November 14, 2017

Director Heidi Grether
c/o Delegated Representative Margie Ring, State Solid Waste Coordinating Engineer
Michigan Department of Environmental Quality
Office of Waste Management and Radiological Protection
Constitution Hall, Floor 4
525 West Allegan Street
Lansing, MI 48913

RE: NOTIFICATION OF INTENT TO INITIATE CLOSURE OF JR WHITING PONDS 1&2

Dear Director Grether:

This letter serves as the Notification of Intent to Initiate Closure of JR Whiting Ponds 1&2 as required by 40 CFR 257.102(g).

Consumers Energy has initiated closure of JR Whiting Ponds 1&2, by submittal of the JR Whiting Ponds 1 & 2 Closure Plan to the Michigan Department of Environmental Quality for review and approval. Included with this notification is the JR Whiting Generating Ponds 1 and 2 Final Cover Design Certification that meets the requirements of 40 CFR 102(d)(3(iii) and professional engineer certification that the submitted Closure Plan meets the requirements of 40 CFR 257.102(d)(3)(i)(A-D).

Also, pursuant to 40 CFR 257.106, this letter serves as notification that the Notification of Intent to Initiate Closure for JR Whiting Ponds 1 and 2 an active surface impoundment, in Erie, MI has been placed in Consumers Energy's Operating Record as required by 40 CFR 257.105 and, pursuant to 40 CFR 257.107, will be placed on the publicly accessible internet site.

If you have any questions regarding this submittal, please contact Michelle Marion at 517-788-5824.

Sincerely,

Bethany Swanberg

Consumers Energy Environmental Services

cc: Brad Runkel, P.E. Consumers Energy
Larry Bean, Supervisor OWMM Jackson MDEQ
Alex Whitlow, OWMM Jackson MDEQ

CERTIFICATION REPORT

J.R. WHITING GENERATING FACILITY

PONDS 1 AND 2

Final Cover Design Certification

Pursuant to 40 CFR 257.102(d)(3)(iii)

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

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

November 14, 2017 **1667572.0005**

Golder Associates

CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.102(d)(3)(iii)]

I hereby certify that, having reviewed the final cover design and being familiar with the provisions of Title 40 of the Code of Federal Regulations Section 257.102(d)(3)(i)(A-D), I attest that the Ponds 1 and 2 final cover design has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of 40 CFR Part 257.102(d)(3)(i)(A-D).

Golder Associates Inc.

Signature

November 14, 2017

Date of Report Certification

Jeffrey R. Piaskowski, P.E.

Name

6201061033

Professional Engineer Certification Number

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1.0 INTRODUCTION

The US Environmental Protection Agency (EPA) published 40 CFR Part 257 – Coal Combustion Residuals (CCR) Final Rule (CCR Rule) in April 2015 to regulate the solid waste management of CCR generated at electric utilities. Section 257.102(g) of the CCR Rule requires the owner or operator of an existing CCR surface impoundment to prepare a notification of intent to close a CCR unit. The notification must include the certification by a qualified professional engineer for the design of the final cover system as required by 257.102(d)(3)(iii), if applicable. 257.102(d)(3)(iii) requires that the qualified professional engineer certify that the final cover meets the requirements in 257.102(d)(3)(i)(A-D). The CCR Rule also states that the owner or operator has completed the notification when it has been placed in the facility's operating record as required by Section 257.105(i)(7).

Golder Associates Inc. (Golder) is submitting this report to certify that the final cover designed for Ponds 1 and 2 meets the requirements provided in 257.102(d)(3)(i)(A-D). Golder understands that this final cover design certification will be included with the Ponds 1 and 2 notification of intent to close.

2.0 FINAL COVER DESIGN REQUIREMENTS

The final cover design of an existing CCR surface impoundment that is closing with CCR in place must meet the following criteria per 40 CFR 257.102(d)(3)(i):

- (A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} centimeters per second (cm/sec), whichever is less.
- (B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- (C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.
- (D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

3.0 FINAL COVER DESIGN

The Ponds 1 and 2 final cover is 24 inches thick with a minimum 2.0 percent vegetated slope to prevent future impoundment of water, sediment, or slurry; prevent/control the release of waste; limit the effects of settlement; and minimize erosion.

3.1 Permeability and Infiltration Layer Thickness

40 CFR 257.102(d)(3)(i)(A) states, "The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less." 40 CFR 257.102(d)(3)(i)(B) states, "The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material."

Since Ponds 1 and 2 were constructed without an engineered liner system and the natural subsoils present are clayey soils, it has been conservatively assumed that the subgrade soils beneath Ponds 1 and 2 have a permeability of 1×10^{-7} cm/sec. As a result, the final cover system was designed with an infiltration layer with a permeability of 1×10^{-7} cm/sec or less using a combination of the high-density polyethylene (HDPE) geomembrane overlain by 18 inches of protective soil. The published permeability of a typical HDPE geomembrane is 1×10^{-12} cm/sec or less (GSE, 2012).

3.2 Erosion Layer Thickness and Settlement

40 CFR 257.102(d)(3)(i)(C) states, "The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth." 40 CFR 257.102(d)(3)(i)(D) states, "The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence."

The final cover of Ponds 1 and 2 is designed with a six-inch-thick topsoil erosion layer. The erosion layer consists of topsoil, seed, fertilizer, and mulch in accordance with Michigan Department of Transportation (MDOT) Standard Specification 816 – Turf Establishment. The final cover is designed with a 2.0 percent grade to limit erosion potential and limit future subsidence. A final cover settlement assessment was completed to demonstrate positive drainage on the final cover throughout the post-closure care period.

4.0 CONCLUSIONS AND SUMMARY

The CCR Rule requires the owner or operator of an existing CCR surface impoundment to prepare a notification of intent to close a CCR unit. The notification must include the certification by a qualified professional engineer for the design of the final cover system as required by 257.102(d)(3)(iii), if applicable. 257.102(d)(3)(iii) requires that the qualified professional engineer certify that the final cover meets the requirements in 257.102(d)(3)(i)(A-D).

Golder is submitting this report to certify that the final cover designed for Ponds 1 and 2 meets the requirements provided in 257.102(d)(3)(i)(A-D). It is understood that this certified report will be included with the Ponds 1 and 2 notification of intent to close the CCR unit which must be placed in the facility's operating record in accordance with 257.105(i)(7) and must be made available on the facility's publicly accessible internet site in accordance with 257.107(i)(7).

Sincerely,

GOLDER ASSOCIATES INC.

Jeff Piaskowski, P.E.
Senior Project Geotechnical Engineer

5.0 REFERENCES

"Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." Title 40 – Protection of the Environment Part 257 – Criteria for Classification of Solid Waste Disposal Facilities and Practices Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.

GSE Lining Technologies (GSE), 2012. *Flexible Membrane Liner (FML) & Compacted Clay Liner (CCL).* July 2012.

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.

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