



HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

12 October 2016
File No. 40373-440

SUBJECT: CCR Conceptual Closure Plan
Ash Pond
Dayton Power & Light Company
Killen Electric Generating Station
Manchester, Ohio

Dayton Power & Light Company (DP&L) operates the coal-fired Killen Electric Generating Station (KEGS) located near Manchester, Ohio. Since beginning operations in 1982, DP&L has stored and disposed of plant generated CCR in an on-site ash impoundment. The Ash Pond is comprised of the Bottom Ash Pond and the Fly Ash Pond, but is considered to be a single impoundment by the Ohio Department of Natural Resources (ODNR). Therefore, for the purposes of this report, the overall impoundment is referred to as the "Ash Pond." The Ash Pond is active and will continue to receive CCR generated by the KEGS plant in the future. This written Closure Plan (Plan) addresses the requirements of §257.102 *Criteria for conducting the closure or retrofit of CCR units* of the USEPA's Final CCR Rule dated April 17, 2015 for the KEGS Ash Pond.

This Plan has been developed based upon information provided by DP&L and describes the ash impoundment, closure plan design, a schedule for closure, and steps required to amend the closure plan in the future if necessary. This Plan calls for the impoundment to be closed leaving CCR's in-place and installing a final cover system.

§257.102(b)(1): *The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b) (1) (i) through (vi) of this section.*

At any point during the active life of the impoundment closure may be necessary. Currently, DP&L plans to operate the KEGS facility through the year 2036 and begin closure of the impoundment thereafter. Regardless of when the impoundment is closed the following steps will be necessary for closure of the unit:

1. Finalize detailed construction plans for closure.



2. Obtain written Professional Engineer (PE) certification that design of the cover system meets the requirements of the Final CCR Rule.
3. No later than the date closure is initiated, prepare a notification of intent to close a CCR unit and place notification in the facility operating record. The notification of intent to close must include the PE certification from Step 2.
4. Obtain State regulatory agency closure design approval.
5. Commence closure no later than 30-days after known final receipt CCR.
6. Complete installation of final cover system within 5-years of commencing closure activities.
7. Obtain PE certification verifying closure has been completed in accordance with this written closure plan.
8. Within 30-days of completion of closure of the CCR unit, prepare a notification of closure of a CCR unit and place notification in the facility operating record. The notification of closure must include the PE certification from Step 7.
9. Following closure of the CCR unit, record a notation on the deed to the property or some other instrument normally examined during title search.
10. Within 30-days of recording a notation on the deed to the property, prepare a notification stating that the notation has been recorded and place the notification in the facility operating record.

§257.102(b)(1)(i): *A narrative description of how the CCR unit will be closed in accordance with this section*

The final cover system will be designed and constructed to meet the USEPA's Final CCR Rule requirements of §257.102(d)(3)(i)(A-D). The proposed final cover system will consist of a minimum 18-inch thick soil infiltration layer that will minimize the infiltration of liquids through the CCR unit. The infiltration layer will have a permeability less than or equal to any natural subsoils present, or no greater than 1×10^{-5} cm/s, whichever is less. An equivalent alternative may also be chosen in the future. Erosion of the final cover system will be minimized by the placement of a minimum 6-inch thick soil erosion layer, capable of supporting native plant growth. It is anticipated that soils will be imported from adjacent borrow areas proximate to the CCR impoundment.

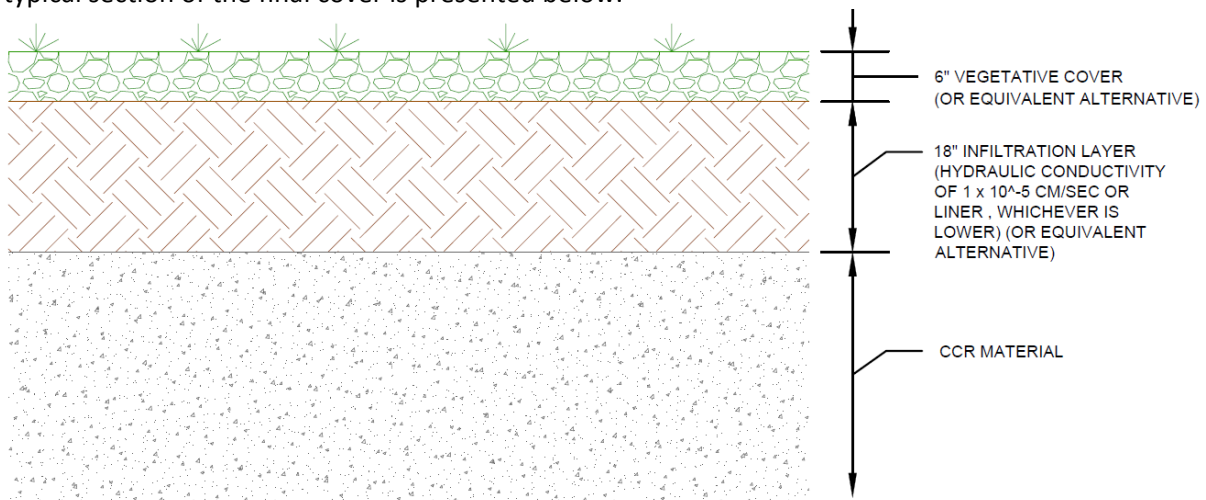
The final cover system will be placed and graded to elevations necessary to prevent future impoundment of stormwater on the final cover system. Grading of the in-place ash may be necessary prior to placement of cover system soils to ensure positive drainage and manage surface water run-off. Surface water run-off and run-on will be managed to minimize the need for future maintenance of the cover system. The final cover system design grades will be analyzed and designed to provide appropriate safety factors against slope failure, sloughing or movement of the final cover system. Final cover grades will also be designed to accommodate settling and subsidence of the impoundment to minimize disruption of the integrity and function of the final cover system.

§257.102(b)(1)(ii): *If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.*

N/A - The CCR unit will be closed in place.

§257.102(b)(1)(iii): If closure of the CCR unit will be accomplished by leaving CCR in place, **a description of the final cover system**, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

A typical section of the final cover is presented below.



§257.102(b)(1)(iii): If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and **the methods and procedures to be used to install the final cover**. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

The following general installation methods and procedures are expected to be used to construct the final cover system:

Subgrade Preparation

Prior to installation of the infiltration layer, any existing vegetation should be removed and the surface smoothed to provide a suitable working base for cover system installation. Fill soil may be required to shape the subgrade and fill in low areas or repair erosion as necessary. Any soft areas should be under-cut and recompacted as necessary to provide a firm, unyielding foundation for placement and compaction of the infiltration layer. The subgrade shall be maintained in a smooth, uniform, and drained condition prior to placement of the infiltration layer.

The subgrade will be surveyed to establish elevations of the surface prior to placement of the infiltration layer.

Infiltration Layer

Soil materials for the infiltration layer will be obtained from an on-site or off-site source, delivered using haul trucks, spread with a dozer, and compacted with soil compaction equipment. Soil will be compacted to achieve compaction and permeability requirements. The final surface of the infiltration layer will be maintained in a smooth, uniform drainage condition.

Upon completion, the infiltration layer will be surveyed to establish elevations and verify a minimum thickness of 18-inches is provided.

Erosion Layer

Soil materials for the erosion layer will be obtained from an on-site or off-site source, delivered using haul trucks, and spread with a dozer. The erosion layer does not require compaction control; however, it should be stable for construction traffic. The erosion layer top surface will remain rough to promote the establishment of native vegetation. Stabilization and seeding of the erosion layer must begin immediately after placement (weather permitting).

Upon completion, the erosion layer will be surveyed to establish elevations and verify a minimum thickness of 6-inches is provided.

Temporary or permanent erosion control materials (mulches, fabrics, rock check dams, soil tackifier) may be used to minimize erosion and aid in establishment of vegetation. Hard armor such as cobbles or rip rap may be used in areas where establishment of vegetation may be difficult or impossible.

§257.102(b)(1)(iii):** If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. **The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

***§257.102(d)(1):** The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:*

***§257.102(d)(1)(i):** 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;*

The proposed final cover system will have a permeability less than or equal to any natural subsoils present, or no greater than 1×10^{-5} cm/s, whichever is less. The final cover system will consist of an 18-inch thick infiltration layer and a 6-inch vegetative cover which will prevent infiltration of liquids into the waste and release of CCR, leachate or contaminated run-off to the ground or surface waters or to the atmosphere.

***§257.102(d)(1)(ii):** Preclude the probability of future impoundment of water, sediment, or slurry;*

The final cover will be graded to promote positive drainage and prevent the impoundment of water, sediment, or slurry.

§257.102(d)(1)(iii): Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;

Slope stability analysis will be performed during design to determine the appropriate slopes of the impoundment cover. Stormwater controls will be designed to remove stormwater from the impoundment and prevent erosion.

§257.102(d)(1)(iv): Minimize the need for further maintenance of the CCR unit; and

Erosion of the final cover system will be minimized by design of stormwater controls such as ditches, swales, and diversions and establishment of native vegetation on the 6-inch thick erosion layer minimizing the need for future maintenance. The design grades of the final cover system will accommodate settling and subsidence without disrupting the integrity of the final cover system. By accounting for potential settlement and subsidence the final cover system minimizes the need for future maintenance

§257.102(d)(1)(v): Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

See closure schedule per §257.102(b)(1)(vi).

§257.102(b)(1)(iv): An estimate of the maximum inventory ever on-site over the active life of the CCR unit.

The maximum volume of CCRs ever stored in the unit will occur at closure and is estimated to be less than or equal to approximately 25,143,000 CY.

§257.102(b)(1)(v): Estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.

The area of the impoundment requiring final cover is approximately 231.9 acres. This area is based on data provided by DP&L of historic impoundment boundaries. There are no planned lateral expansions of the impoundment.

§257.102(b)(1)(vi): A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner

or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f) (1) of this section, the written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under paragraph (f)(2) of this section.

An estimated schedule for completing the activities necessary to satisfy the closure criteria of the CCR Rule is provided below. The schedule lists the sequential steps that need to be taken to close the impoundment.

Item #	Task Item	Completion Timeframe (months)													
		Design and Permitting								Closure					
		-8	-7	-6	-5	-4	-3	-2	-1	0	12	24	36	48	60
1	Prepare Construction Plans														
2	PE Design Certification														
3	Notice of Intent to Close Landfill														
4	Agency Closure Permit Issuance														
5	Cease placing CCR in impoundment														
6	Commence Closure														
7	Dewater Impoundment														
8	Final Cover Installation														
9	PE Closure Certification														
10	Notice of Impoundment Closure														
11	Record Deed Notation														
12	Notice of Deed Recordation														

DP&L will need to initiate some activities prior to commencing closure. As indicated on the schedule, DP&L will need to take action on Steps 1-4 as early as 8 months prior to the anticipated final receipt of CCR at the impoundment.

Per §257.102(e)(3) closure of the impoundment has commenced when DP&L has ceased sluicing CCR in the impoundment and completes any of the following actions or activities: (i) Taken any steps necessary to implement the written closure plan; (ii) Submitted a completed application for any required state or agency permit or permit modification; or (iii) Taken any steps necessary to comply with state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of the CCR impoundment.

DP&L intends to operate the plant through 2036. Closure activities for the CCR impoundment are estimated to be completed in 2041.

§257.102(b)(3)(i): The owner or operator may amend the initial or any subsequent written closure plan developed pursuant to paragraph (b) (1) of this section at any time.

DP&L will assess the Plan and amend the Plan whenever there is a change in operation of the CCR impoundment that would substantially affect the Plan or when unanticipated events necessitate a revision of the Plan either before or after closure activities have commenced.

The Plan will be amended at least 60 days prior to a planned change in the operation of the facility or the CCR impoundment, or no later than 60 days after an unanticipated event requires the need to revise the Plan. If the Plan needs to be revised after closure activities have commenced, the Plan will be revised no later than 30 days following the triggering event.

The amended Plan will be placed in the facility operating record as required by the CCR Rule.


A record of amendments to the plan will be tracked below. The latest version of the Plan will be noted on the front cover of the plan.

Version	Date	Description of Changes Made
1	12 October 2016	Initial Issue

Professional Engineer Certification

§257.102(b)(4): The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written closure plan meets the requirements of this section.

I certify that this written Closure Plan for DP&L's Ash Pond at the Killen Electric Generating Station meets the USEPA's Final CCR Rule requirements of §257.102(b).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal and date:

