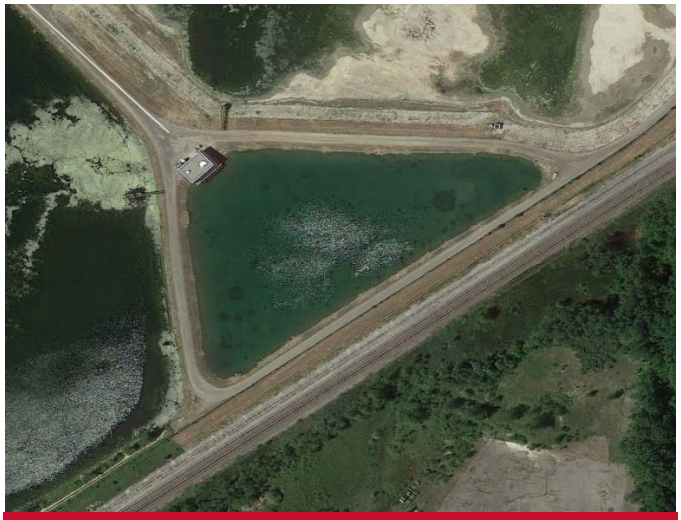

History of Construction

For Compliance with the EPA Coal Combustion Residuals (CCR) Rule 40 CFR 257.73(c)

Erickson Power Station – Clear Water Pond

June 12, 2020

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

Prepared by:
HDR MICHIGAN, Inc.
5405 Data Court
Ann Arbor, Michigan 48108

Contents

Tables

Figures

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1 Introduction

HDR MICHIGAN, Inc. (HDR) has prepared this History of Construction for the Clear Water Pond 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 compile a history of construction, which shall contain, to the extent feasible, the information specified in 40 CFR 257.73(c)(1)(i) through (xii). It was determined that the existing Clear Water Pond 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.

The History of Construction report presented herein addresses the specific requirements of 40 CFR 257.73(c)(1)(i) through (xii). Furthermore, if there is any significant change to any information compiled under paragraph 40 CFR 257.73(c)(1), the owner or operator of the CCR unit must update the relevant information and place it in the facility's operating record as required by 40 CFR 257.105(f)(9).

This History of Construction was prepared by Mr. Bryce Burkett, P.E., 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 in southwest Lansing, Michigan near the intersection of Interstates 69 and 96, as shown in the vicinity map, Figure 1.

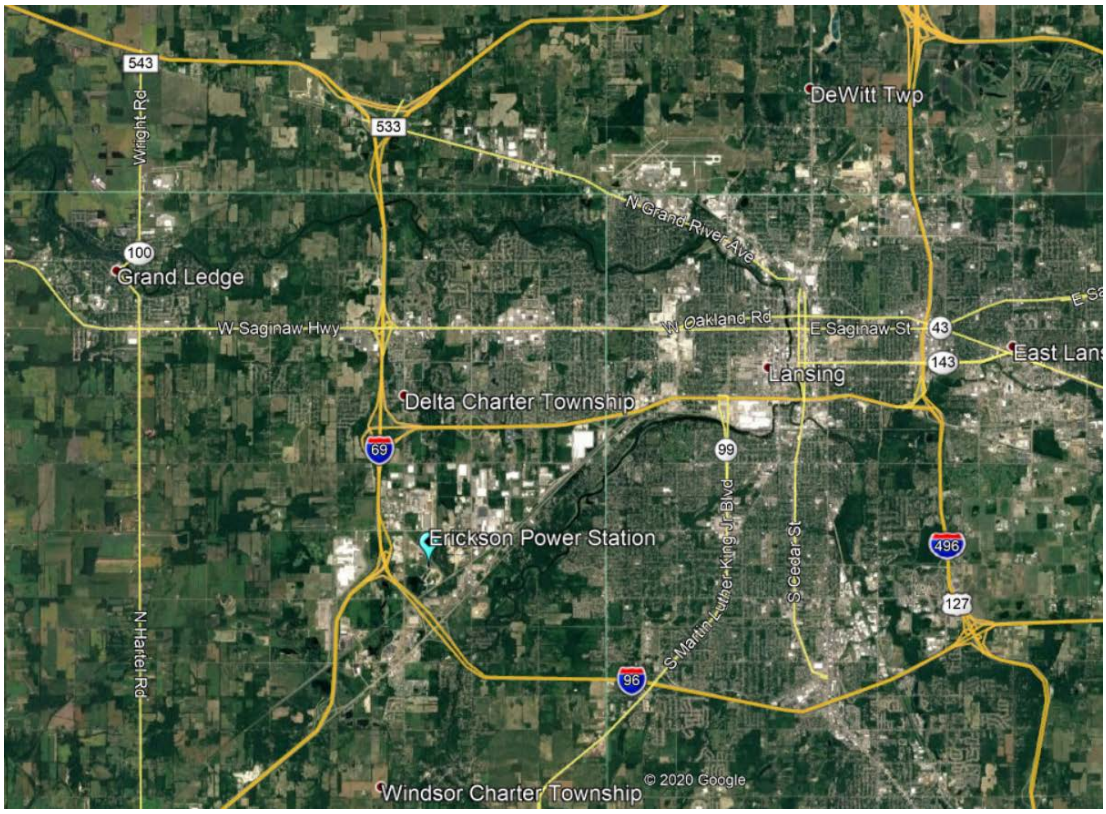

Figure 1. Site Vicinity Map

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.

Currently, the system consists of a series of three impoundments: the Forebay, Retention Basin, and Clear Water Pond. Figure 2 displays the Erickson Power Station site configuration, including the current impoundment system.

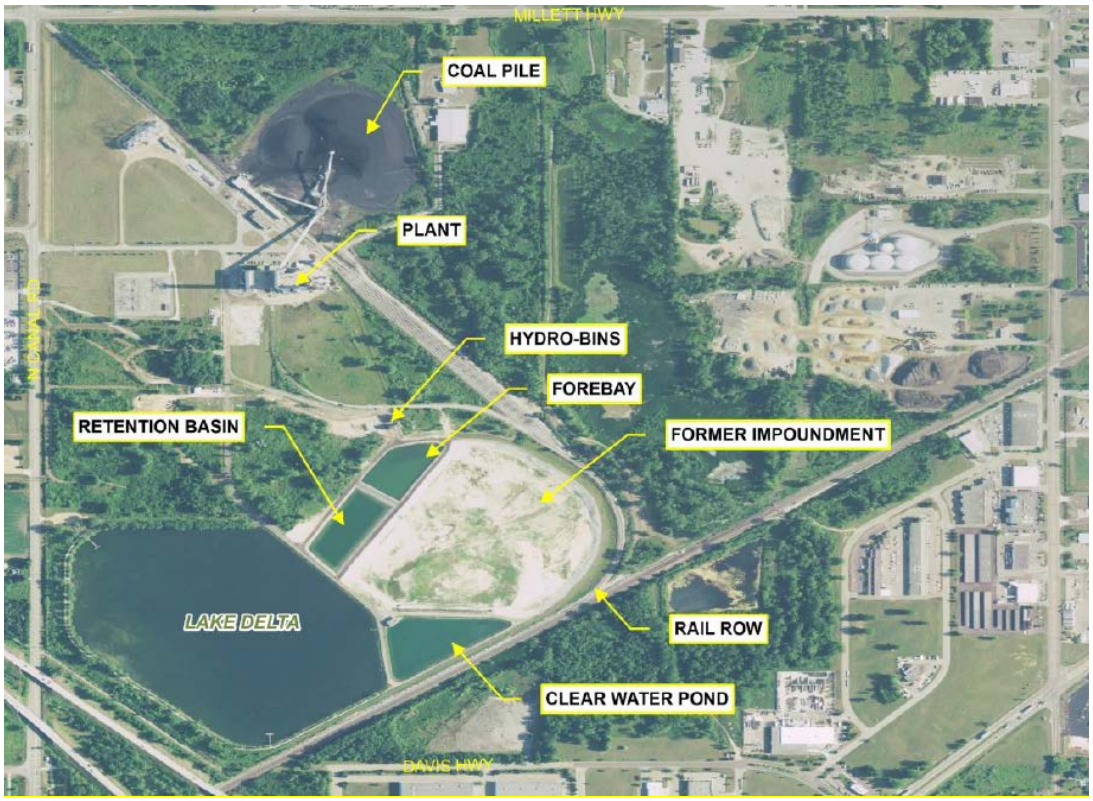

Figure 2. Erickson Power Station Site Configuration

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

Figure 3. Google Earth Image of Impoundment System

2 History of Construction Requirements

The requirements to be included in the History of Construction Report for existing CCR surface impoundments are detailed in 40 CFR 257.73: *Structural integrity criteria for existing CCR surface impoundments*. CCR Rule 40 CFR 257.73(c) states that the history of construction for an existing CCR impoundment (i.e. Clear Water Pond) is to be compiled and contain the information specified in 40 CFR 257.73(c)(1)(i) through (xii). Table 2-1 summarizes the information from paragraphs 40 CFR 257.73(c)(1)(i) through (xii), as well as the location of the information presented in this document.

Table 2-1. List of History of Construction Requirements

40 CFR Rule	Rule Information	Document Section
257.73 (c)(1)(i)	Owner/Unit Information	Section 3.1
257.73 (c)(1)(ii)	USGS Map Location	Section 3.2
257.73 (c)(1)(iii)	Purpose of CCR Unit	Section 3.3
257.73 (c)(1)(iv)	Name and Size of Watershed	Section 3.4
257.73 (c)(1)(v)	Description of Foundation and Abutment Materials	Section 3.5
257.73 (c)(1)(vi)	Statement of Materials Used in Construction, Method of Site Preparation, Dates of Construction	Section 3.6
257.73 (c)(1)(vii)	Detailed Drawings of Unit	Section 3.7
257.73 (c)(1)(viii)	Existing Instrumentation Details	Section 3.8
257.73 (c)(1)(ix)	Area-Capacity Curves	Section 3.9
257.73 (c)(1)(x)	Spillway and Diversion Design Features	Section 3.10
257.73 (c)(1)(xi)	Construction Specifications and Surveillance, Maintenance, and Repair Provisions	Section 3.11
257.73 (c)(1)(xii)	Structural Instability Records	Section 3.12

3 History of Construction

3.1 257.73 (c)(1)(i) - Owner and Unit Identification

§257.73 (c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Erickson Power Station is an electrical power generation facility located at 3725 South Canal Road in Lansing, Michigan and is owned and operated by the Lansing Board of Water & Light (BWL).

The name associated with the unit is the Clear Water Pond.

The unit has not been assigned an identification number by the State of Michigan.

3.2 257.73 (c)(1)(ii) - Unit Location on USGS Quadrangle

§257.73 (c)(1)(ii): The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.

Attachment 1 presents the *Site Location Map* with the Dimondale Quadrangle, Michigan, Eaton County, 7.5-minute series USGS Quadrangle, dated 2019. The location of the Clear Water Pond is shown on the quadrangle.

3.3 257.73 (c)(1)(iii) - Purpose of the CCR Unit

§257.73 (c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

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. [6]) 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 Clear Water Pond was constructed to provide a storage basin for water prior to recycling it back to Erickson Power Station via the Pump House located on the northwest corner of Clear Water Pond. During normal operating conditions, the water flows between the station, the impoundments, the Clear Water Pond, and back to the station.

There is one overflow associated with the impoundment system, which is the Emergency Overflow Structure located in the Clear Water Pond. The overflow structure consists of a 36-inch ductile iron pipe set at El. 883.0 feet NAVD 88. In the event of an emergency overflow, water would enter the overflow structure and flow to discharge to a swale that directs flow north to Carrier Creek, then north to Holly Drain, then to Clements Underhill Drain, and ultimately to the Grand River.

3.4 257.73 (c)(1)(iv) – Watershed Information

§257.73 (c)(1)(iv): The name and size in acres of the watershed within which the CCR unit is located.

According to the EPA WATERS GeoViewer (Ref. [2]), the Clear Water Pond impoundment is located within the Carrier Creek-Grand River subwatershed, which has a size of approximately 22,700 acres. Erickson Power Station is part of the Carrier Creek drainage basin shown in Figure 4.

No natural drainage runs into the Clear Water Pond, and the drainage area of the Clear Water Pond is limited to the 4.7 acre surface area of the pond and dikes.

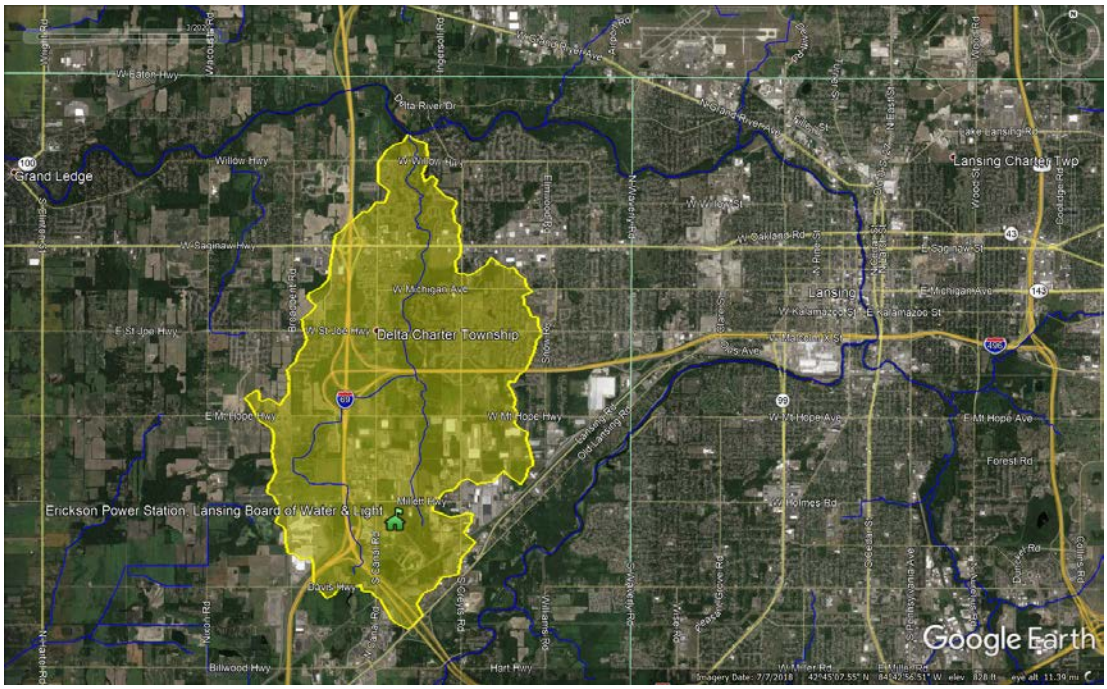

Figure 4. Carrier Creek Drainage Basin

3.5 257.73 (c)(1)(v) - Foundation and Abutment Materials

§257.73 (c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

Surficial soils in the area of the Clear Water Pond are shown to be composed of medium-textured glacial till on the Quaternary Geology of Southern Michigan Map (1982). Glacial till is typically a dense, heterogeneous mixture of soil ranging from clay to cobbles or boulders. Additionally, the map shows that glacial outwash and postglacial alluvium are present close to the site, which is typically comprised of sand or alternating layers of small gravel to heavy cobbles. These soils are anticipated to form the foundation of the Clear Water Pond. The Clear Water Pond was constructed entirely with a perimeter embankment, therefore there are no abutments.

Prior to the construction of the Erickson Power Station impoundment system, a subsurface investigation program was performed in 1969 by Dames & Moore. The soil boring logs performed for that study are presented in the Location Restrictions Report prepared by Mayotte Design & Engineering (MD&E) (Ref. [5]). In addition to the 1969 soil borings, geoprobe borings and test pits were performed at the site by MD&E in 2018. In 2019 and 2020, HDR installed six monitoring wells across the site, with one monitoring well (MW-1) being installed through the south embankment of the Clear Water Pond (Ref. [4]).

As part of the previous subsurface investigations, three borings (AP-4 through AP-6), three geoprobe borings (CW-SB-1 through CW-SB-3), and one monitoring well (MW-1) were performed/installed in the vicinity of the Clear Water Pond. The approximate boring and monitoring well locations are shown on Figure 5. The borings logs and monitoring well log are provided in Attachment 2.

Figure 5. Approximate Boring/Monitoring Well Locations at Clear Water Pond

The physical and engineering properties of the embankment and foundation materials are described in Sections 3.5.1 and 3.5.2.

3.5.1 Physical Properties

The boring logs prepared by Dames & Moore (1969) prior to the construction of the Clear Water Pond indicate that the Clear Water Pond foundation is comprised primarily of alternating layers of sands and silts (i.e. Sand, Silty Sand, Clayey Sand, Clayey Silt) from the surface to depths of approximately 60 feet below existing grade, which was the limit of the investigation depth. The installation log for MW-1, installed in 2019, indicates the presence of cohesive layers (Lean and Fat Clay) within the granular layers of the foundation material. Gravel, traces of clay, and organic matter were observed in the alternating sand and silt layers. In the deepest boring performed (AP-5), a sandstone layer was encountered at approximately 60 feet below grade, which is the depth that the boring was terminated.

The only soil information collected from the embankment was during the installation of MW-1 in 2019. The installation log of MW-1 indicates that the embankment is comprised of firm to stiff cohesive material (Sandy Lean Clay). The installation log indicated the presence of gravel in the embankment material.

It should be noted that there were no laboratory tests presented on the available boring logs.

3.5.2 Engineering Properties

Engineering properties for the foundation materials assumed for the original design of the Clear Water Pond are not available. Standard Penetration Tests (SPT) were performed at three borings (AP-4, AP-5, and AP-6) which include blow counts (N-values) of the foundation material. The existing ground surface at the time of the field exploration ranged from approximately El. 871 to 873 feet. The N-values typically ranged from 2 to 7, from the existing ground surface (prior to construction of the embankment) to approximately El. 855, indicating loose granular soils. Underlying the loose granular soils, medium-dense granular soils with N-values ranging from 10 to 27 were encountered to approximately El. 825 to El. 820, where a dense granular layer with an N-value of 47 was encountered. Below the dense granular layer, medium-dense granular soils were encountered with N-values ranging from 16 to 25 to El. 810 feet, which is where sandstone was encountered and the boring was ultimately terminated after refusal from the SPT.

HDR is not aware of available data that would allow interpretation of the engineering properties of the embankment soils of the Clear Water Pond, other than GZA 2012 (Ref. [3]), which referenced the original specifications for the embankment, and noted that the natural ground surface, which also forms the liner, was stripped and scarified to provide a bond with the first layer of dike fill. The embankment was constructed primarily with selected on-site clay borrow and placed/compacted under controlled conditions. The specifications themselves were not available for review, nor were engineering properties assumed for the embankment design.

The boring logs, along with recorded SPT blow counts, performed in the vicinity of the Clear Water Pond are presented in Attachment 2.

3.6 257.73 (c)(1)(vi) - Construction, Description of the Materials, Methods, and Timeframe of Construction

§257.73 (c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

The Clear Water Pond was constructed between 1970 and 1973 as part of the original construction of the impoundment system for Erickson Power Station, for the purpose of storing water prior to return to Erickson Power Station via the Pump House for reuse. The Pump House is located on the northwest side of the Clear Water Pond.

A review of the installation log of a monitoring well (MW-1), installed in 2019, indicates that the Clear Water Pond embankment generally consists of firm to stiff sandy lean clay. No laboratory tests or construction records were available to confirm the strength or placement methods, other than the reference to the original construction specifications in GZA 2012 (Ref 3).

A review of the available records and discussions with BWL staff indicate that there were no major modifications made to the Clear Water Pond since the original construction, with the exception to repairs to the Emergency Overflow Structure. According the BWL staff,

the top of the intake pipe of the Emergency Overflow Structure was deteriorating and subsequently a portion of the intake pipe was cut off and removed and replaced with an extension in approximately May 2017. The invert of the Emergency Overflow Structure after repair is at El. 883.0 feet NAVD 88.

3.7 257.73 (c)(1)(vii) – Drawings

§257.73 (c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Available construction drawings from 1970, provided by BWL, are presented in Attachment 3. Additionally, grading profiles, along with a plan view locating the sections, developed by NTH Consultants, Ltd. (Ref. [7]) of the Clear Water Pond are provided in Attachment 4. The topographic survey used in the development of the grading plans were collected in 2018 by Droneview.

3.8 257.73 (c)(1)(viii) - Instrumentation

§257.73 (c)(1)(viii): A description of the type, purpose, and location of existing instrumentation.

In 2019 and 2020, HDR installed six monitoring wells for Erickson Power Station as part of the Hydrogeologic Characterization of the site to monitor the groundwater across the Erickson Power Station impoundment system. One of these monitoring well was installed through the south corner embankment of the Clear Water Pond as shown previously in Figure 5. The installation log of MW-1 is provided in Attachment 2.

3.9 257.73 (c)(1)(ix) - Area Capacity Data

§257.73 (c)(1)(ix): Area-capacity curves for the CCR unit.

Area capacity data was requested and not available for the Clear Water Pond.

3.10 257.73 (c)(1)(x) - Spillway and Diversion Design Features

§257.73 (c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

The Clear Water Pond is equipped with an Emergency Overflow Structure located between the Clear Water Pond and the swale adjacent to the Canadian National Railroad right-of way. The overflow of the Clear Water Pond flows through the pipe and exits into the swale

through an elbow in the pipe in the downstream direction. The pipe consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars.

The invert of the overflow pipe is at approximately El. 883.0 feet NAVD 88 and the invert of the outlet pipe is at approximately EL. 873.1 feet NAVD 88.

The top of the inlet of the Emergency Overflow Structure was repaired by BWL in approximately May 2017 due to deterioration of the pipe. The outlet pipe is equipped with fencing to prevent animals from entering and vegetation was maintain around the outlet.

No capacities or calculations were available for the Emergency Overflow Structure.

3.11 257.73 (c)(1)(xi) - Construction Specifications and Provisions for Operations and Maintenance

§257.73 (c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

Construction specifications for the Clear Water Pond were requested and not available. As noted above, GZA 2012 (Ref 3) references the original constructions and presumably had the opportunity to review them.

BWL performs weekly inspections for the entire CCR impoundment system. A typical Weekly Inspection Report is provided in Attachment 5. BWL reportedly conducts maintenance, such as embankment crest re-grading, on an as-needed basis. Documentation of provisions for operations and maintenance for the Clear Water Pond was not available.

3.12 257.73 (c)(1)(xii) - Record of Structural Instability

§257.73 (c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

BWL performs weekly inspections for 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. An inspection was performed by GZA, referred to as a Round 10 Dam Assessment, at the facility (Ref. [3]). An additional inspection of the Clear Water Pond was performed in 2009 by Inspecsol Engineering, Inc. as noted in GZA 2012 (Ref. [3]), however, that report was not available for review of this report. Additionally, an inspection of the Clear Water Pond was performed by HDR in 2020. The results of 2020 inspection performed by HDR will be submitted under a separate cover.

No records of structural instability were available, and the BWL representatives involved in the preparation of this report were not aware of any history of instability of the Clear Water Pond or associated structures, other than corrosion of the intake riser for the Emergency Overflow Structure.

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] Environmental Protection Agency, WATERS GeoViewer (2020). https://www.epa.gov/waterdata/waters-geoviewer

Ref. [3] GZA GeoEnvironmental, Inc. Draft Round 10 Dam Assessment Report, Lansing Board of Water & Light, Erickson Station, Ash Pond. April 30, 2012.

Ref. [4] HDR Engineering, Inc. Groundwater Monitoring 2019 Annual Report, Lansing Board of Water & Light Erickson Station, Lansing, Michigan, January 30, 2020.

Ref. [5] Mayotte Design & Engineering, P.C. Compliance with 40CFR257-Locations Restrictions. Lansing Board of Water & Light Erickson Station. October 10, 2018.

Ref. [6] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Station, Lansing, Michigan, May 2015.

Ref. [7] NTH Consultants, Ltd. Closure Plan, CCR Surface Impoundment System, Erickson Power Station. August 16, 2019.

Ref. [8] Vanlier, K. E., Wood, W. W., and Brunett, J. O. Water-supply development and management alternatives for Clinton, Eaton, and Ingham County, Michigan: U.S. Geological Survey Water-Supply Paper. 1969, 111 p.

5 Attachments

Attachment 1	Site Location Map
Attachment 2	Boring Logs and Monitoring Well Logs at Clear Water Pond
Attachment 3	Construction Drawings
Attachment 4	Grading Profiles of Clear Water Pond
Attachment 5	Typical BWL Weekly Inspection Report

ATTACHMENT 1
SITE LOCATION MAP

DATA SOURCE
7.5 MINUTE USGS QUADRANGLE DIMONDALE, MICHIGAN, 2019.
DOWNLOADED FROM USGS WEBSITE MARCH 2020.

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ATTACHMENT 2
BORING LOGS AND MONITORING WELL LOGS
AT CLEAR WATER POND

MD&E®
Civil & Environmental Engineering

PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-01
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	2.5 ft	Dry	Stiff	Gray-Brown	Sandy Clay	CL	
4								
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Fine to Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Dry	Loose		Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13								
14		4 ft	Moist	Loose		Medium to Coarse Sand	SP	
15								
16			Wet	Stiff		Sandy Clay	SC-CL	
17						End of boring = 16 feet.		
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REMARKS Boring backfilled with bentonite chips.

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PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-02
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	3 ft	Dry	Stiff	Gray-Brown/	Clay	CL	
4					Black			
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Moist	Loose	Gray-Brown	Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13			Wet					
14		4 ft		Loose	Gray-Brown	Medium Sand	SP	
15			Moist					
16								
17						End of boring = 16 feet.		
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REMARKS Boring backfilled with bentonite chips.

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Civil & Environmental Engineering

PROJECT:	LBWL - Erickson	PAGE	1 OF 1
PROJECT NO.:		BORING	CW-SB-03
ELEVATION:		DATE	10/2/2018
FIELD GEOLOGIST:	Tim Mayotte	RIG	Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	2.25 ft	Dry	Stiff	Gray-Brown	Clay	CL	
4								
5								
6			Moist -					
7	NA	3 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13								
14		4 ft	Moist -	Loose	Gray-Brown	Medium Sand	SP	
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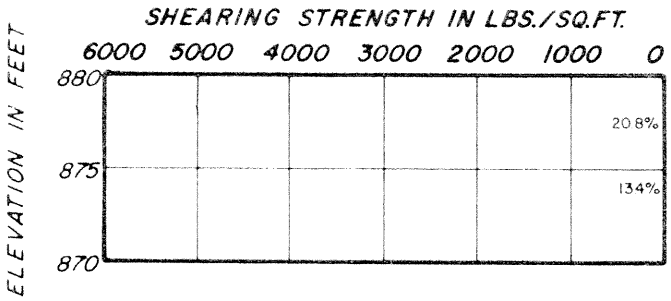
REMARKS Boring backfilled with bentonite chips.



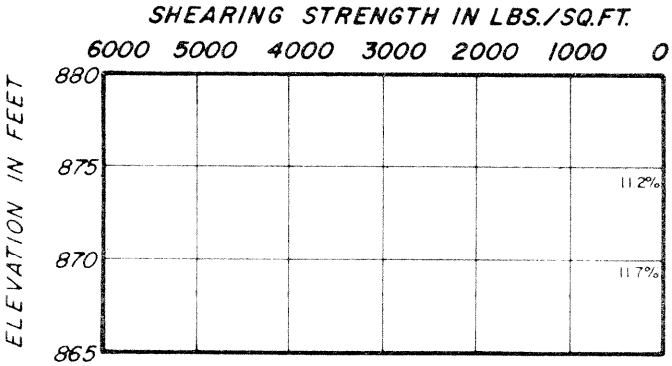
BULK SAMPLES
BAG SAMPLES

TEST PIT AP-1

SURFACE ELEVATION 879.6

SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9")
SC	MOTTLED BROWN AND GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL ROOTS TO 2'-6"
ML	BROWN FINE SANDY SILT WITH SOME SMALL GRAVEL AND TRACE OF CLAY 3" POCKET OF WATER BEARING FINE SAND ON WEST WALL OF PIT AT 6.0'

TEST PIT COMPLETED AT 8.0'
ON 6/23/69
MINOR SEEPAGE WATER FROM POCKET OF SAND AT 6.0'



BULK SAMPLES
BAG SAMPLES

TEST PIT AP-2

SURFACE ELEVATION 877.8

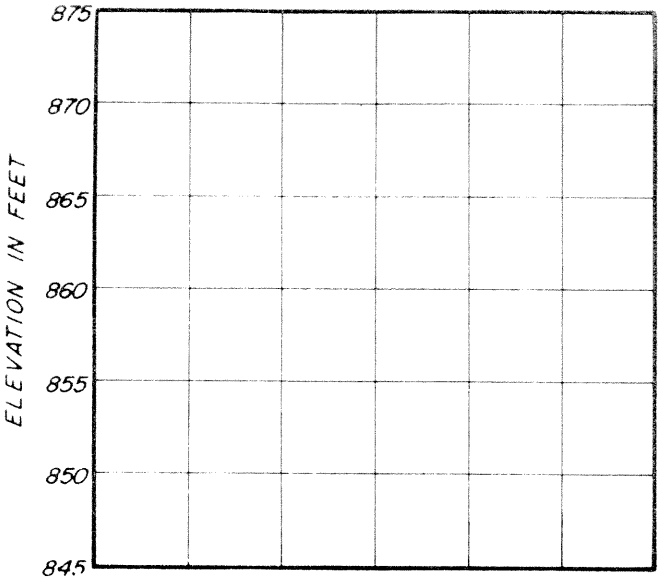
SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (10")
SC	MOTTLED BROWN AND GRAY CLAYEY SAND
SM	MOTTLED BROWN AND GRAY FINE SILTY SAND WITH SOME CLAY AND SMALL GRAVEL
ML	BROWN SILT 2" SEAM OF BROWN FINE TO COARSE SAND WITH GRAVEL AT 5.5'
ML	GRAY CLAYEY SILT WITH SOME FINE SAND AND SMALL GRAVEL

TEST PIT COMPLETED AT 9.0'
ON 6/23/69
MINOR SEEPAGE WATER AT 5.5'

LOG OF TEST PITS

DAMES & MOORE

PLATE A-1T

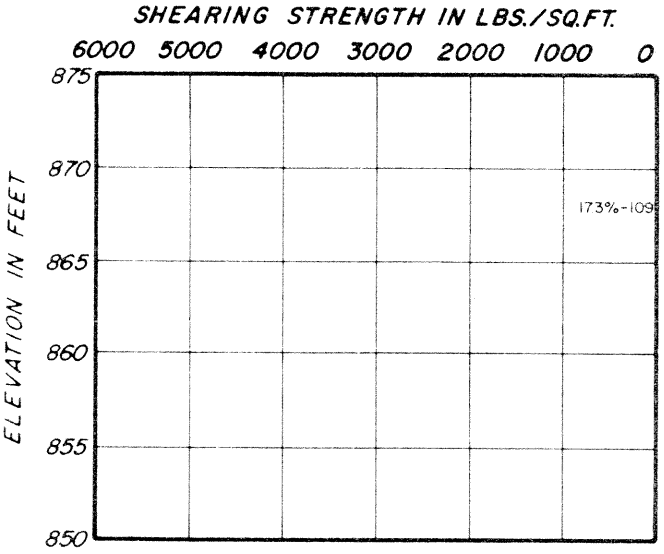


BORING AP-3

SURFACE ELEVATION 872.8

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	ML	BROWN SANDY SILT WITH ROOTS – TOPSOIL (6")
7	CL	BROWN SANDY CLAY WITH SOME ROOTS ROOTS GRADING OUT AT 2.5'
5	SC	BROWN CLAYEY SAND GRADING SOME SMALL GRAVEL
17	CL	BROWN SANDY CLAY WITH SOME SMALL GRAVEL
19	SP	BROWN FINE TO MEDIUM SAND SEEPAGE WATER ENCOUNTERED AT 7 - 3' WATER ROSE TO 5 - 10' IN 15 MINUTES
30		
	SP	GRAYISH - BROWN FINE SAND
25	ML	GRAY FINE SANDY SILT
6	SC	GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL
21	SP	GRAY SILTY FINE SAND WITH SOME GRAVEL

BORING COMPLETED AT 25.0'
ON 7/8/69
CASING USED TO A DEPTH OF 14.0'
WATER LEVEL NOT RECORDED



BORING AP-4

SURFACE ELEVATION 870.7

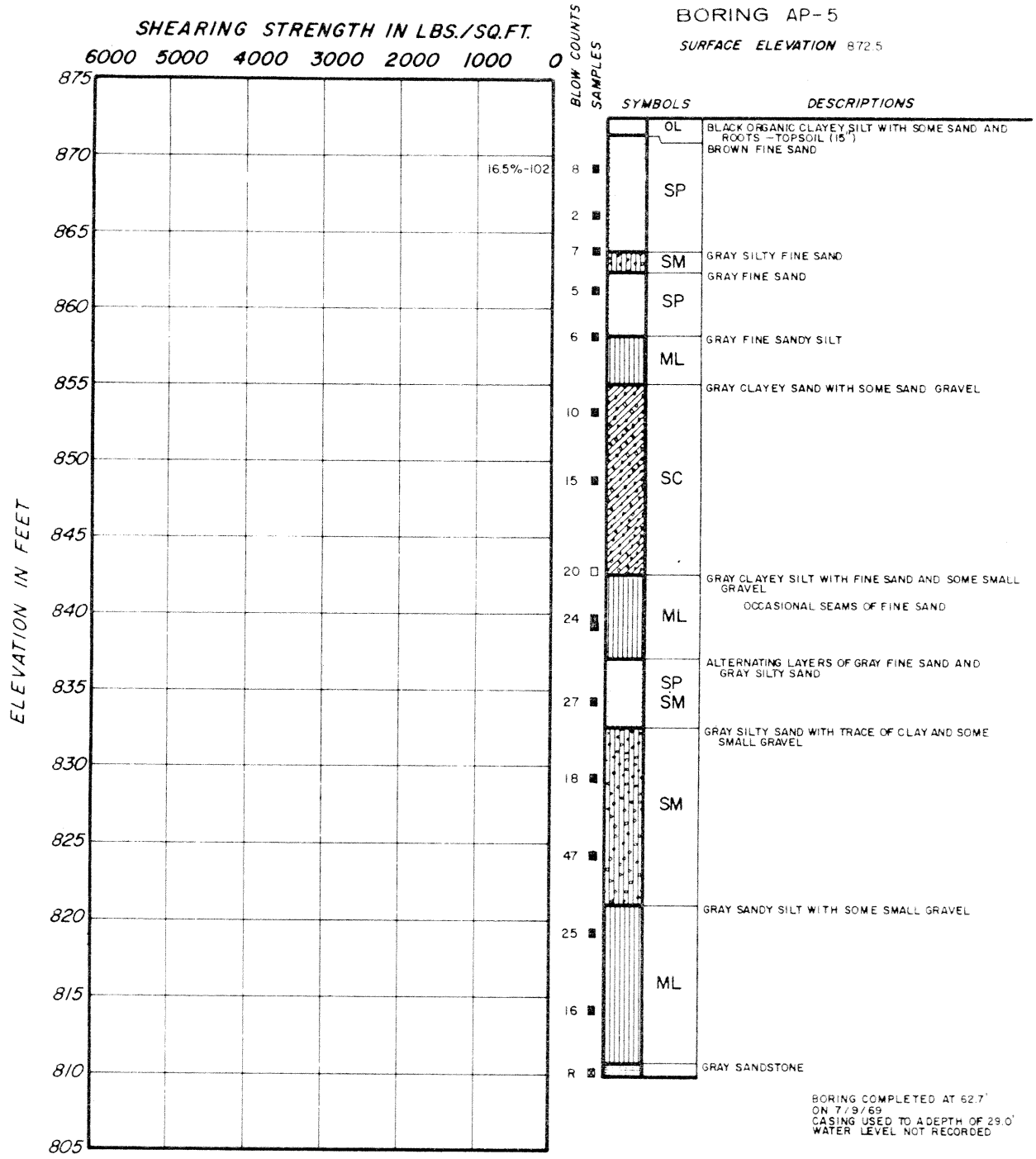
BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	OL	BLACK ORGANIC SILT WITH ROOTS – TOPSOIL (12")
2	SC	GRAY CLAYEY SAND WITH ORGANIC MATTER SEEPAGE WATER ENCOUNTERED AT 2'-6"
3	SC	MOTTLED BROWN AND GRAY CLAYEY SAND WITH POCKETS OF BROWN FINE SAND
4	ML	MOTTLED BROWN AND GRAY CLAYEY SILT WITH SOME SAND
5	ML	GRAY CLAYEY SILT WITH FINE SAND
19	ML	GRAY SILT
	SW	GRAY FINE TO COARSE SAND WITH SOME SMALL GRAVEL
	ML	GRAY SILT

BORING COMPLETED AT 15.0'
ON 7/11/69
NO CASING USED
WATER LEVEL NOT RECORDED

LOG OF BORINGS

DAMES & MOORE

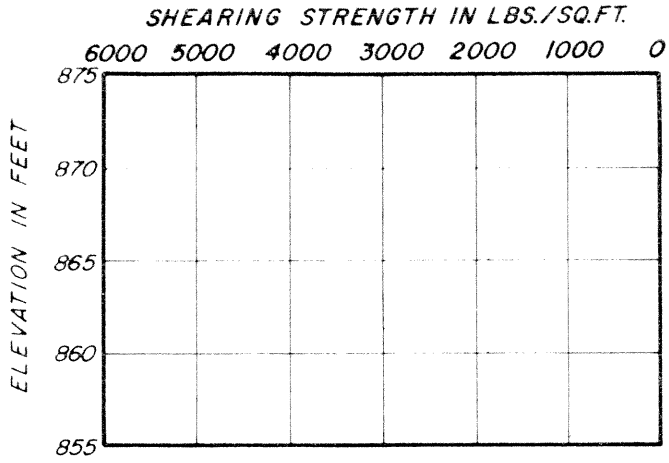
PLATE A-10



LOG OF BORINGS

DAMES & MOORE

PLATE A-IV

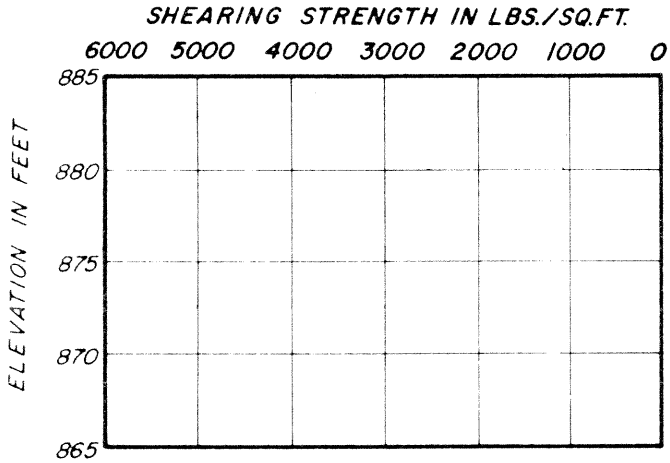


BORING AP-6

SURFACE ELEVATION 872.6

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	OL	BLACK ORGANIC CLAYEY SILT WITH ROOTS - TOPSOIL (9")
3	CL	MOTTLED BROWN AND GRAY SANDY CLAY WITH SOME ROOTS
		ROOTS GRADING OUT SEEPAGE WATER ENCOUNTERED AT 3'-6"
2	ML	GRAY CLAYEY SILT WITH ORGANIC MATTER
4	ML	GRAY FINE SANDY SILT
6		
11	SC	GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL

BORING COMPLETED AT 15.0'
ON 7/9/69
NO CASING USED
WATER LEVEL NOT RECORDED



BORING AP-7

SURFACE ELEVATION 882.6

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS
	ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9")
4	CL	MOTTLED BROWN AND GRAY SANDY CLAY
		SEEPAGE WATER ENCOUNTERED AT 3'-1"
11	SM	MOTTLED BROWN AND GRAY SILTY SAND WITH TRACE OF CLAY
19	SP	BROWN FINE TO MEDIUM SAND
		GRAY SANDY CLAY WITH SOME SMALL GRAVEL
13	CL	
		GRAY CLAYEY SILT WITH FINE SAND
9	ML	

BORING COMPLETED AT 15.0'
ON 7/11/69
NO CASING USED
WATER LEVEL NOT RECORDED

LOG OF BORINGS

DAMES & MOORE

PLATE A-1W

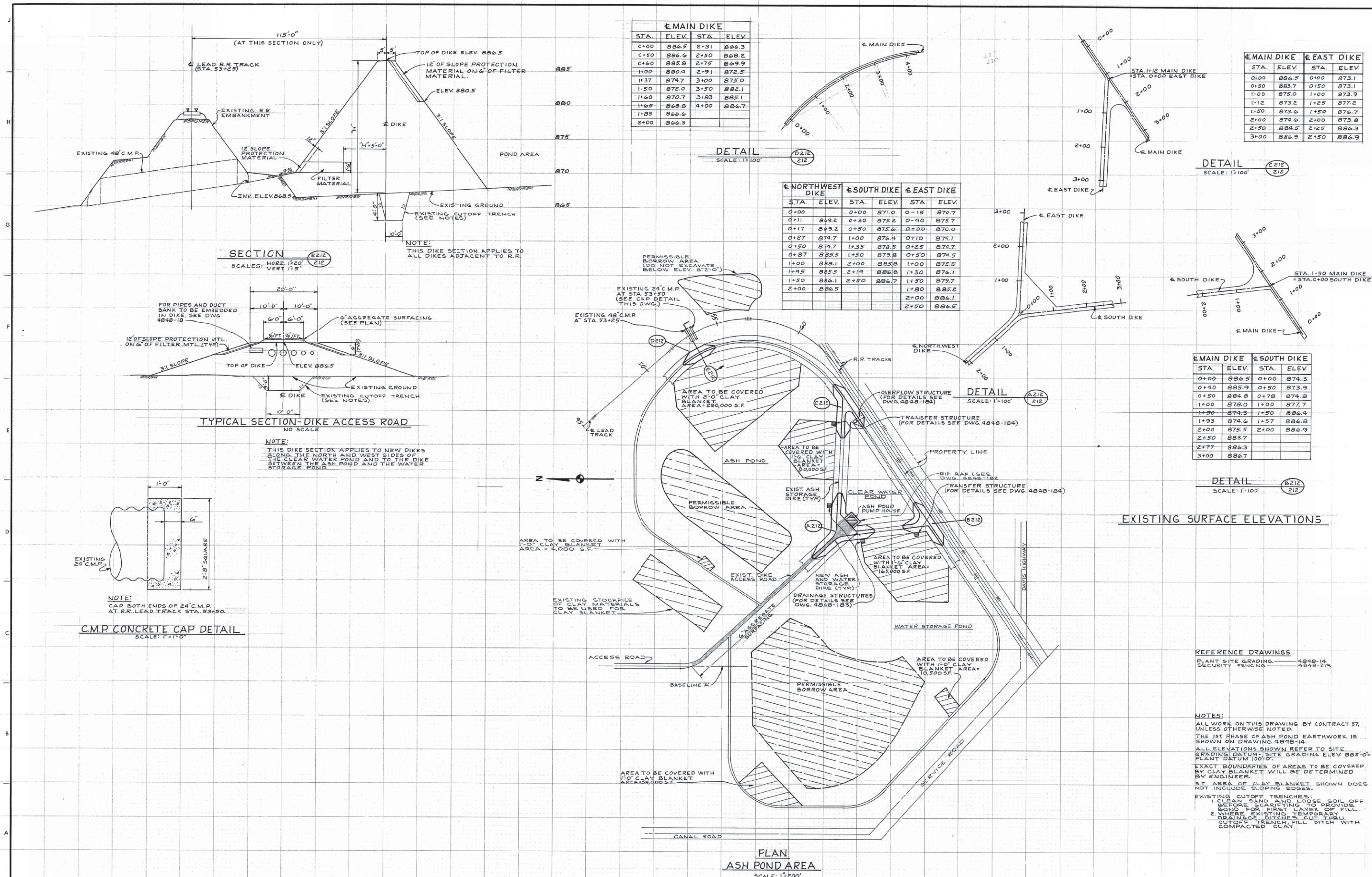
MW-1

CLIENT Lansing Board of Water and Light
PROJECT NAME LBWL Confidential
PROJECT NUMBER 10173187
PROJECT LOCATION Erickson Power Station, Lansing, MI
DATE STARTED 10/15/19 11:00 **COMPLETED** 10/15/19 12:30
GROUND ELEVATION 885.97 ft MSL **HOLE DIAMETER** 7"
DRILLING CONTRACTOR SME **DRILLER** Rudy Musulin
GROUND WATER LEVELS:
DRILLING METHOD HSA **EQUIPMENT** Track-Mounted CME 55
AT TIME OF DRILLING 17.50 ft / Elev 868.47 ft
LOGGED BY Emily Munoz **CHECKED BY**
75 HRS AFTER DRILLING 11.85 ft / Elev 874.12 ft
NOTES Sample ID prefix LBWL-MW1-. Driller recorded blow counts on SME logs.

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0					Casing Top Elev: 888.74 (ft) Casing Type: 2" Sch 40 PVC
			0.5 SANDY LEAN CLAY WITH GRAVEL, (CL) brown (10YR 5/3), dry, stiff, low plasticity	885.5	
			SANDY LEAN CLAY WITH GRAVEL, (CL) yellowish brown (10YR 5/4), dry, medium stiff, mottled, low plasticity		
5					
					Bentonite Chips (Hydrated in Lifts)
10					
			11.0 SANDY LEAN CLAY WITH GRAVEL, (CL) yellowish brown (10YR 5/4), moist, medium stiff, mottled, low plasticity	875.0	
15			15.0 SANDY LEAN CLAY, (CL) very dark gray (2.5Y 3/1), moist, stiff, low plasticity	871.0	
			16.0 CLAYEY SAND, (SC) dark greenish gray (10GY 4/1), poorly graded, fine grained, moist, medium dense, iron oxide staining	870.0	
			17.5	868.5	
			18.0 CLAYEY SAND, (SC) dark greenish gray (10GY 4/1), poorly graded, fine grained, wet, medium dense, iron oxide staining	868.0	
20	SS 20-22		POORLY GRADED SAND WITH CLAY, (SP) gray (5Y 5/1), fine to medium grained, wet, medium dense		
					Silica Sand Filter Pack
			23.5 CLAYEY SAND, (SC) gray (5Y 5/1), poorly graded, fine grained, wet, medium dense	862.5	
25					Screen, 0.010" Slot Size
	SS 26-28		26.0 LEAN CLAY WITH SAND, SILTY, (CL) gray (5Y 5/1), fine grained, wet, soft, low plasticity	860.0	
30			30.0	856.0	Endcap
			FAT CLAY, (CH) gray (5Y 5/1), wet, stiff, medium plasticity		
			31.0	855.0	
			32.0 LEAN CLAY WITH SAND, SILTY, (CL) gray (5Y 5/1), fine to medium grained, wet, soft, low plasticity	854.0	

Bottom of borehole at 32.0 feet.

ATTACHMENT 3
CONSTRUCTION DRAWINGS



DETAIL (D212/212) — SCALE: 1"=100'

℄ MAIN DIKE STA.	ELEV.	STA.	ELEV.
0+00	886.5	2+31	866.3
0+50	886.6	2+50	868.2
0+60	885.8	2+75	869.9
1+00	880.4	2+91	872.5
1+37	874.7	3+00	875.0
1-50	872.0	3+50	882.1
1+60	870.7	3+83	885.1
1-65	868.8	4+00	886.7
1-83	866.6		
2+00	866.3		

DETAIL (A212/212) — SCALE: 1"=100'

℄ NORTHWEST DIKE STA.	ELEV.	℄ SOUTH DIKE STA.	ELEV.	℄ EAST DIKE STA.	ELEV.
0+00		0+00	871.0	0-15	870.7
0+11	869.2	0+30	875.2	0-90	875.7
0+17	869.2	0+50	875.6	0+00	870.0
0+27	874.7	1+00	876.4	0+10	879.1
0+50	874.7	1+35	878.5	0+25	879.7
0+87	885.5	1+50	879.8	0+50	874.5
1+00	888.1	2+00	885.8	1+00	875.5
1+45	885.5	2+14	886.8	1+30	876.1
1+50	886.1	2+50	886.7	1+50	879.7
2+00	886.5			1+80	885.2
				2+00	886.1
				2+50	886.5

DETAIL (C212/212) — SCALE: 1"=100'

℄ MAIN DIKE STA.	ELEV.	℄ EAST DIKE STA.	ELEV.
0+00	886.5	0+00	873.1
0+50	883.7	0+50	873.1
1-00	875.0	1+00	873.9
1+12	873.2	1+25	877.2
1+50	873.6	1+50	876.7
2+00	874.6	2+00	873.8
2+50	884.5	2+25	886.3
3+00	886.9	2+50	886.9

DETAIL (B212/212) — SCALE: 1"=100'

℄ MAIN DIKE STA.	ELEV.	℄ SOUTH DIKE STA.	ELEV.
0+00	886.5	0+00	874.3
0+40	885.9	0+50	873.9
0+50	884.8	0+78	874.8
1+00	878.0	1+00	877.7
1+50	874.3	1+50	886.4
1+93	874.6	1+57	886.8
2+00	875.5	2+00	886.9
2+50	883.7		
2+77	886.3		
3+00	886.7		

REFERENCE DRAWINGS

PLANT SITE GRADING — 4848-14
SECURITY FENCING — 4848-215

NOTES:

ALL WORK ON THIS DRAWING BY CONTRACT 57, UNLESS OTHERWISE NOTED.

THE 1ST PHASE OF ASH POND EARTHWORK IS SHOWN ON DRAWING 4848-14.

ALL ELEVATIONS SHOWN REFER TO SITE GRADING DATUM - SITE GRADING ELEV. 882'-0" = PLANT DATUM 100'-0".

EXACT BOUNDARIES OF AREAS TO BE COVERED BY CLAY BLANKET WILL BE DETERMINED BY ENGINEER.

S.F. AREA OF CLAY BLANKET SHOWN DOES NOT INCLUDE SLOPING EDGES.

EXISTING CUTOFF TRENCHES:
1. CLEAN SAND AND LOOSE SOIL OFF BEFORE SCARIFYING TO PROVIDE BOND FOR FIRST LAYER OF FILL.
2. WHERE EXISTING TEMPORARY DRAINAGE DITCHES CUT THRU CUTOFF TRENCH, FILL DITCH WITH COMPACTED CLAY.

REVISIONS	DATE	DWN.	APP.
1 FINAL	4-18-74		

DRAWN: RON DICKES
CHECKED: D.C. Peterson
APPROVED: D.C. Peterson
APPROVED: [illegible]
DATE: SEPT. 4, 1970

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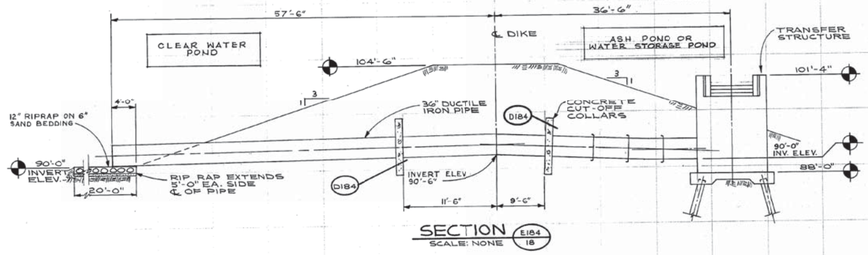
BOARD OF WATER AND LIGHT
LANSING — MICHIGAN
FIRST UNIT — ERICKSON STATION

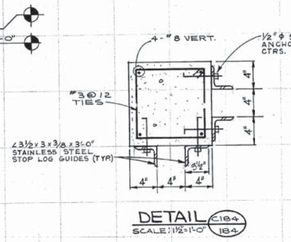
ASH POND EARTHWORK - CONTRACT 57

SCALE: AS NOTED
NO. 4848-212 REV. 1

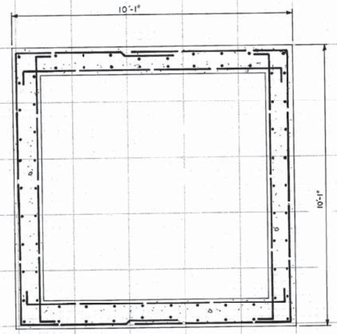
MAC # 0998



SECTION (D184 / 18)
SCALE: NONE

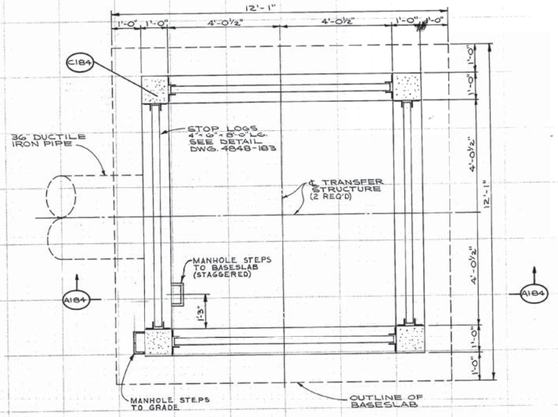


DETAIL (C184 / 184)
SCALE: ½"=1'-0"

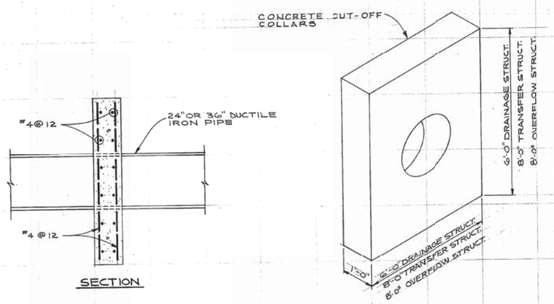


NOTE:
ALL REINFORCING #6 @ 12".

SECTION (B184 / 184)
SCALE: ½"=1'-0"

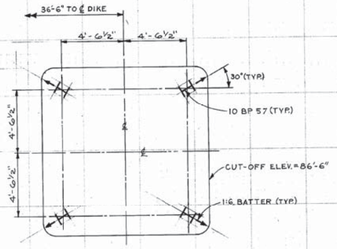


PLAN
SCALE: ½"=1'-0"



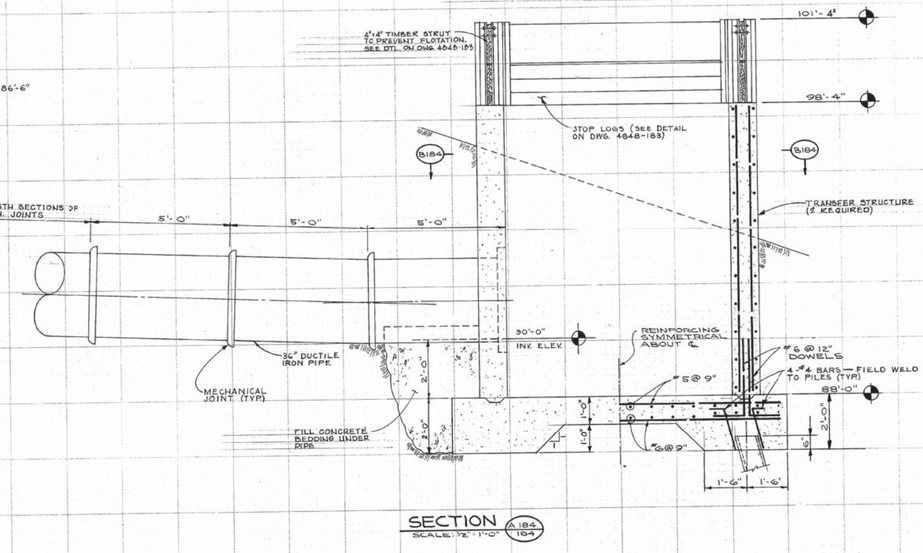
SECTION

DETAIL (D184 / —B3 & 184)
SCALE: NONE

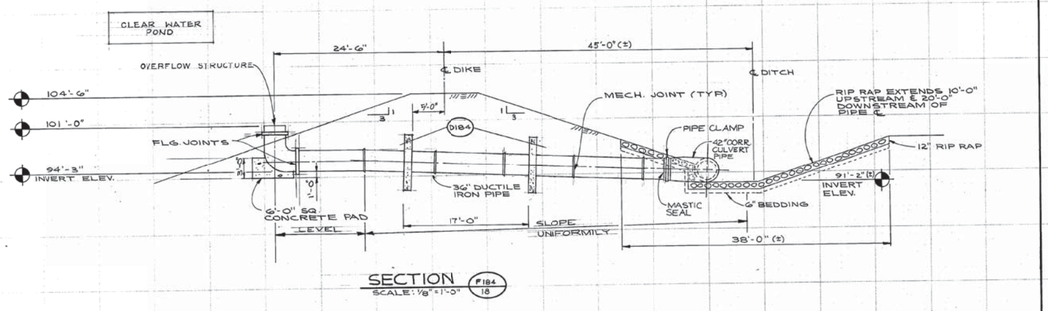


PILING PLAN
SCALE: ¼"=1'-0"

NOTE: PLACE 5 STOP LOGS IN EACH GROOVE FOR ASH POND (WEIR EL. = 99'-6½")
PLACE 7 STOP LOGS IN EACH GROOVE FOR WATER STORAGE POND (WEIR EL. = 101'-0½")



SECTION (A184 / 184)
SCALE: ½"=1'-0"



SECTION (F184 / 18)
SCALE: ⅛"=1'-0"

OPERATIONAL NOTE

INITIAL WATER LEVEL IN ASH POND AND CLEAR WATER POND SHALL BE AT MIN. ELEV. 99.58' PRIOR TO OPERATING ASH WATER PUMPS.

NOTES

ALL WORK ON THIS DRAWING BY CONTRACT 57 UNLESS OTHERWISE NOTED.

FOR REFERENCE DRAWINGS SEE DRAWING 4848-183

PROVIDE ELECTRICAL CONTINUITY BETWEEN A CONNECTION POINT AT TOP OF CONCRETE STRUCTURE AND ALL PIPE BY MEANS OF #8 BAR; WELD ALL CONTACT POINTS; WELDS SHALL PROVIDE CONTACT AREA EQUAL TO BAR CROSS-SECTIONAL AREA.

SCALE: 1-1/2"=1'-0" | SCALE: 1/2"=1'-0" | SCALE: 1/4"=1'-0" | SCALE: 1/8"=1'-0"

REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.	REVISIONS	DATE	DWN.	APP.
								FINAL	4-18-74	H.	TGB

DRAWN W.M. JOHNSON
CHECKED [illegible]
APPROVED [illegible]
APPROVED [illegible]
DATE SEPT 4, 1970

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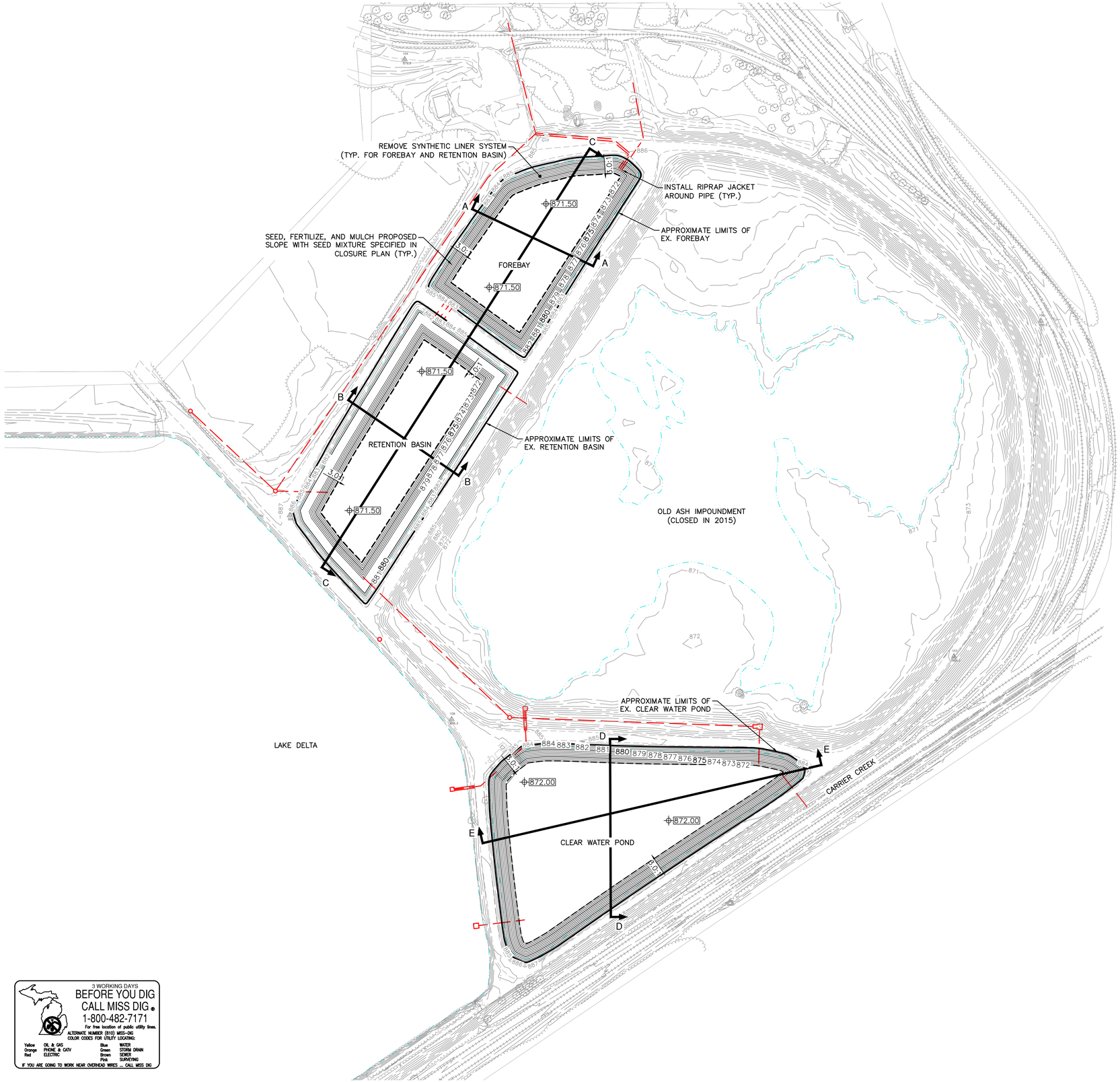
BOARD OF WATER AND LIGHT
LANSING — MICHIGAN
FIRST UNIT — ERICKSON STATION

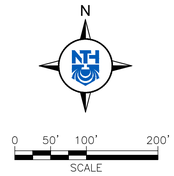
ASH POND STRUCTURES
SHEET 2

SCALE AS NOTED
NO. 4848-184
REV. 1

AAC # 0971

ATTACHMENT 4
GRADING PROFILES OF CLEAR WATER POND





LEGEND

- EXISTING CONTOURS
- EXISTING RAILROAD TRACK
- EXISTING FENCE
- EXISTING EDGE OF WATER
- EXISTING CONVEYANCE PIPE
- EXISTING DRIVEWAY
- EXISTING VEGETATION
- EXISTING TREE
- PROPOSED CONTOURS
- PROPOSED SPOT ELEVATION
- PROPOSED SLOPE

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY DRONEVIEW ON SEPTEMBER 26, 2018. VERTICAL DATUM IS IN NAVD 88.
2. NO POND BOTTOM SOUNDING WAS PERFORMED FOR THE FOREBAY AND RETENTION BASIN. ASH VOLUME ESTIMATED BASED ON REMOVAL EFFICIENCY OF PLANT HYDROBINS.
3. BOTTOM OF ASH LIMITS FOR FOREBAY AND RETENTION BASIN BASED ON INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTATION REPORT FOR THE ASH IMPOUNDMENT RECONFIGURATION BY MAYOTTE DESIGN AND ENGINEERING, P.C., DATED MAY 2015.
4. BOTTOM OF ASH LIMITS FOR CLEAR WATER POND BASED ON HISTORICAL PLANT DRAWINGS 4848-183 "ASH POND STRUCTURES SHEET 1" AND 4848-184 "ASH POND STRUCTURES SHEET 2".

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

Northville, MI	248.553.6300
Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

PROJECT NAME:
ERICKSON STATION ASH IMPOUNDMENT CLOSURE

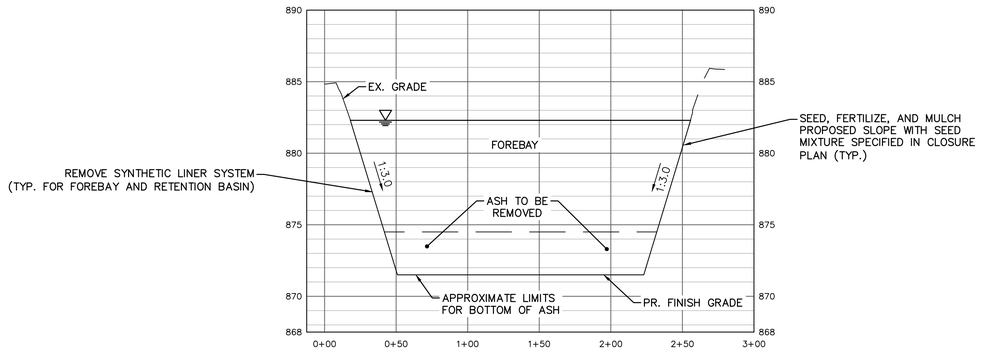
PROJECT LOCATION:
ERICKSON STATION
LANSING, MICHIGAN

NTH PROJECT NO.: 73-180055	CAD FILE NAME: 180055-CLS
DESIGNED BY: SLG	INCEP DATE: 12/19/2018
DRAWN BY: SLG	DRAWING SCALE: 1" = 100'
CHECKED BY: DRL	SUBMITTED DATE: 8/15/2019

SHEET TITLE:
PROPOSED GRADING PLAN

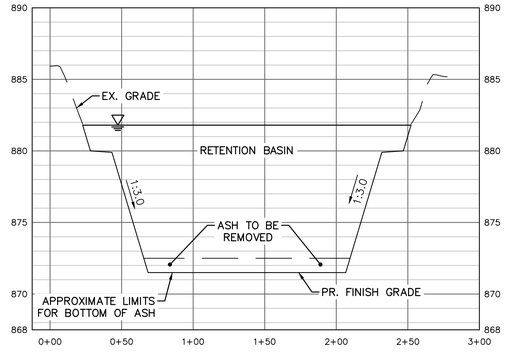
SHEET REFERENCE NUMBER:
3

J:\2018\73\180055\production_work\cad\180055-cls.dwg Plotted: 8/15/2019 4:55 PM by bbosack



SECTION A-A

HORIZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'

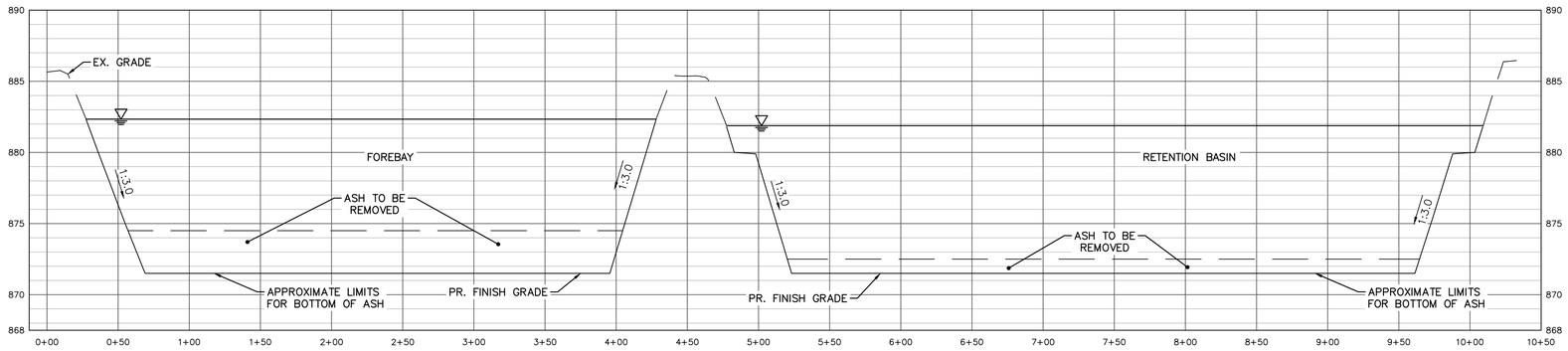


SECTION B-B

HORIZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'

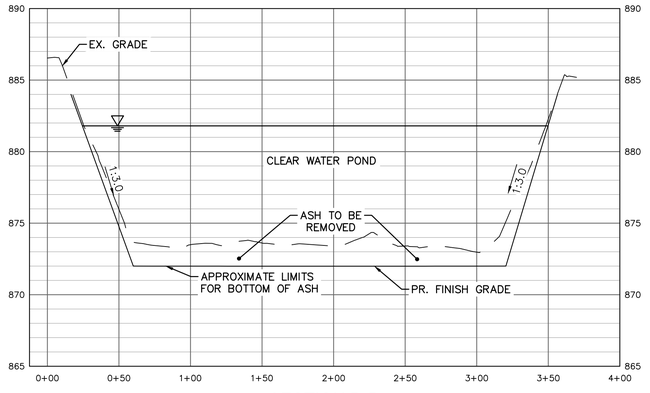
NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY DRONEVIEW ON SEPTEMBER 26, 2018. VERTICAL DATUM IS IN NAVD 88.
2. NO POND BOTTOM SOUNDING WAS PERFORMED FOR THE FOREBAY AND RETENTION BASIN. ASH VOLUME ESTIMATED BASED ON REMOVAL EFFICIENCY OF PLANT HYDROBINS.
3. BOTTOM OF ASH LIMITS FOR FOREBAY AND RETENTION BASIN BASED ON INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTATION REPORT FOR THE ASH IMPOUNDMENT RECONFIGURATION BY MAYOTTE DESIGN AND ENGINEERING, P.C., DATED MAY 2015.
4. BOTTOM OF ASH LIMITS FOR CLEAR WATER POND BASED ON HISTORICAL PLANT DRAWINGS 4848-183 "ASH POND STRUCTURES SHEET 1" AND 4848-184 "ASH POND STRUCTURES SHEET 2".



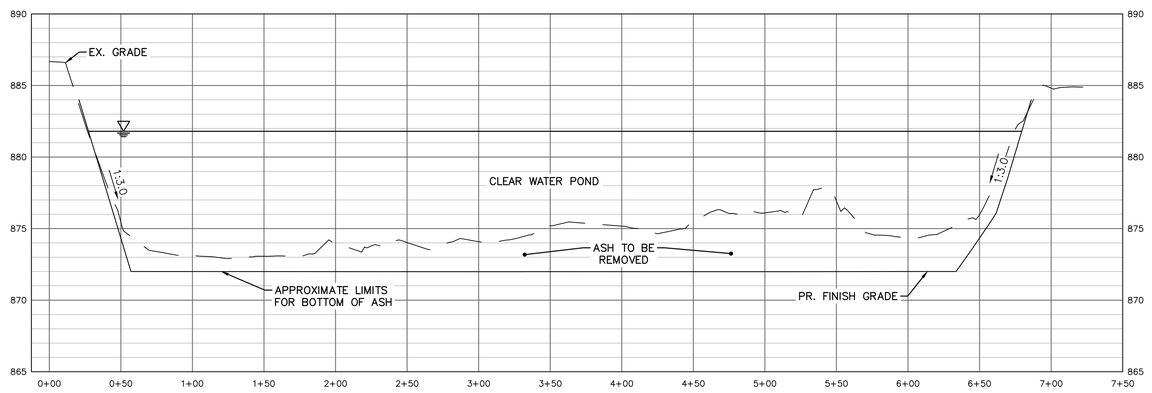
SECTION C-C

HORIZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'



SECTION D-D

HORIZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'



SECTION E-E

HORIZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
For free location of public utility lines.
ALTERNATE NUMBER (810) MISS-DIG
COLOR CODES FOR UTILITY LOCATING:

Yellow	OIL & GAS	Blue	WATER
Orange	PHONE & CATV	Green	STORM DRAIN
Red	ELECTRIC	Brown	SEWER
		Pink	SURVEYING

IF YOU ARE GOING TO WORK NEAR OVERHEAD WIRES ... CALL MISS DIG

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Infrastructure Engineering and Environmental Services

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Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

PROJECT NAME:
ERICKSON STATION ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:
ERICKSON STATION
LANSING, MICHIGAN

NTH PROJECT NO.: 73-180055	CAD FILE NAME: 180055-CLS
DESIGNED BY: SLG	INCEP DATE: 12/19/2018
DRAWN BY: SLG	DRAWING SCALE: 1" = 50'
CHECKED BY: DRL	SUBMITTED DATE: 8/15/2019

SHEET TITLE:
PROPOSED GRADING PROFILES

SHEET REFERENCE NUMBER:
4

ATTACHMENT 5
TYPICAL BWL WEEKLY INSPECTION REPORT

LBWL - WEEKLY INSPECTION REPORT - CCR SURFACE IMPOUNDMENT SYSTEM

Name:	ROBERT L. ALLEN	**Weather:**	SUNNY 43°
Date & Time:	3-5-20 1210	**Site Conditions:**	

If you answer "Yes" to any of the following questions, describe and call Environmental Services.

I. SURFACE IMPOUNDMENT

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
1. Is there any erosion around the impoundment?		X				X		X	
2. Is there excessive CCR (ash) build-up above the water surface?		X				X		X	

II. CREST

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the crest: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any trees or undesired vegetation on crest?		X				X		X	
3. Any depressions, cracks, animal burrows, ruts, or holes on crest?		X				X		X	

III. SLOPES – ABOVE THE WATER LEVEL

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any depressions, cracks, animal burrows, ruts, or holes?		X				X		X	
3. Above the water level, are there any cracks, evidence of erosion, sloughs or indication of slope distress?		X				X		X	

IV. EXTERIOR SLOPES

Forebay	Retention Basin	Clearwater Pond
1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):	1. Describe vegetation on the slope: ☒ Sparse ☐ Good cover ☐ Overgrown (taller than 6-inches) ☐ Rip Rap ☐ Gravel ☐ Other (describe):

Description	Forebay Yes	Forebay No	Forebay Not Visible	Retention Basin Yes	Retention Basin No	Retention Basin Not Visible	Clearwater Pond Yes	Clearwater Pond No	Clearwater Pond Not Visible
2. Any areas of water-loving, (ex. cattails, grasses, etc.) vegetation?		X				X		X	
3. Any depressions, bulges, holes, animal burrows, or erosion on slope?		X				X		X	

4. Are there any cracks, sloughs or indication of slope distress?		X			X			X			
5. Do any wet areas indicate potential seepage through the dike?		X			X			X			
6. Are there any active seeps (flowing water) from the **slope or toe** of the dike? If yes, describe area, location, flow quantity, color etc.		X			X			X			

V. INLET AND OUTLET STRUCTURES

1. What is the ESTIMATED free water level in the surface impoundment today?

Forebay	Retention Basin	Clearwater Pond
Design Water Level: 100.5 ft gauge / 882.5 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level	Design Water Level: 99.5 ft gauge/880.5 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level	Design Water Level: 99 ft gauge / 880.0 ft. X At Design Water Level ___ Above Design Water Level ___ Below Design Water Level
2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	2. How would you describe the overall condition of the inlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):
3. How would you describe the overall condition of the outlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	3. How would you describe the overall condition of the outlet structures? ☒ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☐ Not Visible ☐ Other (describe):	3. How would you describe the overall condition of the outlet structures? ☐ Functioning Normally ☐ Not Functional ☐ Deteriorated ☐ Damaged ☒ Not Visible ☐ Other (describe):
4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):	4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):	4. If observable, describe any discharge from the outlet structure (turbidity, depth, etc.):
5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ☐ Yes ☒ No ☐ Not Visible	5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ☐ Yes ☐ No ☐ Not Visible	5. Is there evidence of damage, erosion, or obstruction around the **INLET** and **OUTLET** structures? If yes, describe: ■ Yes ■ No ■ Not Visible

VI. NOTES

ITEM	Description/Location

✓ RLA

VII. PHOTOGRAPHS – HAS ENVIRONMENTAL SERVICES TAKEN PHOTOGRAPHS DURING THE QUARTER? (AT A MINIMUM ON A QUARTERLY BASIS AND WHENEVER NEEDED TO DOCUMENT ISSUES)

At a minimum, photographs should be taken of the crest, interior and exterior slopes, and any other notable features.