Periodic Inflow Design Flood Control System Plan
Bottom Ash Pond
Sherburne County Generating Plant

Introduction

This report presents documentation and certification of the inflow design flood control system for the Bottom Ash Pond (BAP) at the Sherburne County Generating Plant (Sherco) in Becker, Minnesota. The initial inflow design flood control system plan was certified on October 17, 2016. The BAP is an "existing" (i.e., received coal combustion residuals both before and after October 14, 2015) coal combustion residual (CCR) surface impoundment. On September 29, 2020, Bottom Ash Pond No. 2 (BAP2) became operational and sluice lines were transitioned from BAP to BAP2. On October 31, 2020, BAP ceased receipt of CCR. This document addresses the requirements of 40 CFR Section 257.82, hydrologic and hydraulic capacity requirements for CCR surface impoundments.

Inflow Design Flood Control System

During storm events, the BAP does not receive any inflow from the surrounding native grades. The only source of stormwater inflow to the pond is by direct rainfall on the pond and runoff from the crest of the perimeter embankment.

Compliance with §257.82 (a)

Under the CCR rules §257.73(a), the BAP was determined to be a significant hazard potential CCR surface impoundment and must comply with the 1000-year flood event specified in §257.82(a)(3)(ii). The National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 8, Version 2, 24-hour, 1000-year storm event for Becker, Minnesota is 9.78 inches.

The water level in the BAP is controlled by adding or removing concrete stop logs located in the discharge structure. The water level in the BAP is currently at an elevation of 966 feet MSL but will be lowered in the future prior to initiation of closure. The crest of the BAP is at 1000 feet MSL.

The attached figure shows the BAP inflow area, the water level at an elevation of 966 feet MSL, and the maximum ponding area at 1000 feet MSL (pond crest). Using aerial measurements from Figure 1, the increase in water elevation from the prescribed flood event was calculated.

Inflow Design Calculations

BAP Inflow Area: 20.8 Acres
Volume of water generated from a 1000-year flood event (assuming direct rainfall on the BAP water surface and 100 percent runoff from embankment crests):

$$20.8\ Acres\ *\ \frac{43560\ Square\ Feet}{Acre} * 9.78\ inch\ rain * \frac{1\ foot}{12\ inches} = 738{,}400\ Cubic\ Feet$$

Results

Using the topography shown on Figure 1 and an assumed water level of 966 feet MSL, a 1,000-year flood event would cause BAP to rise to an approximate elevation of 968.5 feet MSL. This is approximately 31.5 feet below the pond crest.

Compliance with §257.82 (b)

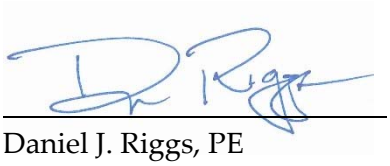
BAP does not discharge CCR to a surface water (impounded water is used for plant processes) and is not subject to the surface water discharge requirements of §257.3-3.

Conclusion

Based on measurements and flood event calculations, the Inflow Design Flood Control System for the Bottom Ash Pond at the Sherburne County Generating Plant is able to collect and control the peak discharge resulting from the inflow design flood specified in §257.82(a)(3)(ii) for a significant hazard potential surface impoundment and complies with the requirements of §§257.82(a) through (c).

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.



October 17, 2021
Daniel J. Riggs, PE Date
License No. 49559

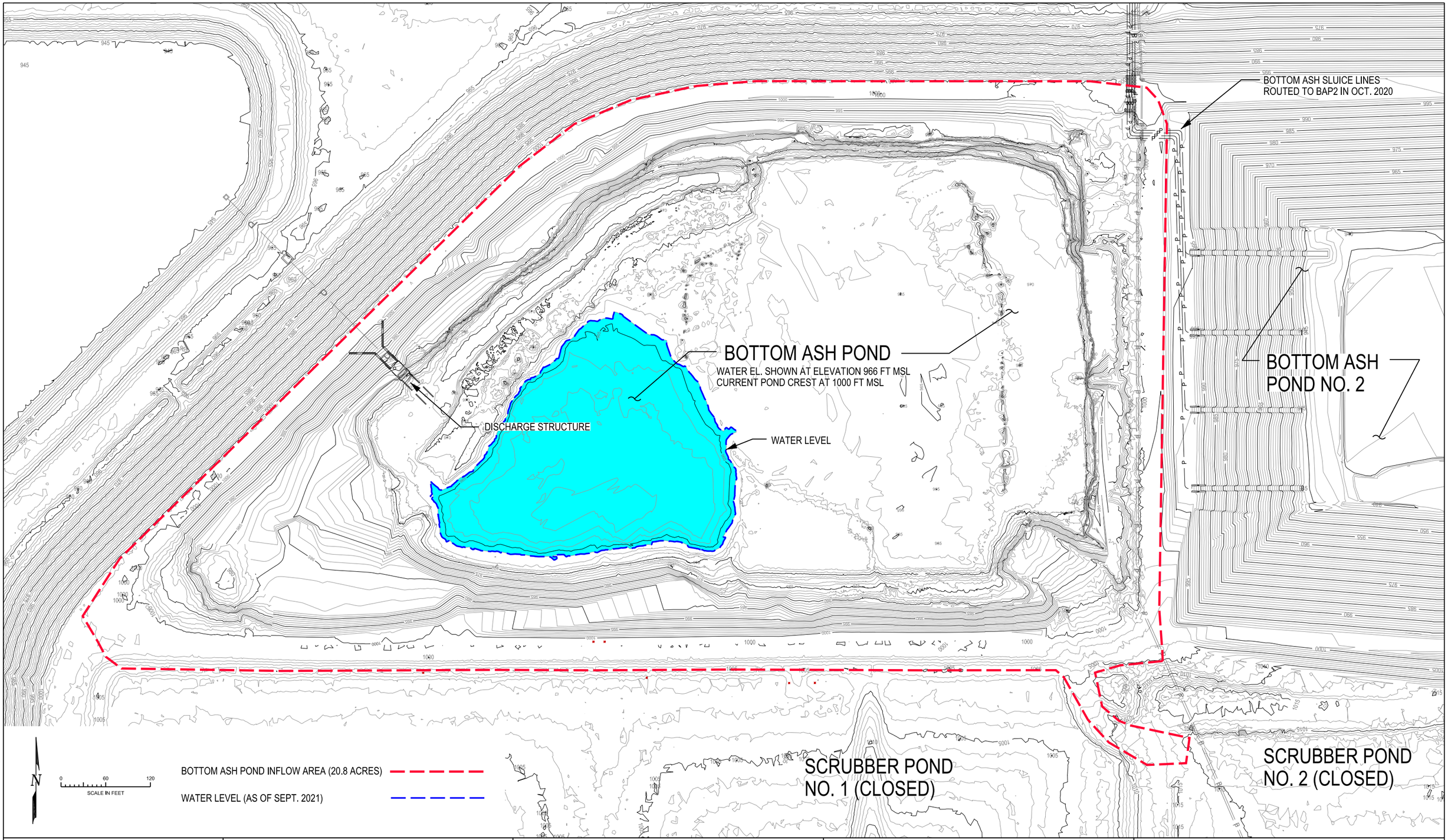
References

National Oceanic and Atmospheric Administration, Atlas 14, Volume 8, Version 2, "Point Precipitation Frequency Estimates", Becker, Minnesota.

References (included in Operating Record and Website)

Carlson McCain, Inc. (October 2021). "Periodic Hazard Potential Classification Assessment, Bottom Ash Pond, Sherburne Country Generating Plant", CCR Compliance Document, Plymouth, Minnesota.

Carlson McCain, Inc. (October 2016). "Inflow Design Flood Control System Plan, Bottom Ash Pond, Sherburne Country Generating Plant", CCR Compliance Document, Plymouth, Minnesota.



CARLSON McCAIN

Notes:

BAP1 CONDITIONS AS OF JULY 2018

BAP2 CONDITIONS AS OF SEPT. 2020

XCEL ENERGY

13999 Industrial Blvd.

Becker, MN 55308

BOTTOM ASH POND NO. 1

FIGURE 1

PERIODIC INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

10/8/2021

P:\Projects\XCEL\3404-01 Sherco Ash Management\CCR Assistance\BA Pond\2021 Updates\257.82 Inflow Design Flood Plan\Figure\Figure 1 BAP Inflow Area.dgn