J.H. CAMPBELL BOTTOM ASH POND 3


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

Submitted By: Golder Associates Inc.
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Lansing, MI 48906 USA

January 2016
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 Bottom Ash Pond 3 at the J.H. Campbell 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 J.H. Campbell Unit 3 electrical generating unit to a pair of ponds, classified as Bottom Ash Pond 3. An elevated trestle and pipe system hydraulically conveys bottom ash to the pond system. Stored bottom ash is removed via mechanical equipment from the ponds as required to maintain storage capacity on a yearly basis. Water is discharged from the ponds via corrugated high-density polyethylene outflow pipes into an internal ditch that conveys the flow to an internal pond system and ultimately to the Site’s permitted National Pollutant Discharge Elimination System (NPDES) outfall. Additionally, a perimeter ditch is located toward the northern and western toe of Bottom Ash Pond 3. This ditch is covered under the Site’s NPDES Permit and flows into the internal pond system and is ultimately discharged through the Site’s NPDES outfall.

The applicable available information reviewed for this assessment is summarized in Table 1 below.

**Table 1: Summary of Background Document Review**

<table>
<thead>
<tr>
<th>Document</th>
<th>Date</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly inspections performed by Consumers Energy Company (CEC)</td>
<td>June 2012 – December 2015</td>
<td>Varying CEC J.H. Campbell Generating Facility Qualified Person</td>
</tr>
<tr>
<td>Surveillance Monitoring Programs (SMPs)</td>
<td>December 2010, Revised 2015</td>
<td>CEC</td>
</tr>
</tbody>
</table>
2.0 2015 VISUAL INSPECTION

The 2015 onsite visual inspection of Bottom Ash Pond 3 was performed by Golder Associates Inc. (Golder) on October 15, 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
- Mr. Bradley Runkel, 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 for the structural stability of Bottom Ash Pond 3. 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 Bottom Ash Pond 3.
- 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:

- Vegetation removal has occurred along the west slopes of the ponds.
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 Pond 3 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

Tiffany Johnson, P.E.
Senior Engineer

JDP
4.0 REFERENCES


### CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

**Facility Name:**  J.H. Campbell Bottom Ash Pond 3  
**Owner:**  Consumers Energy Company (CEC)  
**Purpose of Facility:**  Detention and settlement of sluiced bottom ash from Unit 3  
**County, State:**  Ottawa County, Michigan  
**Inspected By:**  John Puls / Tiffany Johnson  
**Inspection Date:** 10/15/2015  
**Weather:**  Cloudy, 45-degrees F

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<table>
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<tr>
<th>ITEM</th>
<th>Acceptable</th>
<th>Monitor/Maintain</th>
<th>Investigate</th>
<th>Repair</th>
<th>REMARKS</th>
</tr>
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</table>

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: ~611-amsl Pond 3S / ~612-amsl Pond 3N (Estimated at time of Inspection)
   - e. **Current storage capacity**  
     Volume: ~125,500 CY Pond 3S / ~158,100 CY Pond 3N (See Note 1)
   - f. **Current volume of impounded water and CCR**  
     Volume: ~33,300 CY Pond 3S / ~49,500 CY Pond 3N (See Note 1)
   - g. **Alterations**  
     X
   - h. **Development of downstream plain**  
     X
     Intermittent historical plains observed from active and historical seeps, maintain water level controls and erosion controls. See Note 4.
   - i. **Grass cover**  
     X
   - j. **Settlement/misalignment/cracks**  
     X
     Continue weekly monitoring in accordance with SMP, no change was observed. See Note 2.
   - 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
     Perform routine maintenance of inflow piping and supports. See Note 4.
   - d. **Obstacles in inlet**  
     X
   - e. **Riprap/erosion control**  
     X
     Observed erosion along inflow pipe penetrations, maintain erosion controls. See Note 4.

3. **Outflow Structure**
   - a. **Settlement**  
     X
     Minor bend noted in outlet pipe of Pond 3, continue maintenance controls and monitor in accordance with the SMP. See Note 4.
   - b. **Cracking**  
     X
   - c. **Corrosion**  
     X
   - d. **Obstacles in outlet**  
     X
   - e. **Riprap/erosion control**  
     X
   - f. **Seepage**  
     X

4. **Upstream slope**
   - a. **Erosion**  
     X
     Intermittent interior erosion rills observed along eastern slopes, maintain erosion controls in this area. See Note 4.
   - b. **Rodent burrows**  
     X
     Isolated burrows noted, maintain animal control procedures. See Note 4.
   - c. **Vegetation**  
     X
     Observed vegetation on north slope of Pond 3, maintain vegetation controls. See Note 4.
   - 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
     Minor rutting observed along crest of Pond 3, maintain road grading controls. See Note 4.
   - f. **Damage from vehicles/machinery**  
     X

6. **Downstream slope**
   - a. **Erosion**  
     X
   - b. **Vegetation**  
     X
     Observed intermittent woody vegetation, maintain vegetation controls. See Note 4.
   - c. **Rodent burrows**  
     X
   - d. **Slide, Slough, Scarp**  
     X
     See Note 2.
   - e. **Drain conditions**  
     X
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<td>b.</td>
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Notes:

1) Current storage capacity and volume of impounded water and CCR are based on an approximate bottom elevation of ~600.0 ft. amsl and topographic survey data taken in April of 2012. No changes to Pond 3 capacity (with the exception of routine removal of bottom ash) since 2012 warranted a new topographic survey for this annual inspection.

2) Evidence of historic sloughing was observed along areas of the western slope of the Bottom Ash Pond. Sloughing appeared unchanged from previous inspection. Golder recommends weekly observations for visual changes in appearance or further movement. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).

3) Seepage was observed at multiple locations along the toe of the Bottom Ash Pond. Evidence of historic piping was also observed but was not active. Active sediment transport was not observed at the time of inspection. It appears the seepage has not increased or produced additional sediment loss compared to the previous inspection in 2014. Golder recommends CEC visually monitor the seeps weekly, per the site’s SMP, to identify changes in seep flow, sediment transport, or visible piping. 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: [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.