



REPORT

J.R. WHITING PONDS 1 AND 2

Annual RCRA CCR Surface Impoundment Inspection
Report – January 2016

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

Submitted By: Golder Associates Inc.
15851 South US 27, Suite 50
Lansing, MI 48906 USA

January 2016

1539461



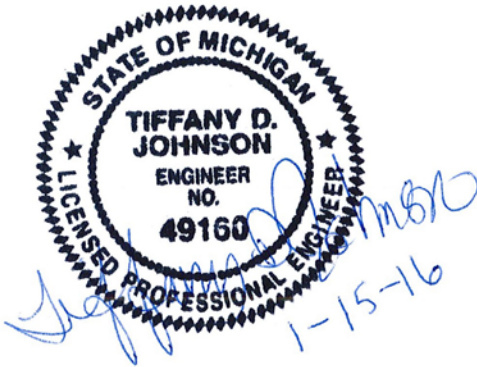


CERTIFICATIONS

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of Michigan.

Tiffany Johnson

January 15, 2016
Date





EXECUTIVE SUMMARY

The United States Environmental Protection Agency (EPA) promulgated the Resource Conservation and Recovery Act (RCRA) Coal Combustion Residuals (CCR) Rule (Rule) on April 17, 2015. The Rule requires owners or operators of existing CCR surface impoundments to have those units inspected on an annual basis by a qualified professional engineer in accordance with 40 CFR 257.83(b). The initial annual qualified professional engineer inspections are required to be completed and the results documented in inspection reports (per 40 CFR 257.83(b)(2) for Existing CCR Surface Impoundments.

Golder Associates Inc. (Golder) was retained by Consumers Energy Company (CEC) to perform the annual inspection of Ponds 1 and 2 at the J.R. Whiting Generating Facility (Site) to document, to the extent reasonable based on the information provided by CEC and the limits of the visual inspection, that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection included the following:

- Review of applicable information regarding the status and condition of the CCR unit
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures
- A visual inspection of hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation



Table of Contents

CERTIFICATIONS	C-1
Executive Summary	ES-1
1.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY	1
2.0 2015 VISUAL INSPECTION	2
3.0 CLOSING	4
4.0 REFERENCES.....	5

List of Tables

Table 1 Summary of Background Document Review

List of Appendices

Appendix A Inspection Checklist Form



1.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

The J.R. Whiting Generating Facility consists of electrical generating Units 1 through 3. Ponds 1 and 2 are currently used as Bottom Ash Ponds, with bottom ash being sluiced from the plant. Ponds 1 and 2 also currently provide backup plant process water. Pond 2 flows into Pond 1 which is discharged to a common internal outfall to the Forebay. Bottom ash is mechanically removed from Ponds 1 and 2 as needed to maintain storage capacity, and retained water is discharged to the Forebay which discharges to the Discharge Channel.

Water from the Discharge Channel exits through the Site's National Pollutant Discharge Elimination System (NPDES) outfall located at the east end of the discharge channel. The J.R. Whiting Generating Facility and Ponds 1 and 2 are scheduled to begin the process of decommissioning in 2016.

The existing reports reviewed for this assessment are summarized in Table 1 below.

Table 1: Summary of Background Document Review

Document	Date	Author
Weekly Inspection Reports	June 2012 – October 2015	Varying Consumers Energy Company (CEC) J.R. Whiting Generating Facility Qualified Persons
J.R. Whiting Ash Disposal Area Triennial Ash Dike Assessment Report – Spring 2014	December 2014	Barr Engineering Company
J.R. Whiting Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	July 2012	AECOM Technical Services, Inc.
Dam Safety Assessment of CCW Impoundments – J.R. Whiting Plant	June 2011	United States Environmental Protection Agency – O'Brien and Gere Engineers, Inc.
Fossil Fuel Generation, Solid Waste Disposal Area - Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC
J.R. Whiting Generating Facility Ash Dike Risk Assessment, Inspection Report	December 2009	AECOM Technical Services, Inc.
J.R. Whiting Generating Facility Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	December 2009	AECOM Technical Services, Inc.



2.0 2015 VISUAL INSPECTION

The 2015 onsite visual inspection of Ponds 1 and 2 was performed by Golder Associates Inc. (Golder) on October 30, 2015.

Golder's inspector (Ms. Tiffany Johnson) was accompanied by three Consumers Energy Company (CEC) representatives, as follows:

- Mr. George McKenzie, CEC Engineering Services Department
- Mr. Frank Rand, CEC Environmental Department
- Ms. Michelle Marion, CEC Engineering Services Department

The inspection checklist form (see Appendix A) provides both observations and recommendations as a result of the visual inspection and the following information as stipulated in 40 CFR 257.83(b):

- Any changes in geometry of the impounding structure since the previous annual inspection. Since this is the first annual inspection, changes in geometry will be incorporated in the report for the next annual inspection.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and Coal Combustion Residuals (CCR) since the previous annual inspection. Since this is the first annual inspection, a placeholder for this data has been provided in the inspection form and will be input for the 2016 annual inspection.
- Storage capacity of the impounding structure at the time of inspection.
- Approximate volume of the impounded water and CCR at the time of inspection.
- Appearances of actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.
- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

The checklist categorizes observed conditions of the impoundment or appurtenant structures as either acceptable, monitor/maintain, investigate, or repair, which are defined as follows:

- **Acceptable:** The condition was visually documented to be acceptable, requiring no action beyond periodic inspection in accordance with the SMP and typical maintenance.
- **Monitor/Maintain:** The condition was visually identified to exhibit the potential for or show existing degeneration that should either be monitored or maintained as detailed in the checklist. Items identified in this category are not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) requiring immediate action by CEC.
- **Investigate:** The limitations of the visual inspection did not allow for an opinion to be made on the condition of the item observed, and Golder recommends additional investigation to categorize the item.
- **Repair:** Golder recommends that items identified with a repair designation exhibited conditions that should initiate measures be taken to rectify the area of concern. It should be noted that no items identified for repair were considered a deficiency or release as classified under 40 CFR 257.83(b)(5) requiring immediate action by CEC.



Based on a review of previous inspection reports listed in Table 1 compared to conditions noted during the inspection the following changes were observed:

- Woody vegetation removal was completed along the western, northern, and eastern slopes of Ponds 1 and 2.

There is currently no instrumentation in place designed to monitor for the structural stability of Ponds 1 and 2 at the Site. At the time of the inspection and report, there are no plans for installation of stability monitoring instrumentation due to the future planned decommissioning of Ponds 1 and 2.



3.0 CLOSING

This report has been prepared in general accordance with normally accepted civil engineering practices to fulfill the Resource Conservation and Recovery Act (RCRA) reporting requirements in accordance with 40 CFR 257.83(b)(2). Golder has reviewed the available information on Bottom Ash Ponds 1 and 2 and performed an onsite visual inspection. Golder's assessment is limited to the information provided by CEC and to the features that could be inspected visually in a safe manner. Golder cannot attest to the condition of subsurface or submerged structures.

GOLDER ASSOCIATES INC.

John Puls, P.E.
Senior Engineer

TDJ

Tiffany Johnson, P.E.
Senior Engineer



4.0 REFERENCES

AECOM Technical Services, Inc., 2009. J.R. Whiting Generating Facility, Ash Dike Risk Assessment.

AECOM Technical Services, Inc., 2009. Potential Failure Modes Analysis (PFMA) Report. J.R. Whiting Generating Facility, Ash Dike Risk Assessment.

AECOM Technical Services, Inc., 2012. J.R. Whiting Ash Disposal Area: 2012 Ash Dike Risk Assessment Final Inspection Report.

Barr Engineering Company, 2014. J.R. Whiting Ash Disposal Area: Triennial Ash Dike Risk Assessment Report – Spring 2014.

Consumers Energy Company, 2010. Fossil Fuel Generation Solid Waste Disposal Area Surveillance Monitoring Programs (SMPs).

Consumers Energy Company, 2014 through 2015. Weekly Inspection Reports.

United States Environmental Protection Agency, O'Brien and Gere Engineers, Inc., 2011. Dam Safety Assessment of CCW Impoundments – J.R. Whiting.

**APPENDIX A
INSPECTION CHECKLIST FORM**

CCR SURFACE IMPOUNDMENT INSPECTION CHECKLIST

Facility Name: J.R. Whiting Ponds 1 and 2

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Detention and settlement of sluiced bottom ash and plant process water

County, State: Monroe County, Michigan

Inspected By: Tiffany Johnson

Inspection Date: October 30, 2015

Weather: Cloudy, No Precipitation, 50 degrees F

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
1. General Conditions					
a. Year Minimum Water Elevation					Elevation: NA – This is the first RCRA Annual Inspection
b. Year Average Water Elevation					Elevation: NA – This is the first RCRA Annual Inspection
c. Year Maximum Water Elevation					Elevation: NA – This is the first RCRA Annual Inspection
d. Current water level					Elevation: ~584 ft.-amsl - (Estimated at time of Inspection)
e. Current storage capacity					Volume: ~ 457,000 CY (AECOM, 2009)
f. Current volume of impounded water and CCR					Volume: ~ 373,800 CY (See Note 1)
g. Alterations					NA
h. Development of downstream plain					NA
i. Grass cover		X			Vegetation recently removed on downstream slopes, maintain vegetation controls. See Note 7.
j. Settlement/misalignment/cracks	X				
k. Sudden drops in water level?					NA – No drop in water level observed.
2. Inflow Structure					
a. Settlement	X				
b. Cracking	X				
c. Corrosion	X				
d. Obstacles in inlet	X				
e. Riprap/erosion control	X				
3. Outflow Structure					
a. Settlement	X				
b. Cracking	X				
c. Corrosion	X				
d. Obstacles in outlet		X			Observed vegetation blocking the inlet to Pond 1. Observed riprap at the southeast corner of Pond 2, but no pipe visible, pipe was removed. Maintain pipe and pond cleaning procedures. See Note 7.
e. Riprap/erosion control	X				
f. Seepage	X				
4. Upstream slope					
a. Erosion		X			Observed minor erosion in limited areas, maintain erosion controls. See Note 7.
b. Rodent burrows	X				
c. Vegetation	X				
d. Cracks/settlement	X				
e. Riprap/other erosion protection	X				
f. Slide, Slough, Scarp	X				
5. Crest					
a. Soil condition	X				
b. Comparable to width from previous inspection	X				
c. Vegetation	X				
d. Rodent burrows	X				
e. Exposed to heavy traffic	X				
f. Damage from vehicles/machinery		X			Groundwater well drilling was occurring at the time of inspection, observed minor damage from equipment, maintain road grading controls. See Note 7.
6. Downstream slope					
a. Erosion		X			Areas of minor erosion noted, and several areas of equipment rutting causing erosion, see Note 2, maintain erosion and grading controls.
b. Vegetation		X			Vegetation was recently removed and slopes were hydro-seeded, maintain vegetation controls. See Notes 3 and 4.
c. Rodent burrows		X			Several rodent burrows were observed, maintain animal control procedures. See Note 5.
d. Slide, Slough, Scarp	X				
e. Drain conditions	X				

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
f. Seepage		X			Noted wet areas on west and north sides of Ponds 1 and 2, maintain water level and erosion controls. See Note 6.
7. Toe					
a. Vegetation		X			Vegetation was recently removed and slopes were hydro-seeded, maintain vegetation controls. See Notes 3 and 4.
b. Rodent burrows		X			Observed rodent burrows, see Note 4, maintain animal control procedures.
c. Settlement	X				
d. Drainage conditions	X				
e. Seepage		X			Noted wet areas on west and north sides of Ponds 1 and 2, maintain water level and erosion controls. See Note 6.

Notes:

- 1) Current volume of impounded water and CCR approximated with an average approximate pond bottom (bottom of in place CCR) elevation of 560 ft. for Pond 1 and 555 ft. for Pond 2 and a fill height to 588 ft.
- 2) The equipment used to remove the woody vegetation on the west, north, and east slopes of Ponds 1 and 2 damaged surface areas of the slope causing erosion and uneven slope faces. Also, rutting caused by drilling equipment was noted on the crest. Maintain erosion and vegetation controls. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 3) The woody vegetation was recently removed along the west, north, and east slopes of Ponds 1 and 2; and the slopes were then hydro-seeded. The hydro-seeding may not establish appropriate ground cover due to the time of year it was performed, so maintain these areas with erosion and vegetation controls and monitor weekly per the SMP. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 4) The removal of woody vegetation left several stumps along the west and east sides of Ponds 1 and 2. The stumps should be monitored weekly per the SMP, specifically on the east side adjacent to Lake Erie, and maintain erosion and vegetation controls. Due to the 2016 planned decommissioning of Ponds 1 and 2, Golder does not recommend removal of the stumps at this time. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 5) There were several rodent burrows located on the south side of Pond 2. These areas should be monitored weekly per the SMP and maintain animal control procedures. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 6) Areas of wet soils, wetland type vegetation, and standing water were observed from approximately two to three feet up the slope down to the toe of the west side of Ponds 1 and 2 and the north side of Pond 1. These areas did not appear to be active seepage areas; these areas should be monitored weekly per the SMP, and maintain vegetation and water level controls. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 7) Features observed and documented in this checklist were not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) and required no immediate action beyond periodic inspection in accordance with the SMP and typical maintenance.

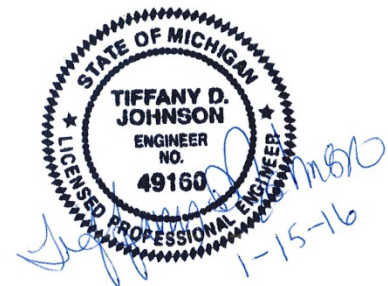
Name of Engineer: Tiffany Johnson, P.E.

Date: 1/15/2016

Engineering Firm: Golder Associates Inc.

Signature:

Tiffany Johnson



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 US 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