

CCR Rule Report: Initial Safety Factor Assessment

Ash Pond 2
Basin Electric Power Cooperative
Leland Olds Station
Stanton, North Dakota

AECOM Project No. 60565307
April 13, 2018

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1. Introduction

This Coal Combustion Residual (CCR) Rule Report documents that that Ash Pond 2 at the Basin Electric Power Cooperative (BEPC) Leland Olds Station meets the safety factor assessment requirements specified in 40 Code of Federal Regulations (CFR) §257.73(e) of the HAZARDOUS AND SOLID WASTE MANAGEMENT SYSTEM; DISPOSAL OF COAL COMBUSTION RESIDUALS FROM ELECTRIC UTILITIES [RIN-2050-AE81; FRL-9149-4] (EPA Final CCR Rule).

Ash Pond 2 is an existing CCR surface impoundment as defined by §257.53 of the EPA Final CCR Rule. In October 2015, BEPC determined that the impoundment met the criteria for an inactive surface impoundment as defined in §257.100 of the EPA Final CCR Rule, and the 'Notification of Intent to Initiate Closure of CCR Surface Impoundment' for Ash Pond 2 was completed on December 15, 2015, in accordance with §257.100 of the EPA Final CCR Rule.

Since that time, §257.100 of the CCR Rule has been vacated, and the compliance deadlines for inactive surface impoundments have been extended. Specifically, CCR impoundments that were initially classified with the 'Inactive' status and seeking closure under §257.100 now must have the initial safety factor assessment completed by April 17, 2018. The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial safety factor assessment meets the requirements of 40 CFR §257.73.

The owner or operator must prepare a safety factor assessment every five years.

2. Initial Safety Factor Assessment

40 CFR §257.73(e)(1)

The owner or operator must conduct initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in (e)(1)(i) through (iv) of this section for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

(i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.

(ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

(iii) The calculated seismic factor of safety must equal or exceed 1.00.

(iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

An initial safety factor assessment has been performed to document that the calculated factors of safety for Ash Pond 2 achieve the minimum factors of safety listed in §257.73(e)(1)(i) through (iv). This assessment is based on analysis of the north embankment of the adjacent Pond 3, which was determined to have similar soil properties but less favorable embankment stability conditions due to steeper side slopes and a smaller crest width. The stability of the embankments for Ash Pond 2 were determined by engineering review to have stability factors equal to or greater than those for Pond 3, which were satisfactory.

The west, south and east perimeters of Ash Pond 2 are effectively incised. Failure of embankments along the west, south, and east perimeter of Ash Pond 2 were determined to not plausibly result in an uncontrolled release from the impoundment due to the toe of the slope for the downstream embankment being higher than the Ash Pond 2 surcharge water level. Failure of the northern embankment along Ash Pond 2 would result in discharge only to Pond 3 and would thus not result in an uncontrolled release from the impoundment.

Further discussion of these considerations and the stability review are contained in AECOM's Reconstitution of the CCR Surface Impoundment Design Subsurface and Geotechnical Engineering Analysis dated April 2018. The assessment included evaluating multiple cross-sections and performing analyses at the critical (i.e. most susceptible) cross section at Pond 3, based on appropriate engineering considerations and calculations. The analyses used subsurface information collected from recent and historic subsurface investigations, including laboratory testing data. Engineering properties for the various material strata were selected based on the results of available field and laboratory data. The results of the safety factor assessment are listed in Table 1.

Table 1. Summary of Initial Safety Factor Assessment

Loading Conditions	§257.73(e)(1) Subsection	Minimum Factor of Safety	Calculated Factor of Safety
Maximum Storage Pool Loading	(i)	1.50	>2.18
Maximum Surcharge Pool Loading	(ii)	1.40	>1.86
Seismic	(iii)	1.00	>1.93
Soils Susceptible to Liquefaction	(iv)	1.20	>2.00

Based on this evaluation, Ash Pond 2 meets the requirements in §257.73(e)(1).

3. Certification Statement

CCR Unit: Basin Electric Power Cooperative; Leland Olds Station; Ash Pond 2

I, Aaron M Humphrey, being a Registered Professional Engineer in good standing in the State of North Dakota, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this CCR Rule Report has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the initial safety factor assessment as included in the Reconstitution of the CCR Surface Impoundment Design Subsurface and Geotechnical Engineering Analysis dated April 2018 meets the requirements of 40 CFR § 257.73.

Aaron M. Humphrey
Printed Name

April 13, 2018
Date



