

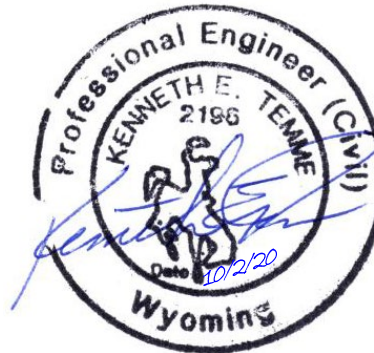
# CCR Rule Closure and Post-Closure Care

## §257.102 Closure Plan

FGD Pond 5  
Naughton Power Plant  
Kemmerer, Wyoming

October 30, 2017

Rev 1 October 2, 2020



### PREPARED FOR

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## PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify, as a Professional Engineer in the State of Wyoming, 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 PacifiCorp or others without specific verification or adaptation by the Engineer.


I hereby certify, as a Professional Engineer in the State of Wyoming that the closure plan provided herein meets the requirements of 40 Code of Federal Regulations §257.102.



Jason M. Stratton, P.E.

October 30, 2017

Date



Kenneth Temme, P.E.

Rev 1.

October 2, 2020

Date

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## 1.0 INTRODUCTION

The PacifiCorp Naughton Power Plant is located approximately three miles southwest of Kemmerer, Wyoming. This report addresses the requirements of §257.102 – Closure Plan, as it pertains to FGD Pond 5 at the Plant. FGD Pond 5 was constructed in 2017.

## 2.0 EXISTING CONDITIONS

The Naughton Power Plant is located approximately 3 miles southwest of Kemmerer, Wyoming. The Plant historically consisted of three coal-fueled units, rated with a net dependable capacity of 156 MW, 201 MW, and 330 MW, respectively. Unit 3 has been converted to only burn natural gas, has a net rating of 247 MW, and no longer generates coal combustion residuals. Coal combustion residuals at the Plant include several types of materials including bottom ash, fly ash, and FGD materials. FGD Pond 5 was constructed in 2017 at the location shown on Figure 1. The pond has a permitted capacity of 1,467 acre-ft which is expected to provide approximately 10 years of disposal capacity. The pond may remain operational when full to allow additional evaporation of water. As water evaporates, additional effluent may be added eventually filling the pond with solids. When filled with solids or when continued operation is no longer feasible, a cover will be constructed, and the pond will be permanently closed. FGD Pond 5 is scheduled to cease receipt of waste with the cessation of coal fired boilers, with closure activities initiating no later than 30 days following.

The pond has a surface area of 49 acres at the crest with a maximum interior depth of 46 ft. The pond is located on a topographically high area with surface water drainage away from the pond in all directions. The only source of water or waste entering the pond is through two effluent delivery pipelines as well as any precipitation falling within the pond area. No surface water run-on is allowed to enter the pond. The pond has no discharge outlets or spillways (all water entering the pond will be evaporated). The pond embankments have 3 horizontal to 1 vertical slopes and was constructed using soil excavated from within the pond limits and an adjacent borrow area. The pond foundation materials consist of stiff clay and claystone bedrock. Permanent ballast consisting of grout filled tubes was placed over the geomembrane to prevent wind damage. A chain link security fence was installed around the pond to prevent larger wildlife from entering the area. A bird hazing system was installed to reduce impacts to migratory water fowl.

The pond was constructed with a composite liner system consisting of a 60-mil HDPE geomembrane (upper component) in direct contact with a two-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec (lower component) (Clay liner material obtained from claystone bedrock borrow indicated in Appendix B).

## 3.0 CLOSURE PLAN

Pond closure will be permitted through the State of Wyoming Department of Environmental Quality (WDEQ) - Water Quality Division (WQD). Closure activities will commence within 30 days of cessation of FGD effluent flow from the plant.

The final cover system design will follow the requirements outlined in §257.102 (d), as described below. The estimated aerial extent of waste requiring a final cover is about 47 acres, and the maximum volume of CCR to be contained is about 1,500 acre-ft.

The list of activities related to closure is described in more detail in the following sections and includes:

- 1) Receipt of final effluent from the plant;
- 2) All groundwater pump back flows, or other sources of effluent, diverted to a new waste pond;
- 3) Remove HDPE effluent delivery pipelines to a point 10 ft beyond the limits of FGD Pond 5. Plug the remaining effluent delivery pipelines where cut.
- 4) Allow evaporation of surface water. The following activities will be conducted:
  - a. Apply dust suppressant to areas of exposed FGD solid waste as the water surface recedes. Alternatively, these areas may be covered with repurposed bottom ash or other on-site soil;
  - b. After the first period of evaporation, install dewatering wells within the FGD solid waste. Commence dewatering of the solids in areas away from exposed surface water. Liquid from dewatering will be pumped to a CCR compliant waste pond or otherwise be treated;
  - c. Install infiltration layer (compacted clay soil) and any required doming soil (repurposed bottom ash or common borrow) in areas where surface water has receded;
- 5) Upon completion of surface water evaporation, continue solids dewatering and installation of doming soil;
- 6) Remove perimeter embankments to the elevation of the top of the cover to allow surface water drainage from the cover to the exterior toe of the embankments. Reuse excavated embankment material for the doming soil;
- 7) Upon completion of construction of doming soil remove dewatering wells;
- 8) Install a flexible membrane liner (FML) or geo-composite liner (GCL);
- 9) Install topsoil (erosion layer) and a protective soil cover of the FML or GCL;
- 10) Seed topsoil;
- 11) And initiate post-closure monitoring of vegetation, groundwater, and cap integrity.

### 3.1 COVER SECTION

The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than  $1 \times 10^{-5}$  cm/s, whichever is less. FGD Pond 5 will be constructed with a composite liner system. Therefore, the cover must include a flexible membrane liner or geo-composite clay liner with permeability equivalent to the 60-mil HDPE geomembrane used in the composite liner. The cover section should have a minimum 18-inch thick protective soil layer over the FML or GCL and must have a minimum 6-inch thick erosion layer placed over the protective soil layer. The erosion layer will consist of native topsoil capable of sustaining vegetative growth.

### 3.2 EROSION LAYER

Vegetation will be established on the erosion layer (topsoil) using a combination of native grasses. The seeding will be performed using a hydro-seeder or drill seeder. Prior to seeding the topsoil layer will be prepared by disking, or tilling and harrowing, or other methods. The topsoil will be tested for pH and nutrient content and will be amended as necessary to provide adequate nutrients to sustain vegetative growth. Seeding will occur during climatologically favorable seasons and the seed will be covered with a

mulch to protect from erosion and moisture loss. Supplemental watering will be used if adequate water is not present in the topsoil.

### **3.3 SURFACE WATER CONTROL**

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The final cover will be graded to direct storm water runoff to the existing perimeter of FGD Pond 5. Perimeter ditches will be installed where surrounding grade does not allow surface water to flow away from the pond cover. The existing storm water diversions will remain in place. The elevation of the pond embankments will be lowered to the elevation of the pond cover to allow for surface water drainage away from the cover. No depressions will be created on top of the final cover that would allow the ponding of storm water.

### **3.4 SETTLEMENT AND FINAL GRADE**

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The FGD waste forms a solid crystalline structure that has been demonstrated to provide support for heavy equipment. However, settlement of the solids has been demonstrated during dewatering. Additional doming soil will be placed over the FGD waste during dewatering operations should settlement occur to provide drainage for the final grade. Negligible settlement of the FGD waste is anticipated upon completion of dewatering.

Final grades, post-settlement, shall be established steep enough to inhibit surface water infiltration but flat enough to reduce the potential for erosion from run-off. The final slopes should be no flatter than 1% and no steeper than 3H:1V. Drainage over the cover area will be accomplished by placing doming soil over the waste prior to installation of the FML or GLC, protective soil, and erosion layer. The final pond grade will create a dome in the center of the cover area sloping downwards towards the edge of the cover. Alternatively, an accordion drainage plan may be installed. An accordion drainage plan consists of a series of drainage swales throughout the cover system on a discrete horizontal spacing interval. The area between the drainage swales is sloped to drain towards the swales at a 1% minimum slope. The drainage swales are sloped to drain towards the edge of the cover at a 0.5% minimum slope. This allows for a much thinner doming soil layer in the cover system.

### **3.5 SLOPE STABILITY**

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The closure plan provides for long term stability of the FGD Pond 5 cover. Adequate factors of safety for the embankments have been demonstrated. No increase in net driving force on the pond embankments will occur due to closure of FGD Pond 5.

### 3.6 CLOSURE ACTIVITIES DURATION AND SCHEDULE

The following closure schedule is planned for FGD Pond 5 following receipt of the final CCR waste material or beneficial use. The schedule complies at a minimum with CFR 257.102 (e).

<b><u>Activity</u></b>	<b><u>Elapsed Time from Receipt of Final CCR or Beneficial Use</u></b>
1) Coordinate with Regulatory Agencies on Pending Closure	380 Days Prior To
2) Submit Closure and Post Closure Plans	270 Days Prior To
3) WDEQ Closure and Post Closure Plans Review	270 to 90 Days Prior To
4) Finalize Closure and Post Closure Plans	90 to 60 Days Prior To
5) WDEQ Review and Approval of Final Closure Plan	60 to 30 Days Prior To
6) Contract Closure Contractor	30 Days Prior To
7) Receipt of Final CCR or Beneficial Use	0
8) Begin Final Closure Activities	30 days
9) Surface water evaporation	2 to 5 years
10) Dewatering of waste	5 to 7 years
11) Installation of cover including doming, topsoil, a seeding	7 years
12) Submit Closure Certification and Notice to WDEQ	7 to 10 years
Perform Annual Vegetation Success Monitoring Until Revegetated	

### SOURCE(S)

- [1] USEPA, 2015. 40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. April 17, 2015. 201 pp.

**REVISIONS**

Revision Number	Date	Revision Made	By Whom
0	10/30/2017	Initial Issue	Tetra Tech
1	10/02/2020	Updates to reflect updated 2019 Integrated Resource Plan	Tetra Tech





