



REPORT

B.C. COBB BOTTOM ASH POND

Annual RCRA CCR Surface Impoundment Inspection
Report – January 2016

Submitted To: Consumers Energy Company
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Submitted By: Golder Associates Inc.
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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.

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 the Bottom Ash Pond at the B.C. Cobb Generating Facility (Site) to document, to the extent reasonable based on 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 available 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



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1.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

Bottom ash is sluiced from the B.C. Cobb Units 4 and 5 electrical generating unit to an onsite Bottom Ash Pond. Stored bottom ash is mechanically removed routinely from the pond as needed to maintain storage capacity. The Bottom Ash Pond discharges water via two corrugated metal outflow pipes. The pipes discharge to an internal pond network (Ponds 0 through 8) and then to the permitted National Pollutant Discharge Elimination System (NPDES) outfall to Muskegon Lake. B.C. Cobb Generating Facility and the Bottom Ash Pond 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 inspections performed by Consumers Energy Company (CEC)	June 2012 – December 2015	Varying CEC B.C. Cobb Generating Facility Qualified Person
B.C. Cobb Ash Disposal Area, Triennial Ash Dike Risk Assessment Report – Spring 2014	December 2014	Barr Engineering Company
B.C. Cobb Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	July 2012	AECOM Technical Services, Inc.
Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC
B.C. Cobb Generating Facility Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	November 2009	AECOM Technical Services, Inc.



2.0 2015 VISUAL INSPECTION

The 2015 onsite inspection of the Bottom Ash Pond was performed by Golder Associates Inc. (Golder) on October 14, 2015.

Golder's inspectors (Mr. John Puls and Ms. Tiffany Johnson) were accompanied by two Consumers Energy Company (CEC) representatives, as follows:

- Mr. George McKenzie, CEC Engineering Services 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.
- There is currently no instrumentation in place designed to monitor the structural stability of the Bottom Ash Pond. 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 the Bottom Ash Pond.
- 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 has been provided for this data. Note that the Bottom Ash Pond is currently scheduled to begin the process of decommissioning in 2016.
- 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 an 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 review of previous inspection reports listed in Table 1 compared to conditions noted during the inspection, the following changes were observed:

- Vegetation removal has occurred along the west slope of the pond.
- Riprap armoring was installed around the NPDES outfall location.



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 the Bottom Ash Pond 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

JDP

Tiffany Johnson, P.E.
Senior Engineer



4.0 REFERENCES

Barr Engineering Company, 2014. B.C. Cobb Ash Disposal Area: Triennial Ash Dike Risk Assessment Report – Spring 2014.

AECOM Technical Services, Inc., 2009 Potential Failure Modes Analysis Report, B.C. Cobb Generating Facility, Ash Dike Risk Assessment.

AECOM Technical Services, Inc., 2012. B.C. Cobb Ash Disposal Area: 2012 Ash Dike Risk Assessment Inspection Report.

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

**APPENDIX A
INSPECTION CHECKLIST FORM**

CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

Facility Name: B.C. Cobb Bottom Ash Pond

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Detention and settlement of sluiced bottom ash

County, State: Muskegon County, Michigan

Inspected By: John Puls / Tiffany Johnson

Inspection Date: 10/14/2015

Weather: Sunny, 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: ~593-amsl (Estimated at time of Inspection)
e. Current storage capacity					Volume: ~11,800 CY (See Note 1)
f. Current volume of impounded water and CCR					Volume: ~8,800 CY (See Note 1)
g. Alterations	X				
h. Development of downstream plain	X				
i. Grass cover	X				
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			Observed corrosion on pipe, continue maintenance controls. See Note 4.
d. Obstacles in inlet	X				
e. Riprap/erosion control		X			Observed erosion at interior slope likely from concentrated flow, maintain erosion controls. See Note 4.
3. Outflow Structure					
a. Settlement		X			Observed sloughing around outlet pipe into Pond 6, maintain erosion and grading controls. See Note 4.
b. Cracking	X				
c. Corrosion		X			Observed corrosion on pipe, continue maintenance controls. See Note 4.
d. Obstacles in outlet	X				
e. Riprap/erosion control	X				
f. Seepage	X				No seepage observed.
4. Upstream slope					Upstream slope of bottom ash pond considered as the west slope.
a. Erosion		X			Observed erosion, likely due to recent clearing of vegetation, maintain erosion and vegetation controls. See Note 4.
b. Rodent burrows	X				
c. Vegetation		X			See Note 2.
d. Cracks/settlement	X				
e. Riprap/other erosion protection	X				
f. Slide, Slough, Scarp	X				
5. Crest					
a. Soil condition	X				Crest of bottom ash pond consists primarily of bottom ash.
b. Comparable to width from previous inspection	X				
c. Vegetation		X			Pine trees that remain intended to act as visual screening and dust suppression, maintain vegetation controls. See Note 4.
d. Rodent burrows	X				
e. Exposed to heavy traffic	X				
f. Damage from vehicles/machinery		X			Minor ruts observed along perimeter, maintain grading controls. See Note 4.
6. Downstream slope					Downstream slope considered the southern slope of the pond.
a. Erosion		X			Intermittent minor erosion observed along the slope, maintain erosion controls. See Note 4.
b. Vegetation		X			Woody vegetation observed, maintain erosion controls. See Note 4.
c. Rodent burrows	X				
d. Slide, Slough, Scarp	X				
e. Drain conditions	X				
f. Seepage	X				
7. Toe					
a. Vegetation	X				
b. Rodent burrows	X				

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
c. Settlement	X				
d. Drainage conditions		X			Observed evidence of historic seeps along the south toe, maintain water level controls and erosions controls. See Note 3.
e. Seepage		X			Soils south of the toe were visibly saturated at the surface; however, no active seeps were located at the embankment toe contributing to the saturation of the soils, maintain water level and CCR level controls. See Note 3.

Notes:

- 1) Current storage capacity and volume of impounded water and CCR are based on approximate bottom elevation of 585-ft amsl and topographic survey data taken in January 2015. No changes to the bottom ash pond capacity (with the exception of routine removal of bottom ash), since January 2015 warranted a new topographic survey for this annual inspection.
- 2) Vegetation was recently cleared on the west slope, maintain erosion and vegetation controls and weekly inspections per the SMP. This is not a deficiency or release as classified under 40 CFR 257.83(b)(5).
- 3) CEC personnel were aware of the saturated conditions along the south toe and indicated that this condition has remained consistent for as long as the staff members were employed at the facility. According to CEC, visible seepage is observed when bottom ash is over-excavated along the southern interior of the Bottom Ash Pond. When visible seepage is observed; plant staff replace bottom ash along the southern interior slope, and the seep subsides within 24 hours. It is recommended that the south toe be monitored weekly, per the SMP. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).
- 4) 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: John Puls, P.E.

Date: 1/15/2016

Engineering Firm: Golder Associates Inc.

Signature: _____



PROFESSIONAL ENGINEER SEAL

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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