



Hazard Potential Classification Assessment Report

B.C. COBB GENERATING FACILITY

PONDS 0-8 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT REPORT

Muskegon, Michigan

Pursuant to 40 CFR 257.73

Submitted To: Consumers Energy Company
1945 W. Parnall Road
Jackson, Michigan 49201

Prepared By: Golder Associates Inc.
15851 South US 27, Suite 50
Lansing, Michigan 48906

October 2016

1652598






CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.73(a)(2)(ii)]

I hereby certify that, having reviewed the attached documentation and being familiar with the provisions of Title 40 of the Code of Federal Regulations Section 257.73 (40 CFR Part 257.73), I attest that this Hazard Potential Classification Assessment Report is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of 40 CFR Part 257.73.

Golder Associates Inc.



Signature

October 14, 2016

Date of Report Certification

John D Puls, PE

Name

6201055787

Professional Engineer Certification Number

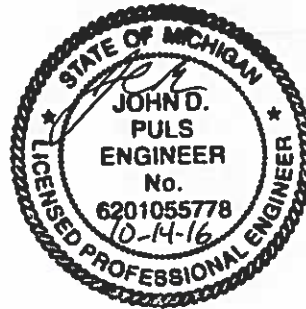




Table of Contents

CERTIFICATION..... C-1
 Professional Engineer Certification Statement [40 CFR 257.73(a)(2)(ii)]..... C-1
1.0 INTRODUCTION..... 1
2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT DETERMINATION..... 2
3.0 CONCLUSION AND SUMMARY 4
4.0 REFERENCES..... 5

List of Tables

Table 2.0.1 Ponds 0-8 Dimension and Water Surface Elevation Summary

List of Figures

Figure 1 Site Location Map



1.0 INTRODUCTION

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the Coal Combustion Residual (CCR) Resource Conservation and Recovery Act (RCRA) Rule (40 CFR 257 Subpart D) (“CCR RCRA Rule”) to regulate the beneficial use and disposal of CCR materials generated at coal-fired electrical power generating complexes. Section 257.73(a)(2) of the CCR RCRA Rule requires the owner or operator of an existing CCR surface impoundment to document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. Consequently, the owner or operator must document the basis for each hazard potential classification.

Hazard potential classification means the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances. The hazard potential classifications include high hazard potential CCR surface impoundment, significant hazard potential CCR surface impoundment, and low hazard potential CCR surface impoundment, which terms mean:

- High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
- Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

According to 257.73(a)(2)(ii), the hazard classification potential assessment must be certified by a qualified professional engineer (QPE) stating that an initial hazard potential classification and each subsequent periodic classification were conducted in accordance with the requirements of 40 CFR 257.73. Golder Associates Inc. (Golder) is submitting this Hazard Potential Classification Assessment Report (Report) to certify a significant hazard potential classification for the Ponds 0-8 CCR surface impoundment (Ponds 0-8) at the Consumers Energy Company (CEC) B.C. Cobb Generating Facility (BC Cobb) in Muskegon, Michigan per 40 CFR Part 257.73(a)(2).



2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT DETERMINATION

Ponds 0-8 is an existing CCR surface impoundment at BC Cobb located in Muskegon, Michigan as shown on Figure 1 – Site Location Map. BC Cobb was a coal-fired power plant that formerly operated two coal burning baseload electrical power generating units. BC Cobb ceased operation on April 15, 2016 and is currently being decommissioned.

Ponds 0-8 is a complex of connected ponds with one perimeter dike that encompasses a surface area of approximately 28.4 acres. The perimeter dike separates Ponds 0-8 from Muskegon Lake on the south and west sides. The combined volume of Ponds 0-8 is approximately 145 acre-feet with a crest elevation that ranges from 588 to 594 feet (NAVD88). The bottom elevation varies depending on deposition/removal of ash, but generally ranges from 572 to 582 feet (NAVD88).

Currently, no sluiced CCR is being discharged into Ponds 0-8. The only source of inflow to the existing CCR surface impoundment is through direct precipitation onto the surface of Ponds 0-8 and the negligible amount of contact wash water deposited into Ponds 0-8 from demolition activities. The water level elevation within Ponds 0-8 is anticipated to equalize near the level of Muskegon Lake (Lake Michigan). Muskegon Lake's (Lake Michigan) mean long-term water level is 579.4 feet (NAVD88) (Golder 2016).

During the inflow design flood (1000-year storm event), the water levels will potentially be temporarily elevated in Ponds 0-8 due to accumulation of precipitation. The water levels have been estimated in Golder's B.C. Cobb Generating Facility Ponds 0-8, Inflow Design Flood Control System Plan (Golder 2016), which assumes no infiltration during the 1000-year storm event.

Table 2.0.1 provides a summary of the following Ponds 0-8 parameters used to determine the hazard classification:

- Pond bottom and berm elevations
- 1000-year storm event water surface elevations
- Volume of water stored above the mean lake level during the 1000-year storm event

The total water temporarily stored above the mean lake level during the 1000-year storm event is estimated to be 40.4 acre-feet. The lake level is assumed to be mean level, because it is related to the level of Lake Michigan rather than a local extreme rain event at BC Cobb.

**Table 2.0.1 - Ponds 0-8 Dimension and Water Surface Elevation Summary**

Name	Pond Bottom Elevation (ft) ^{1,2}	Perimeter Berm Elevation (ft) ^{1,2}	1000-year Water Elevation (ft) ^{1,2}	Storage Volume during 1000-year Storm Event (acre-ft) ³
Pond 0	572.0	589.0	581.64	7.8
Pond 1	578.0	588.0	581.91	5.0
Pond 2	578.0	588.0	581.77	5.0
Pond 3	578.0	588.0	581.60	5.9
Pond 4	577.0	588.0	581.73	7.9
Pond 5	578.0	590.0	582.58	2.8
Pond 6	579.0	592.0	588.75	2.4
Pond 7	582.0	593.0	587.35	1.7
Pond 8	580.0	594.0	587.93	1.9
Total				40.4

Notes:

¹Elevations are in NAVD88²Dimensions from topographic survey by Summit Surveying, Inc. (October 2015)³Storage volume based on volume of water during the 1000-year storm event above the mean lake level (579.4 feet) or pond bottom, whichever is greater

Based on the above parameters, if the perimeter dike fails, CCR from the berm and the surface impoundment will discharge into Muskegon Lake. No probable loss of human life, economic loss, or disruption of lifeline facilities are expected during this scenario. However, there could be environmental damage that is not principally limited to the surface impoundment owner's property. As a result, a significant hazard potential classification has been given to Ponds 0-8 CCR surface impoundment at BC Cobb.



3.0 CONCLUSION AND SUMMARY

Ponds 0-8 at BC Cobb has been rated a significant hazard potential classification as a dike failure or mis-operation would result in a discharge of CCR from the dike and the surface impoundment into Muskegon Lake. No probable loss of human life is expected, but the dike failure may cause environmental damage that would not be limited to the surface impoundment owner's property.

Significant hazard potential classification assessments for existing CCR surface impoundments provide the design inflow criterion of the 1000-year storm event in the inflow design flood control system and the structural stability assessment required in 40 CFR 257.82 and 40 CFR 257.73, respectively. Consequently, it also requires that an emergency action plan be developed as required in 40 CFR 257.73.

This hazard potential classification certification must be placed in the facility's operating record in accordance with 257.105(f) and must be made available on the facility's publicly accessible internet site in accordance with 257.107(f).

Sincerely,

GOLDER ASSOCIATES INC.

Handwritten signature of Scott Stoneman in blue ink.

Scott Stoneman, P.E.
Senior Water/Civil Engineer

Handwritten signature of John Puls in blue ink.

John Puls, P.E.
Senior Engineer

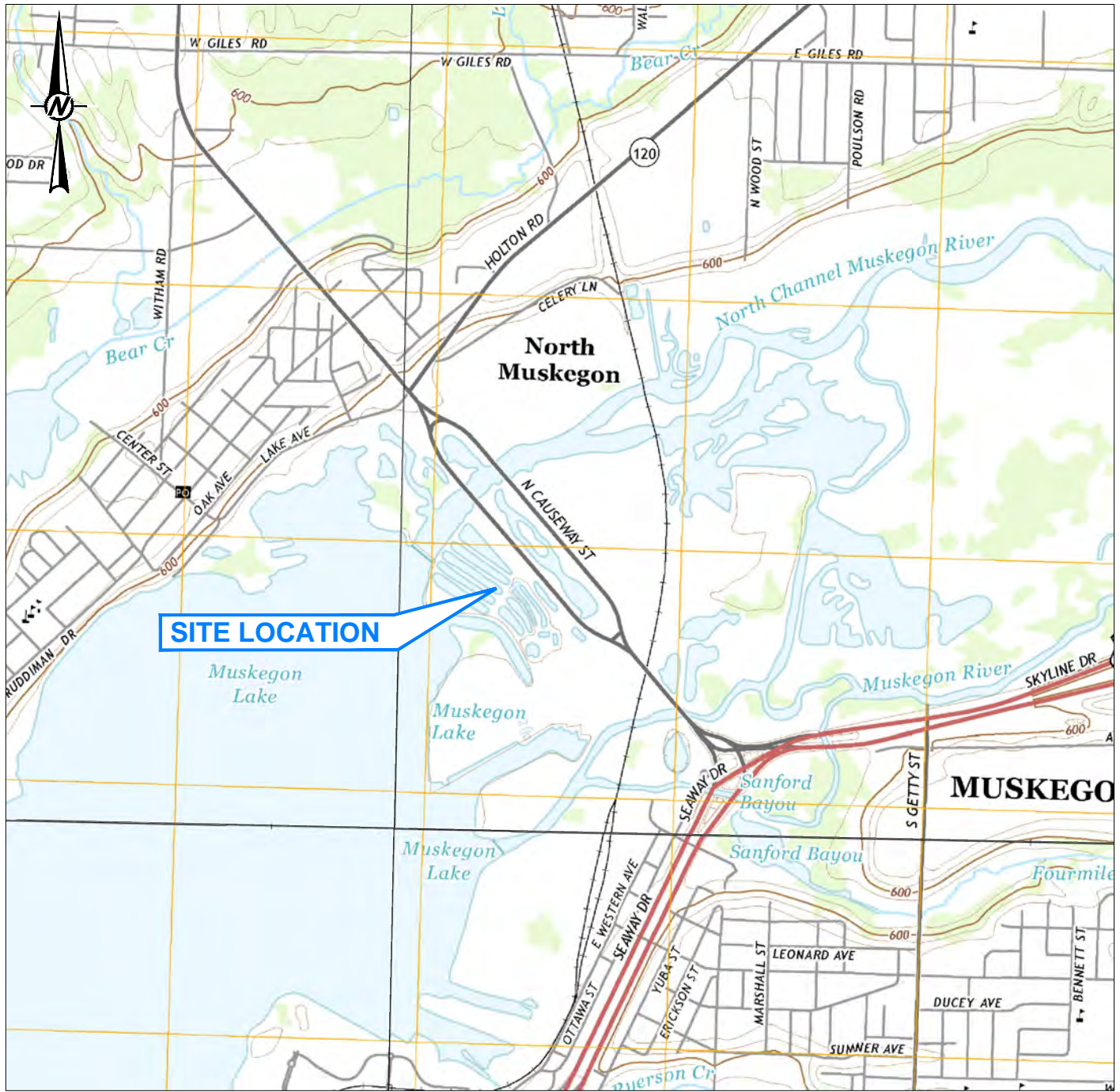


4.0 REFERENCES

Golder Associates. 2016. B.C. Cobb Generating Facility Ponds 0-8, Inflow Design Flood Control System Plan.

USEPA (Environmental Protection Agency). 2015. Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 40 CFR Part 257. Effective Date October 19, 2015.

FIGURES

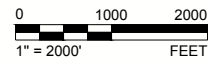


SITE LOCATION

MICHIGAN COUNTIES
NOT TO SCALE

REFERENCE(S)

1. BASE MAP TAKEN FROM 7.5 MINUTE U.S.G.S. QUADRANGLES OF DALTON, TWIN LAKE, MUSKEGON EAST, AND MUSKEGON WEST, MICHIGAN, DATED 2014.



CLIENT
CONSUMERS ENERGY COMPANY
 151 N. CAUSEWAY
 MUSKEGON, MI 49445

PROJECT
B.C. COBB PLANT, PONDS 0-8
HAZARD POTENTIAL CLASSIFICATION ASSESSMENT REPORT
 MUSKEGON, MI 49445

CONSULTANT

YYYY-MM-DD 2016-06-14

DESIGNED JRP

PREPARED AM

REVIEWED JRP

APPROVED MAB



TITLE

SITE LOCATION MAP

PROJECT NO.
1652598

CONTROL
B001

REV.
0

FIGURE
1

Established in 1960, Golder Associates is a global, employee-owned organization that helps clients find sustainable solutions to the challenges of finite resources, energy and water supply and management, waste management, urbanization, and climate change. We provide a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. By building strong relationships and meeting the needs of clients, our people have created one of the most trusted professional services organizations in the world.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Inc.
15851 South U.S. 27, Suite 50
Lansing, MI 48906 USA
Tel: (517) 482-2262
Fax: (517) 482-2460



Engineering Earth's Development, Preserving Earth's Integrity

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation