides and therefore must approve of construction activities within 500 feet of the crest on the landside of the levee. The closure construction was delayed for over four months from the anticipated USACE approval date while awaiting the initial USACE reviews and approval. In discussions with the USACE, the delays have been caused by furloughs of government employees, flood fighting activities as well as the high number of applicants that require approval from the agency. Additionally, the overall closure design was evaluated to minimize future environmental impacts. This caused a new study and new design to occur. It is planned that a demonstration for an extension of the closure timeframe shall be completed pursuant to §257.102(f)(2).

The CCR Rule does not define “closure complete” for CCR units. For the purposes of this Closure Plan, closure of the impoundment is considered complete when the final cover system is installed, and the applicable construction completion documentation is finalized.

Within 30 days of completion of closure of the impoundment, MEC must prepare a notification of closure of the impoundment and place it in the facility’s CCR Operating Record and on MEC’s CCR public

website. This notification shall include certification by a qualified professional engineer in the State of Iowa verifying that closure has been completed in accordance with this Closure Plan and the requirements of §257.102. Additionally, MEC must record a notation on the deed to the property following completion of closure of the impoundment in accordance with §257.102(i). The purpose of this notation is to inform any potential future owner of the property of the previous use of the land, and that the land is restricted by post-closure care requirements.

3.0 REVISIONS AND AMENDMENTS

The initial Closure Plan for the North Impoundment was placed in the CCR Operating Record prior to April 17, 2018. The South Impoundment Closure Plan was placed in the Operating Record by October 17, 2016. This update replaces both closure plans. If the Closure Plan is further 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 Iowa 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 4.0 of this document.

4.0 RECORD OF REVISIONS AND UPDATES

Revision Number	Date	Revisions Made	By Whom
0	04/11/2018	Initial Issue	Burns & McDonnell
1	03/10/2020	Redesign of Closure	Burns & McDonnell

APPENDIX A – SITE PLAN

BURNS McDONNELL

date JANUARY 13, 2020

designed M. BLEYTHING

MIDAMERICAN ENERGY COMPANY
WALTER SCOTT, JR. ENERGY CENTER

CCR SURFACE IMPOUNDMENT
CLOSURE SITE PLAN

project 85382

contract

SK - 125

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Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com