



July 1, 2016

Grand Haven Board of Light & Power
17000 Eaton Drive
Grand Haven, Michigan 49417

Attention: Mr. Paul Cedarquist

Regarding: Grand Haven BLP - Ash Impoundment Evaluation
Grand Haven, Ottawa County, Michigan
Project No. 2016.0329

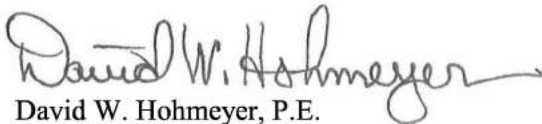
Dear Mr. Cedarquist:

Soils & Structures is pleased to present the report of the annual inspection the ash (CCR, Coal Combustion Residuals) surface impoundments at the Grand Haven Board of Light & Power Plant.

The attached report presents the observations, conclusions and recommendations.

We appreciate the opportunity to be of service to you. If additional information is required, questions arise or we may be of additional assistance please contact our office.

Sincerely,
Soils & Structures Inc.


David W. Hohmeyer, P.E.
DWH/dh

Project No. 2016.0329





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1.0 Purpose of Inspection

The annual inspection of Coal Combustion Residuals (CCR) surface impoundments commonly referred to as ash ponds is required by United State Environmental Protection Agency.

The Grand Haven Board of Light & Power Generating Plant on Harbor Island has two impoundments as part of its facility.

The purpose of the inspection is to verify the condition of the two impoundments and identify maintenance or repair items relative to potential accidental discharge or loss of the contained materials and fluid. The scope of work consisted of the following tasks:

1. Visual examination and photographic documentation of the impoundments
2. Review of the evaluation report by Soils & Structures dated July 17, 2016

2.0 Background Information

The Grand Haven Board of Light & Power Generating Plant is located on Harbor Island in Grand Haven, Ottawa County, Michigan. The facility is owned by the City of Grand Haven.

The ponds are used to contain the bottom ash captured by the precipitator. The process used to capture the ash results in a slurry of water and ash. The impoundments are used to allow the ash to settle out of the slurry reducing its water content and volume before it is transported to a landfill.

The two impoundments are similar in size and are situated adjacent to each other so that they have a common embankment between them. The overall length of the impoundment areas ranges from 175 to 190 feet. The width ranges from 71.0 to 80.0 feet. The depth of the impoundments ranges from 4.0 to 6.0 feet. The volume of each of the impoundments is approximately 2 acre feet. The width of the top of the berms ranges from 10.0 to 24.0 feet. Table One summarizes the range of elevations.



The range of the elevation of each part of the impoundments is present in Table One.

Table #1: Impoundment Elevations			
Location	Impoundment Interior Grade Elevation	Top of Berm Elevation	Exterior Grade Elevation
East Impoundment	587.4' to 587.9'	591.2' to 592.7'	583.8' to 583.9'
West Impoundment	585.0' to 588.2'	591.2' to 592.7'	583.8' to 590.5'

The elevation of the Grand River ranges from 577.5 to 582.0 feet.

3.0 Conclusions & Recommendations

The items reviewed is summarized in the attached table. The items were categorized based on condition and the following definitions.

Acceptable: Item is intact and requires monitoring only per the required inspections.

Monitor: A condition exists that could deteriorate and become more significant. Frequent inspections are recommended. When this condition is a note an inspection will be recommended.

Inspection: A condition exists that is potential of immediate concern. Testing and further inspections are recommended to access the significance.

Repair: An item or condition exists that requires repair. Repairs are divided into three categories, immediate, short term and long term. Immediate repairs are recommended in less than one month. Short term repairs are recommended in one to six months. Long term repairs are recommended in six months to one year.

Based on this inspection one item is recommended for repair. The exterior side of the berm that forms the east side of the east impoundment is recommended. The recommended detail is 3.0 inches of topsoil covered by a seeded erosion control mat. The recommended erosion control mat is American Green Eronet SC150 Permanent Erosion Control Blanket or equal.



Photograph #1: East berm of the east embankment. Vegetating the exterior slope is recommended. The view is to the south. (Grand Haven Board of Light & Power, Ash Impoundments, Grand Haven, Michigan, June, 2016)



Photograph #2: Typical erosion gully on the exterior face of the east berm of the east embankment. Vegetating the exterior slope is recommended. The view is to the west. (Grand Haven Board of Light & Power, Ash Impoundments, Grand Haven, Michigan, June, 2016)

4.0 General Conditions & Reliance

The report was prepared in accordance with generally accepted practices of the engineering profession. The scope of work consisted of a visual examination of the impoundments.

The report and test information may be relied upon by the Grand Haven Board of Light & Power for the operation, operation and permitting of the existing two ash ponds or impoundments at the Grand Haven Board of Light and Power Facility in Grand Haven, Ottawa County, Michigan.



Dam/Impoundment Visual Inspection Summary

Project: Grand Haven Board of Light and Power
 Client: Grand Haven Board of Light and Power
 Inspector: David Hohmeyer, P.E.

Project No. 2016.0329
 Location: Grand Haven, Michigan
 Inspection Date: April 29, 2016

General Description of Structure: Two evaporation ponds located in the north side of the plant. The entire facility is located on an island. The two ponds are connected with a weir. The ash-water mixture enters the ponds through steel pipe and weir. The weir is located in the berm common to the two ponds. All of the solidification and reduction in water content is achieved by evaporation.

Table One: Summary of Observations							
Item	Acceptable	Monitor/ Maintenance	Investigation	Repair			Remarks
				Immediate	Short Term	Long Term	
1. Overall Conditions							
a. Normal water level	X						588' to 590' 1' to 3' below crest
b. High water level	X						588' to 590' 1' to 3' below crest
c. Low water level	X						585' to 588' Empty
d. Water level at time of inspection	X						East – 586±, near empty West - 589±, normal level
e. Capacity	X						40,000 to 50,000 cf.
f. Alterations / Renovations	X						No recent renovations apparent
g. Cover							Grass in most areas. Limited exposed areas.
h. Settlement / Subsidence	X						None observed



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2. Inflow Structure						Weir located in the perm common to the two ponds.
a. Settlement	X					None
b. Cracking / Distress	X					None
c. Corrosion	X					Surface corrosion on metal mostly near water line. Very minor efflorescence on concrete near water line.
d. Obstructions	X					None
e. Erosion / Undermining	X					None
f. Seepage Around Structure	X					None
3. Outflow Structure						Not applicable – No out flow structure
a. Settlement						
b. Cracking / Distress						
c. Corrosion						
d. Obstructions						
e. Erosion / Undermining						
f. Seepage						
4. Exterior Slopes						
a. Settlement / Slumping	X					None
b. Erosion				X		East side of east pond. Shallow gullies or washouts up to 12" deep. Note (A)
c. Rodent burrows	X					None
d. Vegetation				X		Grass with well-established root structure except on east face of east pond. Note (A)
e. Erosion Protection				X		Grass with well-established root structure except on east face of east pond. Note (A)
5. Interior Slopes						
a. Settlement / Slumping	X					Minor slumping near top of slope.
b. Erosion		X				Minor erosion near top of slope. Note (B)
c. Rodent burrows	X					None
d. Vegetation	X					Vegetation is present above the water line on the berm common to the two ponds. The remainder of the interior slopes are exposed soil.
e. Erosion Protection	X					



6. Crest							
a. Cover / Soil Condition	X						Exposed soil mixed with stone
b. Erosion	X						None
c. Rodent burrows	X						None
d. Traffic	X						Occasional truck traffic. Tracks apparent with little or no rutting
7. Toe & Surrounding Area							
a. Settlement	X						None
b. Rodent burrows	X						None
c. Vegetation	X						Well established grass outside of maintained road ways
d. Erosion / Undermining	X						None
e. Seepage	X						None
Remarks: (A) Minor erosion on the exterior of the east berm. Vegetating slope is suitable method for preventing erosion on this slope. (B) Minor regrading and incidental filling of the top of the interior slopes was apparent. Regular maintenance is suitable method for addressing this item.							