Initial Inspection Report

For Compliance with the EPA Coal Combustion Residuals (CCR) Rule 40 CFR 257.83(b)

Erickson Power Station –
Forebay and Retention Basin

August 10, 2020

Prepared for:
Lansing Board of Water and Light
Erickson Power Station
3725 South Canal Road
Lansing, Michigan 48917

Prepared by:
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1 Introduction and Purpose

HDR MICHIGAN, Inc. (HDR) has prepared this Initial Inspection Report for the Forebay and Retention Basin at Erickson Power Station following the requirements of the Federal Coal Combustion Residuals (CCR) Rule to demonstrate compliance of the existing Erickson Power Station in Lansing, Michigan.

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the final rule (Ref. [1]) for disposal of Coal Combustion Residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act (RCRA). CCR Rule 40 CFR 257.73(b) requires that owners or operators of an existing CCR surface impoundment that either 1) has a height of five feet or more and a storage volume of 20 acre-feet or more; or 2) has a height of 20 feet or more perform periodic structural stability assessments (40 CFR 257.73(d)) and periodic safety factor assessments (40 CFR 257.73(e)). It was determined that the Forebay and Retention Basin at the Erickson Power Station meets the first criteria with a height of five feet or more and a storage volume greater than 20 acre-feet.

Additionally, CCR Rule 40 CFR 257.83(b)(1) states that if the existing CCR surface impoundment is subject to the periodic structural stability assessment requirements under 40 CFR 257.73(d), then the impoundment must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This report presents the initial inspections for the Forebay and Retention Basin.

The Initial Inspection Report presented herein addresses the specific requirements of 40 CFR 257.83(b). This Initial Inspection Report was prepared by Mr. Bryce Burkett, P.E., and was reviewed in accordance with HDR's internal review policy by Mr. Adam N. Jones, P.E., both of HDR. Mr. Burkett is a registered Professional Engineer in the State of Michigan.

1.1 Site Location

Erickson Power Station is an electrical power generation facility located at 3725 South Canal Road, Lansing, Michigan which is owned and operated by Lansing Board of Water & Light (BWL). The latitude and longitude of the Erickson Power Station are approximately 42.692422 N and 84.657764 W. The site is located southwest of Lansing Michigan, near the intersection of Interstates 69 and 96, as shown in the vicinity map, Figure 1.

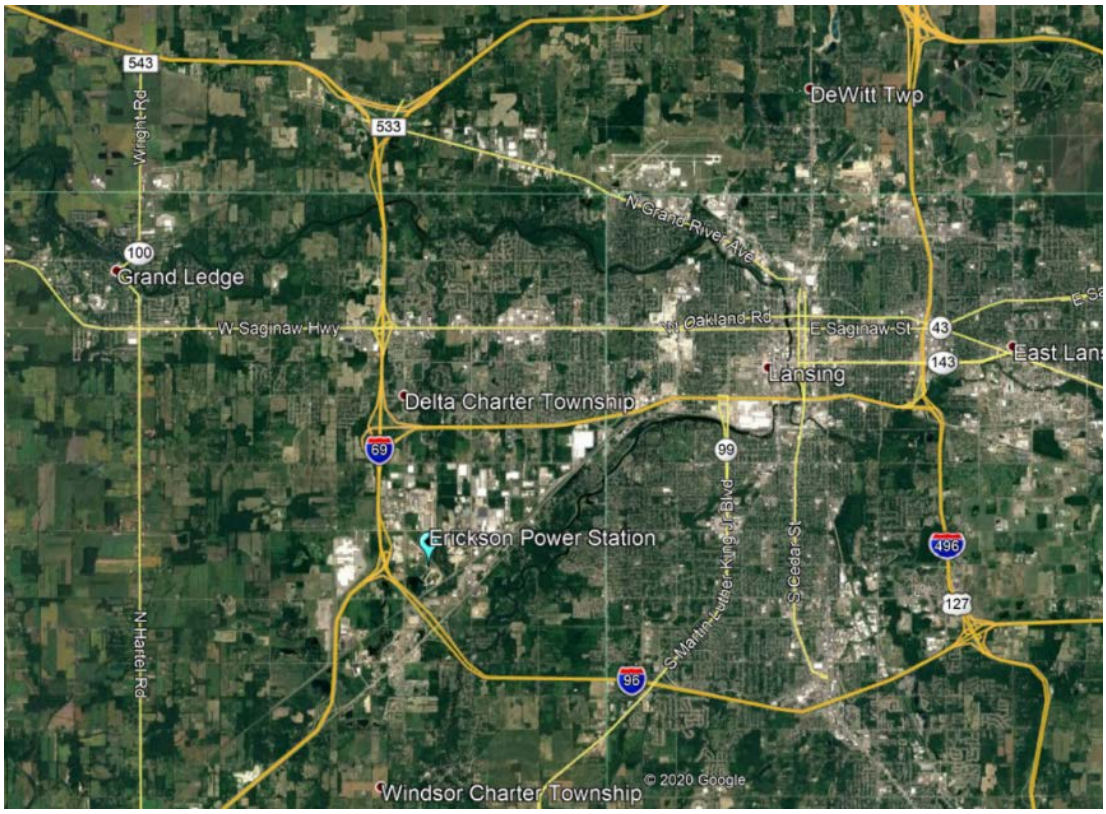


Figure 1. Site Vicinity Map

1.2 Site Description

Erickson Power Station was constructed starting in 1970, was completed in 1973, and is scheduled to close in 2025 as part of the BWL's move to cleaner energy sources. Erickson Power Station contains a single coal-fired steam turbine/generator capable of producing 165 megawatts of electricity.

Historically, fly ash and bottom ash resulting from the coal combustion process were mixed with water to form a slurry and pumped from the plant to the 33-acre impoundment system (physically closed in 2014). From the impoundment, the water then flowed hydraulically to the Clear Water Pond. Water from the Clear Water Pond was recycled back to the plant via the Pump House for reuse.

From 2009 through 2014, the ash was removed from the 33-acre impoundment, and a new system (including the construction of the Forebay and Retention Basin) (Ref. [5]) was installed. The Forebay and Retention Basin were installed within the footprint of the excavated 33-acre Former Impoundment and cover approximately 5-acres, leaving the Former Impoundment with a surface area of 28-acres.

Currently, bottom ash from the coal-fired boiler is sluiced from the plant to dewatering tanks (hydro-bins). The dewatered bottom ash is trucked to a sanitary landfill and the decant water is hydraulically fed through the current impoundment system, which consists of a series of three impoundments: the Forebay, Retention Basin, and Clear Water Pond.

The Forebay has an approximate normal pool surface areas of 2.1 acres. The Forebay has a normal operating pool level of approximately El. 882.3 feet NAVD 88[1].

The Retention Basin has an approximate normal pool surface areas of 2.6 acres. The Retention Basin has a normal operating pool level of approximately El. 881.8 NAVD 88.

The embankments of the Forebay and Retention Basin consist of compacted clay fill. Liner systems are installed on the interior embankments and impoundment floors of the Forebay and Retention Basin. The liner system consists of geosynthetic clay liners (GCL) overlain with a 40 millimeter-thick flexible polyvinylchloride membrane (FML). Each FML is protected with geofabric and 6- to 12-inches of granular fill. Vents are positioned at 40-feet intervals along the perimeter of the embankments to relieve buildup of gases that may develop under the installed liner system.

The water conveyance system associated with the Forebay and Retention Basin is discussed below. Rainfall that falls directly onto the footprint of the Forebay and Retention Basin and adjacent dikes is the only other inflow (i.e. there is no run-on from adjacent areas). There are no gates valves or regulating devices in the outlet structures.

Figure 2 displays the Erickson Power Station site configuration.

Figure 2. Erickson Power Station Site Configuration

[1] North American Vertical Datum of 1988

Figure 3 presents a Google Earth view looking NNE, identifying the Forebay and Retention Basin in relation to the impoundment system. Also viewable in Figure 3 is the Clear Water Pond, Lake Delta, Former Impoundment, coal pile, and Erickson Power Station.

Figure 3. Google Earth Image of Impoundment System

The Forebay and Retention Basin have nine hydraulic structures that extend through the embankments:

- Forebay Influent Pipes
  - Three ductile iron pipes (DIP) transferring water from the 1) plant sump, 2) Hydro-Bins, and 3) Coal-Pile Runoff Pond to the Forebay.
- Forebay Overflow
  - Three corrugated plastic pipes (CPP) transferring water from the Forebay to the Retention Basin.
- Former Impoundment Overflow
  - One CPP transferring water from the Former Impoundment to the Retention Basin.
- Retention Basin Overflow Structure
  - Retention Basin Overflow Structure allows flow from the Retention Basin to the Clear Water Pond.
- By-Pass Pipe
  - One CPP pipe by-pass inlet from transferring water from the plant sump directly to the Retention Basin (bypassing the Forebay).

Figure 4 (Ref. [6]) displays a plan view of the Forebay and Retention Basin with the locations of the associated hydraulic structures and pipes extending through the

embankments. Elevations displayed in Figure 4 (Ref. [6]) presents survey information referenced to NGVD 29[2] and NAVD 88.

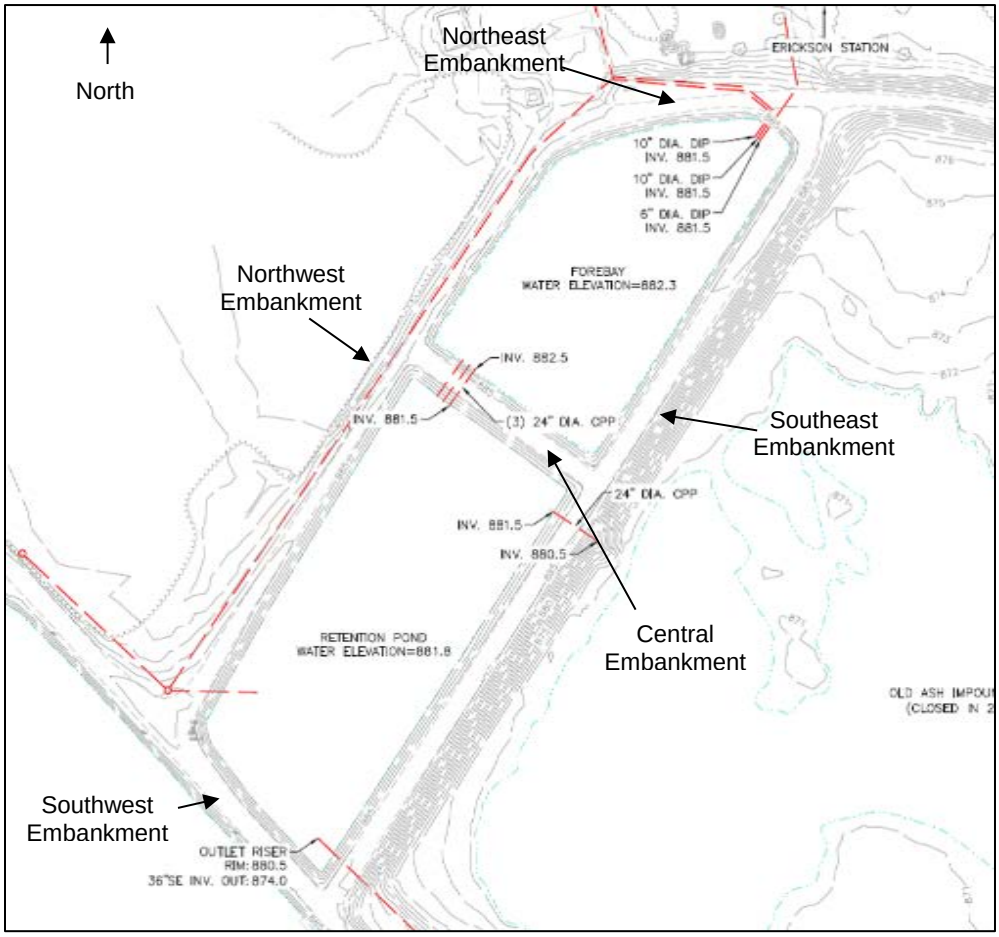


Figure 4. Location of Forebay and Retention Basin Hydraulic Structures

The following provides details of each hydraulic structure located at the Forebay and Retention Basin.

It should be noted that elevations presented in this report refer to NGVD 29 and NAVD 88 as elevations presented in existing documents reference to each vertical datum. A survey was performed by BWL on May 7, 2020 which provided elevations at many of the structures for the impoundment system. At the site, the conversion from NGVD 29 to NAVD 88 is -0.63 feet (i.e. NGVD 29 is 0.63 feet higher than NAVD 88). Elevations are provided referencing each datum throughout this report for clarity.

Forebay Influent Pipes

Water enters the Forebay through the Northeast Embankment through a gang of three DIP with inverts set at El. 881.6 feet NAVD 88 (882.2 feet NGVD 29):

- One 12-inch diameter pipe from the plant sump, reduced to a 10-inch diameter discharge pipe to the Forebay.
- One 10-inch diameter pipe from the Hydro-Bins to the Forebay.

[2] National Geodetic Vertical Datum of 1929

- One 6-inch diameter pipe from the Coal-Pile Runoff Pond to the Forebay.

Forebay Overflow

Water travels from northeast to southwest across the Forebay, where the water exits the Forebay through the Central Embankment that separates the Forebay and Retention Basin, via three 24-inch diameter CPP pipes. The invert of the effluent pipes (Forebay side) are set at approximately El. 882.4 to 882.6 feet NAVD (883.1 to 883.3 feet NGVD 29). The invert of the influent pipes (Retention Basin side) are set at approximately El. 881.4 to 881.7 feet NAVD 88 (882.0 to 882.3 feet NGVD 29).

Former Impoundment Overflow

The Former Impoundment Overflow is located through the Southeast Embankment of Retention Basin and consists of one 24-inch diameter CPP which conveys flow to the Retention Basin from the Former Impoundment, in the event of flooding in the Former Impoundment. The invert of the effluent pipe (Former Impoundment side) is set at approximately El. 881.5 feet NAVD 88 (882.2 feet NGVD 29) and the invert of the influent pipe (Retention Basin side) is set at approximately El. 880.8 feet NAVD 88 (881.4 feet NGVD 29).

Retention Basin Overflow Structure

The Retention Basin Overflow Structure is located at the southeast corner of the Retention Basin. Overflow from the Retention Basin flows through the 72-inch overflow riser and then through a 941 feet long, 36-inch diameter CPP which enters the Old Ash Impoundment Transfer Structure located at the southwest corner of the Former Impoundment. From there, the effluent water then enters the Clear Water Pond. The pipe consists of 36-inch CPP, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. The Retention Basin Overflow Structure was originally constructed with a trash rack consisting of high-impact plastic, however the trash rack was disconnected from the structure during a storm event and is currently resting in the shallow water of the Retention Basin.

The invert of the overflow pipe is set at approximately El. 879.9 feet NAVD 88 (880.5 feet NGVD 29) and the invert of the outlet pipe is at approximately EL. 873.4 feet NAVD 88 (874.0 feet NGVD 29).

By-Pass Pipe

A 12-inch diameter CPP was installed as a by-pass pipe to transfer water from the Erickson Power Station plant sump. The by-pass is operated by two valves located at the southwest corner of the Retention Basin. The by-pass pipe travels under the Northwest Embankment of the Retention Basin.

1.3 Previous Assessments and Inspections

A dam assessment was performed previously for the Erickson Power Station Ash Pond, as summarized in the Round 10 Dam Assessment in GZA 2012 (Ref. [2]). GZA 2012 addressed the Ash Pond, which was undergoing closure at the time of the assessment. The Ash Pond has since been closed and is referred to herein as the Former Impoundment. GZA 2012 was conducted prior to the construction of the Forebay and Retention Basin.

BWL performs weekly inspections of the entire CCR impoundment system. The weekly inspections are completed by qualified individuals to check for potentially hazardous conditions or structural weakness and the results of the inspections are documented internally on Weekly Inspection Reports.

There have been no reports of structural instability at the Forebay and Retention Basin during previous inspections.

There are no records of previous inspections (aside from the BWL weekly inspections) that have been performed for the Forebay and Retention Basin embankments.

2 Visual Inspection - 40 CFR 257.83(b)

The requirements to be documented in the Inspection Report for existing CCR surface impoundments are detailed in 40 CFR 257.83(b): *Annual inspections by a qualified professional engineer.* CCR Rule 40 CFR 257.83(b)(2) states that the inspection report must address the following items:

§257.83 (b)(2)(i): Any changes in geometry of the impounding structure since the previous annual inspection.

§257.83 (b)(2)(ii): The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection.

§257.83 (b)(2)(iii): The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.

§257.83 (b)(2)(iv): The storage capacity of the impounding structure at the time of the inspection.

§257.83 (b)(2)(v): The approximate volume of the impounded water and CCR at the time of the inspection.

§257.83 (b)(2)(vi): 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.

§257.83 (b)(2)(vii): Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

The visual inspection site visit was conducted on June 24, 2020 by Bryce Burkett, P.E. of HDR. Cheryl Louden of BWL accompanied HDR during the inspection. The pool levels in the Forebay and Retention Basin were unknown at the time of inspection as there are no staff gauges installed for either pond. However, the ponds appeared to be operating at their normal pool levels of approximately El. 882.3 feet NAVD 88 (882.9 feet NGVD 29) for the Forebay and approximately El. 881.8 NAVD 88 (882.4 feet NGVD 29) for the Retention Basin. The weather on June 24 was sunny with temperatures between 70 and 80 degrees. Rainfall had not occurred within the 24 hours prior to the inspection.

The storage capacity of the Forebay is 933,000 cubic feet at approximate top of dike El. 883.4 NAVD 88 (884 feet NGVD 29), and the approximate volume of impounded

water/CCR in the Forebay at the time of inspection (surface water level of El. 882.3 feet NAVD 88) was approximately 832,000 cubic feet (Ref. [4]).

The storage capacity of the Retention Basin is 1,298,000 cubic feet at approximate top of dike El. 884.4 NAVD 88 (885 feet NGVD 29) and the approximate volume of impounded water/CCR in the Retention Basin at the time of inspection (surface water level of El. 881.8 feet NAVD 88) was approximately 964,000 cubic feet (Ref. [4]).

The visual inspection was conducted in accordance with the CCR Final Rule to identify signs of distress or malfunction of the CCR unit and appurtenant structures and consisted of observations of features and conditions readily discernible by external visual inspection through reasonable efforts. Relevant photographs with the corresponding photograph locations are provided in Appendix A and the Inspection Checklist Forms are provided in Appendix B. A discussion of the embankment conditions is presented in the following subsections and the terminology describing the embankment sections is shown in Figure 5.

Figure 5. Forebay and Retention Basin Embankment Terminology

2.1.1 Southeast Embankment

The Southeast Embankment separates the Forebay and Retention Basin to the northwest and the Former Impoundment, which is closed, to the southeast. The Southeast Embankment appeared to be in good condition (Photos 1, 3, 6, 7, and 18), and no evidence

of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes, except as noted herein.

- The crest of the embankment consisted of a gravelly/soil surface (Photos 1, 7, and 18). Minor rutting of the crest was observed, as seen in Photo 7.
- Rip-rap protects the interior and exterior slopes, which was in good condition.
- Vegetation has become overgrown on the interior and exterior slopes.
- The vents installed as part of the liner system were visible, appeared to be in good condition, and were free of debris.

There were no other significant observations.

2.1.2 Northeast Embankment

The Northeast Embankment separates the Forebay to the southwest and the Hydro-Bins and grassy areas to the north. The Northeast Embankment appeared to be in good condition, and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed, except as noted herein.

- Rip-rap protects the interior slope. The crest of the embankment consisted of a gravelly/soil surface. There is no exterior slope for the Northeast Embankment. The crest and downstream slope appeared to be in good condition.
- Vegetation has become overgrown on the interior slope.

There were no other significant observations.

2.1.3 Northwest Embankment

The Northwest Embankment separates the Forebay and Retention Basin to the southeast and wooded areas to the northwest. The Northwest Embankment appeared to be in good condition (Photos 11, 12, and 14), and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes, except as noted herein.

- Rip-rap protects the interior slope and vegetation covers the exterior slope. The condition of the exterior slope was hard to assess due to the dense vegetation. The crest of the embankment consisted of a gravelly/soil surface.
- Vegetation has become overgrown on the interior and exterior slopes.

There were no other significant observations.

2.1.4 Southwest Embankment

The Southwest Embankment separates the Retention Basin to the northeast and Lake Delta to the southwest. The Southwest Embankment appeared to be in good condition (Photos 15 and 16), and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes, except as noted herein.

- Rip-rap protects the interior slope and vegetation covers the exterior slope (adjacent to Lake Delta). The condition of the exterior slope was hard to assess due to the dense vegetation. The crest of the embankment consisted of a gravelly/soil surface (Photos 15 and 16).
- Vegetation has become overgrown on the interior and exterior slopes.

There were no other significant observations.

2.1.5 Intake/Outlet Structures

Forebay Influent Pipes

The Forebay Influent Pipes, located at the northeast corner of the Forebay, appeared to be in good condition (Photos 8 through 10). The coal run-off pipe was plugged at the time of the visual inspection (Photo 9). The pipes were submerged and the interior could not be observed. There was no evidence of settlement, sinkholes, or cracking in the area above the pipes extending through the Northeast Embankment.

Forebay Overflow

The Forebay Overflow pipes, appeared to be in good condition (Photos 13, 24, 25, 26, and 27). The pipes were partially submerged and the interior could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area above the pipes extending through the Central Embankment.

Former Impoundment Overflow

The Former Impoundment Overflow appeared to be in good condition (Photos 20, 21, and 22). There was insignificant overflow entering the Former Impoundment Overflow from the Retention Basin at the time of the inspection (Photo 21). The pipe consists of 24-inch CPP and the interior was observable at the time of the inspection and was clear of obstructions. There was no evidence of settlement, sinkholes, or cracking in the area above the Former Impoundment Overflow extending through the Southeast Embankment.

Retention Basin Overflow Structure

The Retention Basin Overflow Structure was submerged but partially visible at the time of inspection and appeared to be in good condition (Photo 19). However, the trash rack installed to prevent debris from entering the overflow has been dislodged during a storm event and now rests near the bank of the Retention Basin (Photo 22 and 28).

There was no evidence of settlement, sinkholes, or cracking in the area above the pipe extending through the Southeast embankment.

By-Pass Pipe

The by-pass pipe is buried and was not visible during the visual inspection.

There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Southwest Embankment.

Inspection of Submerged Structures

The CCR Final Rule requires that the annual inspection include a visual inspection of any 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. Visual inspections (either in the dewatered condition or via a remotely operated vehicle (ROV)) were not available for the buried or submerged pipes.

2.1.6 Instrumentation

As part of the hydrogeologic characterization study for Erickson Power Station, HDR installed several monitoring wells across the site to develop a groundwater monitoring network in 2019 and 2020 (Ref. [3]). Two of these monitoring wells (MW-3 and MW-4) were installed in the vicinity of the Forebay and Retention Basin as shown in Figure 6. The monitoring wells consist of 2-inch, Sch. 40 PVC risers. The monitoring well screen consists of 0.010-inch slots and is surrounded by a silica sand filter pack. Table 2-1 provides details for the two monitoring wells installed in the vicinity of the Forebay and Retention Basin.

Figure 6. Monitoring Well Locations

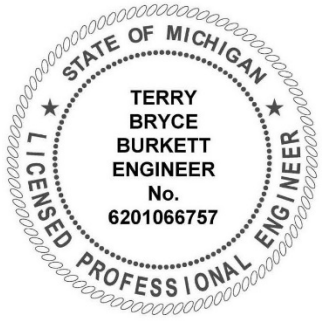
Table 2-1. Monitoring Well Details

Well	Elevation (TOC) (feet NAVD 88)	Well Stickup (feet)	Total Depth (feet)	Depth of Screen (feet)	Static Water Elevation (feet NAVD 88)
MW-3	884.81	-0.31	34.5	24-34	873.34
MW-4	889.15	3.92	28.0	18-28	874.65

No other instrumentation is present at the Forebay and Retention Basin.

3 Closure

Based on the information provided to HDR by BWL, information available on BWL's CCR website, and HDR's visual observations and analyses, this Initial Inspection was conducted in accordance with the requirements of the USEPA 40 CFR Parts 257 and 261 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 17, 2015 (CCR Final Rule). Based on the information currently available, I certify to the best of my knowledge, information and belief that this Initial Inspection of the Forebay and Retention Basin meets the requirements of CCR Rule §257.83(b) in accordance with professional standards of care for similar work. HDR appreciates the opportunity to assist BWL with this project. Please contact us if you have any questions or comments.



Bryce Burkett, P.E.
Senior Geotechnical Project Manager

Adam Jones, P.E.
Engineering Manager

10 Aug 2020

4 References

Ref. [1] Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, Washington D.C., April 2015.

Ref. [2] GZA GeoEnvironmental, Inc. Draft Round 10 Dam Assessment Report, Lansing Board of Water & Light, Erickson Power Station, Ash Pond. April 30, 2012.

Ref. [3] HDR Engineering, Inc. Monitoring Wall Installation Report, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, March 25, 2020.

Ref. [4] HDR Engineering, Inc. Inflow Design Flood Control System Plan, Erickson Power Station – CCR Surface Impoundments, Lansing Board of Water & Light, Lansing, Michigan, June 9, 2020.

Ref. [5] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, May 2015.

Ref. [6] NTH Consultants, Ltd. Closure Plan, CCR Surface Impoundment System, Erickson Power Station. August 16, 2019.

5 Appendices

Appendix A Site Visit Photographs
Appendix B Inspection Checklists

APPENDIX A
SITE VISIT PHOTOGRAPHS

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 1

Description:
Exterior slope of Southeast Embankment. Former Impoundment to the right of the photo and Forebay to the left of photo.

Photograph No. 2

Description:
Central Embankment. Forebay to the right of photo and Retention Basin to the left of photo.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 3

Description:
Interior slope of Southeast Embankment, Forebay to left of photo. Note vegetation.

Photograph No. 4

Description:
Forebay with Hydro-Bins in the distance.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 5

Description:
Vents for liner system underneath Forebay and Retention Basin. Vents are located approximately 40-feet intervals along perimeter embankment.

Photograph No. 6

Description:
Exterior slope of Southeast Embankment. Pump House at Clear Water Pond in the distance.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 7

Description:
Crest of Southeast Embankment. Note rutting from vehicle traffic.

Photograph No. 8

Description:
Forebay influent pipes. Note influent pipe (far left) from coal run-off was plugged by BWL at the time of the inspection.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 9

Description:
Forebay influent pipe from coal run-off. Note pipe is currently plugged.

Photograph No. 10

Description:
Signs indicating Forebay influent pipes. Forebay in the background.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 11

Description:
Interior slope of Northwest Embankment with Forebay to the left.

Photograph No. 12

Description:
Exterior slope of Northwest Embankment. Note vegetation.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 13

Description:
Central Embankment which separates Forebay and Retention Basin. Forebay overflow pipes (three) extending through the Central Embankment.

Photograph No. 14

Description:
Southwest Embankment with Retention Basin to left of photo. Lake Delta in the background.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 15

Description:
Southwest Embankment. Retention Basin to the left of photo and Lake Delta to the right of photo.

Photograph No. 16

Description:
Exterior slope of Southwest Embankment. Lake Delta to right of photo. Note vegetation.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 17

Description:
View of Retention Basin from Southwest Embankment.

Photograph No. 18

Description:
Southeast Embankment. Former Impoundment to right of photo and Retention Basin to the left of photo.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 19

Description:
Retention Basin Overflow Structure. Note missing trash rack.

Photograph No. 20

Description:
Former Impoundment Overflow through Southeast Embankment.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 21

Description:
Former Impoundment Overflow (photo take from Former Impoundment side). Note water flowing from Retention Basin into Former Impoundment.

Photograph No. 22

Description:
Former Impoundment Overflow (photo take from Retention Basin side) and sign. Note trash rack resting in pond. Trash rack became disconnected from the Retention Basin Overflow during a storm event.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 23

Description:
Central Embankment. Forebay to the right of the photo and Retention Basin to the left of the photo.

Photograph No. 24

Description:
Forebay overflow pipes discharging water from Forebay to Retention Basin.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 25

Description:
Forebay Overflow (influent) pipes and sign. Forebay in background.

Photograph No. 26

Description:
Forebay Overflow (effluent) pipes. Retention Basin in background.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Forebay and Retention Basin Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: June 24, 2020

Photograph No. 27

Description:
Forebay Overflow (effluent) pipes. Retention Basin to left of photo.

Photograph No. 28

Description:
Retention Basin Overflow trash rack resting in pond. Trash rack became disconnected from the Retention Basin Overflow during a storm event.

APPENDIX B
INSPECTION CHECKLISTS

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: June 24, 2020
Unit Name: Forebay	Operator's Name: Lansing Board of Water and Light
Unit I.D.: N/A	Hazard Potential Classification: **High** **Significant** **(Low)**
Inspector's Name: Bryce Burkett, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	882.3 ft		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	882.4 ft		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	884.0 ft		Is water exiting outlet, but not entering inlet?		X
If instrumentation is present, are readings recorded (operator records)?	X		Is water exiting outlet flowing clear?		X
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trash racks clear and in place?	N/A		From downstream foundation area?		X
Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

1. Weekly inspection performed by BWL staff of CCR Impoundment System.

5. Elevation obtained from MD&E Construction Documentation Report.

6. Monitoring well readings (MW-3, MW-4, and MW-5) collected by HDR.

23. Water is on the downstream toe for the embankment bordering Former Impoundment.

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # N/A INSPECTOR Bryce Burkett, P.E.

Date June 20, 2020

Impoundment Name: Erickson Power Station – Forebay

Impoundment Company Lansing Board of Water and Light

EPA Region N/A

State Agency (Field Office) Address N/A

Name of Impoundment Erickson Power Station – Forebay

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New x Update _____

	Yes	No
Is impoundment currently under construction?		x
Is water or ccw currently being pumped into the impoundment?	x	

IMPOUNDMENT FUNCTION: Settling of ash and nutrient uptake by wetlands vegetation

Nearest Downstream Town: Name: Dimondale

Distance from the impoundment: 1.05 miles

Impoundment Location:

Longitude 84 Degrees 39 Minutes 19 Seconds

Latitude 42 Degrees 41 Minutes 20 Seconds

State MI County Eaton

Does a state agency regulate this impoundment? YES _____ NO x

If So, Which State Agency? N/A

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__X__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

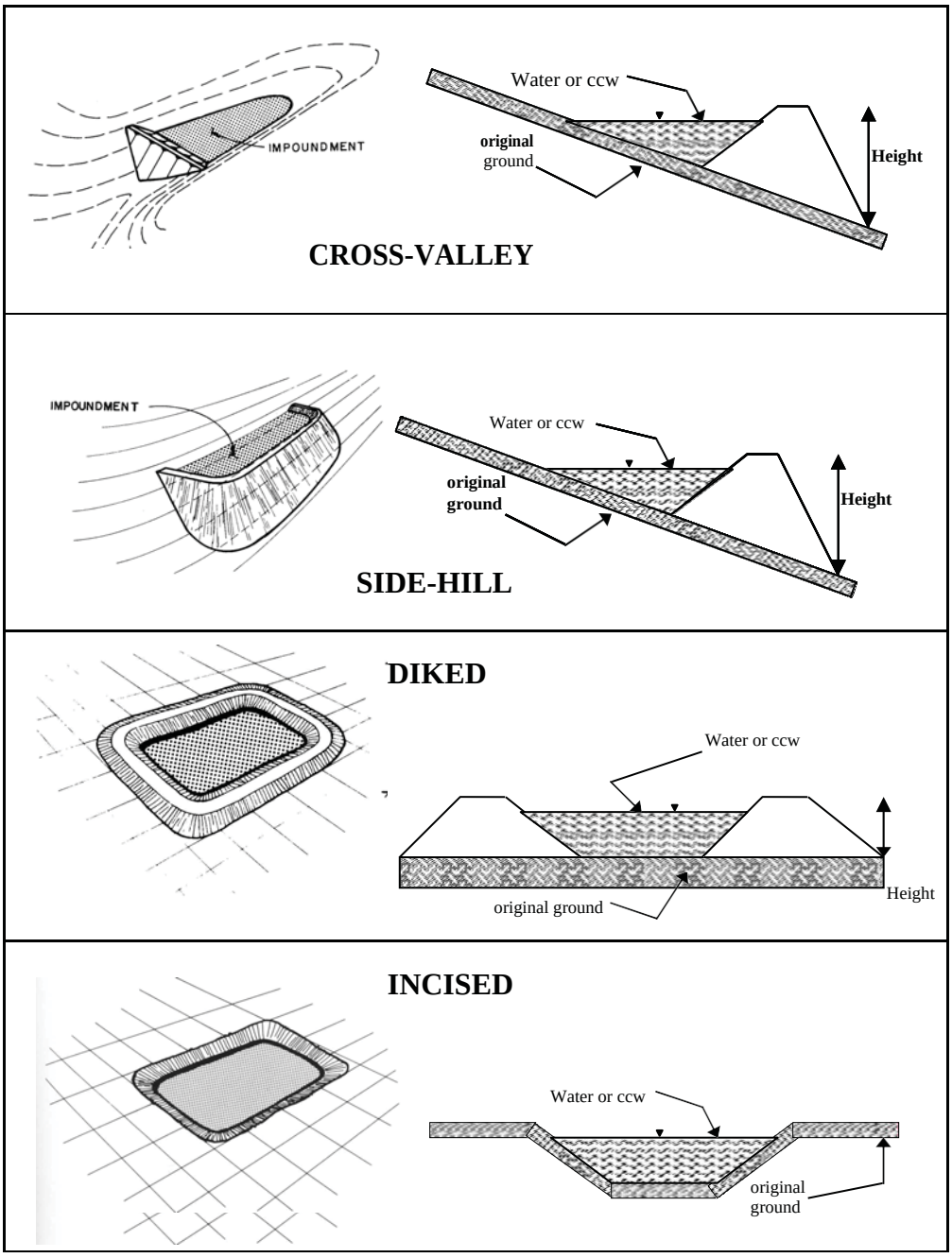
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Embankment failure would be limited primarily to owner's property with no probable loss of human life and low economic/environmental losses.

CONFIGURATION:



_____ Cross-Valley
_____ Side-Hill
__x__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height ____13____ feet
Pool Area ____2.7____ acres
Current Freeboard __2__ feet

Embankment Material Compacted Clay
Liner geosynthetic clay (GCL) and 40 millimeter-thick FML
Liner Permeability unknown

TYPE OF OUTLET (Mark all that apply)

N/A **Open Channel Spillway**

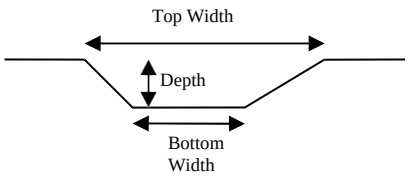
_____ Trapezoidal

_____ Triangular

_____ Rectangular

_____ Irregular

TRAPEZOIDAL



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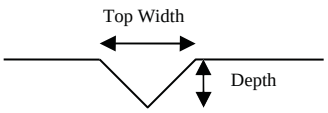
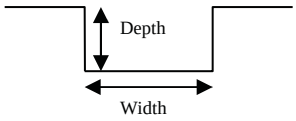


_____ depth

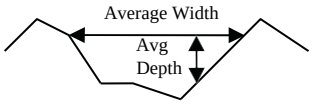
_____ bottom (or average) width

_____ top width

RECTANGULAR

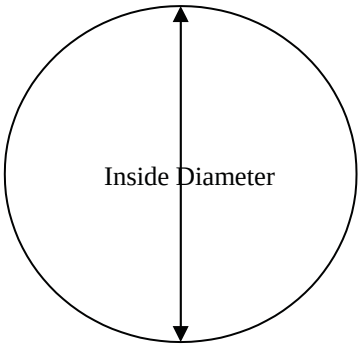


IRREGULAR



3 Outlets

2 ft inside diameter



Material

_____ corrugated metal

_____ welded steel

_____ concrete

x plastic (hdpe, pvc, etc.)

_____ other (specify) _____

Is water flowing through the outlet? YES x NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By: Mayotte Design & Engineering, P.C.

Has there ever been a failure at this site? YES_____NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES_____NO x

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES_____ NO___x___

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: June 24, 2020
Unit Name: Retention Basin	Operator's Name: Lansing Board of Water and Light
Unit I.D.: N/A	Hazard Potential Classification: **High** **Significant** (**Low**)
Inspector's Name: Bryce Burkett, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	881.8 ft		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	880.5 ft		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	885.0 ft		Is water exiting outlet, but not entering inlet?		X
If instrumentation is present, are readings recorded (operator records)?	X		Is water exiting outlet flowing clear?		X
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trash racks clear and in place?		X	From downstream foundation area?		X
Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

1. Weekly inspection performed by BWL staff of CCR Impoundment System.

5. Elevation obtained from MD&E Construction Documentation Report.

6. Monitoring well readings (MW-3, MW-4, and MW-5) collected by HDR.

12. Trash rack for overflow structure has been dislodged and is resting near bank of impoundment.

23. Water is on the downstream toe for the embankment bordering Former Impoundment and Lake Delta.

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # N/A INSPECTOR Bryce Burkett, P.E.

Date June 20, 2020

Impoundment Name: Erickson Power Station – Retention Basin
Impoundment Company Lansing Board of Water and Light

EPA Region N/A
State Agency (Field Office) Address N/A

Name of Impoundment Erickson Power Station – Retention Basin

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New x Update _____

	Yes	No
Is impoundment currently under construction?		x
Is water or ccw currently being pumped into the impoundment?	x	

IMPOUNDMENT FUNCTION: Settling of ash and nutrient uptake by wetlands vegetation

Nearest Downstream Town: Name: Dimondale
Distance from the impoundment: 1.05 miles
Impoundment Location: Longitude 84 Degrees 39 Minutes 16 Seconds
Latitude 42 Degrees 41 Minutes 21 Seconds

State MI County Eaton

Does a state agency regulate this impoundment? YES _____ NO x

If So, Which State Agency? N/A

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__X__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

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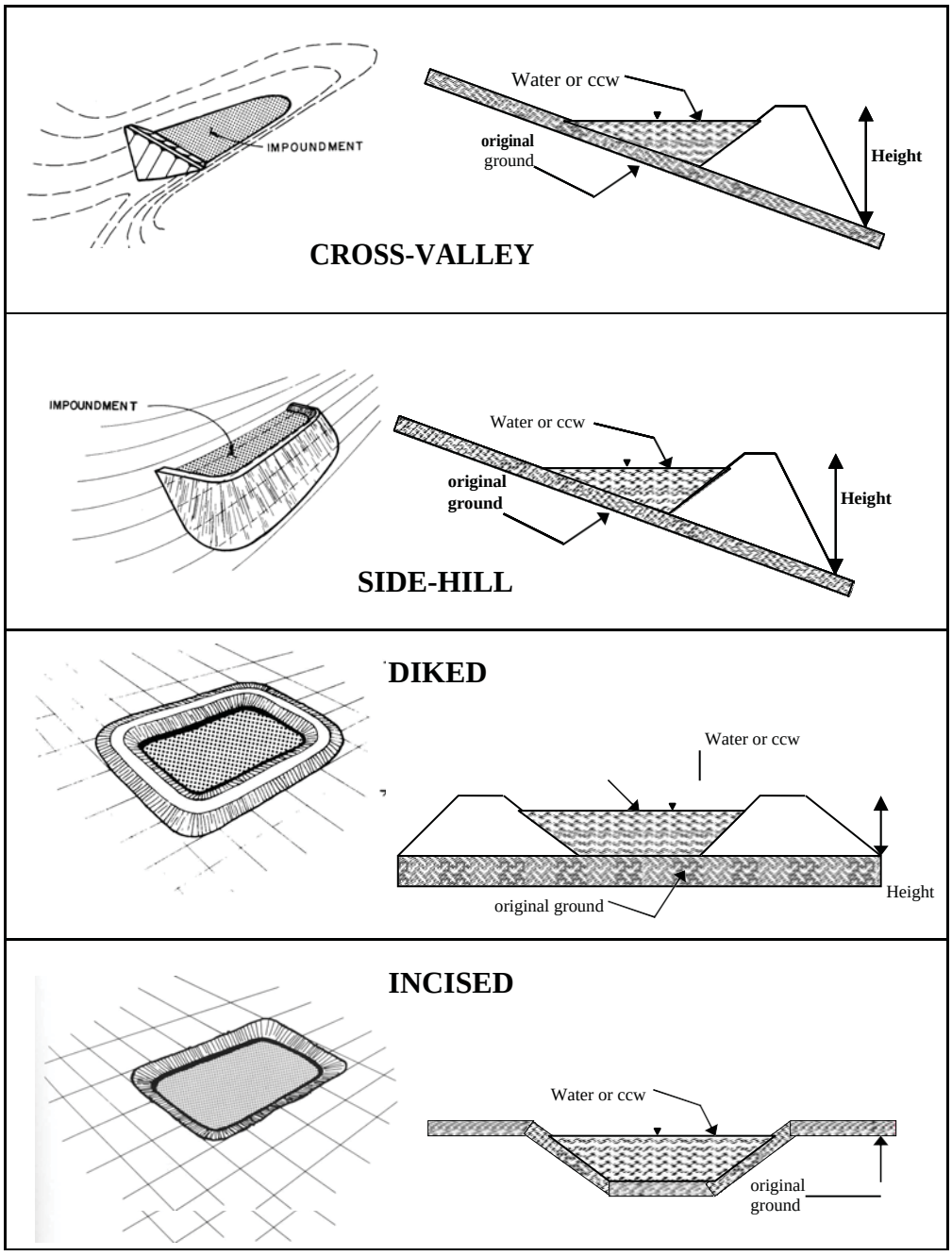
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Embankment failure would be limited primarily to owner's property with no probable loss of human life and low economic/environmental losses.

CONFIGURATION:



_____ Cross-Valley
_____ Side-Hill
__x__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height ____14____ feet
Pool Area ____3.6____ acres

Current Freeboard __3-4__ feet

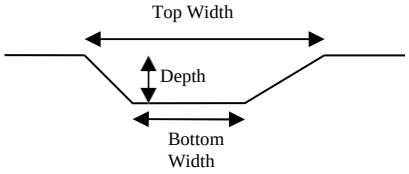
Embankment Material Compacted Clay
Liner geosynthetic clay (GCL) and 40 millimeter-thick FML

Liner Permeability unknown

TYPE OF OUTLET (Mark all that apply)

N/A **Open Channel Spillway**

TRAPEZOIDAL



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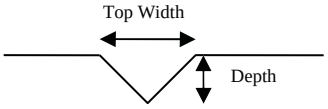
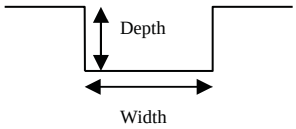


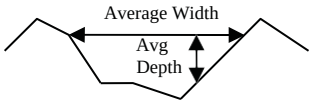
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR



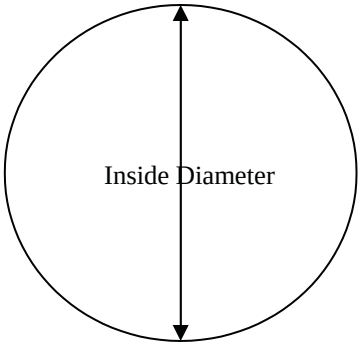
IRREGULAR



2 Outlets

6 ft inside diameter

2 ft inside diameter



Material
_____ corrugated metal
_____ welded steel
x concrete
x plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES x NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By: Mayotte Design & Engineering, P.C.

Has there ever been a failure at this site? YES_____NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES_____NO __x__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES_____ NO___x___

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____