ALLIANT ENERGY
Wisconsin Power and Light Company
Edgewater Generating Station

CCR SURFACE IMPOUNDMENT

STRUCTURAL STABILITY ASSESSMENT

Report Issued: September 21, 2016
Revision 0

HARD HAT SERVICES™
Engineering, Construction and Management Solutions

EXECUTIVE SUMMARY

This Structural Stability Assessment (Report) is prepared in accordance with the requirements of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System – Disposal of Coal Combustion Residual from Electric Utilities (40 CFR Parts 257 and 261, also known as the CCR Rule) published on April 17, 2015 and effective October 19, 2015.

This Report assesses the structural stability of each CCR unit at Edgewater Generating Station in Sheboygan, WI in accordance with §257.73(b) and §257.73(d) of the CCR Rule. For purposes of this Report, "CCR unit" refers to an existing CCR surface impoundment.

Primarily, this Report is focused on documenting whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded within each CCR unit.

Table of Contents

Figures

Appendices

1 INTRODUCTION

The owner or operator of the Coal Combustion Residual (CCR) unit must conduct an initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. This Report is prepared in accordance with the requirements of §257.73(b) and §257.73(d) of the CCR Rule.

1.1 CCR Rule Applicability

The CCR Rule requires a periodic structural stability assessment by a qualified professional engineer (PE) for existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more; or the existing CCR surface impoundment has a height of 20 feet or more.

1.2 Structural Stability Assessment Applicability

The Edgewater Generating Station (EDG) in Sheboygan, WI (Figure 1) has four existing CCR surface impoundments that meet the requirements of §257.73(b)(1) and/or §257.73(b)(2) of the CCR Rule, which are identified as follows:

- EDG Slag Pond
- EDG North A-Pond
- EDG South A-Pond
- EDG B-Pond

2 FACILITY DESCRIPTION

EDG is located on the south edge of the City of Sheboygan, Wisconsin along the western shore of Lake Michigan in Sheboygan County, at 3739 Lakeshore Drive, Sheboygan, Wisconsin (Figure 1).

EDG is a fossil-fueled electric generating station that initiated operations in 1930. EDG consists of two steam electric generating units (Unit 4 and Unit 5). A third steam electric generating unit (Unit 3) was removed from service in 2015. Sub-bituminous coal is the primary fuel used at EDG for producing steam. The burning of coal produces CCR byproducts. The CCR at EDG is categorized into five types: precipitator fly ash, slag, bottom ash, economizer ash, and scrubber byproducts.

The Unit 4 precipitator fly ash is collected by Unit 4's electrostatic precipitators and sent to an on-site storage silo located southwest of the generating plant. The precipitator fly ash is then transported off-site for either beneficial reuse or for disposal at the EDG I-43 CCR landfill. The Unit 5 precipitator fly ash is collected by Unit 5's electrostatic precipitators and sent to a separate on-site storage silo located southwest of the generating plant. Unit 5's precipitator fly ash is then transported off-site for beneficial reuse or for disposal at the EDG I-43 CCR landfill..

The slag at EDG is produced from Unit 4 and is sluiced from the generating plant to a surface impoundment identified as the EDG Slag Pond (Figure 2). The EDG Slag Pond is located southwest of the generating plant.

Byproducts from the circulating dry scrubber (CDS) system are transported offsite for disposal at the EDG I-43 CCR Landfill.

General Facility Information:

Date of Initial Facility Operations:	1930
WPDES Permit Number:	WI-0001589-07-0
Latitude / Longitude:	43.716153, -87.706262

Nameplate Ratings:	Unit 1 (Retired)
	Unit 2 (Retired)
	Unit 3 (Retired)
	Unit 4 351 MW
	Unit 5 414 MW

2.1 EDG Slag Pond

The EDG Slag Pond is located southwest of the generating plant and north of the EDG North A-Pond. The EDG Slag Pond receives influent flow from the generating plant via the Unit 4 boiler slag tanks. The water-slag slurry discharges into the southwest portion of the EDG Slag Pond. The slag is dredged out of the EDG Slag Pond and stockpiled in a containerized area adjacent to the existing CCR surface impoundment for dewatering. The slag is then screened to separate the coarsely graded material from the finely graded material prior to being transported off-site for beneficial reuse. The water in the EDG Slag Pond flows to the southwest where it gravity flows through a V-notch weir and through a four feet wide concrete structure into a 48-inch diameter corrugated metal pipe. The water from the EDG Slag Pond, which combines with flows from the EDG North A-Pond and EDG South A-Pond in the 48-inch diameter corrugated metal pipe, flows to the south into the northwest corner of the EDG B-Pond.

The surface area of the EDG Slag Pond is approximately 2.2 acres and has an embankment height of approximately 12 feet from the crest to the toe of the downstream slope. The interior storage depth of the EDG Slag Pond is approximately 17 feet. The total volume of impounded CCR and water within the EDG Slag Pond is approximately 47,000 cubic yards.

2.2 EDG North A-Pond

The EDG North A-Pond is located southwest of the generating plant and south of the EDG Slag Pond. Historically, the EDG North A-Pond has received influent flows from the surge tank. Water in the surge tank includes excess process water from the Unit 5 hydrobin, steam water treatment reject water, and water from the facility floor drains. Therefore, the EDG North A-Pond has likely received residual bottom ash from the

hydrobin system, de minimis quantities of fly ash from routine maintenance operations, coal fines, and other materials from the plant floor drains. The water was pumped from the surge tank to the EDG North A-Pond via a 10-inch diameter steel pipe. The steel pipe, at a location northeast of the EDG North A-Pond, splits into two separate 10-inch diameter pipes. Each pipe then discharged into the northeast corner of both the EDG North A-Pond and EDG South A-Pond. Currently, EDG North A-Pond does not receive operational process discharges from the generating plant, although it still has the ability to be routed to the EDG North A-Pond.

Previously, water within the EDG North A-Pond flowed to the west. The EDG North A-Pond discharge consists of an 18-inch diameter corrugated plastic pipe located in the southwest corner of the existing CCR surface impoundment. The water would flow through the corrugated plastic pipe to the west into a concrete sluice box. The water within the sluice box flows through a Parshall flume prior to discharging into a 48-inch diameter corrugated metal pipe, which also receives influent flow from the EDG Slag Pond and EDG South A-Pond, prior to gravity flowing to the south into the northwest corner of the EDG B-Pond. Presently, no water within the EDG North A-Pond discharges through the 18-inch diameter corrugated plastic pipe as the pipe has been plugged.

The surface area of the EDG North A-Pond is approximately 2.2 acres and has an embankment height of approximately 18 feet from the crest to the toe of the downstream slope. The interior storage depth of the EDG Secondary Ash Pond is approximately 21 feet. The total volume of impounded CCR and water within the EDG North A-Pond is approximately 73,000 cubic yards.

2.3 EDG South A-Pond

The EDG South A-Pond is located southwest of the generating plant and south of the EDG North A-Pond. As currently configured, the EDG South A-Pond receives influent flows from the surge tank. Water in the surge tank includes excess process water from the Unit 5 hydrobin, steam water treatment reject water, and water from the facility floor

drains. Therefore, the EDG North A-Pond has likely received residual bottom ash from the hydrobin system, de minimis quantities of fly ash from routine maintenance operations, coal fines, and other materials from the plant floor drains. The water is pumped from the surge tank to the EDG South A-Pond via a 10-inch diameter steel pipe. The steel pipe, at a location northeast of the EDG North A-Pond, splits into two separate 10-inch diameter pipes. Each pipe then discharges into the northeast corner of both the EDG North A-Pond and EDG South A-Pond. Note, the EDG North A-Pond no longer receives operational process flows from the generating plant.

The water within the EDG South A-Pond flows to the west. The EDG South A-Pond consists of an 18-inch diameter corrugated plastic pipe located in the northwest corner of the existing CCR surface impoundment. The water flows through the corrugated plastic pipe to the west into a concrete sluice box. The water within the sluice box flows through a Parshall flume prior to discharging into a 48-inch diameter corrugated metal pipe, which also receives influent flow from the EDG Slag Pond, prior to gravity flowing to the south into the northwest corner of the EDG B-Pond.

The surface area of the EDG South A-Pond is approximately 2.2 acres and has an embankment height of approximately 18 feet from the crest to the toe of the downstream slope. The interior storage depth of the EDG South A-Pond is approximately 25 feet. The total volume of impounded CCR and water within the EDG South A-Pond is approximately 90,500 cubic yards.

2.4 EDG B-Pond

The EDG B-Pond is located southwest of the generating plant and south of the EDG South A-Pond. The EDG B-Pond receives influent flow via a 48-inch diameter corrugated metal pipe from the EDG Slag Pond and EDG South A-Pond. Additionally, the EDG B-Pond receives storm water drainage from a part of the closed ash landfill west of the EDG B-Pond. The storm water from the closed ash landfill discharges into the west side of the EDG B-Pond via a small corrugated plastic pipe.

The water in the EDG B-Pond flows to the east through an overflow weir wet well structure, Figure 2. The elevated weir prevents CCR that has settled in the EDG B-Pond from flowing out of the impoundment. The water gravity flows to the east through a 24-inch diameter corrugated metal pipe where it discharges into the west side of the EDG C-Pond. The water in the EDG C-Pond gravity flows to the east into the EDG F-Pond. The water in the EDG F-Pond flows through the facility's Wisconsin Pollution Discharge Elimination System (WPDES) Outfall 004 and discharges into Lake Michigan. As determined by WPL, process water discharging from the EDG B-Pond does not contain a significant quantity of CCR, and downstream impoundments contain only de minimis quantities of CCR.

The water surface area of the EDG B-Pond is approximately 1.9 acres and has an embankment height of approximately 24 feet from the crest to the toe of the downstream slope in EDG C-Pond. The interior storage depth of the EDG B-Pond is approximately 15 feet. The total volume of impounded CCR and water within the EDG B-Pond is approximately 46,500 cubic yards.

3 STRUCTURAL STABILITY ASSESSMENT- §257.73(d)

This Report documents whether the design, construction, operation, and maintenance of each CCR unit is consistent with recognized and generally accepted good engineering practices for maximum volume of CCR and CCR wastewater which can be impounded.

3.1 EDG Slag Pond

The EDG Slag Pond is constructed in the northeast corner of the CCR management area located west of Lake Shore Drive, Figure 2. The impoundment has exterior embankments constructed of compacted clay on the north and east sides of the Impoundment, Figure 4, is separated from EDG North A-Pond to the south by an interior embankment constructed of bottom ash, Figure 4, and is incised into a CCR landfill area to the west.

The embankment soil is stiff to very stiff low plasticity clay (CL) or (CL-ML). The foundation soil under the compacted clay embankment inferred from the nearest boring into the foundation soil (boring R, Appendix B, is loose silt (ML) which is underlain by medium stiff clay (CL). The crest of the EDG Slag Pond embankment is 2 foot lower than the embankment separating the EDG Slag Pond from the North A-Pond.

3.1.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The foundation soil is silt and low plasticity clay deposited by glacial activity. The silt is medium dense to loose due to saturation by the impoundments and natural ground water recharge from rainfall. The silt and clay are both located below the normal ground water elevations of discharge to Lake Michigan to the east. The silt strength is adequate to support the embankments under the design loading conditions, EDG Safety Factor Assessment Report §257.73(b).

3.1.2 Slope Protection - §257.73(d)(1)(ii)

The west side of the EDG Slag Pond is incised. The south side abuts the EDG North A-Pond. The crest of the embankment is approximately 20 feet wide and downstream side has a vegetated 3:1 slope. The east crest is approximately 15 wide and the downstream 3:1 slope is vegetated to the Lake Shore Drive. The north crest is approximately 15 wide

and the downstream 3:1 slope is vegetated. Well established and managed vegetation will minimize erosion on both the upstream and downstream slopes. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore the impoundment configuration protects against surface erosion.

The impoundment is located where the embankments will likely not be inundated by water which eliminates the potential for wave action on the downstream slopes.

Sudden drawdown is addressed in Section 3.1.7.

3.1.3 CCR Embankment Density- §257.73(d)(1)(iii)

The constructed clay embankments are stiff to very stiff low plasticity clay and have adequate strength to contain the CCR contents. The measured embankment strength indicates adequate compaction during construction and the EDG Safety Factor Assessment Report § 257.73(b) shows that the compacted clay is not the limiting stability factor for the embankment. Foundation soil, Section 3.1.1, is the critical stability factor for the embankment.

3.1.4 Vegetation Management - §257.73(d)(1)(iv)

Historically vegetation management has been conducted on a periodic basis. At the time of the initial Annual Inspection in October 2015, the grassy vegetation was well managed. The facility plans to continue maintaining the vegetation in a manner that facilitates effective inspections and long-term operations.

3.1.5 Spillway Management - §257.73(d)(1)(v)

The EDG Slag Pond discharges over a 3.67 foot wide broad crested weir structure, Figure 2. The tailwater of the weir is drained by a 48-inch diameter pipe which does not limit the capacity of the discharge from the impoundment. The outlet of the 48-inch diameter pipe is in a lower elevation impoundment that will not back up into the EDG Slag Pond. The structure and pipe are constructed of non-erodible material and designed to carry sustained flows.

This impoundment currently has a hazard potential classification of "Significant," which in turn requires an evaluation of the impacts of a 1,000 year rainfall event. The Inflow Flood Control Plan, which is a separate document developed to comply with §257.82, shows that the precipitation from this event will drain through the culverts without overtopping the embankments of the impoundment.

3.1.6 Hydraulic Structures - §257.73(d)(1)(vi)

On June 23, 2016 the discharge pipe was inspected using remote camera video inspection. The inspection showed that there was minimal deterioration, deformation, distortion, sedimentation, debris, and no bedding deficiencies were observed.

3.1.7 Sudden Drawdown - §257.73(d)(1)(vii)

There is no surface water on the outside toe of the embankment and the embankment is not subjected to sudden drawdown toe failure.

3.2 EDG North A-Pond

The EDG North A-Pond is constructed between the EDG Slag pond and the EDG South A-Pond, Figure 2. The impoundment no longer received process water and is currently a zero liquid discharge pond. The flow of process water was stopped by plugging the 10-inch diameter inlet pipe on the East side of the impoundment and the 18-inch diameter discharge pipe in the southwest corner of the impoundment. Only rainwater enters the pond and either evaporates or exfiltrates the impoundment.

The impoundment has a single exterior embankments constructed of compacted clay on the east side of the impoundment, Figure 4, and is separated from EDG South A-Pond and the EDG Slag Pond by an interior embankments constructed of bottom ash, Figure 4, and is incised into a CCR landfill area to the west.

The embankment soil is very stiff low plasticity clay (CL) or (CL-ML). The foundation soil under the compacted clay embankment inferred from the nearest boring into the foundation soil (boring R, Appendix B, is loose silt (ML) which is underlain by medium stiff clay (CL).

3.2.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The foundation soil is silt and low plasticity clay deposited by glacial activity. The silt is medium dense to loose due to saturation by the impoundments and natural ground water recharge from rainfall. The silt and clay are both located below the normal ground water elevations of discharge to Lake Michigan to the east. The silt strength is adequate to support the embankments under the design loading conditions, EDG Safety Factor Assessment Report §257.73(b).

3.2.2 Slope Protection - §257.73(d)(1)(ii)

The west side of the EDG North A-Pond is incised. The south side abuts the EDG South A-Pond. The crest of the embankment is approximately 15 feet wide and downstream side has a vegetated 3:1 slope. The east crest is approximately 15 wide and the downstream 3:1 slope is vegetated to the Lake Shore Drive. The north crest is approximately 15 wide and the downstream 3:1 slope is vegetated. Well established and managed vegetation will minimize erosion on both the upstream and downstream slopes. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore the impoundment configuration protects against surface erosion.

The impoundment is located where the embankments will likely not be inundated by water which eliminates the potential for wave action on the downstream slopes.

Sudden drawdown is addressed in Section 3.2.7.

3.2.3 CCR Embankment Density- §257.73(d)(1)(iii)

The constructed clay embankments is very stiff low plasticity clay and have adequate strength to contain the CCR contents. The measured embankment strength indicates adequate compaction during construction and the EDG Safety Factor Assessment Report §257.73(b) shows that the compacted clay is not the limiting stability factor for the embankment. Foundation soil, Section 3.1.1, is the critical stability factor for the embankment.

3.2.4 Vegetation Management - §257.73(d)(1)(iv)

Historically vegetation management has been conducted on a periodic basis. At the time of the initial Annual Inspection in October 2015, the grassy vegetation was well managed. The facility plans to continue maintaining the vegetation in a manner that facilitates effective inspections and long-term operations.

3.2.5 Spillway Management - §257.73(d)(1)(v)

The EDG North A-Pond is operated as a zero discharge pond. The former spillway is an 18 inch diameter HDPE corrugated smooth interior pipe. The pipe is plugged with a metal plate. The pipe is constructed of non-erodible material and designed to carry sustained flows.

This impoundment currently has a hazard potential classification of "Significant," which in turn requires an evaluation of the impacts of a 1,000 year rainfall event. The Inflow Flood Control Plan, which is a separate document developed to comply with §257.82, shows that the precipitation from this event will be contained within the impoundment without overtopping the embankment.

3.2.6 Hydraulic Structures - §257.73(d)(1)(vi)

On June 23, 2016 the discharge pipe was inspected using remote camera video inspection. The inspection showed that there was minimal deterioration, deformation, distortion, sedimentation, debris, and no bedding deficiencies were observed.

3.2.7 Sudden Drawdown - §257.73(d)(1)(vii)

There is no surface water on the outside toe of the embankment and the embankment is not subjected to sudden drawdown toe failure.

3.3 EDG South A-Pond

The EDG South A-Pond is constructed between the EDG North A-Pond and the EDG B-Pond, Figure 2. The Pond has exterior embankments constructed of compacted clay on the east side of the Pond, Figures 3 and 5, is separated from EDG North A-Pond to the north by an interior embankment constructed of bottom ash, Figure 3, and is incised into

a CCR landfill area to the west. The south embankment is constructed very stiff clay topped with dense bottom ash where it is exposed to EDG C-Pond and is constructed of bottom ash between where it separates EDG B-Pond, Boring I Appendix B.

The embankment soil is stiff to very stiff low plasticity clay (CL) or (CL-ML) below elevation 603.5 and dense bottom ash to the crest at approximately elevation 612 feet. The foundation soil under the compacted clay embankment inferred from the nearest boring into the foundation soil (boring R and E, Appendix B, is loose silt (ML) which is underlain by medium stiff clay (CL). The crest of the EDG South A-Pond embankment is 4 foot higher than the embankment of the EDG B-Pond.

3.3.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The foundation soil is silt and low plasticity clay deposited by glacial activity. The silt is medium dense to very loose due to saturation by the impoundments and natural ground water recharge from rainfall. The silt and clay are both located below the normal ground water elevations of discharge to Lake Michigan to the east. The silt strength is adequate to support the embankments under the design loading conditions, EDG Safety Factor Assessment Report §257.73(b).

3.3.2 Slope Protection - §257.73(d)(1)(ii)

The west side of the EDG South A-Pond is incised. The south side abuts the EDG B-Pond. The crest of the embankment is approximately 15 feet wide and downstream side has a vegetated 3:1 slope. The east crest is approximately 15 wide and the downstream 3:1 slope is vegetated to the Lake Shore Drive. To the north the impoundment abuts the EDG North A-Pond. The crest is approximately 15 wide and the downstream 3:1 slope is vegetated. Well established and managed vegetation will minimize erosion on both the upstream and downstream slopes. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore the impoundment configuration protects against surface erosion.

The impoundment is located where the embankments will likely not be inundated by water which eliminates the potential for wave action on the downstream slopes.

Sudden drawdown is addressed in Section 3.3.7.

3.3.3 CCR Embankment Density- §257.73(d)(1)(iii)

The constructed clay embankment is very stiff low plasticity clay with a top layer of dense bottom ash and has adequate strength to contain the CCR contents. The measured embankment strength indicates adequate compaction during construction and the EDG Safety Factor Assessment Report §257.73(b) shows that the compacted clay and bottom ash is not the limiting stability factor for the embankment. Foundation soil, Section 3.1.1, is the critical stability factor for the embankment.

3.3.4 Vegetation Management - §257.73(d)(1)(iv)

Historically vegetation management has been conducted on a periodic basis. At the time of the initial Annual Inspection in October 2015, the grassy vegetation was well managed. The facility plans to continue maintaining the vegetation in a manner that facilitates effective inspections and long-term operations.

3.3.5 Spillway Management - §257.73(d)(1)(v)

The EDG South A-Pond discharges through an 18-inch diameter corrugated HDPE pipe with smooth interior. The pipe invert is at 608.2 feet and the discharge from the impoundment is controlled by entrance conditions into the pipe, not the discharge conditions through the 48-inch diameter corrugated metal pipe to EDG B-Pond. The pipe is constructed of non-erodible material and designed to carry sustained flows.

This impoundment currently has a hazard potential classification of "Significant," which in turn requires an evaluation of the impacts of a 1,000 year rainfall event. The Inflow Flood Control Plan, which is a separate document developed to comply with §257.82, shows that the precipitation from this event will drain through the culverts without overtopping the embankment.

3.3.6 Hydraulic Structures - §257.73(d)(1)(vi)

On June 23, 2016 the discharge pipe was inspected using remote camera video inspection. The inspection showed that there was minimal deterioration, deformation, distortion, sedimentation, debris, and no bedding deficiencies were observed.

3.3.7 Sudden Drawdown - §257.73(d)(1)(vii)

Surface water is present in EDG C-Pond at the toe of the embankment at section I-I'. The water is normally at elevation 587 feet and rises to elevation 590 feet when the impoundment is full. A sudden decrease of water elevation is limited to three feet on a clay embankment toe and will not lead to sudden drawdown toe failure.

3.4 EDG B-Pond

The EDG B-Pond is constructed in the southeast corner of the CCR management area located west of Lake Shore Drive, Figure 2. The impoundment has exterior embankments constructed of compacted clay on the east side of the impoundment, Figures 3 and 5, is separated from EDG South A-Pond to the north by an interior embankment constructed of bottom ash, Figure 3, and is incised into a CCR landfill area to the west.

The embankment soil is stiff to very stiff low plasticity clay (CL) or (CL-ML), Borings E and Q, Appendix B. The foundation soil under the compacted clay embankment is loose to very loose silt (ML) which is underlain by medium stiff clay (CL). The crest of the EDG B-Pond embankment is 4 feet lower than the embankment of the EDG B-Pond.

3.4.1 CCR Unit Foundation and Abutments - §257.73(d)(1)(i)

The foundation soil is silt and low plasticity clay deposited by glaciers. The silt is loose to very loose due to saturation by the impoundments and natural ground water recharge from rainfall. The silt and clay are both located below the normal ground water elevations of discharge to Lake Michigan to the east. The silt strength is adequate to support the embankments under the design loading conditions, EDG Safety Factor Assessment Report §257.73(b).

3.4.2 Slope Protection - §257.73(d)(1)(ii)

The west side of the EDG B-Pond is incised. The south crest is approximately 15 wide and the downstream 3:1 slope is vegetated. The east crest is approximately 15 wide and the downstream 2:1 slope is vegetated to the EDG C-Pond. The north crest abuts the EDG South A-Pond and is approximately 15 wide and the downstream 3:1 slope is vegetated. Well established and managed vegetation will minimize erosion on both the upstream and downstream slopes. Additionally, storm water runoff is limited to the crest and downstream slope of the embankment, which limits the erosive force. Therefore the impoundment configuration protects against surface erosion.

Given the size of the EDG C-Pond, the wave action generated on the downstream slope will not produce forces to cause undercutting of the east embankment.

Sudden drawdown is addressed in Section 3.4.7.

3.4.3 CCR Embankment Density- §257.73(d)(1)(iii)

The constructed clay embankment is stiff to very stiff low plasticity clay (CL). The measured embankment strength indicates adequate compaction during construction and the EDG Safety Factor Assessment Report §257.73(b) shows that the compacted clay is not the limiting stability factor for the embankment. Foundation soil, Section 3.1.1, is the critical stability factor for the embankment.

3.4.4 Vegetation Management - §257.73(d)(1)(iv)

Historically vegetation management has been conducted on a periodic basis. At the time of the initial Annual Inspection in October 2015, the grassy vegetation was well managed. The facility plans to continue maintaining the vegetation in a manner that facilitates effective inspections and long-term operations.

3.4.5 Spillway Management - §257.73(d)(1)(v)

The EDG B-Pond discharges over a 3 foot wide broad crested overflow weir set at elevation 598.3 feet. The water enters a wet well that discharges through a 24 inch

diameter corrugated steel culvert to EDG C-Pond. The structure and pipe are constructed of non-erodible material and designed to carry sustained flows.

This impoundment currently has a hazard potential classification of "Significant," which in turn requires an evaluation of the impacts of a 1,000 year rainfall event. The Inflow Flood Control Plan, which is a separate document developed to comply with §257.82, shows that the precipitation from this event will drain through the culverts without overtopping the embankments of the impoundment.

3.4.6 Hydraulic Structures - §257.73(d)(1)(vi)

On June 23, 2016 the discharge pipe was inspected using remote camera video inspection. The inspection showed that there was minimal deterioration, deformation, distortion, sedimentation, debris, and no bedding deficiencies were observed.

3.4.7 Sudden Drawdown - §257.73(d)(1)(vii)

Surface water is present in EDG C-Pond at the toe of the embankment at section E-E'. The water at the toe is normally at elevation 587 feet and rises to elevation 590 feet when the EDG C-Pond is full. A sudden decrease of water elevation is limited to three feet on a clay embankment toe and will not lead to sudden drawdown toe failure.

4 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

To meet the requirements of 40 CFR 257.73(d)(3), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Wisconsin; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.73(b) and 40 CFR 257.73(d).

By: _____

Name: Mark Loerop

Date: 10/5/2016

FIGURES

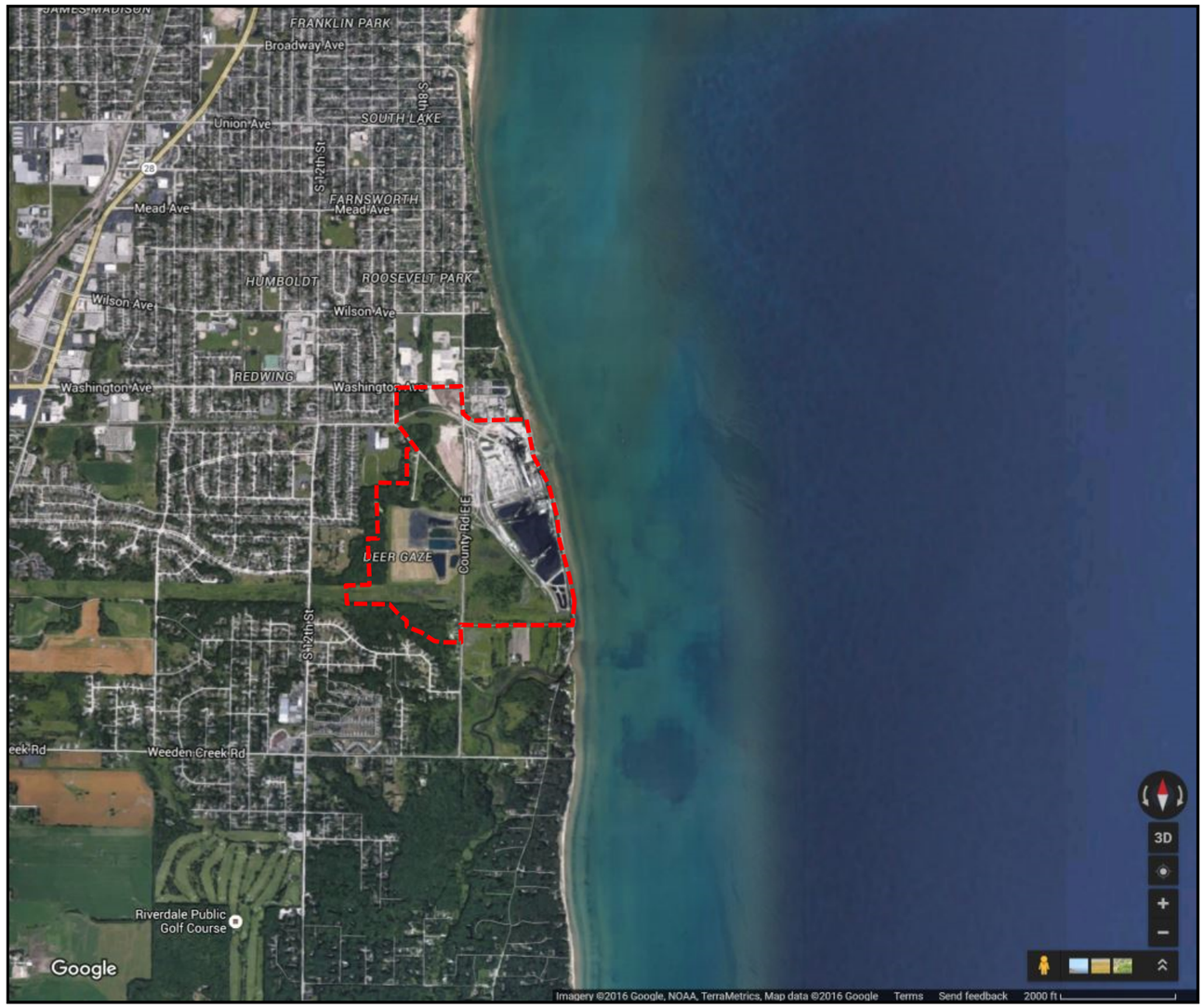
Alliant Energy
Wisconsin Power and Light Company
Edgewater Generating Station
Sheboygan, WI

Structural Stability Assessment

Historical Topo Map

2013

Historical Aerial Photo



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sheboygan South, 2013, 7.5-minute

SITE NAME: Edgewater Generating Station
ADDRESS: 3739 Lakeshore Drive
Sheboygan, WI 53081
CLIENT: Environmental Site Assessors

N

Approximate Property Boundary

HARD HAT SERVICES™
Engineering, Construction and Management Solutions

Site Location
Edgewater Generating Station
Wisconsin Power and Light Company

Drawing
Figure 1

Date
7/12/2016

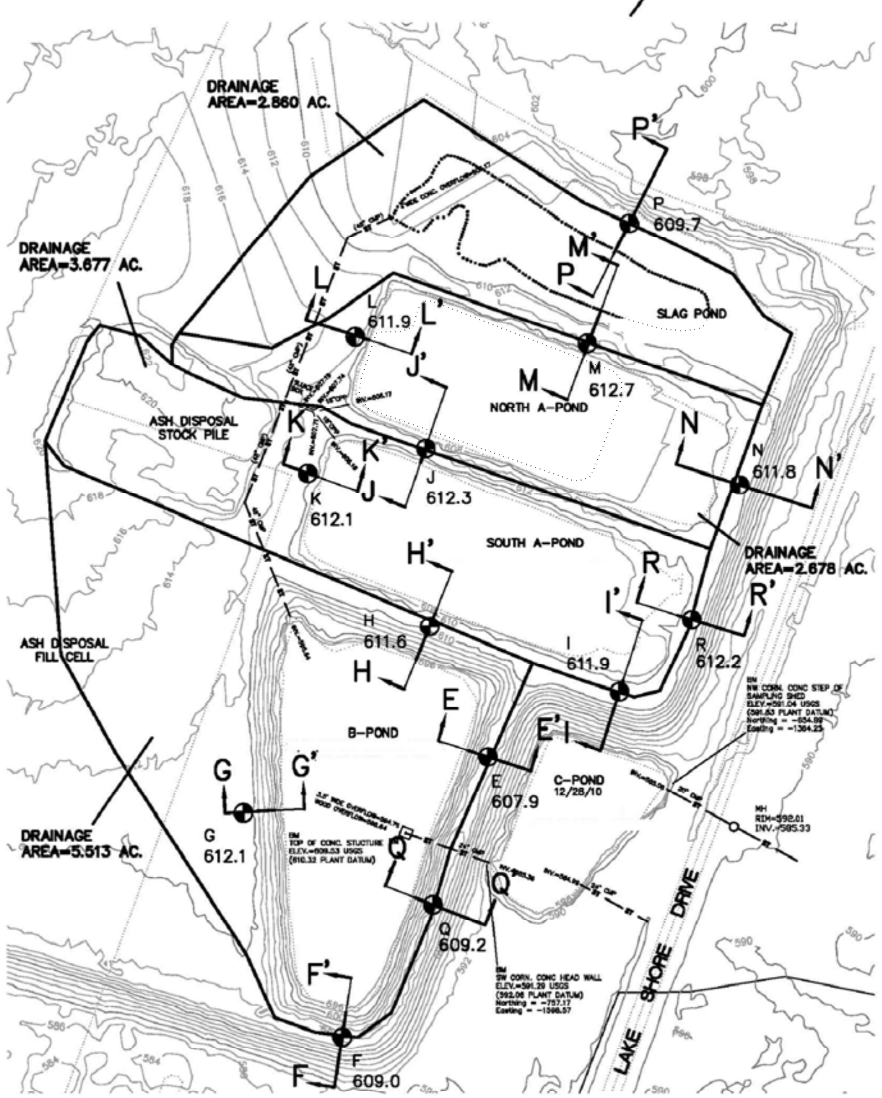
MAP SOURCE:
MODIFIED FROM MILLER ENGINEERS SCIENTISTS, ASH POND SLOPE STABILITY EVALUATION, IMPOUNDMENT ANALYSIS, SHEET 1 OF 5, FEB. 25, 2011.

LEGEND

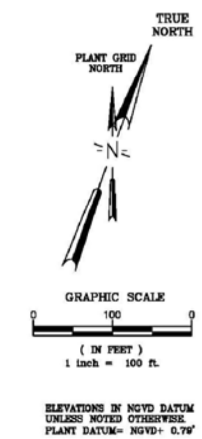
A 589.5 — MILLER ENGINEERS & SCIENTISTS JANUARY AND FEBRUARY 2011 SOIL EXPLORATION BORINGS & GROUND ELEVATION MEASUREMENTS

A A' — BERM CROSS SECTION LOCATION

SITE LOCATION MAP



BM WILSON GPS MONUMENT PID DE7583 LOCATED 278' SOUTH OF THE CENTERLINE OF BLACK RIVER ROAD AND 37' EAST OF THE CENTERLINE OF LAKE SHORE DRIVE ELEV.=586.86 NAVD88



REV	DATE	BY	DESCRIPTION
5			
4			
3			
2			
1			

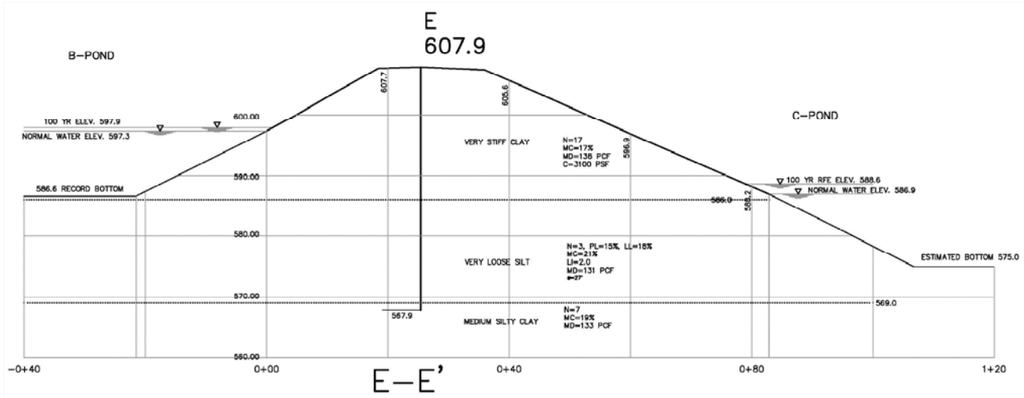
hard hat™ SERVICES

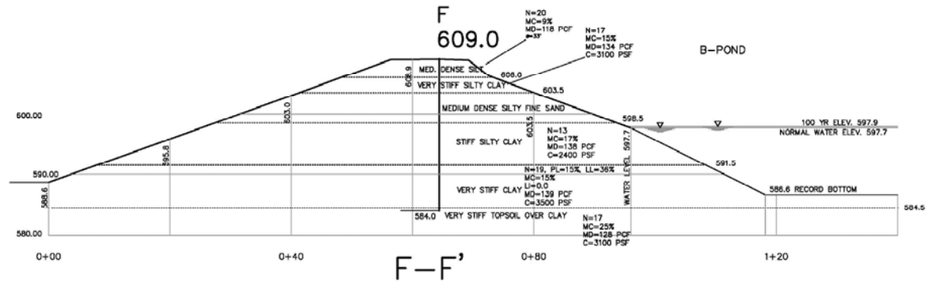
SCALE:	AS SHOWN
DATE:	7-18-16
DRAWN BY:	JFD
CHKD BY:	MWL
APRVD BY:	TJH

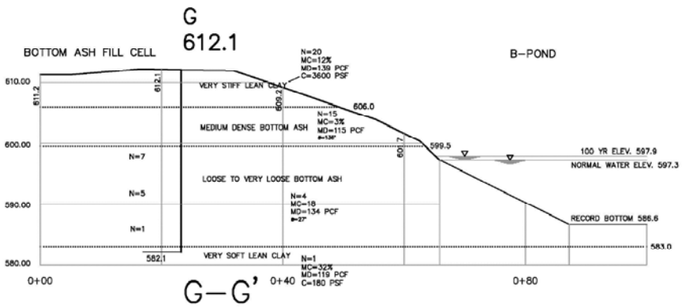
CLIENT / LOCATION
ALLIENT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN WISCONSIN

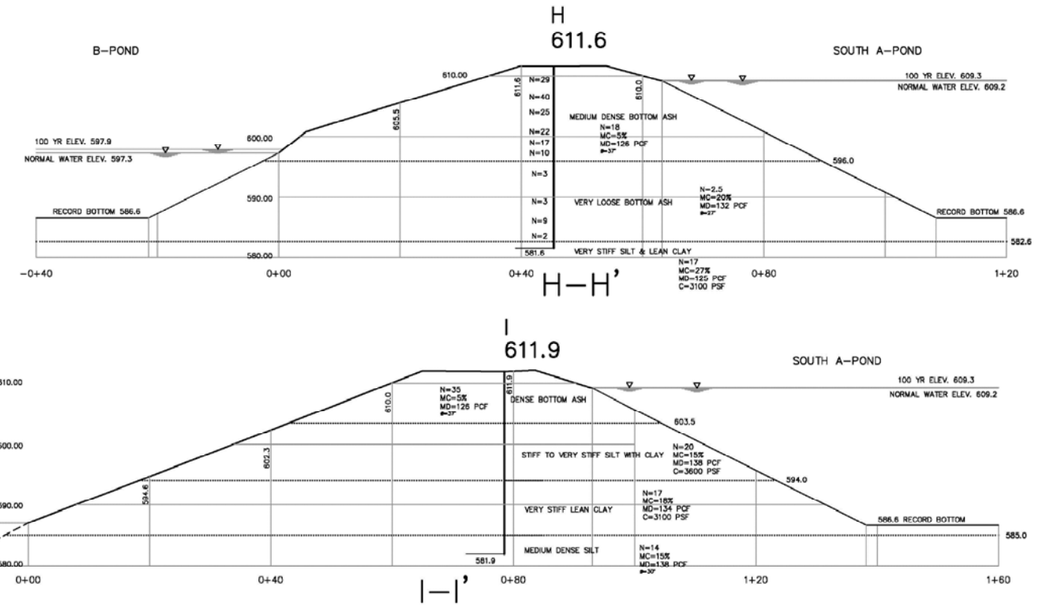
DRAWING DESCRIPTION
Structural Stability Assessment
BORING AND CROSS-SECTION LOCATIONS

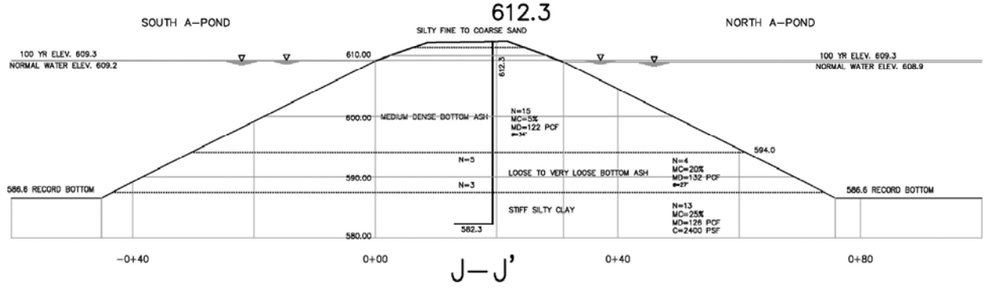
JOB 154.018.012.006
SHT. FIGURE 2
DWG. __________











LEGEND

SOIL LAYER BOUNDARY USED IN STABILITY ANALYSIS

N= SPT BLOW COUNTS
MC= SOIL MOISTURE CONTENT
MD= SOIL MOIST DENSITY
C= SOIL COHESIVE STRENGTH
Ø = ESTIMATED SOIL INTERNAL ANGLE OF FRICTION

GRAPHIC SCALE
0 10 0
(IN FEET)

MAP SOURCE:
MODIFIED FROM MILLER ENGINEERS SCIENTISTS, ASH POND SLOPE STABILITY EVALUATION, IMPOUNDMENT ANALYSIS, SHEET 3 OF 5, FEB. 25, 2011.

REV	DATE	BY	DESCRIPTION
5			
4			
3			
2			
1			

hard hat SERVICES™

SCALE:	AS SHOWN
DATE:	7–18–16
DRAWN BY:	JFD
CHKD BY:	MWL
APRVD BY:	TJH

CLIENT / LOCATION

ALLIENT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN WISCONSIN

DRAWING DESCRIPTION

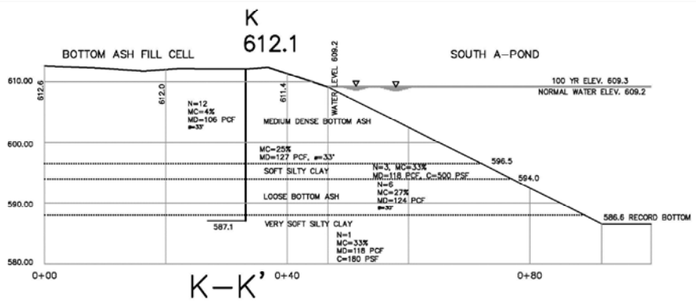
Structural Stability Assessment

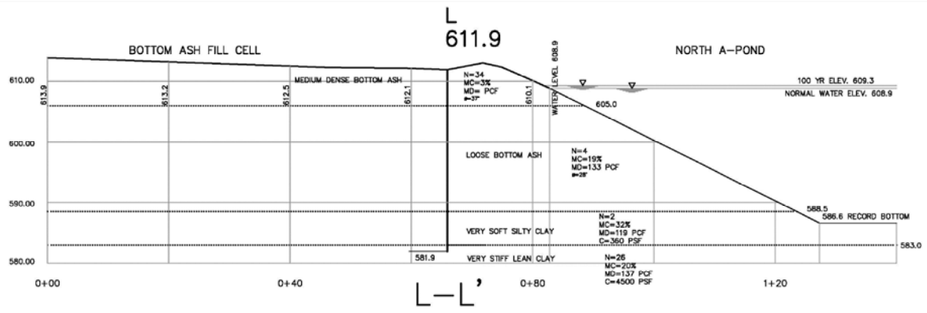
CROSS–SECTIONS
EDG POND B AND SOUTH–A POND

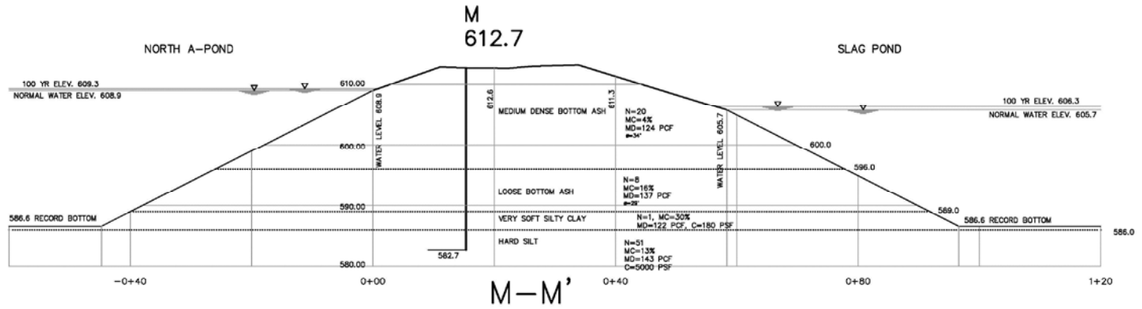
JOB 154.018.012.006

SHT. FIGURE 3

DWG. ----------







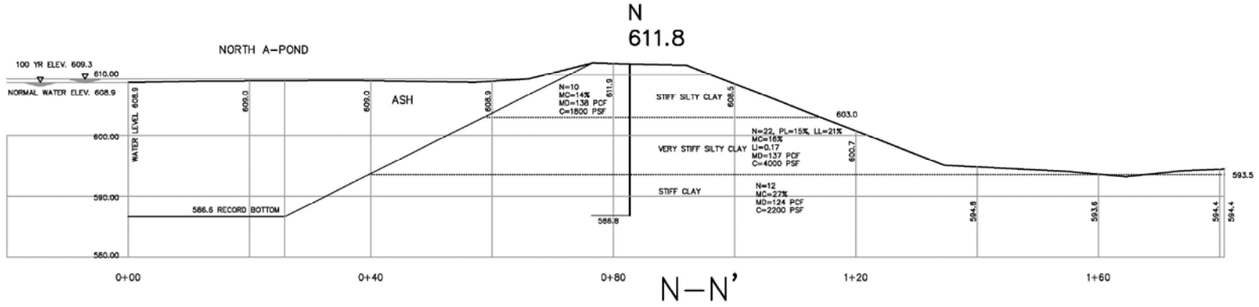
LEGEND

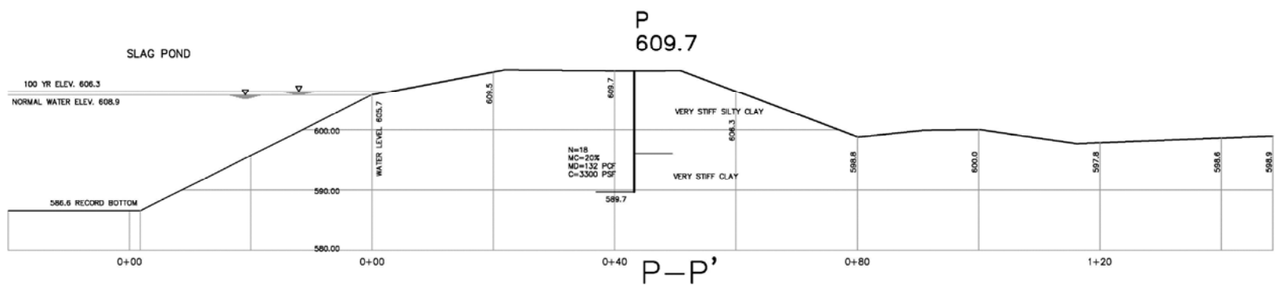
- SOIL LAYER BOUNDARY USED IN STABILITY ANALYSIS
- N= SPT BLOW COUNTS
- MC= SOIL MOISTURE CONTENT
- MD= SOIL MOIST DENSITY
- C= SOIL COHESIVE STRENGTH
- ø = ESTIMATED SOIL INTERNAL ANGLE OF FRICTION

GRAPHIC SCALE

0 10 0

(IN FEET)





MAP SOURCE:
MODIFIED FROM MILLER ENGINEERS SCIENTISTS, ASH POND SLOPE STABILITY EVALUATION, IMPOUNDMENT ANALYSIS, SHEET 4 OF 5, FEB. 25, 2011.

REV	DATE	BY	DESCRIPTION
5			
4			
3			
2			
1			

hard hat SERVICES™

SCALE:	AS SHOWN
DATE:	7–18–16
DRAWN BY:	JFD
CHKD BY:	MWL
APRVD BY:	TJH

CLIENT / LOCATION

ALLIENT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN WISCONSIN

DRAWING DESCRIPTION

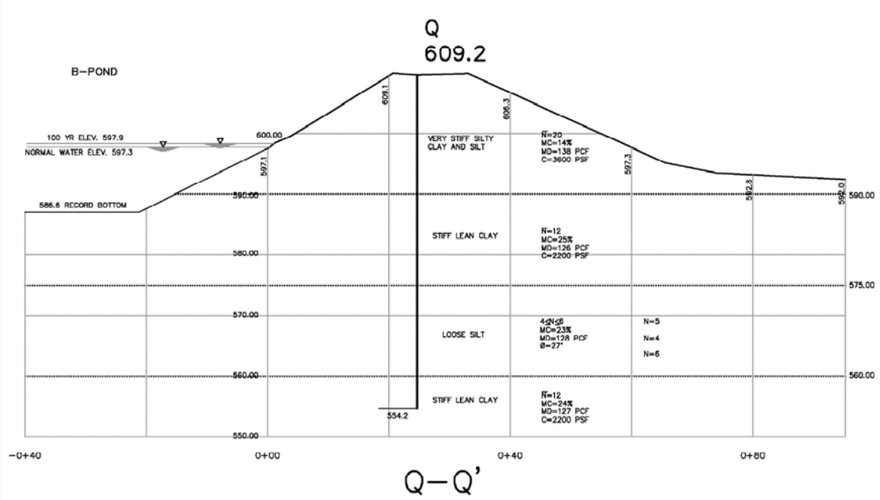
Structural Stability Assessment

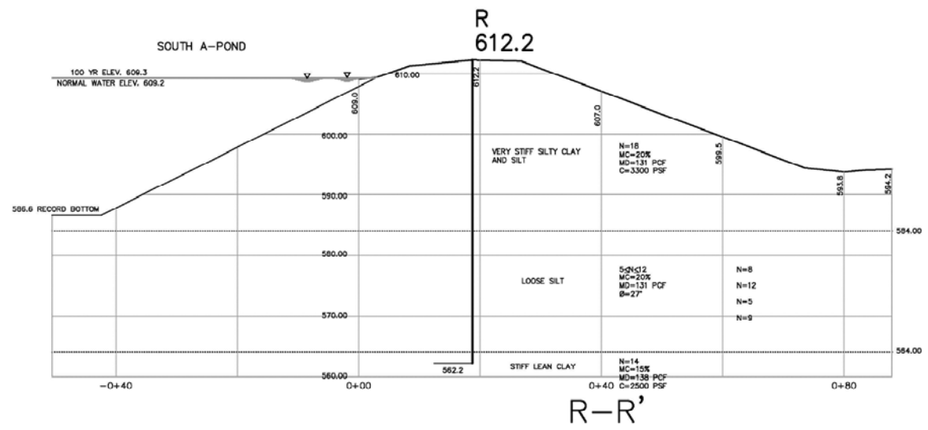
CROSS–SECTIONS
EDG POND A–NORTH AND SLAG POND

JOB 154.018.012.006

SHT. FIGURE 4

DWG. ----------





MAP SOURCE:
MODIFIED FROM MILLER ENGINEERS SCIENTISTS, ASH POND SLOPE STABILITY EVALUATION, IMPOUNDMENT ANALYSIS, SHEET 5 OF 5, FEB. 25, 2011.

LEGEND

.....	SOIL LAYER BOUNDARY USED IN STABILITY ANALYSIS
N=	SPT BLOW COUNTS
MC=	SOIL MOISTURE CONTENT
MD=	SOIL MOIST DENSITY
C=	SOIL COHESIVE STRENGTH
Ø =	ESTIMATED SOIL INTERNAL ANGLE OF FRICTION

GRAPHIC SCALE
0 10 0
(IN FEET)

REV	DATE	BY	DESCRIPTION
5			
4			
3			
2			
1			

hard hat™ SERVICES

SCALE:	AS SHOWN
DATE:	7–18–16
DRAWN BY:	JFD
CHKD BY:	MWL
APRVD BY:	TJH

CLIENT / LOCATION
ALLIENT ENERGY
EDGEWATER GENERATING STATION
SHEBOYGAN WISCONSIN

DRAWING DESCRIPTION
Structural Stability Assessment
CROSS–SECTIONS AT BORING Q AND R
DEEP SOIL BORINGS

JOB 154.018.012.006
SHT. FIGURE 5
DWG. ----------

APPENDIX A – Outfall Pictures

Alliant Energy
Wisconsin Power and Light Company
Edgewater Generating Station
Sheboygan, WI

Structural Stability Assessment

Photo 1: EDG Slag Pond inlet of hydraulic structure. Hydraulic structure consist of v-notch overflow weir that discharges into a 48-inch diameter corrugated metal pipe.

Photo 2: EDG North A-Pond inlet of hydraulic structure. Hydraulic structure consist of 18-inch diameter corrugated plastic pipe. The hydraulic structure is currently plugged.

Photo 3: EDG South A-Pond inlet of hydraulic structure. Hydraulic structure consist of 18-inch diameter corrugated plastic pipe. Water flows through the hydraulic structure and discharges into a concrete sluice box prior to flowing through a Parshall flume structure.

Photo 4: Outlets of EDG North A-Pond and EDG South A-Pond hydraulic structures. Currently, water only flows through the hydraulic structure of the EDG South A-Pond. Water flows through a Parshall flume structure and into a 48-inch diameter corrugated metal pipe.

Photo 5: Water from the EDG South A-Pond flows into a 48-inch diameter corrugated metal pipe and combines with the flow from the EDG Slag Pond. The combined flows discharge into the EDG B-Pond.

Photo 6: Outlet of 48-inch diameter corrugated metal pipe which contains flows of the EDG Slag Pond and EDG South A-Pond. The water discharges into the EDG B-Pond.

Photo 7: Water within the EDG B-Pond flows through an overflow weir structure. The water gravity flows through a 24-inch diameter corrugated metal pipe which discharges into the EDG C-Pond.

Photo 8: Outlet of EDG B-Pond hydraulic structure. Water from EDG B-Pond discharges into the EDG C-Pond. Water within EDG C-Pond flows to the east to the EDG F-Pond. Water in the EDG F-Pond discharges through the facility's WPDES Outfall 004 into Lake Michigan.

APPENDIX B – Soil Boring Logs

Alliant Energy
Wisconsin Power and Light Company
Edgewater Generating Station
Sheboygan, WI

Structural Stability Assessment

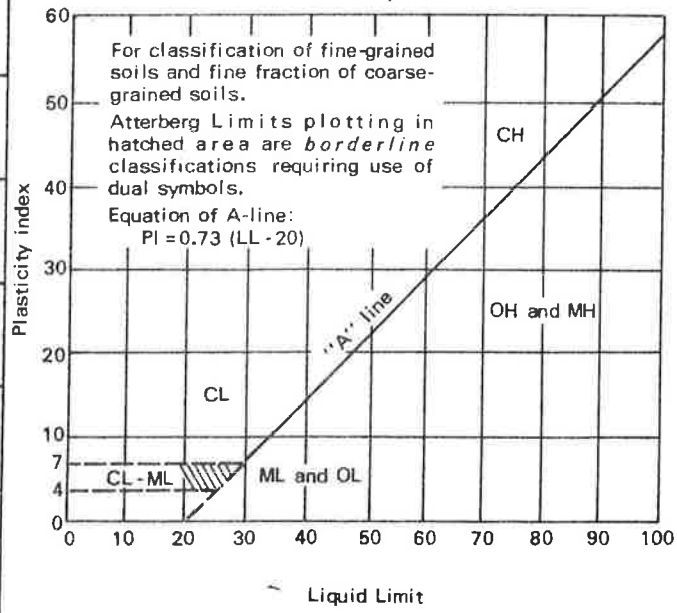
CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487 – 69 AND D 2488 – 69

(Unified Soil Classification System)

Major divisions			Group symbols	Typical names	Classification criteria		
Coarse-grained soils: More than 50% retained on No. 200 sieve*	Gravels: 50% or more of coarse fraction retained on No. 4 sieve	Clean gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve . . . . . GW, GP, SW, SP; More than 12% pass No. 200 sieve . . . . . GM, GC, SM, SC; 5 to 12% pass No. 200 sieve . . . . . *Borderline* classifications requiring use of dual symbols	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are *borderline* classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands: More than 50% of coarse fraction passes No. 4 sieve	Clean sands	SW	Well-graded sands and gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with fines	SM	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are *borderline* classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils: 50% or more passes No. 200 sieve*	Silts and clays: Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays: Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		Pt	Peat, muck and other highly organic soils			

Plasticity Chart



*Based on the material passing the 3 in. (76 mm) sieve.

LOG OF TEST BORING
GENERAL NOTES

Descriptive Soil Classification

GRAIN SIZE TERMINOLOGY

Soil Fraction	Particle Size	U.S. Sieve Size
Boulders	Larger Than 12"	Larger Than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	3/4" to 3"	3/4" to 3"
Fine	4.76mm to 3/4"	#4 to 3/4"
Sand: Coarse	2.00mm to 4.76mm	#10 to #4
Medium	0.42mm to 2.00mm	#40 to #10
Fine	0.074mm to 0.42mm	#200 to #40
Fines	Less Than 0.074mm	Smaller Than #200
Silt	0.005mm to 0.074mm	Smaller Than #200
Clay	Smaller Than 0.005mm	

(Plasticity characteristics differentiate between silt and clay.)

COMPOSITION TERMINOLOGY (ASTM D2487)

Primary Constituent: Gravel	Sand	Fines (Silt or Clay)
with sand...>=15% sand	with gravel.....>=15% gravel	with gravel....15-29% gravel
with silt.....5-12% silt	with silt.....5-12% silt	gravelly.....>=30% gravel
with clay.....5-12 clay	with clay.....5-12% clay	with sand.....15-29% sand
silty.....>12% silt	silty.....>12% silt	sandy.....>=30%sand
clayey.....>12% clay	clayey.....>12% clay	

RELATIVE DENSITY
COHESIONLESS SOILS

Term	"N" Value
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	over 50

The penetration resistance, N, is the summation of the number of blows required to affect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test (ASTM 1586).

CONSISTENCY
COHESIVE SOILS

Term	pp (tons/sq. ft.)	"N" Value
Very Soft	0.00 to 0.25	<2
Soft	0.25 to 0.50	2-4
Medium	0.50 to 1.00	4-8
Stiff	1.00 to 2.00	8-15
Very Stiff	2.00 to 4.00	15-30
Hard	over 4.00	>30

PLASTICITY

Term	Plasticity Index
None to slight	0 to 4
Slight	5 to 7
Medium	8 to 22
High to Very High	over 22

SYMBOLS

DRILLING AND SAMPLING

CS--Continuous Sampling
RC--Rock Coring: Size AW, BW, NW, 2" W
RQD--Rock Quality Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", NW, 4", HW
CW--Clear Water
DM--Drilling Mud
HSA--Hollow Stem Auger
FA--Flight Auger
HA--Hand Auger
SS--2" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter Piston Tube Sample
AS--Auger Sample
PS--Pitcher Sample
NR--No Recovery
VS--Vane Shear Test

LABORATORY TESTS

pp--Penetrometer Reading, tons/sq.ft.
qu--Unconfined Strength, tons/sq. ft.
MC--Moisture Content, %
LL--Liquid Limit, %
PL--Plastic Limit, %
PI--Plasticity Index, %
SL--Shrinkage Limit, %
LI--Loss on Ignition, %
D--Dry Unit Weight, lbs./cu. ft.
pH--Measure of Soil Alkalinity or Acidity
FS--Free Swell, %
HNu--ppmv as Benzene
TLV--ppmv as Hexane
TPH--Total Petroleum Hydrocarbons, ppm

WATER LEVEL MEASUREMENTS

▼--Water Table Interpretation

Note: Water level measurements recorded in notes on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

MILLER
ENGINEERS
SCIENTISTS

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **C**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **590.1**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/20/10**	Drilling Completed: **12/20/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
590.1 / 0	1				FILL: SILT with clay and trace fine to coarse sand and fine gravel - moist, brown (10YR 5/4)	ML
	2		3	30	... - spoon driven 3" only, sample frozen.	ML
	3		12	12	FILL: SILTY FINE SAND - moist, medium dense, dark yellowish brown (10YR 4/4)	SM
585.1 / 5	4		16	17	FILL: LEAN CLAY with little silt, trace roots - moist, very stiff, dark yellowish brown (10YR 4/4)	CL
	5		18	30	... trace cinders	CL
580.1 / 10	6		18	16	LEAN CLAY (native) - moist, very stiff, brown (10YR 4/3)	CL
	7		18	14	... with little silt and fine to coarse sand - wet, stiff, brown (10YR 4/3)	CL
575.1 / 15	8		18	31	... with trace silt and fine to medium sand- wet, very stiff, brown 10YR 4/3)	CL
	9		16	37	SANDY SILT - wet, brown (10YR 4/3)	ML
					... - wet, hard, grayish brown (10YR 5/2)	ML
570.1 / 20					Boring terminated at 20 feet.	

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft): 590.1 / 0; 585.1 / 5; 580.1 / 10; 575.1 / 15; 570.1 / 20

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		ft.	Cave-in Depth	ft.
	12/20/2010		dry	ft.	13	ft.
				ft.		ft.
				ft.		ft.

Borehole Abandonment
Date: 12/20/2010
Material: BENTONITE

Crew: M&K Drill/WGF
Rig: Mobile B52
Method: HSA

GEOTLOG GINT 18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **D**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **590.9**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/10/10**	Drilling Completed: **12/10/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

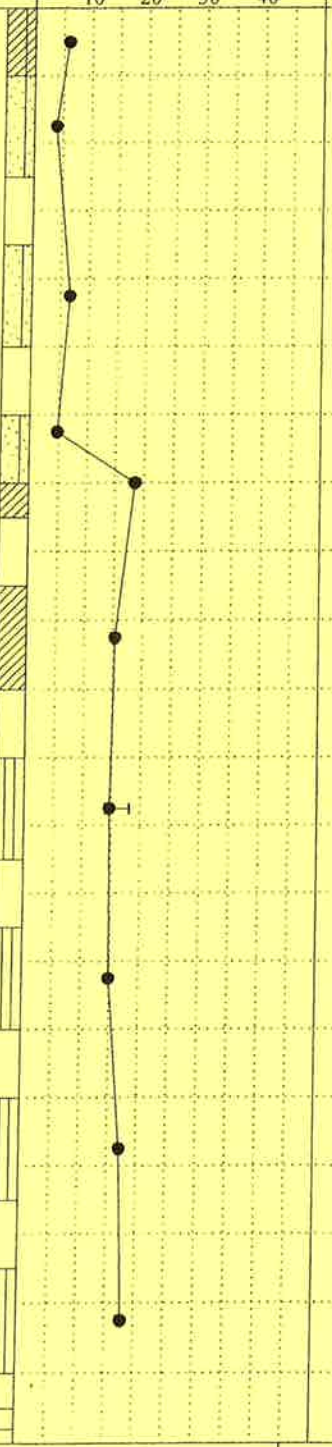
ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
590.9 / 0	1				FILL: SILTY CLAY with fine to coarse sand - moist, light yellow brown (2.5YR 6/4)	CL ML
	2		13	18	FILL: SILTY FINE SAND - moist, medium dense, olive yellow (2.5YR 6/6)	SM
	3		15	12	...	SM
585.9 / 5				18		
	4		14		... with occasional fine gravel- light gray (2.5YR 7/2)	SM
					LEAN CLAY (native) - moist, very stiff, brown (7.5YR 5/4)	CL
	5		18	27	... with roots - moist, very stiff, yellowish brown (10YR 5/6)	CL
580.9 / 10						
	6		14	43	SILT with little CLAY - moist, hard, light brown gray (10YR 6/2)	ML
	7		18	28	SILT with little CLAY - moist to wet, very stiff, pink gray (7.5YR 6/2)	ML
575.9 / 15						
	8		18	14	... wet, stiff, light brown gray (10YR 6/2)	ML
	9		18	26	SILT wih little fine sand and clay - wet, very stiff, light brown gray (10YR 6/2)	ML
570.9 / 20					Boring terminated at 20 feet.	

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40



ELEV. / DEPTH (ft): 590.9 / 0; 585.9 / 5; 580.9 / 10; 575.9 / 15; 570.9 / 20

MILLER ENGINEERS SCIENTISTS

Water Level Cave-in Depth

Date _____ Time _____ _____ ft. _____ ft.
Date _____ Time _____ _____ ft. _____ ft.
Date _____ Time _____ _____ ft. _____ ft.

Borehole Abandonment
Date: **12/10/2010**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **HSA**

GEOTLOG GINT 18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **E**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **607.9**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
607.9 / 0	1				FILL: LEAN CLAY - moist, brown (7.5YR 4/4)	CL
	2		18	9	FILL: LEAN CLAY, trace roots and cinder - moist, stiff, brown (7.5YR 5/4)	CL
	3		18	16	... CLAY interbedded with silt seams - moist, very stiff, brown (7.5YR 4/4)	CL
602.9 / 5	4		18	16	...	CL
	5		18	18	... dark brown (7.5YR 3/3)	CL
597.9 / 10	6		18	18	... brown (7.5YR 5/4)	CL
	7		18	16	... trace fine to medium sand - brown (7.5YR 4/4)	CL
592.9 / 15	8		18	20	... dark brown (7.5YR 3/4)	CL
	9		18	16	LEAN CLAY (native) with trace roots, wood, and occasional fine gravel - moist, very stiff, dark brown (7.5YR 3/3)	CL
587.9 / 20						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft): 607.9 / 0; 602.9 / 5; 597.9 / 10; 592.9 / 15; 587.9 / 20

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		ft.	Cave-in Depth	ft.
	12/21/2010		3	ft.	32.5	ft.
				ft.		ft.
				ft.		ft.

Borehole Abandonment — Date: **12/21/2010** — Material: **BENTONITE**

Crew: **M&K Drill/WGF**

Rig: **Mobile B52**

Method: **HSA**

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **E**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **607.9**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
	10		16	13	SILT - wet, medium dense, brown (10YR 4/3)	ML
582.9 / 25						
	11		15	2	SILT with clay - wet, very loose, dark yellowish brown (10YR 4/4)	ML
577.9 / 30						
	12		18	4	SILT with little clay, trace fine sand - wet, very loose, brown (10YR 4/3)	ML
572.9 / 35						
	13		18	7	...	SM
					SILTY CLAY - wet, brown (10YR 4/3)	CL ML
567.9 / 40					Boring terminated at 40 feet.	

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft)

582.9 / 25 — 577.9 / 30 — 572.9 / 35 — 567.9 / 40

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		Cave-in Depth
	12/21/2010		3 ft.	32.5 ft.
			ft.	ft.
			ft.	ft.

Borehole Abandonment
Date: **12/21/2010**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **HSA**

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **F**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **609.0**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
	10		18	17	... with trace medium sand - moist, very stiff, dark brown (7.5YR 3/4)	CL
584.0 25					SILT topsoil with CLAY (native), trace fine sand and roots - moist, stiff, black (10YR 2/1) / Boring terminated at 25 feet.	ML

PLASTIC M.C. LIQUID (10 20 30 40)

UNCONFINED COMPRESSION (tsf) 1.0 2.0 3.0 4.0

POCKET PEN (tsf) 1.0 2.0 3.0 4.0

BLOW COUNT (N) 10 20 30 40

ELEV. / DEPTH (ft)

584.0 25

579.0 30

574.0 35

569.0 40

Water Level	Date	Time		
	12/21/2010	____	dry ft.	26 ft.
	____	____	____ ft.	____ ft.
	____	____	____ ft.	____ ft.

Borehole Abandonment: Date: **12/21/2010** Material: **BENTONITE**

Crew: **M&K Drill/WGF**

Rig: **Mobile B52**

Method: **HSA**

MILLER ENGINEERS SCIENTISTS

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **F**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **609.0**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
609.0 / 0	1				FILL: SILT with trace to little clay and fine sand - dry, medium dense, dark yellowish brown (10YR 4/4)	ML
	2		18	20	...	ML
604.0 / 5	3		18	17	FILL: SILTY CLAY with trace fine sand - moist, very stiff, dark yellowish brown (10YR 4/4)	CL ML
	4		17	17	FILL: SILTY FINE SAND interbedded with silty clay - moist, medium dense, brown (7.5YR 5/3)	SM
	5		18	16	... strong brown (7.5YR 4/6)	SM
599.0 / 10	6		18	10	FILL: SILTY CLAY with trace fine sand, interbedded with silty fine sand - moist, stiff, brown (10YR 4/3)	CL ML
	7		18	16	FILL: TOPSOIL/ROOT Layer over SILTY CLAY interbedded with silty fine sand and topsoil - moist, stiff, brown (10YR 4/3)	CL ML
594.0 / 15	8		18	14	... brown (7.5YR 5/4)	CL ML
	9		17	20	FILL: CLAY interbedded with silty fine sand - moist, very stiff, brown (7.5YR 5/4)	CL
589.0 / 20						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft): 609.0 / 0; 604.0 / 5; 599.0 / 10; 594.0 / 15; 589.0 / 20

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		Cave-in Depth
	12/21/2010		dry ft.	26 ft.
			ft.	ft.
			ft.	ft.

Borehole Abandonment — Date: **12/21/2010** — Material: **BENTONITE**

Crew: **M&K Drill/WGF** — Rig: **Mobile B52** — Method: **HSA**

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **I**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **611.9**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
611.9 / 0	1				FILL: Bottom ash - moist, black (10YR 2/1)	SP
	2		14	40	FILL: Bottom ash - moist, dense, black (10YR 2/1)	SP
	3		16	40	...	SP
606.9 / 5	4		15	26	...	SP
	5		17	14	FILL: SILT with clay - moist, medium dense, yellowish brown (10YR 5/4)	ML
601.9 / 10	6		18	21	...	ML
	7		18	16	FILL: SILTY CLAY - moist, very stiff, dark yellowish brown (10YR 3/6)	CL ML
596.9 / 15	8		18	27	FILL: SILT with clay pockets - moist, medium dense, dark yellowish brown (10YR 3/6)	ML
	9		17	17	LEAN CLAY (Native) - moist, very stiff, strong brown (7.5YR 4/6)	CL
591.9 / 20						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft): 611.9 / 0; 606.9 / 5; 601.9 / 10; 596.9 / 15; 591.9 / 20

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		Cave-in Depth	
	12/21/2010		dry ft.	27	ft.
			ft.		ft.
			ft.		ft.

Borehole Abandonment

Date: **12/21/2010**

Material: **BENTONITE**

Crew: **M&K Drill/WGF**

Rig: **Mobile B52**

Method: **HSA**

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **I**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **611.9**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
586.9 / 25	10		18	17	LEAN CLAY with trace medium sand - moist, very stiff, strong brown (7.5YR 4/6)	CL
581.9 / 30	11		18	14	SILT with little clay - wet, medium dense, brown (7.5YR 5/2)	ML
					Boring terminated at 30 feet.	
576.9 / 35						
571.9 / 40						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft): 586.9 / 25; 581.9 / 30; 576.9 / 35; 571.9 / 40

MILLER ENGINEERS SCIENTISTS

	Water Level	Cave-in Depth
Date 12/21/2010 Time ____	dry ft.	27 ft.
Date ____ Time ____	____ ft.	____ ft.
Date ____ Time ____	____ ft.	____ ft.

Borehole Abandonment
Date: **12/21/2010**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **HSA**

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 09:59

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **N**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **611.8**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
611.8 / 0	1				FILL: SILTY CLAY with fine to coarse sand and bottom ash - moist, very stiff, very dark brown (10YR 2/1)	CL ML
	2		11	23	...	CL ML
	3		15	10	... stiff, black (7.5YR 2/1)	CL ML
606.8 / 5					... yellowish brown (10YR 5/4)	CL ML
	4		14	10	FILL: SILTY CLAY with clay layers - moist, medium dense, yellowish brown	CL ML
	5		15	11	...	CL ML
601.8 / 10	6		18	23	... very stiff, brown (10YR 5/3)	CL ML
	7		18	29	... brown (10YR 4/3)	CL ML
596.8 / 15	8		18	16	FILL: CLAY with trace bottom ash and wood - moist, very stiff, dark yellowish brown (10YR 3/4)	CL
	9		18	12	CLAY (native) - moist, stiff, brown (7.5YR 4/4)	CL
591.8 / 20						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● 10 20 30 40

ELEV. / DEPTH (ft) 611.8 / 0 / 606.8 / 5 / 601.8 / 10 / 596.8 / 15 / 591.8 / 20

MILLER ENGINEERS SCIENTISTS

Water Level Cave-in Depth

Date 12/21/2010 Time ____ dry ft. 29 ft.

Date ____ Time ____ ____ ft. ____ ft.

Date ____ Time ____ ____ ft. ____ ft.

Borehole Abandonment

Date: 12/21/2010

Material: BENTONITE

Crew: M&K Drill/WGF

Rig: Mobile B52

Method: HSA

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **N**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **611.8**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **12/21/10**	Drilling Completed: **12/21/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC	PLASTIC M.C. LIQUID (10 20 30 40)	UNCONFINED COMPRESSION (tsf) 1.0 2.0 3.0 4.0 / POCKET PEN (tsf) 1.0 2.0 3.0 4.0 / BLOW COUNT (N) 10 20 30 40	ELEV. / DEPTH (ft)
	10		13	22	... wet, very stiff, strong brown (7.5YR 4/4)	CL			
586.8 / 25					Boring terminated at 25 feet.				586.8 / 25
581.8 / 30									581.8 / 30
576.8 / 35									576.8 / 35
571.8 / 40									571.8 / 40

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 2/9/11 10:00

MILLER ENGINEERS SCIENTISTS

	Water Level	Cave-in Depth
Date 12/21/2010 Time ____	dry ft.	29 ft.
Date ____ Time ____	____ ft.	____ ft.
Date ____ Time ____	____ ft.	____ ft.

Borehole Abandonment
Date: **12/21/2010**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **HSA**

Project:	**POND STABILITY EVALUATION**	Job No:	**10-1-18634**	Boring No:	**P**
Client:	**ALLIANT UTILITIES**	Drilled By:	**M&K ENV & SOILS DRILLING**	Elevation:	**609.7**
Location:	**EDGEWATER - SHEBOYGAN, WI**	Drilling Begun:	**12/20/10**	Drilling Completed:	**12/20/10**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
609.7 / 0	1				FILL: SILTY CLAY with FINE TO COARSE SAND - moist, very dark brown (7.5YR 2.5/2)	CL ML
	2		5		... 35 blow counts for 3", sample frozen	CL ML
	3		18	43	FILL: SILTY CLAY with clay pockets - moist, dense, yellowish brown (10YR 5/8)	CL ML
604.7 / 5					FILL: CLAY with SILT layers - moist, dense, brown (10YR 4/3)	CL ML
	4		18	22	... very stiff, yellowish brown to gray brown (10YR 5/4 and 10YR 5/2)	CL
	5		18	31	...	CL
599.7 / 10					FILL: SILT with CLAY and trace fine sand - moist, vert stiff, dark brown	CL ML
	6		16	10	CLAY - moist, stiff	CL
	7		16	15	CLAY (native) with silt layers and pockets, trace fine gravel and topsoil- moist, stiff, dark brown (7.5YR 3/3)	CL
594.7 / 15						
	8		18	21	CLAY with trace roots - moist, very stiff, brown mottling (7.5YR 4/4)	CL
	9		18	20	... with gray mottling	CL
589.7 / 20					Boring terminated at 20 feet.	

PLASTIC M.C. LIQUID — 10 20 30 40

UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

POCKET PEN (tsf) — 1.0 2.0 3.0 4.0

BLOW COUNT (N) — 10 20 30 40

ELEV. / DEPTH (ft): 609.7 / 0; 604.7 / 5; 599.7 / 10; 594.7 / 15; 589.7 / 20

MILLER ENGINEERS SCIENTISTS	Water Level: Date **12/20/2010** Time ____ **dry** ft. Cave-in Depth **16** ft.	Borehole Abandonment: Date: **12/20/2010** Material: **BENTONITE**	Crew: **M&K Drill/WGF** Rig: **Mobile B52** Method: **HSA**

GEOTLOG GINT 18634.GPJ MLLR_ENG.GDT 2/9/11 10:00

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **Q**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **609.2**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **2/23/11**	Drilling Completed: **2/23/11**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

ELEV. / DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
609.2 / 0	1				FILL: Lean clay - moist, brown (7.5YR 4/4)	CL
604.2 / 5	2		18	23	FILL: Silt with layers of lean clay and silty fine sand, occasional gravel - moist, very stiff, brown (7.5YR 5/4)	ML
599.2 / 10	3		18	21	... - moist, medium dense, brown (7.5YR 5/4)	ML
594.2 / 15	4		18	18	FILL: Silty clay with sand - moist, very stiff, brown (7.5YR 5/4)	CL ML
589.2 / 20	5		18	25	Fill: Sandy lean clay, trace black topsoil, trace fine sand - moist, very stiff, dark brown (10YR 3/3)	CL
584.2 / 25	6		18	13	Fill: Lean clay - moist, stiff, dark brown (10YR 4/4)	CL
579.2 / 30	7		18	11	Silty clay with trace roots - moist to wet, stiff, light olive gray (5YR 6/2) with sand seams with black (10YR 2/1) lean clay	CL ML
574.2 / 35	8		16	5	Silty fine sand - wet, medium, grayish brown (10YR 5/2)	SM
569.2 / 40	9		18	4	Silt - soft, brown (10YR 4/3)	ML
564.2 / 45	10		18	6	... medium, brown (10YR 5/3)	ML
559.2 / 50	11		18	10	... - wet, loose, brown (10YR 5/3)	ML
					Lean clay - moist, stiff, brown (7.5YR 4/4)	CL
554.2 / 55	12		18	13	Lean clay (lacustrine) - moist, stiff, dark brown (7.5YR 3/4)	CL
					Boring terminated at 55 feet.	

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40

ELEV. / DEPTH (ft) 609.2 — 0, 604.2 / 5, 599.2 / 10, 594.2 / 15, 589.2 / 20, 584.2 / 25, 579.2 / 30, 574.2 / 35, 569.2 / 40, 564.2 / 45, 559.2 / 50, 554.2 / 55

MILLER ENGINEERS SCIENTISTS

Water Level Cave-in Depth

Date _____ Time _____ _____ft. _____ ft.
Date _____ Time _____ _____ft. _____ ft.
Date _____ Time _____ _____ft. _____ ft.

Borehole Abandonment

Date: **2/23/2011**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **Mud Rotary**

GEOTLOG GINT_18634.GPJ MLLR_ENG.GDT 3/16/11 10:17

Project: **POND STABILITY EVALUATION**	Job No: **10-1-18634**	Boring No: **R**
Client: **ALLIANT UTILITIES**	Drilled By: **M&K ENV & SOILS DRILLING**	Elevation: **612.2**
Location: **EDGEWATER - SHEBOYGAN, WI**	Drilling Begun: **2/24/11**	Drilling Completed: **2/24/11**

SAMPLE TYPE: 1" Geoprobe | No Recovery | Grab Sample | Auger Sample | 3" Shelby Tube | 2" Split Spoon

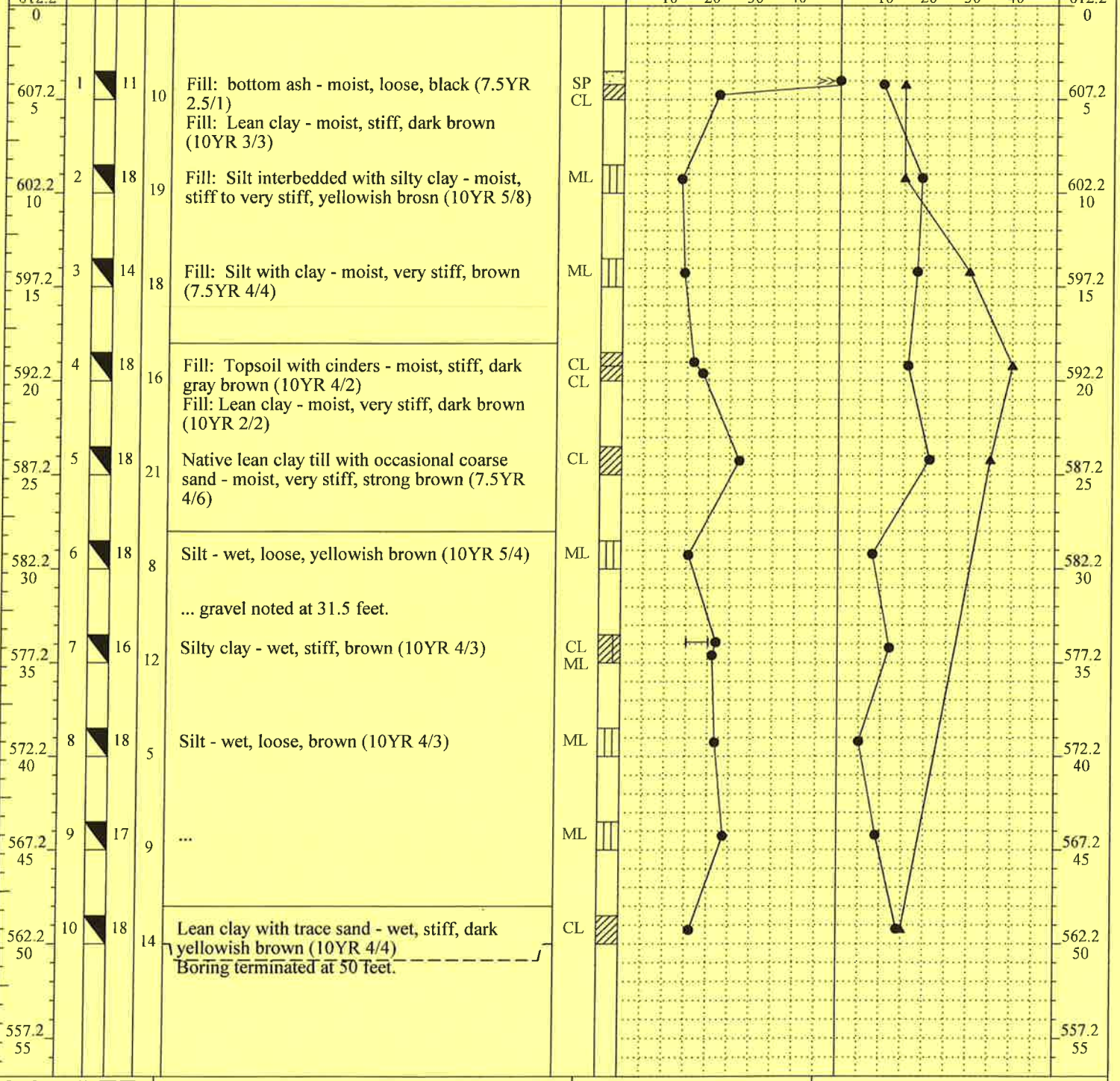
ELEV. DEPTH (ft)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (in.)	SPT (N)	SOIL DESCRIPTION	USC
612.2 0						
607.2 5	1		11	10	Fill: bottom ash - moist, loose, black (7.5YR 2.5/1) Fill: Lean clay - moist, stiff, dark brown (10YR 3/3)	SP CL
602.2 10	2		18	19	Fill: Silt interbedded with silty clay - moist, stiff to very stiff, yellowish brosn (10YR 5/8)	ML
597.2 15	3		14	18	Fill: Silt with clay - moist, very stiff, brown (7.5YR 4/4)	ML
592.2 20	4		18	16	Fill: Topsoil with cinders - moist, stiff, dark gray brown (10YR 4/2) Fill: Lean clay - moist, very stiff, dark brown (10YR 2/2)	CL CL
587.2 25	5		18	21	Native lean clay till with occasional coarse sand - moist, very stiff, strong brown (7.5YR 4/6)	CL
582.2 30	6		18	8	Silt - wet, loose, yellowish brown (10YR 5/4) ... gravel noted at 31.5 feet.	ML
577.2 35	7		16	12	Silty clay - wet, stiff, brown (10YR 4/3)	CL ML
572.2 40	8		18	5	Silt - wet, loose, brown (10YR 4/3)	ML
567.2 45	9		17	9	...	ML
562.2 50	10		18	14	Lean clay with trace sand - wet, stiff, dark yellowish brown (10YR 4/4) Boring terminated at 50 feet.	CL
557.2 55						

PLASTIC M.C. LIQUID — 10 20 30 40

■ UNCONFINED COMPRESSION (tsf) — 1.0 2.0 3.0 4.0

▲ POCKET PEN (tsf) ▲ — 1.0 2.0 3.0 4.0

● BLOW COUNT (N) ● — 10 20 30 40



GEOTLOG GINT 18634.GPJ MLLR_ENG.GDT 3/16/11 10:17

MILLER ENGINEERS SCIENTISTS

Water Level	Date	Time		Cave-in Depth
	Date _____	Time _____	_____ft.	_____ ft.
	Date _____	Time _____	_____ft.	_____ ft.
	Date _____	Time _____	_____ft.	_____ ft.

Borehole Abandonment
Date: **2/24/2011**
Material: **BENTONITE**

Crew: **M&K Drill/WGF**
Rig: **Mobile B52**
Method: **Mud Rotary**