



Closure Plan

Ash Disposal Facility

Otter Tail Power Company – Coyote Station (Blue Pit)

Introduction

This report presents the Closure Plan for the Blue Pit (landfill) at Coyote Station near Beulah, North Dakota. This Closure Plan has been written to satisfy §257.102(b)(3) of the Coal Combustion Residual Rule and is an amendment to the previous Closure Plan dated October 17, 2016.

Disposal of Coyote Station's CCR in the landfill has been regulated by the North Dakota Department of Health (DOH) since 1997. CCR generated prior to 1997 was disposed of in landfills that are now closed.

Early landfill progression occurred along the east side, while current fill progression is from north to south. Ultimately, there are 10 sequences planned for the Blue Pit. At this time, 8 sequences have been constructed; 5 of those have reached final grades and have been closed. Final closure on the remaining sequences will occur as areas reach final grades. Closure is planned to occur biennially, with each sequence consisting of multiple closure projects.

Closure Procedures §257.102(b)(1)(i)

Closure of the landfill will be in-place. Fill progression of the landfill occurs from north to south, and the active portion of the landfill is kept as small as practicable to reduce the generation of leachate and control fugitive dust. Future cell expansions will necessitate a change in fill progression. Sequences 9 and 10 will be filled from east to west.

Closure will initiate as sufficient areas of final grades are achieved. CCR will be brought to grade and compacted to provide a smooth finish capable of supporting the final cover system.

Details on schedule, final cover design, notification timelines, and certification can be found below.

Quantity of CCR §257.102(b)(1)(iv)-(v)

No temporary storage of ash will take place at this facility. 8.8 million cubic yards of CCR is estimated to be ultimately disposed of in Sequences 1-10. The largest area of the CCR unit requiring final cover is approximately 18 acres.

Closure Schedule §257.102(b)(1)(vi)

Closure phases of the landfill are dependent on the quantity of ash produced. The design of the facility is such that the final grades will be achieved in individual phases as quickly as possible, allowing final cover to be placed sequentially. Closure will commence as final grades are achieved, and as sufficient area is available to place final cover. The owner or operator of a CCR unit will commence closure activities no later than 30 days after the last known receipt of waste or removing the last amount of CCR from the unit for beneficial use in accordance with §257.102(e)(1)(i).

Final closure is planned to occur in 2049. Closure of the landfill will be completed within 180 days commencing closure for that phase (§257.102(f)(i)). Please see Figure 1 and Table 1 for more details.

**Table 1 Closure
 Schedule
 Estimated Date of Sequence Construction Closure Commencement**

Sequence 6 Partial Closure 2	July 15, 2019
Sequence 6 Final Closure	July 15, 2021
Sequence 7 Partial Closure 1	July 15, 2023
Sequence 7 Partial Closure 2	July 15, 2025
Sequence 7 Partial Closure 3	July 15, 2027
Sequence 7 Final Closure	July 15, 2029
Sequence 8 Partial Closure 1	July 15, 2031
Sequence 8 Partial Closure 2	July 15, 2033
Sequence 8 Final Closure	July 15, 2035
Sequence 9 Partial Closure 1	July 15, 2037
Sequence 9 Partial Closure 2	July 15, 2039
Sequence 9 Final Closure	July 15, 2041
Sequence 10 Partial Closure 1	July 15, 2043
Sequence 10 Partial Closure 2	July 15, 2045
Sequence 10 Partial Closure 3	July 15, 2047
Sequence 10 Final Closure	July 15, 2049

Closure Performance Standard §257.102(d)

Post closure infiltration will be minimized or eliminated by constructing a landfill final cover system in accordance with DOH rules. The final cover profile from bottom to top will consist of:

- Compacted clay barrier layer, 24 inches thick (§257.102(d)(3)(i)(A))
- Cover layer, 21 inches thick (§257.102(d)(3)(i)(B))
- Rooting soil, 9 inches thick (§257.102(d)(3)(i)(B))
- Top soil, 6 inches thick (§257.102(d)(3)(i)(B))
- Vegetative cover (§257.102(d)(3)(i)(C))

All final cover phases will be designed and constructed to capture and convey stormwater off the landfill, down to stormwater drainages. Run-off from the active fill area will be handled in accordance with §257.81, and will collect and contain the run-off from a 25-year, 24-hour storm event.

HELP Model analyses were conducted using the final cover profile and the base liner with both fly ash and bottom ash fill to determine the efficiency of each system. Due to the limited availability of fill types in the HELP Model, fly ash and bottom ash were used to represent flue-gas desulfurization (FGD) product and boiler slag, respectively.

The HELP Model analysis determined that the final cover system is 97.3% efficient at preventing infiltration through the compacted clay barrier layer, the base liner with FGD-only waste fill was 97.6% efficient, and the base liner with boiler slag-only fill was 91.1% efficient. The value of FGD and Boiler slag generation at Coyote Station is 40% and 60%, respectively. This ratio presents a base liner efficiency of 93.7%, and the permeability of the final cover system will meet or be less than the permeability of the base liner in accordance with §257.102(d)(3)(i)(A).

Together, the final cover and base liner system, regardless of CCR material, have an efficiency greater than 98.5%. The results for the HELP model analyses can be found in Appendix A.

Maintenance requirements for the final cover system will be minimized by establishing and supporting vegetation. Erosion control products appropriate for the slope and expected stormwater run-off velocity will be implemented to assist vegetative growth. Once vegetation is established, mowing will occur to prevent the growth of woody vegetation.

Notification of Closure §257.102(g)

A notification of intent (NOI) to close will be submitted to the DOH Commissioner 90 days prior to final closure of the landfill. A NOI will be placed in the facility's operating record and CCR website. The NOI will include a certification by a qualified professional engineer that the design of the final cover system meets the requirements of §257.102(d)(iii). The estimated dates for closure of the phases are presented in Table 1 and Figure 1, but are subject to change.

Certification of Final Phase of Closure §257.102(h)

Upon completion of closure activities at the landfill, a closure documentation report will be submitted to the DOH. This will be signed by an authorized officer of Otter Tail Power Company and a professional engineer licensed in North Dakota. The report will state that the landfill has been closed in accordance with DOH-approved plans and specifications and in accordance with this closure plan (§257.102(d)(3)(iii)) and §257.107(i).

Testing of the various components of the cover will be conducted and documented in accordance with the Construction Quality Assurance/Quality Control Plan in effect at the time of final closure, and in accordance with applicable rules. The closure and construction documentation will be submitted to the DOH, placed in the facility's operating record, and posted on the CCR website within 30 days of completion of closure. The report will contain record drawings, testing data and a description of the construction process with photographs.

In addition, upon final closure of the entire facility, a detailed description, including plat, will be recorded with the Mercer County Recorder. The description will include types and location of wastes, depth of fill and other information that may be of interest to future land owners. A copy of the Record Drawings will be submitted to the Mercer County Recorder and the DOH.

Following final closure of the landfill, the facility will then be subject to the post-closure care as required by the DOH and federal regulations. Please see "Blue Pit Post-Closure Plan" for more details. The Otter Tail Power Company contact after the landfill receives its final closure will be:

Manager, Environmental Services
Otter Tail Power Company
215 South Cascade Street
PO Box 496
Fergus Falls, MN 56538-0496
Phone:218.739

Deed Notation §257.102(i)

A notation will be made on the deed or other instrument normally examined during a title search. In accordance with §257.102(i)(2) the notation will include record drawings and in perpetuity notify potential purchasers that: a) the land has been used as CCR unit, and b) its use is restricted under the post-closure care requirements as provided by §257.104(d)(1)(iii). A copy of the notation carrying the Mercer County Recorder's seal will be included with the certification.

Amendment of Closure Plan §257.102(b)(3)

If any event or change affects the plan, an amended Closure Plan will be prepared and submitted to the DOH, placed in the facility's operating record, and posted on the CCR website. This applies to any change in the Operations and Maintenance Plan, facility design, or estimated year of closure. At a minimum, the Closure Plan will be reviewed and updated, if necessary, every two years beginning with this version of the Closure Plan §257.102(b)(3)(ii).

Certification:

I hereby certify under penalty of law that this report was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Paul M. Vukonich
License No. PE-27050

October 10, 2017

Date

FIGURE 1 – BLUE PIT CLOSURE TIMELINE OVERVIEW

