



REPORT

GRAND HAVEN BOARD OF LIGHT AND POWER - J.B. SIMS GENERATING STATION

Surface Impoundments Annual Visual Inspection

Submitted to:

Grand Haven Board of Light and Power

J.B. Sims Generating Station
1231 North 3rd Street
Grand Haven, Michigan 49417

Submitted by:

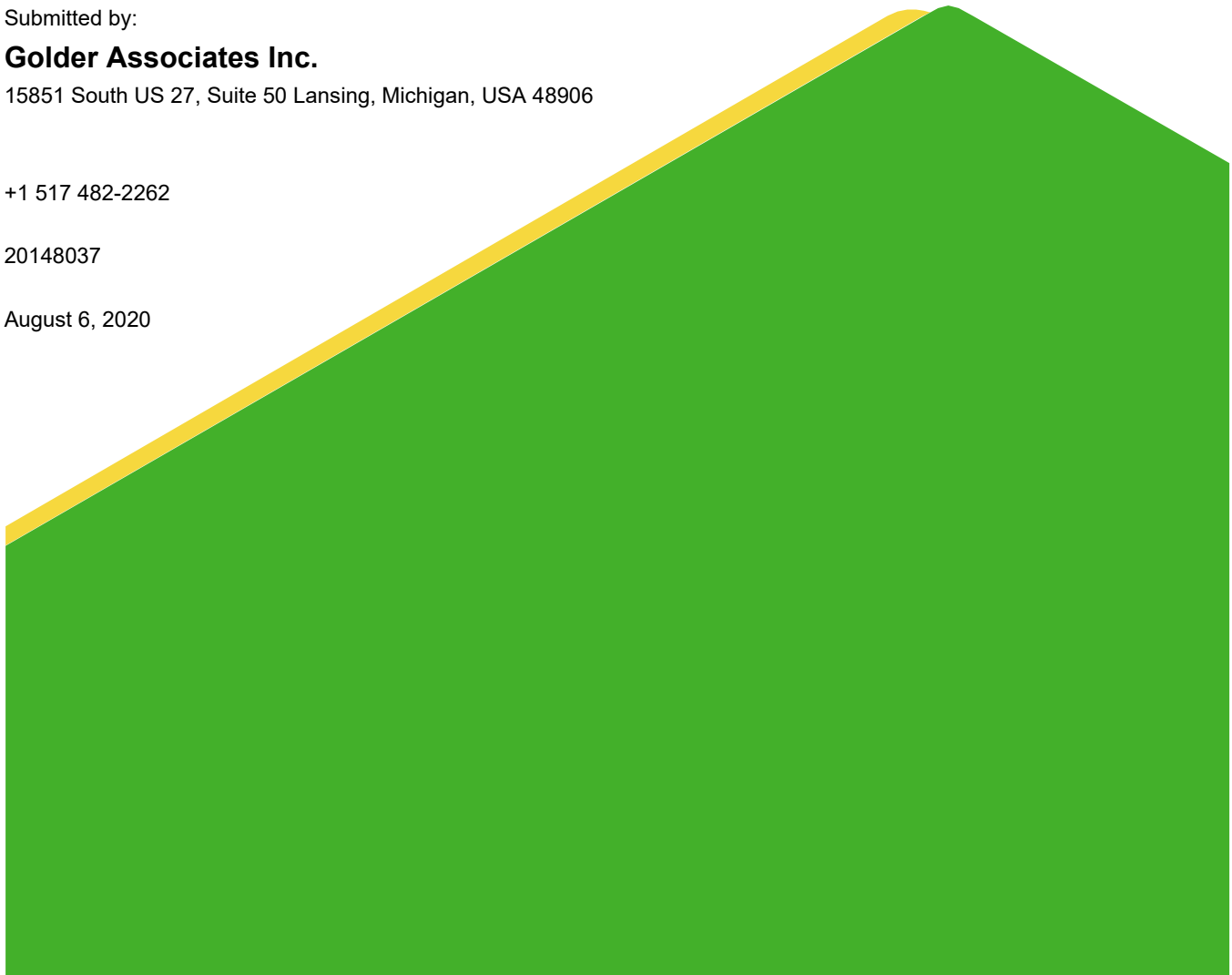
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August 6, 2020

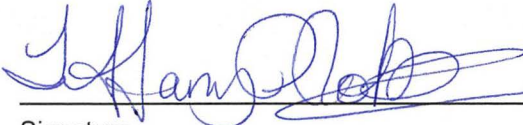


CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.83]

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 257.83 (40 CFR Part 257.83), I attest that this Annual Inspection 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 257.83.

Golder Associates Inc.



Signature

August 6, 2020

Date of Report Certification

Tiffany D. Johnson, P.E.

Name

6201049160

Michigan P.E. #

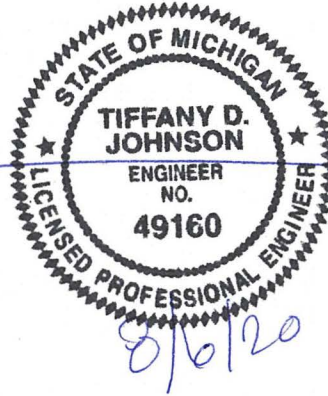


Table of Contents

| | |
|---|----------|
| 1.0 INTRODUCTION | 3 |
| 2.0 FACILITY DESCRIPTION..... | 4 |
| 3.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY | 4 |
| 4.0 2020 VISUAL INSPECTION | 5 |
| 5.0 CLOSING | 6 |

APPENDICES

APPENDIX A

Visual Inspection Checklist

1.0 INTRODUCTION

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, with an effective date of October 19, 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)(1). The 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 CCR surface impoundments. Golder Associates Inc. (Golder) was retained by Grand Haven Board of Light and Power (GHBLP) J.B. Sims Generating Station (JBSGS) to perform the annual inspection of the Unit 3 East and West Bottom Ash Impoundments, the CCR surface impoundments located at the JBSGS (Site). It should be noted that the inactive CCR units also at the JBSGS, the Units 1 and 2 Ash Impoundments, are not subject to 40 CFR 257.83 because they are incised.

The CCR Rule establishes national minimum criteria and new CCR management obligations for existing, new, and lateral expansions of CCR disposal units. One of the new obligations pertains to inspections, specifically; CCR unit owners/operators must initiate the following activities:

- weekly inspections and monthly instrument monitoring of CCR Units by October 19, 2015; and
- annual inspections of CCR units starting January 18, 2016.

This report presents the results of the 2020 annual inspection of the Unit 3 East and West Bottom Ash Impoundments CCR surface impoundment units at the JBSGS, located on Harbor Island, Grand Haven, Michigan. The inspection was conducted to comply with 40 CFR 257.83 of the CCR Rule.

Per 40 CFR 257.83(b)(1), Golder reviewed available information regarding the status and condition of the CCR units and performed an onsite visual inspection on July 7, 2020. The inspection objectives included the following:

- Review of Operational Records (as applicable, see Section 3):
 - Design and construction information.
 - Results of previous structural stability assessments.
 - Results of previous annual inspections.
- A visual inspection to identify signs of distress or malfunction in the CCR units and appurtenant structures.
- A visual inspection of the hydraulic structures underlying the CCR units, or passing through the dike of the CCR units, for structural integrity and continued safe and reliable operation.

In accordance with §257.83(b)(2), this inspection report has been prepared by a qualified professional engineer documenting the operational records review, visual inspection, and identifying the following since the previous annual inspection:

- Any changes in geometry of the CCR surface impoundment since the previous annual inspection.
- The location and type of existing instrumentation and the maximum recorded readings for each instrument since the previous annual inspection.

- The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.
- The storage capacity of the impounding structure at the time of inspection.
- The approximate volume of the impounded water and CCR at the time of inspection.
- Any appearances of an actual or potential structural weakness of the CCR units, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR units and appurtenant structures.
- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

2.0 FACILITY DESCRIPTION

The Unit 3 East and West Bottom Ash Impoundments are located adjacent to each other and are formed by compacted clay earthen embankments with a common embankment between them. The impoundment areas range from 175 to 190 feet long by 71 to 80 feet wide with an approximate surface area of 0.2 and 0.3 acres for the east and west impoundments, respectively. The impoundments were designed by Black & Veatch in 1981 and are constructed with compacted clay embankments with 3 horizontal to 1 vertical (3H:1V) exterior slopes and 2H:1V interior slopes with an approximately 10 feet wide crest. The embankments are not regulated as dams by the Michigan Dam Safety office.

Both impoundments were constructed with a minimum 3 feet of 3×10^{-7} centimeters per second (cm/sec) (Golder, January 2018) clay over the floor and are approximately 9 feet deep. The design bottom elevation of the impoundments is Elevation (El) 585 feet above mean sea level (ft-msl) and the current crest elevation ranges from 591 to 592 ft-msl. Based on visual observations and discussions with GHBLP personnel, the impoundments are no longer receiving CCR from the plant, as boiler operations ceased in February 2020. Although the estimated storage capacity of each impoundment (with two feet of freeboard) is approximately 68,000 and 77,000 cubic feet for the East and West impoundments, respectively, the West Impoundment is dry and the East Impoundment is only taking storm water and coal pile runoff.

A concrete overflow structure and sluice gate conduit between the east and west impoundments allowed for water level regulation between the two impoundments and prevents overtopping of the embankment. These impoundments do not have an outlet structure that discharges from the impoundments. Water from the impoundments is pumped through an outfall regulated by the Michigan Department of Environment, Great Lakes and Energy (EGLE) Permit number MI 0000728. Bottom ash has been cleaned from these impoundments via crane or excavator and transported off-site to a licensed landfill. The impoundments are planned for removal in 2020.

3.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

Golder performed a review of the following historic documentation relative to the Unit 3 East and West Bottom Ash Impoundment surface impoundments:

- City of Grand Haven, Michigan Board of Light and Power J.B. Sims Station, Unit 3 Ash Pond Construction Report (Black & Veatch, 1983)

- DRAFT - Coal Combustion Residue Impoundment, Round 12 - Dam Assessment Report, JB Sims Power Plant (Site 04), East and West Bottom Ash Ponds, Grand Haven Board of Power and Light, Grand Haven, Michigan, Prepared for: United States Environmental Protection Agency Office of Resource Conservation and Recovery, Prepared by: Dewberry & Davis, LLC Fairfax, Virginia, Dated October 2012 (EPA, 2012)
- Final Report of Evaluation for Grand Haven Power Plant Ash Impoundment Grand Haven, Michigan (Soils & Structures, 2014)
- Annual Ash Impoundment Inspection Report (Soils & Structures, July 2016)
- Select GHBLP Personnel's J.B. Sims Ash Pond Daily Inspection Forms (Dated August 2018 to July 2019)
- 2017 Grand Haven Board of Light and Power J.B. Sims Generating Station, Unit 3 East and West Ash Pond Surface Impoundments Annual Visual Inspection Report (Golder, July 2017)
- Grand Haven Board of Light and Power J.B. Sims Generating Station, Units 1 and 3 Ash Ponds and Unit 3 East and West Bottom Ash Ponds – Documentation of Liner Construction, (Golder, January 2018)
- 2019 Grand Haven Board of Light and Power J.B. Sims Generating Station, Unit 3 East and West Ash Pond Surface Impoundments Annual Visual Inspection Report (Golder, August 2019)
- Updated Topography, prepared by Westshore Engineering and Surveying, dated October 21, 2019.

4.0 2020 VISUAL INSPECTION

The 2020 onsite inspection of the Unit 3 East and West Bottom Ash Impoundments was performed by Tiffany Johnson, P.E. on July 7, 2020. Ms. Johnson is a Professional Engineer, licensed in the State of Michigan. Golder's inspector was directed by Mr. Paul Cederquist, Environmental Compliance Specialist for the GHBLP JBSGS.

The inspection provides the following information as stipulated in 40 CFR 257.83(b)(2):

- Any changes in geometry of the CCR surface impoundment since the previous annual inspection.
 - None.
- The location and type of existing instrumentation and the maximum recorded readings for each instrument since the previous annual inspection.
 - There is currently no instrumentation in place designed to monitor for the structural stability of the Unit 3 East and West Bottom Ash Impoundments.
- The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.
 - Minimum: Approximately 585 ft-msl (empty)
 - Maximum: Approximately 586 ft-msl (4 feet below the crest) (assumed based on visual observation)
 - Present Depth: The West impoundment is dry and the East impoundment's water depth is approximately 1 foot above the bottom of the pond (based on visual observation).
- The storage capacity of the impounding structure at the time of inspection.

- With two feet of freeboard - approximately 68,000 and 77,000 cubic feet for the East and West impoundments, respectively (based on review of available information).
- The approximate volume of the impounded water and CCR at the time of inspection.
 - Water = East impoundment impounded approximately 7,500 cubic feet of water (was recently cleaned and CCR removed), West impoundment impounded approximately 0 cubic feet of water (was recently cleaned and CCR removed).
 - CCR = West and East impoundments had no CCR due to the CCR removal in preparation for closure.
- Any 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.
 - None were observed.
- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.
 - None were observed.

Based on the July 7, 2020 visual inspection, the overall condition of the Unit 3 East and West Bottom Ash Impoundments is acceptable. There were no structural weaknesses or safety issues observed within the upstream, downstream, crest or hydraulic structures that would likely impact operations. The following minor observations were documented (Note: Features observed and documented during the inspection were not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) and required no immediate action beyond periodic inspection or maintenance, and the impoundments are planned for removal in 2020):

- Minor erosion on the east side of the East Impoundment.
- Woody vegetation present along the western outboard slope of the West Impoundment's road next to the Grand River.

5.0 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). Based on review of information provided by GHBLP and Golder's on-site visual inspection, the overall condition of the Unit 3 East and West Bottom Ash Impoundments is acceptable. Golder's assessment is limited to the information provided by GHBLP and to the features that could be visually inspected in a safe manner. Golder cannot attest to the condition of subsurface or submerged structures.

APPENDIX A

Visual Inspection Checklist

CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

Facility Name: J.B. Sims Generating Station (JBSGS) Unit 3
East and West Bottom Ash Impoundments

Owner: Grand Haven Board of Light and Power (GHBLP)

Purpose of Facility: These impoundments were used to store bottom ash from the power plant, they are now inactive and only taking stormwater and coal pile runoff. The impoundments are planned for removal in 2020.

Location: Harbor Island, Grand Haven, Michigan

Inspected By: Tiffany Johnson, P.E. accompanied by Paul Cederquist (GHBLP)

Inspection Date: July 7, 2020

Weather: 80 degrees, sunny and humid, no precipitation

| ITEM | | | | | REMARKS |
|--------------------------------------|------------|--------------------|-------------|--------|--|
| | Acceptable | Monitor / Maintain | Investigate | Repair | |
| 1. General Conditions | | | | | The West and East Impoundments were recently cleaned. The West Impoundment is dry. |
| a. Year Minimum Water Elevation | | - | | | Elevation: Approximately 585 ft-msl (or empty when impoundments are cleaned, based on information from GHBLP) |
| b. Year Average Water Elevation | | - | | | Elevation: Approximately 586 ft-msl (assumed based on visual) Ponds have been emptied in early 2020. |
| c. Year Maximum Water Elevation | | - | | | Elevation: Approximately 586 ft-msl (assumed based on visual) Ponds have been emptied in early 2020. |
| d. Current water level | | - | | | Current water level: West impoundments is dry, the East Impoundments has approximately 1-foot of water in the bottom of the impoundment. |
| e. Current storage capacity | | - | | | Volume: With two feet of freeboard - approximately 68,000 and 77,000 cubic feet for the east and west impoundments, respectively |
| f. Current volume of impounded water | | - | | | Volume: West Impoundment is dry. East Impoundment is approximately 7,500 cubic feet (approximately 1 foot of water) |
| g. Alterations | X | | | | None |
| h. Development of downstream plain | X | | | | None observed |
| i. Grass cover | X | | | | |
| j. Settlement/misalignment/cracks | X | | | | None observed. |
| k. Sudden drops in water level? | X | | | | |
| 2. Inflow Structure | | | | | Inflow structure planned for removal in 2020. |
| a. Settlement | X | | | | |
| b. Cracking | X | | | | |
| c. Corrosion | X | | | | |
| d. Obstacles in inlet | X | | | | |
| e. Riprap/erosion control | X | | | | |
| 3. Outflow Structure | | | | | Outflow weir structure planned for removal in 2020. |
| a. Settlement | X | | | | |
| b. Cracking | X | | | | |
| c. Corrosion | X | | | | |
| d. Obstacles in outlet | X | | | | |
| e. Riprap/erosion control | X | | | | |

| ITEM | Acceptable | Monitor / Maintain | Investigate | Repair | REMARKS |
|---|------------|--------------------|-------------|--------|---|
| f. Seepage | X | | | | None observed. |
| 4. Upstream slope | | | | | |
| a. Erosion | | X | | | Minor erosion was observed on East side of the East Impoundment interior slope. |
| b. Rodent burrows | X | | | | |
| c. Vegetation | X | | | | Clay interior slopes. |
| d. Cracks/settlement | X | | | | |
| e. Riprap/other erosion protection | X | | | | |
| f. Slide, Slough, Scarp | X | | | | |
| 5. Crest | | | | | |
| a. Soil condition | X | | | | Recently regraded on the east. |
| b. Comparable to width from previous inspection | X | | | | West impoundment crest width: 14-ft East impoundment crest width: 19-ft |
| c. Vegetation | X | | | | Gravel road crest. |
| d. Rodent burrows | X | | | | None observed. |
| e. Exposed to heavy traffic | | X | | | Inspection performed after the cleaning of bottom ash from the West and East Impoundment. Crest is exposed to of heavy vehicle traffic, but no major damage was observed. |
| f. Damage from vehicles/machinery | X | | | | |
| 6. Downstream slope | | | | | |
| a. Erosion | | X | | | Erosion observed on eastern berm. |
| b. Vegetation | | X | | | Woody vegetation present along the western slope of the West Impoundment next to the Grand River. |
| c. Rodent burrows | X | | | | None observed. |
| d. Slide, Slough, Scarp | X | | | | |
| e. Drain conditions | X | | | | |
| f. Seepage | X | | | | |
| 7. Toe | | | | | |
| a. Vegetation | X | | | | |
| b. Rodent burrows | X | | | | |
| c. Settlement | X | | | | |
| d. Drainage conditions | X | | | | |
| e. Seepage | X | | | | |
| f. Other | X | | | | |

Notes:

- 1.) A concrete overflow structure and sluice gate conduit between the east and west impoundments allow for water level regulation between the two impoundments and prevents overtopping of the embankment. These impoundments do not have an outlet structure that discharges from the impoundments. A pumped outlet is regulated by the Michigan Department of Environment, Great Lakes and Energy (EGLE) Permit number MI 0000728. Bottom ash has been excavated from these impoundments via crane or excavator and transported off-site. The impoundments no longer receive ash from the plant, the plant ceased operations in February 2020.
- 2.) Approximate impoundment capacities and interior elevations obtained from, Soils and Structures: Final Report of Evaluation For Grand Haven Power Plant Ash Impoundment Grand Haven, Michigan (Soils & Structures, 2014), and Annual Ash Impoundment Inspection Report (Soils & Structures, 2016). There have been no changes to the geometry of the Unit 3 East and West Bottom Ash impoundments.
- 3.) 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 Operations and Maintenance Plan.
- 4.) ft-msl = feet above mean sea level.



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