Periodic Inflow Design Flood Control System Plan
Scrubber Solids Pond No. 3
Sherburne County Generating Plant

Introduction

This report presents documentation and certification of the Inflow Design Flood Control System for Scrubber Solids Pond No. 3 (Pond 3) at the Sherburne County Generating Plant (Sherco) in Becker, Minnesota. The Initial Inflow Design Flood Control System Plan was certified on October 17th, 2016. Pond 3 is an "existing" (i.e. received coal combustion residuals both before and after October 14, 2015) coal combustion residual (CCR) surface impoundment. 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, Pond 3 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. Non-stormwater pond inputs are pump-controlled and consist of sluicing of scrubber solids and water pumped from the Recycle Basin (a non-CCR, incised pond).

During rain events, the plant may pump water under manual control from the Recycle Basin to Pond 3. However, such pumping would not occur if there were insufficient capacity, including freeboard, in Pond 3.

Compliance with §257.82 (a)

Under the CCR rules §257.73(a); Pond 3 was determined to be a significant hazard potential CCR surface impoundment and must comply with the 1000-year storm 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 maximum Pond 3 operating elevation is 1008 feet MSL, four feet below the pond crest elevation of 1012 feet MSL. Note that the current water elevation is 997 feet MSL.

The attached Figure 1 shows the Pond 3 inflow area at the maximum operating elevation of 1008 feet MSL. Using aerial measurements from Figure 1, the increase in water elevation from the prescribed flood event was calculated.

Inflow Design Calculations

Pond 3 Inflow Area: 95.6 Acres
Volume of water generated from a 1000-year flood event (assuming direct rainfall on the Pond 3 water surface and 100 percent runoff from embankment crests):

$$95.6\ Acres\ *\ \frac{43560\ Square\ Feet}{Acre} * 9.78\ inch\ rain * \frac{1\ foot}{12\ inches} = 3.4\ Million\ Cubic\ Feet$$

Current Maximum Ponding Area: 65.4 Acres (2.85 million Square Feet)

Increase in water elevation from flood event: $\frac{\text{3.4 M Cubic Feet of stormwater}}{\text{2.85 M Square Feet of ponding}} = 1.2$ feet

Scrubber Solid Generation

The input from scrubber solids to the pond, which includes both solids and sluice water averages 183,000 cubic feet per day. This equates to a 0.06 feet per day increase over the current maximum ponding area and will not significantly affect the short-term ponded water elevation.

Results

If Pond 3 receives a 1000-year flood event while at the maximum operating elevation of 1008 feet MSL, there will be 2.8 feet of freeboard to the pond crest.

Compliance with §257.82 (b)

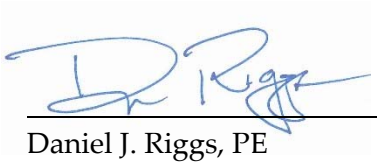
Pond 3 does not discharge CCR to a surface water (impounded water is used for plant processes) and is not subject to the surface water discharge requirements of §257.3-3.

Conclusion

Based on aerial measurements and flood event calculations, the Inflow Design Flood Control System for Scrubber Solids Pond No. 3 at the Sherburne County Generating Plant can 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

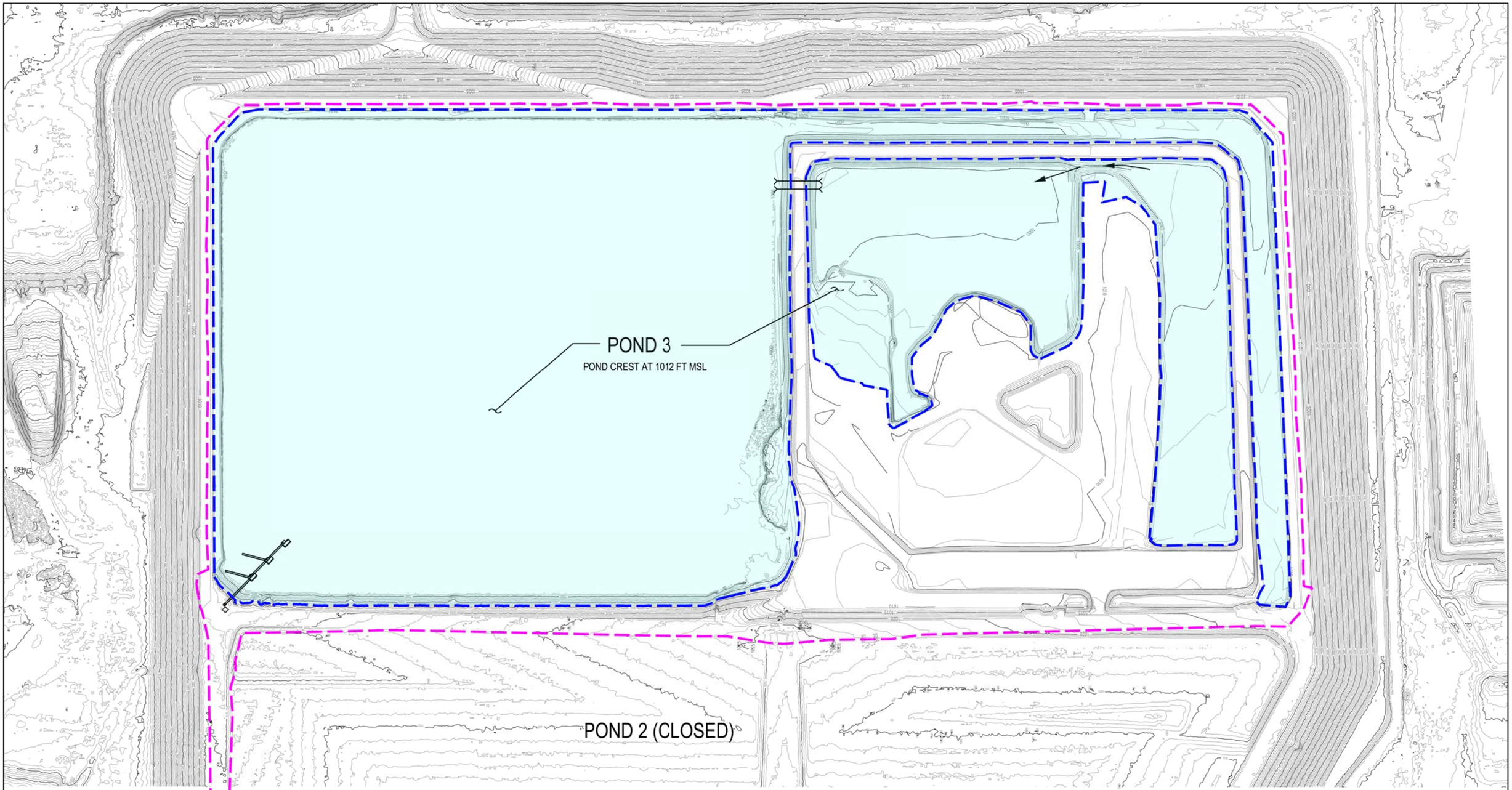
References

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. (July 2016). "Hazard Potential Classification Assessment, Scrubber Solids Pond No. 3, Sherburne Country Generating Plant", CCR Compliance Document, Plymouth, Minnesota.

Carlson McCain, Inc. (October 2016). "Inflow Design Flood Control System Plan, Scrubber Solids Pond No. 3, Sherburne Country Generating Plant", CCR Compliance Document, Plymouth, Minnesota.



CARLSON McCAIN

Notes:

XCEL ENERGY
13999 Industrial Blvd.
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SCRUBBER SOLID POND NO. 3

FIGURE 1
PERIODIC INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

10/6/2021

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