

US EPA ARCHIVE DOCUMENT



**DRAFT REPORT
ROUND 7 DAM ASSESSMENT - WISCONSIN POWER & LIGHT
COLUMBIA GENERATING STATION
PRIMARY ASH, SECONDARY ASH, POLISHING & LANDFILL
STORMWATER PONDS
PARDEEVILLE, WISCONSIN**

January 17, 2011



PREPARED BY:



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GZA File No. 01.0170142.20**

GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

January 17, 2011
File No. 01.0170142.20

Mr. Stephen Hoffman
U. S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460



Re: Round 7 Dam Assessment - Draft Report
EPA Contract No. EP10W001313
Wisconsin Power & Light – Columbia Generating Station
Primary Ash, Secondary Ash, Polishing & Landfill Storm Water Ponds
Pardeeville, Wisconsin

Dear Mr. Hoffman:

In accordance with our proposal 01.P00000177.11, dated August 11, 2010, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-CALL-0001, GZA GeoEnvironmental, Inc. (GZA) has completed our inspection of the Wisconsin Power & Light, Columbia Generating Station; Primary Ash, Secondary Ash, Polishing & Landfill Storm Water Ponds located in Pardeeville, Wisconsin ("Site"). The Site visit was conducted on September 28, 2010. The purpose of our efforts was to provide the EPA with a Site specific inspection of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act Section 104(e). We are submitting one hard copy and one CD-ROM copy of this Draft Report directly to the EPA.

Based on our visual inspection, and in accordance with the EPA's criteria, the Primary Ash, Secondary Ash, and Polishing Pond Impoundments are currently in **SATISFACTORY** condition and the Landfill Storm Water Pond Impoundment is currently in **FAIR** condition, in our opinion. Further discussion of our evaluation and recommended actions are presented in the Round 7 Dam Assessment Report. The report includes: (a) completed Field Assessment Checklists; (b) figures of the impoundments; and (c) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A** and the Terms and Conditions of our contract agreement.

We are happy to have been able to assist you with this inspection and appreciate the opportunity to continue to provide you with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Round 7 Dam Assessment Report.

Sincerely,

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PREFACE

The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Prepared by:

GZA GEOENVIRONMENTAL, INC.

Patrick J. Harrison, P.E.

Wisconsin License No.: _____

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CCW Impoundments
WP&L – Columbia Generating Station

Date of Inspection: 9/28/10

DRAFT REPORT

EXECUTIVE SUMMARY

This Inspection Report presents the results of a visual inspection of the Wisconsin Power and Light Company (WP&L) Columbia Generating Station (CGS, Site) Coal Combustion Waste Impoundments in Pardeeville, Wisconsin. The inspection was performed on September 28, 2010 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of CGS.



The CGS is a two-unit coal-fired power plant with a maximum generating capacity of approximately 1,000 Megawatts. Commercial operation of the facility began in the 1970's. Three unlined earthen embankment CCW impoundments known as the Primary Ash Pond Impoundment (PAP), the Secondary Ash Pond Impoundment (SAP), and the Polishing Pond Impoundment (PP) were constructed in the 1970's in conjunction with the CGS facility for the purpose of storing CCW waste and recycling or discharging plant wastewater. A fourth impoundment, the Landfill Storm Water Pond Impoundment (LSP), was commissioned in 1984 in conjunction with the on-Site ash landfill. The LSP is a lined earthen embankment structure and stores storm water runoff and sediments from the open cells of the ash landfill.

The size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum height of 23 feet and a storage volume of approximately 72 acre-feet, the PAP was classified as a **Small** sized structure. Based on the maximum height of 23 feet and a storage volume of 204 acre-feet, the SAP was classified as a **Small** sized structure. Based on the maximum height of 10 feet and a storage volume of 5 acre-feet, the PP was classified as a **Small** sized structure. Based on the maximum height of 35 feet and a storage volume of 11 acre-feet, the LSP was classified as a **Small** sized structure. According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet were classified as Small sized structures.

The PAP, SAP, PP, and LSP have not been given a hazard rating by the Wisconsin Department of Natural Resources. Under the State of Wisconsin classification system, it is GZA's opinion that the PAP and SAP would be classified as **Significant** hazard structures and that the PP and LSP would be classified as **Low** hazard structures.

Based on the results of the visual inspection, discussions with CGS personnel, and a review of available design documentation, the PAP, SAP, and PP were found to be in **SATISFACTORY** condition and the LSP was found to be in **FAIR** condition. The following deficiencies were noted at each impoundment area.

Primary Ash Pond (PAP)

1. Minor erosion due to wave action along the upstream slope;
2. Minor erosion due to wave action along the downstream slope of the eastern embankment that also forms the upstream embankment of the SAP;
3. Large erosion ditch on the downstream slope near the southeast corner of the impoundment; and,
4. Tree stumps and roots on the downstream slope near the northwest corner of the embankment.



Secondary Ash Pond (SAP)

1. Minor erosion due to wave action along the upstream slope;
2. Minor erosion due to wave action along the upstream slope of the western embankment that also forms the downstream embankment of the PAP; and,
3. Large erosion ditch on the upstream slope near the southwest corner of the impoundment (same erosion ditch noted in Item 3 for the PAP).

Polishing Pond (PP)

1. No routine maintenance plan.

Landfill Stormwater Pond

1. Erosion ditches on the eastern and western embankment;
2. Sparse vegetation in select areas of the upstream slope;
3. Trees up to 15 inches in diameter located on the upstream slope and crest;
4. Animal burrows on the northern and southern embankments; and,
5. Water level above the maximum allowable level of 794.85 feet.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments.

Studies and Analyses:

1. Evaluate the extent of wave action erosion on the upstream slopes of the PAP;
2. Perform a hydrologic/hydraulic analysis of the PAP, SAP and PP to determine the adequacy of the current operating conditions and design to accommodate the appropriate precipitation event;
3. Evaluate the slope and seepage stability of the PAP, SAP and LSP based on current operating conditions and methodologies. The effects of high water events from the Wisconsin River should be considered in the analysis for the PAP and SAP; and,
4. Develop an EAP for the impoundments.

**Operation & Maintenance Activities:**

1. Documentation of the periodic visual observations of the PAP, SAP and LSP;
2. Maintain copies of the impoundment design and construction documentation on Site.
2. Semi-annual inspection of the PP and LSP in addition to the inspections being completed on the PAP and SAP;
3. Clear deep rooted vegetation stumps from the PAP embankment;
4. Clear deep rooted vegetation from the embankments and crest of the LSP;
5. Add topsoil and reseed areas of sparse vegetation in the LSP; and,
6. Remove excess water from LSP and relocate marker stake to accommodate current maximum water level of 794.85 feet.

Repair Recommendations:

1. Repair erosion ditches present in the PAP, SAP and LSP.

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PRIMARY ASH, SECONDARY ASH, POLISHING & LANDFILL STORMWATER PONDS
WISCONSIN POWER & LIGHT – COLUMBIA GENERATING STATION
PARDEEVILLE, WISCONSIN

TABLE OF CONTENTS



US EPA ARCHIVE DOCUMENT

	<u>Page</u>
1.0 DESCRIPTION OF PROJECT	1
1.1 General.....	1
1.1.1 Authority.....	1
1.1.2 Purpose of Work.....	1
1.1.3 Definitions	1
1.2 Description of Project	2
1.2.1 Location.....	2
1.2.2 Owner/Caretaker.....	2
1.2.3 Purpose of the Impoundments	2
1.2.4 Description of the Primary Ash Pond Impoundment and Appurtenances.....	3
1.2.5 Description of the Secondary Ash Pond Impoundment and Appurtenances.....	4
1.2.6 Description of the Polishing Pond Impoundment and Appurtenances	5
1.2.7 Description of the Landfill Storm Water Pond Impoundment and Appurtenances	6
1.2.8 Operations and Maintenance	6
1.2.9 Size Classification	7
1.2.10 Hazard Potential Classification	8
1.3 Pertinent Engineering Data.....	9
1.3.1 Drainage Area.....	9
1.3.2 Reservoir.....	9
1.3.3 Discharges at the Impoundment Sites.....	9
1.3.4 General Elevations.....	9
1.3.5 Design and Construction Records and History.....	10
1.3.6 Operating Records	10
1.3.7 Previous Inspection Reports	10
2.0 INSPECTION	11
2.1 Visual Inspection	11
2.1.1 Primary Ash Pond Impoundment General Findings.....	11
2.1.2 Primary Ash Pond Impoundment Upstream Slope (Photos 1 through 19).....	11
2.1.3 Primary Ash Pond Crest (Photos 20 through 23)	11
2.1.4 Primary Ash Pond Downstream Slope (Photos 24 through 37)	12
2.1.5 Primary Ash Pond Impoundment Pump House and Ash Discharge Pipes (Photos 85 through 88).....	12
2.1.6 Secondary Ash Pond Impoundment General Findings.....	12
2.1.7 Secondary Ash Pond Impoundment Upstream Slope (Photos 30 through 45)..	12
2.1.8 Secondary Ash Pond Crest (Photos 45 through 50)	13
2.1.9 Secondary Ash Pond Downstream Slope (Photos 14, 15, 20, 93, 94, 95).....	13
2.1.10 Secondary Ash Pond Impoundment Pump House and Discharge Pipes (Photos 89 through 92)	13
2.1.11 Polishing Pond Impoundment General Findings.....	13

PRIMARY ASH, SECONDARY ASH, POLISHING & LANDFILL STORMWATER PONDS
WISCONSIN POWER & LIGHT – COLUMBIA GENERATING STATION
PARDEEVILLE, WISCONSIN

TABLE OF CONTENTS



	<u>Page</u>
2.1.12 Polishing Pond Impoundment Upstream Slope (Photos 51 through 55).....	13
2.1.13 Polishing Pond Crest (Photos 56 through 60).....	14
2.1.14 Polishing Pond Impoundment Spillways (Photos 61 through 63).....	14
2.1.15 Landfill Storm Water Pond Impoundment General Findings.....	14
2.1.16 Landfill Storm Water Pond Impoundment Upstream Slope (Photos 64 through 74, 83)	15
2.1.17 Landfill Storm Water Pond Crest (Photos 75 through 82, 84)	15
2.2 Caretaker Interview	15
2.3 Operation and Maintenance Procedures	15
2.4 Emergency Action Plan	16
2.5 Hydrologic/Hydraulic Data	16
2.6 Structural and Seepage Stability	16
3.0 ASSESSMENTS AND RECOMMENDATIONS	16
3.1 Assessments.....	16
3.2 Studies and Analyses	17
3.3 Recurrent Operation & Maintenance Recommendations	17
3.4 Repair Recommendations	18
3.5 Alternatives.....	18
4.0 ENGINEER’S CERTIFICATION.....	18

FIGURES

Figure 1	Locus Plan
Figure 2	Overall Ash Basin Plan
Figure 3	Primary and Secondary Ash Pond Impoundments
Figure 4	Polishing Pond Impoundment
Figure 5	Landfill Stormwater Pond Impoundment

APPENDICES

Appendix A	Limitations
Appendix B	Definitions
Appendix C	Inspection Checklists
Appendix D	Photographs
Appendix E	Reference List

1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The United States Environmental Protection Agency (EPA) has retained GZA GeoEnvironmental, Inc. (GZA) to perform a visual inspection and develop a report of conditions for the Wisconsin Power and Light Company (WP&L) Columbia Generating Station (CGS, Site) Coal Combustion Waste (CCW) Impoundments in Columbia County, Wisconsin. This inspection was authorized by the EPA under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). This inspection and report were performed in accordance with Request for Quote (RFQ) RFQ-DC-13, dated August 5, 2010 and EPA Contract No. EP10W001313, Order No. EP-CALL-01. The inspection generally conformed to the requirements of the Federal Guidelines for Dam Safety¹, and this report is subject to the limitations contained in **Appendix A** and the Terms and Conditions of our Contract Agreement.

1.1.2 Purpose of Work

The purpose of this investigation was to visually inspect and evaluate the present condition of the impoundments and appurtenant structures (the management unit) to attempt to identify conditions that may adversely affect their structural stability and functionality, to note the extent of any deterioration that may be observed, review the status of maintenance and needed repairs, and to evaluate the conformity with current design and construction standards of care.

The investigation was divided into five parts: 1) obtain and review available reports, investigations, and data from the Owner pertaining to the impoundments and appurtenant structures; 2) perform an on Site review with the Owner of available design, inspection, and maintenance data and procedures for the management unit; 3) perform a visual inspection of the Site; 4) prepare and submit a field assessment checklist; and 5) prepare and submit a draft and a final report presenting the evaluation of the structure, including recommendations and proposed remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in **Appendix B**. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and 6) condition rating.

¹ FEMA/ICODS, April 2004: <http://www.ferc.gov/industries/hydropower/safety/guidelines/fema-93.pdf>





1.2 Description of Project

1.2.1 Location

The CGS is located about four miles southeast of the City of Portage in Columbia County, Wisconsin. The entrance to the Site is on Murray Road. The CGS CCW impoundments are located near the power plant, which is located at latitude 43° 29' 10" North and longitude 89° 25' 11" West. A Site locus of the impoundments and surrounding area is shown on **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. The four management units (impoundments) can be accessed by vehicles from earthen access roads from the CGS.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Wisconsin Power and Light Company as a subsidiary of Alliant Energy, Madison Gas & Electric Company and Wisconsin Public Service Company (collectively, Owners). The CCW impoundments are operated by the WP&L and the CGS.

	Impoundment Caretaker
Name	Wisconsin Power and Light, Columbia Generating Station
Mailing Address	W8375 Murray Road
City, State, Zip	Pardeeville, Wisconsin, 53954
Contact	Jerald L. Lokenvitz
Title	Plant Manager
E-Mail	geraldlokenvitz@alliantenergy.com
Daytime Phone	608-742-0715
Emergency Phone	911 / (608) 751-3886 (Plant Manager's Cell Phone)

1.2.3 Purpose of the Impoundments

The CGS is a two-unit coal-fired power plant with a maximum generating capacity of approximately 1,000 Megawatts. Commercial operation of the facility began in the 1970's. Three unlined earthen embankment CCW impoundments known as the Primary Ash Pond Impoundment (PAP), the Secondary Ash Pond Impoundment (SAP), and the Polishing Pond Impoundment (PP) were constructed in the 1970's in conjunction with the CGS facility for the purpose of storing CCW waste and recycling or discharging plant wastewater. A fourth impoundment, the Landfill Storm Water Pond Impoundment (LSP), was commissioned in 1984 in conjunction with the on-Site ash landfill. The LSP is a lined earthen embankment structure and stores storm water runoff and sediments from the open cells of the ash landfill.



The PAP functions as a sedimentation basin and receives water and ash from a variety of processes from the CGS. The impoundment also receives excess storm water runoff from the LSP as needed during high precipitation events.² Prior to 2004, most solids would settle in the PAP and the remaining solids would be discharged with water to the SAP. Since 2004, the solids settle in the PAP and the pump house on the northeast portion of the impoundment returns water to the plant for reuse and/or treatment and disposal per the National Pollutant Discharge Elimination System (NPDES) permit.³ Solids recovered from the PAP are recycled for beneficial use or disposed of in the active dry ash landfill on Site.

The SAP is currently inactive and is not currently permitted to receive CCW waste materials. Prior to being deactivated in 2004, the SAP received water and unsettled solids from the PAP. The solids settled in the SAP and the clarified water was pumped from the SAP to the PP via the pump house near the southeast portion of the SAP. The SAP currently contains fly ash, bottom ash, economizer ash and other products that were transported in the discharge water from the PAP. Since 2004, precipitation that collects in the SAP infiltrates into the ground or evaporates. There is no appreciable drainage area beyond the surface area of the SAP.

The PP is currently inactive and is not currently permitted to receive CCW waste materials. Prior to being deactivated in 2004, the PP received water and unsettled solids from the SAP. Any remaining solids were allowed to settle and water was discharged from the PP into a drainage ditch via a spillway. Water travelled through the ditch and was eventually discharged off-Site under NPDES Permit Number WI0002780. The PP currently contains fly ash, bottom ash, and economizer ash and other products that were transported in the water from the SAP. Similar to the SAP, since 2004, precipitation that collects in the PP infiltrates into the ground or evaporates.

The LSP functions as a storage and evaporation basin for storm water runoff from the ash landfill and the material that is transported with the runoff. It receives fly ash, bottom ash, and economizer ash with the storm water runoff from the ash landfill. Water that collects in the LSP is removed by evaporation. During periods of high precipitation, water is transported from the LSP to the PAP via tankers to maintain water levels below the top of the liner.

1.2.4 Description of the Primary Ash Pond Impoundment and Appurtenances

The PAP was designed in 1972 by Sargent & Lundy Engineers of Chicago, Illinois. No construction documentation was available for the impoundment but limited design drawings and reports were on file with the Wisconsin Department of Natural Resources (WDNR) – Solid Waste Division. The following description of the PAP is based on the available design information, the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA, and information provided by CGS.

The PAP is located north of the CGS and was commissioned in 1975. The ash in the southern portion of the original impoundment was dewatered and the area was converted to a

² Information regarding the materials received by each impoundment is based on the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA.

³ Based on information provided by CGS on September 28, 2010.



landfill in accordance with the WDNR approval⁴. The current impoundment receives ash transport water, boiler/precipitator wash water, steam grade water production wastewaters, plant floor drain waters, and boiler blowdown waters via a series of pipelines entering the western and southern portions of the pond, as shown on **Figure 3**. A channel is maintained through the ash delta present in the PAP and ash deposited in the channel is recovered for reuse or disposal. The channel is located along the southern, western and northwest portions of the PAP. Water travels through the channel and eventually is returned to the CGS via the pump house located on the northeast portion of the impoundment.

The impoundment consists of an earthfill embankment with a crest length of approximately 4,200 feet⁵ and a general height (from the lowest toe elevation to the top of impoundment) of approximately 23 feet. The impoundment is unlined and the embankments were constructed from native sand and gravel that was placed as “controlled compacted fill”.⁶ Based on the design drawings provided and discussions with CGS personnel, it does not appear the embankments of any impoundments were constructed over wet ash, slag or other unsuitable materials. The impoundment has a surface area of approximately 8.5 acres at the maximum water level elevation of 796 feet Mean Sea Level (MSL) and the ash delta occupies approximately 50 percent of the storage capacity⁷. A gravel access road is present on the top of the impoundment. The elevation of the impoundment varies from approximately 802 feet to 812 feet MSL^{8,9}.

The impoundment embankments were designed with 4-horizontal to 1-vertical (4H:1V) upstream and downstream slopes with the southern and western portions of the impoundment incised into the existing topography.

There are two groundwater monitoring wells (M3, M4R) located near the PAP. In addition, there is an electronic water level monitor and staff gauging station (SG2) located at the pump house.

1.2.5 Description of the Secondary Ash Pond Impoundment and Appurtenances

The SAP was designed in 1972 by Sargent & Lundy Engineers of Chicago, Illinois. No construction documentation was available for the impoundment but limited design drawings and reports were on file with the WDNR – Solid Waste Division. The following description of the SAP is based on the available design information, the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA, and information provided by CGS.

⁴ Based on conversations with the WDNR – Solid Waste Division.

⁵ The length of the embankments for the impoundments was estimated by GZA using Google Earth Software.

⁶ Based on March 3, 1972 Drawing S-37 by Sargent & Lundy Engineers.

⁷ Surface area and storage volumes of the impoundments based on the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA. Based on GZA’s measurements using Google Earth, this represents the surface area of open water only.

⁸ Elevations of the impoundments are based on topographic contours provided in January 30, 2003 RMT Drawing titled “Water Table Map (October 2002)”.

⁹ GZA originally reported a minimum crest elevation of 805 feet based on information available at the time the EPA checklist was generated.



The SAP is located north of the CGS and east of the PAP and was commissioned in 1975. Prior to being deactivated in 2004, the SAP received water and unsettled solids from the PAP, via an 8-inch pipeline, and discharged to the PP via the pump house located in the southeastern portion of the impoundment as shown on **Figure 3**. Since 2004, precipitation that collects in the SAP either infiltrates into the ground or evaporates.

The impoundment consists of an earthfill embankment with a crest length of approximately 4,000 feet and a general height (from the lowest toe elevation to the top of impoundment) of approximately 23 feet. The impoundment is unlined and the embankments were constructed from native sand and gravel that was placed as “controlled compacted fill”.¹⁰ The impoundment has a surface area of approximately 16 acres at the maximum water level elevation of 796 feet MSL and the settled ash products occupy approximately 25 percent of the storage capacity. A gravel access road is present on the top of the impoundment. The top elevation of the impoundment varies from approximately 802 feet to 808 feet MSL.

The impoundment embankments were designed with 4H:1V upstream and downstream slopes with the southern and eastern portions of the impoundment incised into the existing topography. The upstream and downstream slopes were generally vegetated with grass.

There are two groundwater monitoring wells (MW57, MW59) located near the SAP. In addition, there is a staff gauging station (SG1) located at the former pump house.

1.2.6 Description of the Polishing Pond Impoundment and Appurtenances

The PP was designed by Sargent & Lundy Engineers of Chicago, Illinois. No construction documentation or design information was available for the PP. The following description of the PP is based on the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA, and information provided by CGS.

The PP is located east of the CGS and was commissioned in 1975. The PP is currently inactive and is not currently permitted to receive CCW waste materials. Prior to 2004, water was pumped from the SAP to the PP and discharged to the drainage ditch via the spillway. Currently, precipitation that collects in the PP infiltrates into the ground or evaporates.

The impoundment is incised into the surrounding topography and has a crest length of approximately 1,050 feet and a general height (from the lowest toe elevation to the top of impoundment) of approximately 10 feet. The impoundment is unlined and the slopes were constructed by excavating and grading native sand and gravel. The impoundment has a surface area of approximately 1 acre at the maximum water level elevation of 802 feet MSL and an estimated 10 cubic yards of ash is present in the impoundment. A gravel access road is present on the top of the eastern side of the impoundment. The elevation of the impoundment is approximately 805 feet MSL. The impoundment currently has slopes of approximately 4H:1V.

¹⁰ Based on March 3, 1972 Drawing S-37 by Sargent & Lundy Engineers.

There is one groundwater monitoring well (MW83) located near the PP. In addition, there is a staff gauging station (SG4) located near the northern portion of the impoundment¹¹.

1.2.7 Description of the Landfill Storm Water Pond Impoundment and Appurtenances



The LSP was designed by Warzyn Engineering Inc. (Warzyn) and constructed in June 1984 by Kaiser Construction Company. An October 30, 1984 report¹² by Warzyn documenting construction of the LSP was on file with the WDNR – Solid Waste Division. The following description of the PP is based on the construction documentation report, the March 31, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from Alliant Energy to the EPA, and information provided by CGS.

The LSP is located east of the CGS and the PP as shown in **Figure 2** and was commissioned in 1984. The LSP functions as a storage and evaporation basin for storm water runoff from the ash landfill and the material that is transported with the runoff. Water that collects in the LSP is allowed to evaporate. During periods of high precipitation, water is transported to the PAP via tankers to maintain water levels below the top of the liner.

The impoundment is incised into the existing topography and has a crest length of approximately 1,750 feet and a general height (from the lowest toe elevation to the top of impoundment) of approximately 32 feet. The impoundment is lined and the slopes were constructed by excavating and grading native sand and gravel. The subgrade was compacted with a vibratory roller compactor and hand raked to remove sharp objects. A 30 mil polyvinyl chloride (PVC) liner was placed on the prepared subgrade, the top of the liner was anchored in to the subgrade, and 12 inches of sand was placed on the liner and compacted. The impoundment has a surface area of approximately 10.8 acres at the maximum water level elevation of 798 feet (MSL) and an estimated 400 cubic yards of ash is present in the impoundment. A gravel access road is present on the top of the western side of the impoundment. The elevation of the impoundment crest varies from approximately 803 feet to 830 feet MSL. The northern, eastern, and southern portions of the impoundment have an approximately 3H:1V slope below elevation 810 feet MSL and 2H:1V slope above elevation 810 feet MSL. The western portion of the impoundment has a 4H:1V slope. The slopes are generally vegetated with grass.

There are two groundwater monitoring wells (MW91A, MW91B) located near the LSP. In addition, there is a metal stake pond level marker that is used as an indicator of the water levels in the impoundment. If pond levels approach the elevation of the metal stake, water is removed from the LSP as previously described.

1.2.8 Operations and Maintenance

The impoundments are operated and maintained by CGS personnel. Operation of the impoundments includes operation of the return pumps in the PAP, removal of settled ash in the PAP, monitoring of the water levels in the PAP and LSP, removal of the excess water from the

¹¹ Based on the January 30, 2003 RMT Drawing titled “Water Table Map (October 2002)”.

¹² “Construction Observation Report, Site Preparation for Phase I, Module I, Ash Disposal Facility, Columbia Generating Station, Wisconsin Power and Light Company, Town of Pacific, Columbia County, Wisconsin” by Warzyn Engineering Inc., dated October 30, 1984.

LSP as necessary, and periodic inspection of the PAP and LSP. Maintenance of the impoundments includes regular mowing of the PAP and SAP and periodic deep-rooted vegetation removal. There is currently no operation or maintenance of the PP, and no inspection of the PP or SAP.



Operation and maintenance of the CGS facility, including the PP, is regulated by the EPA under NPDES Permit WI0002780. Operation and maintenance of the CGS and PAP, SAP, and LSP is also regulated by the WDNR - Solid Waste Division under two solid waste license numbers: License 3025 applies to the active dry ash landfill including the LSP and License 2325 applies to the closed portion of the PAP, the active portion of the PAP, and the SAP.

The CGS personnel monitor the impoundments according to a series of protocols. These protocols include:

- Monitoring and recording of the water levels in the PAP;
- Periodic visual observation of the impoundments that is typically not recorded;
- Monitoring of the water levels in the LSP on a weekly basis in the Spring and as otherwise needed during high precipitation events; and,
- Semi-annual inspection of the PAP and SAP.

Based on information provided by CGS, the observation and inspection of the impoundments is conducted by CGS personnel and the water levels in the PAP are collected and recorded 5 days per week.

As part of the WDNR Solid Waste Division program, the PAP, SAP, and LSP are inspected on an annual basis or more frequently if WDNR staff are at the Site for other work. A report of the WDNR visual inspection, including recommended actions to correct any deficiencies, is sent to CGS personnel following each inspection. There were no issues noted by the WDNR that were unresolved at the time of our inspection.

1.2.9 Size Classification

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum height of 23 feet and a storage volume of approximately 72 acre-feet, the PAP was classified as a **Small** sized structure. Based on the maximum height of 23 feet and a storage volume of 204 acre-feet, the SAP was classified as a **Small** sized structure. Based on the maximum height of 10 feet and a storage volume of 5 acre-feet, the PP was classified as a **Small** sized structure. Based on the maximum height of 35 feet and a storage volume of 11 acre-feet, the LSP was classified as a **Small** sized structure. According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet were classified as Small sized structures. The maximum impoundment height and storage volume was based on information provided by CGS.



1.2.10 Hazard Potential Classification

The PAP, SAP, PP, and LSP have not been given a hazard rating by the WDNR. Under the State of Wisconsin classification system, it is GZA's opinion that the PAP and SAP would be classified as **Significant** hazard structures due to no probable loss of human life, disruption of lifeline facilities and the potential for environmental damage. Wisconsin State Rule NR 333.06 defines significant hazard structures as follows:

A significant hazard rating shall be assigned to those dams that have no existing development in the hydraulic shadow that would be inundated to a depth greater than 2 feet and have land use controls in place to restrict future development in the hydraulic shadow. Potential for loss of human life during failure must be unlikely. Failure or mis-operation of the dam would result in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities.

Under the State of Wisconsin classification system, it is GZA's opinion that the PP and LSP would be classified as **Low** hazard structures. Wisconsin State Rule NR 333.06 defines low hazard structures as follows:

Low hazard. A low hazard rating shall be assigned to those dams that have no development unrelated to allowable open space use in the hydraulic shadow where the failure or mis-operation of the dam would result in no probable loss of human life, low economic losses (losses are principally limited to the owners property), low environmental damage, no significant disruption of lifeline facilities, and have land use controls in place to restrict future development in the hydraulic shadow.

Under the EPA classification system, as presented on page 2 of the EPA checklist (**Appendix C**) and the Definitions section (**Appendix B**), it is GZA's opinion that the PAP and the SAP would be considered as having a **Significant** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure, potential environmental impacts and interruption of power generation due to a failure and subsequent loss of PAP capacity. The area downstream of the PAP and SAP is shown on **Figure 2**. Under the EPA classification system, as presented on page 2 of the EPA checklist (**Appendix C**) and the Definitions section (**Appendix B**), it is GZA's opinion that the PP would be considered as having a **Less than Low** hazard potential. The hazard potential rating is based on no probable loss of human life and no probable economic or environmental losses due to a failure of the impoundment and subsequent loss of impoundment capacity. It is GZA's opinion that the LSP would be considered as having a **Low** hazard potential with no probable loss of human life and low probable economic or environmental losses. Probable impacts of the failure of the PP and LSP would be limited to the Owners' property. Due to the incised nature of the PP and LSP, there is no area downstream of the impoundments.



1.3 Pertinent Engineering Data

1.3.1 Drainage Area

Based on the the January 30, 2003 RMT drawing titled “Water Table Map (October 2002)”, GZA estimates that approximately 15 acres drains into the SAP and 19 acres drains into the LSP. Water that enters the PAP and PP is due to direct precipitation only.

1.3.2 Reservoir

Based on information provided by CGS, the PAP has a surface area of 8.5 acres and a storage volume of 72 acre-feet at a pool elevation of 796 feet MSL. The SAP has a surface area of 16 acres and a storage volume of 204 acre-feet at a pool elevation of 796 feet MSL. The PP has a surface area of 1 acre and a storage volume of 5 acre-feet at a pool elevation of 805 feet MSL. The LSP has a surface area of 10.8 acres and a storage volume of 11 acre-feet at a pool elevation of 796 feet MSL.

1.3.3 Discharges at the Impoundment Sites

Under normal operating conditions, no water is discharged from the impoundments. Water is pumped from the PAP and returned to the CGS for reuse in the facility operations or treatment and discharge. Precipitation and storm water runoff that enters the SAP and PP infiltrates into the ground or evaporates. Precipitation and storm water runoff that collects in the LSP evaporates or is transported to the PAP.

1.3.4 General Elevations

Elevations were taken from design drawings, reports, and data provided by the CGS. Elevations were based upon the USGS topographic map MSL vertical datum.

Primary Ash Pond Impoundment (PAP)

- A. Top of Embankment (Minimum) 802 feet
- B. Upstream Water at Time of Inspection ± 796 feet

Secondary Ash Pond Impoundment (SAP)

- A. Top of Embankment (Minimum) 802 feet
- B. Upstream Water at Time of Inspection ± 790 feet

Polishing Pond Impoundment (PP)

- A. Top of Embankment (Minimum) 805 feet
- B. Upstream Water at Time of Inspection No water present
- C. Downstream Tail Water at Time of Inspection No water present
- D. Spillway Type Rectangular, concrete lined
- E. Upstream Channel 802 feet
- F. Downstream Channel 802 feet



Landfill Storm Water Pond Impoundment (LSP)

A. Top of Embankment (Minimum)	803 feet
B. Upstream Water at Time of Inspection	796 feet
C. Maximum Water Elevation ¹³	794.85 feet

1.3.5 Design and Construction Records and History

Based on information contained in the WDNR files for the Site, the PAP, SAP and PP were designed by Sargent & Lundy Engineers. The impoundments were reportedly constructed under the supervision of a professional engineer but no supporting documentation was present in the WDNR files or provided by CGS.¹⁴

The LSP was designed by Warzyn and constructed in June 1984 by Kaiser Construction Company under the supervision of a professional engineer. Prior to LSP construction, the site was stripped and topsoil removed. The LSP was constructed by excavating and grading native sand and gravel. The subgrade was compacted with a vibratory roller compactor and hand raked to remove sharp objects. A 30 mil PVC liner was placed on the prepared subgrade, the top of the liner was anchored into the subgrade, and 12 inches of sand was placed on the liner and compacted. The construction of the LSP was documented in an October 30, 1984 report by Warzyn titled: "Construction Observation Report, Site Preparation for Phase I, Module I, Ash Disposal Facility, Columbia Generating Station, Wisconsin Power and Light Company, Town of Pacific, Columbia County, Wisconsin."

1.3.6 Operating Records

Operations records for the PAP were provided to GZA by CGS. Water level information from the PAP between June 11, 2010 and September 28, 2010 was provided to GZA. The water levels are measured electronically at the pump house and manually recorded by CGS personnel five days a week. Based on conversations with CGS, visual observations of the PAP pond level are made during daily visits to the impoundment, but are not generally recorded. No operations records are generated for the SAP, PP, and LSP.

1.3.7 Previous Inspection Reports

Visual observations of the impoundments are conducted periodically by CGS personnel but generally not documented. Visual inspections of the PAP and SAP are conducted and documented semi-annually by CGS personnel. In addition, the WDNR – Solid Waste Division visually inspects the PAP, SAP, and the LSP on an annual basis. Based on information provided to GZA, no inspections of the PP are performed.

The two most recent inspections of the PAP and SAP by CGS personnel were conducted on October 5, 2009 and on April 20, 2010. No significant deficiencies were noted by CGS personnel in either report. Animal burrows were noted in the PAP and SAP in the April 20, 2010 report and filling of the burrows was recommended. A copy of the June 3, 2008 WDNR

¹³ Based on CGS analysis of maximum allowable water elevation to accommodate design rain event based on current operating conditions as provided in November 19, 2010 communication from CGS personnel.

¹⁴ Based on the March 31, 2009 "Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act" from Alliant Energy.

inspection report was provided to GZA. Based on the inspection reports and discussions with WDNR staff, no major deficiencies have been noted by the WDNR.

2.0 INSPECTION



2.1 Visual Inspection

The CGS impoundments were inspected on September 28, 2010 by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E., of GZA GeoEnvironmental, Inc. The weather was sunny with temperatures in the 70's to 80's Fahrenheit. Photographs to document the conditions of the impoundments were taken during the inspection and are included in **Appendix D**. Based on information provided by CGS, the water levels of the PAP, SAP, and LSP were 796 feet, 790 feet, and 796 feet respectively. There was no water present in the PP at the time of our inspection. Underwater areas were not inspected, as this level of investigation was beyond of GZA's scope of services. A copy of the EPA Checklist and a separate copy of the GZA inspection checklist are included in **Appendix C**.

With respect to our visual inspection, there was no evidence of prior releases, failures, or patchwork observed by GZA.

2.1.1 Primary Ash Pond Impoundment General Findings

In general, the PAP was found to be in **SATISFACTORY** condition. The specific concerns and minor deficiencies observed are identified in more detail in the sections below. An overall Site plan showing the impoundments is provided as **Figure 2**. A Site plan showing key features of the PAP, including deficiencies observed during the current inspection, is provided as **Figure 3**. The location and orientation of photographs provided in **Appendix D** is shown on the Photo Plan in **Figure 3**.

2.1.2 Primary Ash Pond Impoundment Upstream Slope (Photos 1 through 19)

The PAP water surface elevation at the time of inspection was at an elevation of 796 feet MSL. Therefore, the lower portion of the upstream slope was underwater or covered by ash deltas and not visible. No rip rap was present on the upstream slope and there was wave action erosion of the upstream slope at the pond water elevation throughout much of the impoundment. An example of the observed erosion is shown in Photo 16. The upstream slope was generally vegetated with grass that appeared to be regularly mowed.

2.1.3 Primary Ash Pond Crest (Photos 20 through 23)

The impoundment crest had a gravel cover over much of the impoundment, with some grasses on the western, northern and eastern embankments. The crest on the southern embankment consisted of grassy areas and areas of reclaimed ash stockpiles. The alignment of the impoundment crest appeared generally level, with no depressions or irregularities observed. Based on topographic information provided by CGS, the crest elevation ranged from elevation 802 feet to elevation 812 feet MSL. No significant settlement was observed at the time of our inspection.



2.1.4 Primary Ash Pond Downstream Slope (Photos 24 through 37)

The impoundment is incised along the western and southern embankments. An embankment separates the PAP from the SAP such that the eastern embankment downstream slope of the PAP is the same as the western embankment upstream slope of the SAP. The backwaters of the Wisconsin River are generally near the downstream slope of the northern embankment of the PAP. During high water events, such as occurred during our Site visit, the backwaters of the Wisconsin River cover the downstream toe and part of the northern embankment as shown in Photos 24 through 26. The downstream slope of the northern embankment of the impoundment was generally in good condition. The northern embankment was vegetated with grass that appeared to be regularly mowed and trees had recently been removed from the northern embankment as shown in Photo 27. There was minor wave action erosion over much of the eastern embankment downstream slope as shown in Photos 31 and 32. A large ditch that appeared to be formed by stormwater erosion was noted on the downstream slope near the southeast corner of the PAP. The eroded ditch was approximately 10 feet wide, 6 feet to 8 feet deep, and 50 feet long and is shown in Photos 34 and 35.

2.1.5 Primary Ash Pond Impoundment Pump House and Ash Discharge Pipes (Photos 85 through 88)

The pump house and ash discharge pipes were generally in good condition. There were no leaks observed in the discharge pipes and the pump house generally appeared to be in good repair. There were no observed defects or areas of these structures that required repair.

2.1.6 Secondary Ash Pond Impoundment General Findings

In general, the SAP was found to be in **SATISFACTORY** condition. The specific concerns and minor deficiencies observed are identified in more detail in the sections below. An overall Site plan showing the impoundments is provided as **Figure 2**. A Site plan showing key features of the SAP, including deficiencies observed during the current inspection, is provided as **Figure 3**. The location and orientation of photographs provided in **Appendix D** is shown on the Photo Plan in **Figure 3**.

2.1.7 Secondary Ash Pond Impoundment Upstream Slope (Photos 30 through 45)

The SAP water elevation at the time of inspection was approximately at an elevation of 790 feet MSL¹⁵. Therefore, the lower portion of the upstream slope was underwater or covered by ash deltas and not visible. No rip rap was present on the upstream slope and there was minor wave action erosion of the upstream slope at the historic pond water elevation (approximately 796 feet MSL) throughout much of the impoundment. An example of the observed erosion is shown in Photo 31. The upstream slope was generally vegetated with grass that appeared to be regularly mowed.

The western embankment of the SAP separates the SAP from the PAP. Please refer to Section 2.1.4 for discussion of the erosion features noted on the upstream slope of western SAP embankment which corresponds to the downstream slope of eastern PAP embankment.

¹⁵ Pond elevation visually estimated by GZA during inspection.



2.1.8 Secondary Ash Pond Crest (Photos 45 through 50)

The impoundment crest generally had a gravel cover, with some grasses on the western, northern and eastern embankments. The impoundment crest on the southern embankment consisted of grassy areas and areas of reclaimed ash stockpiles. The alignment of the impoundment crest appeared generally level, with no depressions or irregularities observed. Based on topographic information provided by CGS, the crest elevation ranged from an elevation of 802 feet to an elevation of 808 feet MSL. No significant settlement was observed at the time of our inspection.

2.1.9 Secondary Ash Pond Downstream Slope (Photos 14, 15, 20, 93, 94, 95)

The impoundment is incised along the southern and eastern embankments. The backwaters of the Wisconsin River are generally near the downstream slope of the northern embankment of the PAP. During high water events, such as occurred during our Site Visit, the backwaters of the Wisconsin River cover the downstream toe along the northern embankment as shown in Photos 93 and 95. The downstream slope of the northern embankment of the impoundment was generally in good condition. The embankments were generally vegetated with grass that appeared to be regularly mowed.

The western embankment of the SAP separates the SAP from the PAP. Please refer to Section 2.1.2 for discussion of the downstream slope of western SAP embankment which corresponds to the upstream slope of eastern PAP embankment.

2.1.10 Secondary Ash Pond Impoundment Pump House and Discharge Pipes (Photos 89 through 92)

The exterior of the pump house located in the southeast corner of the impoundment was generally in good condition. GZA did not inspect the interior of the pump house. The discharge pipe that would be used to transfer water from the SAP to the PP were generally in good condition. There were no observed defects or areas of these structures that required repair.

2.1.11 Polishing Pond Impoundment General Findings

In general, the PP was found to be in **SATISFACTORY** condition. The specific concerns and minor deficiencies observed are identified in more detail in the sections below. An overall Site plan showing the impoundments is provided as **Figure 2**. A Site plan showing key features of the PP, including deficiencies observed during the current inspection, is provided as **Figure 4**. The location and orientation of photographs provided in **Appendix D** is shown on the Photo Plan in **Figure 4**.

2.1.12 Polishing Pond Impoundment Upstream Slope (Photos 51 through 55)

There was no water present in the PP at the time of our inspection and no rip rap was present on the upstream slope. The upstream slope was generally vegetated with grass that did not appear to be regularly mowed. There is a primary discharge pipe that was used to transfer water from the SAP located on the northern portion of the impoundment. A secondary discharge pipe enters the PP on the eastern portion of the impoundment.



2.1.13 Polishing Pond Crest (Photos 56 through 60)

There is a gravel access road on the eastern portion of the impoundment crest, grass vegetation on the northern and southern portion of the impoundment crest, and a gravel surface cover on the western portion of the impoundment crest. The discharge spillways are located on the southern portion of the impoundment crest. The alignment of the top of the impoundment appeared generally level, with no depressions or irregularities observed. Based on topographic information provided by CGS, the top of impoundment elevation is approximately 805 feet MSL. No significant settlement was observed at the time of our inspection.

2.1.14 Polishing Pond Impoundment Spillways (Photos 61 through 63)

When the PP was in use prior to 2004, the water levels in the pond were maintained by the spillway located on the southern portion of the impoundment. An emergency spillway is also present on the southern portion of the impoundment east of the primary spillway as shown on **Figure 4**.

The primary spillway is a concrete structure that is 12 inches wide and 36 inches tall at the narrowest point beneath the equipment shed. The invert elevation of the primary spillway is approximately 802 feet MSL¹⁶. The approach apron for the primary spillway is approximately 68 inches wide and 17 feet long and tapers to 12 inches wide beneath the equipment building. The discharge apron (shown in Photo 62) expands to approximately 66 inches wide and extends 20.5 feet before emptying into the drainage ditch (shown in Photo 63) that extends south from the spillway. The primary spillway appeared to be in good condition with no major cracks or structural defects at the time of our inspection.

A small equipment building that has been empty since 2004 is located above the primary spillway. When the PP was actively used, water quality and levels were monitored from instrumentation in the equipment building. The instrumentation has since been removed.

An emergency spillway (shown in Photo 61) is located about 15 feet east of the primary spillway. The emergency spillway is a concrete structure that is approximately 36 inches wide and 24 inches tall. The spillway is approximately 28 feet long and empties in the drainage ditch south the spillway. The invert elevation of the emergency spillway is approximately 803 feet MSL. The emergency spillway appeared to be in good condition with no major cracks or structural defects at the time of our inspection.

2.1.15 Landfill Storm Water Pond Impoundment General Findings

In general, the LSP was found to be in **FAIR** condition. The specific concerns and minor deficiencies observed are identified in more detail in the sections below. An overall Site plan showing the impoundments is provided as **Figure 2**. A Site plan showing key features of the LSP, including deficiencies observed during the current inspection, is provided as **Figure 5**. The location and orientation of photographs provided in **Appendix D** is shown on the Photo Plan in **Figure 5**.

¹⁶ Invert elevations for primary and emergency spillway were estimated by GZA based on visual observations and measurements taken during the inspection.



2.1.16 Landfill Storm Water Pond Impoundment Upstream Slope (Photos 64 through 74, 83)

The LSP pond water surface at the time of inspection was at an elevation of 796 feet MSL based on information provided by CGS. Therefore, the lower portion of the upstream slope was underwater and not visible. No rip rap was present on the upstream slope. A 24-inch diameter corrugated metal pipe discharges storm water into the impoundment along the western embankment. The metal stake that is used to mark the water levels in the impoundment is located in the southwest corner and is shown in Photo 83.

There were trees as large as 15 inches in diameter present on the southern, eastern and northern upstream slopes. Animal burrows were present on the southern and northern upstream slopes. There were two erosion ditches located along the eastern upstream slope. One erosion ditch was approximately centered in the north-south direction along the eastern embankment and was approximately 6 inches wide, 6 inches deep and 50 feet long. Another erosion ditch was located in the northeast corner of the impoundment and was approximately 6 inches to 18 inches deep, 6 inches to 12 inches wide and 100 feet long. Vegetation on the western embankment was sparse and minor erosional features were present. The upstream slope was generally vegetated with grass that did not appear to be regularly mowed and was sparse in select areas.

2.1.17 Landfill Storm Water Pond Crest (Photos 75 through 82, 84)

The crest of the LSP was vegetated with grass that had not been mowed on the northern, eastern and southern portions of the impoundment, and a gravel service road is present on the crest of the western portion of the impoundment. Trees up to 15 inches in diameter were present on the impoundment crest. The alignment of the impoundment crest appeared generally level, with no depressions or irregularities observed. Based on topographic information provided by CGS, the impoundment crest elevation varies from approximately elevation 803 feet MSL to approximately elevation 830 feet MSL. No significant settlement was observed at the time of our inspection.

2.2 Caretaker Interview

Maintenance of the impoundments is the responsibility of CGS personnel. GZA met with CGS personnel and discussed the operations and maintenance procedures, regulatory requirements, and the history of the impoundments since their construction.

2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.8, CGS personnel are responsible for the regular operations and maintenance of the impoundment. Routine maintenance procedures include routine mowing of the PAP and SAP, periodic removal of deep-rooted vegetation from the PAP and SAP embankments and removal of water from the LSP as needed. Routine operations of the impoundments include measurement of the PAP water levels five days a week, routine recovery of ash settled in the PAP, periodic observation of the PAP, SAP, and LSP, and semi-annual inspection of the PAP and SAP.



2.4 Emergency Action Plan

No Emergency Action Plan (EAP) has been developed for CGS with regards to potential or actual failure of the ash impoundments.

2.5 Hydrologic/Hydraulic Data

The results of an analysis for the LSP were provided to GZA. The analysis indicated the maximum allowable water level in the LSP is 794.85 feet to allow sufficient free-board to accommodate the 25 year, 24-hour storm event based on current operating conditions. No hydrologic or hydraulic design data was provided to GZA for the PAP, SAP or PP. GZA did not perform an independent assessment of the hydraulics and hydrology for the impoundments as this was beyond our scope of services.

2.6 Structural and Seepage Stability

No engineering design information was available for PP or LSP. The design information available for the PAP and SAP did not provide information regarding the structural or seepage stability of the impoundments.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of the PAP was judged to be **SATISFACTORY**. The impoundment was found to have the following deficiencies:

1. Minor erosion due to wave action along the upstream slope;
2. Minor erosion due to wave action along the downstream slope of the eastern embankment that also forms the upstream embankment of the SAP;
3. Large erosion ditch on the downstream slope near the southeast corner of the impoundment; and,
4. Tree stumps and roots on the downstream slope near the northwest corner of the embankment.

In general, the overall condition of SAP was judged to be **SATISFACTORY**. The impoundment was found to have the following deficiencies:

1. Minor erosion due to wave action along the upstream slope;
2. Minor erosion due to wave action along the upstream slope of the western embankment that also forms the downstream embankment of the PAP; and,
3. Large erosion ditch on the upstream slope near the southwest corner of the impoundment (same erosion ditch noted in Item 3 for the PAP).

In general, the overall condition of PP was judged to be **SATISFACTORY**. The impoundment was found to have the following deficiencies:

1. No routine maintenance plan.



In general, the overall condition of LSP was judged to be **FAIR**. The impoundment was found to have the following deficiencies:

1. Erosion ditches on the eastern and western embankment;
2. Sparse vegetation in select areas of the upstream slope;
3. Trees up to 15 inches in diameter located on the upstream slope and crest;
4. Animal burrows on the northern and southern embankments; and,
5. Water level above the maximum allowable level of 794.85 feet.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of the appropriate regulatory agencies.

3.2 Studies and Analyses

GZA recommends the following studies and analyses:

1. Evaluate the extent of wave action erosion on the upstream slopes of the PAP;
2. Perform a hydrologic/hydraulic analysis of the PAP, SAP and PP to determine the adequacy of the current operating conditions and design to accommodate the appropriate precipitation event;
3. Evaluate the slope and seepage stability of the PAP, SAP and LSP based on current operating conditions and methodologies. The effects of high water events from the Wisconsin River should be considered in the analysis for the PAP and SAP; and,
4. Develop an EAP for the impoundments.

3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Documentation of the periodic visual observations of the PAP, SAP and LSP;
2. Maintain copies of the impoundment design and construction documentation on Site.
2. Semi-annual inspection of the PP and LSP in addition to the inspections being completed on the PAP and SAP;
3. Clear deep rooted vegetation stumps from the PAP embankment;
4. Clear deep rooted vegetation from the embankments and crest of the LSP;
5. Add topsoil and reseed areas of sparse vegetation in the LSP; and,
6. Remove excess water from LSP and relocate marker stake to accommodate current maximum water level of 794.85 feet.



3.4 Repair Recommendations

GZA recommends the following minor repairs which may improve the overall condition of the impoundment, but do not alter the current design. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Repair erosion ditches present in the PAP, SAP and LSP.

3.5 Alternatives

There are no practical alternatives to the repairs itemized above.

4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management unit referenced herein, the CGS Primary Ash Pond, Secondary Ash Pond and Polishing Pond Impoundments have been assessed to be in **SATISFACTORY** condition and the Landfill Storm Water Pond Impoundment has been assessed to be in **FAIR** condition on September 28, 2010.

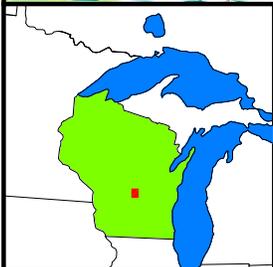
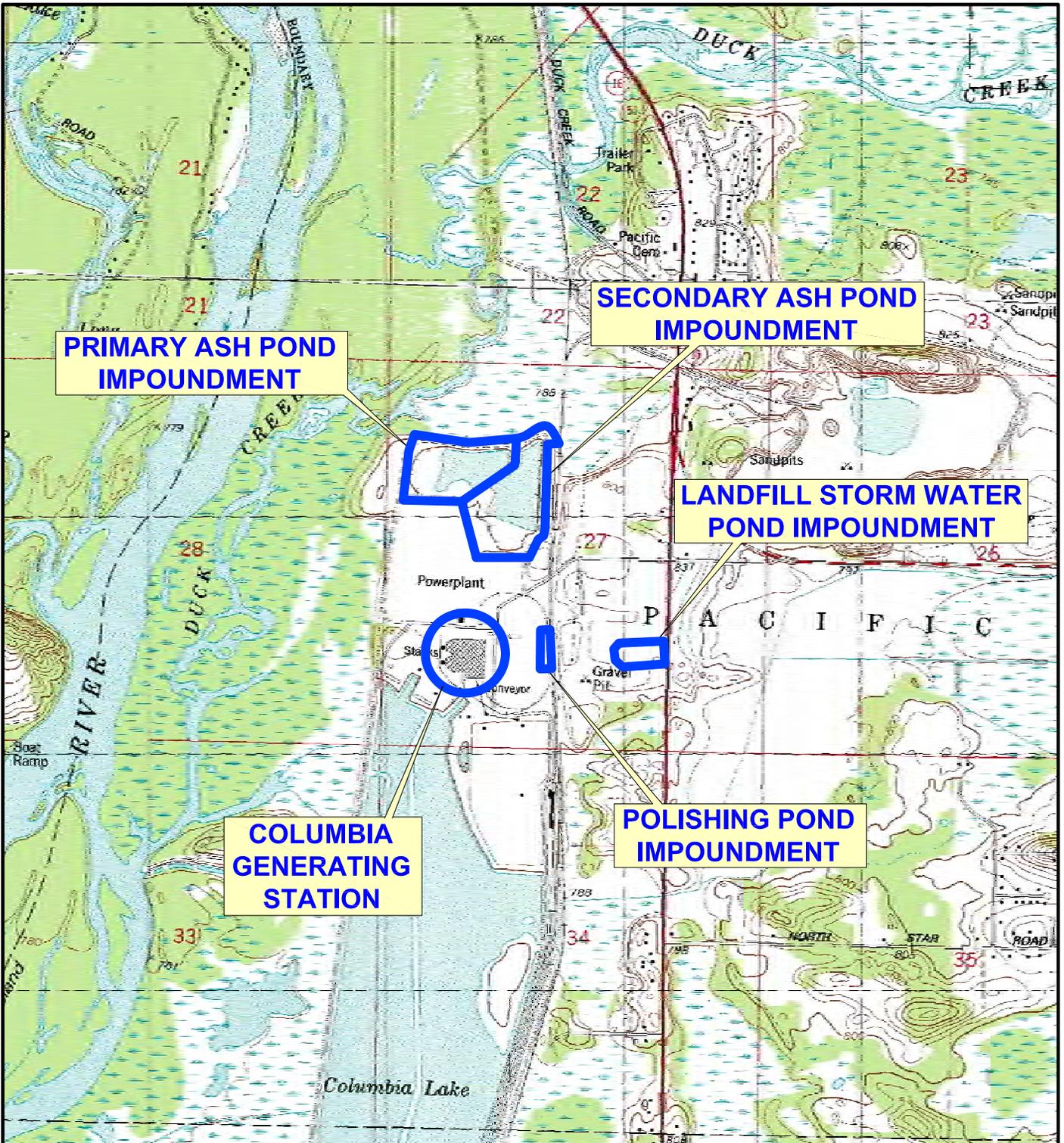
Patrick J. Harrison, P.E.
Senior Engineering Consultant

J:\01.xx Norwood\01.0170142.20 CCW Dams Round 7\Task 4 CLIN 022 Alliant Energy Columbia WI\Draft Report 1_4_11\Columbia Generating Station Report_Draft 1-18-11.docx



Figures

GZA-1;GZA_USA# 01.0170142.2 Ash Impoundments\Columbia, WI\DRAWINGS\AutoCAD\MATCHED - SITE LOCATION.dwg [FIGURE 1 - SITE LOCATION (5)] November 08, 2010 - 2:04pm justin.hegarty



SOURCE:
 USGS TOPOGRAPHIC QUADRANGLE MAPS:
 POYNETTE, WI. (1984)
 PORTAGE, WI. (1984)

Data Supplied by:



PROJ. MGR.: DPS
 DESIGNED BY: DPS
 REVIEWED BY: DPS
 OPERATOR: JAH
 DATE: 10-25-2010

LOCUS PLAN
 (USGS 7.5-MINUTE TOPOGRAPHIC QUAD)
 COLUMBIA GENERATING STATION
 PARDEEVILLE, WISCONSIN

FIGURE NO.
 01.0170142.20
 FIGURE NO.
1

GZA-U:\GZA_USA\01.0170142.2 Ash Impoundments\Columbia, WI\DRAWINGS\AutoCAD\MATCHED - SITE PLANS.dwg [LARGE] November 08, 2010 - 1:59pm justin.hegarty

SOURCE: DIGITAL ORTHOPHOTO/AERIAL IMAGERY
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EARTH MAPPING PROGRAM.
DATA ACCESSED OCTOBER 2010



500 250 0 500 Feet

WISCONSIN RIVER

APPROXIMATE DOWNSTREAM AREA

PRIMARY ASH POND
IMPOUNDMENT

SECONDARY ASH POND
IMPOUNDMENT

Railroad

MURRAY ROAD

LANDFILL STORMWATER
POND IMPOUNDMENT

COLUMBIA
GENERATING STATION

POLISHING POND
IMPOUNDMENT

HIGHWAY 51

LEGEND

-  APPROXIMATE IMPOUNDMENT BOUNDARY
-  APPROXIMATE DOWNSTREAM AREA FROM THE PRIMARY AND SECONDARY ASH POND IMPOUNDMENTS

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711



COLUMBIA GENERATING STATION
W8375 MURRAY ROAD
PARDEEVILLE, WISCONSIN

OVERALL ASH BASIN PLAN

PROJ. MGR.: DPS	DWG. Date: 10-25-2010	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170142.20	2
REVIEWED BY: DPS		
OPERATOR: JAH		

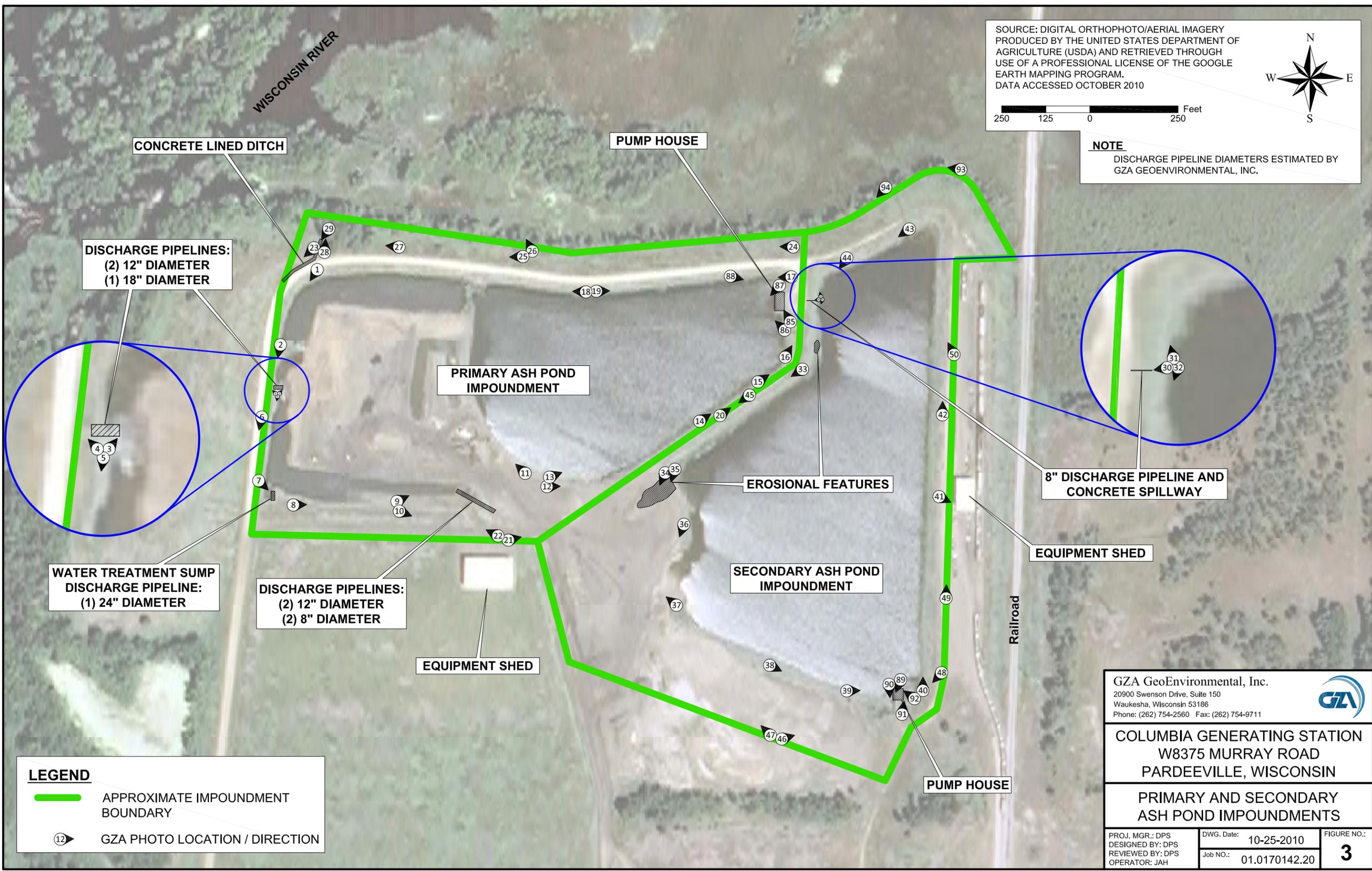
GZA - J:\GZA_USA\01.0170142.2 Ash Impoundments\Columbia, WI\DRAWINGS\AutoCAD\MATCHED - SITE PLANS.dwg [1ST & 2ND ASH] November 08, 2010 - 2:00pm justin.hegarty

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DATA ACCESSED OCTOBER 2010



250 125 0 250 Feet

NOTE
DISCHARGE PIPELINE DIAMETERS ESTIMATED BY
GZA GEOENVIRONMENTAL, INC.



LEGEND
— APPROXIMATE IMPOUNDMENT BOUNDARY
⑫ GZA PHOTO LOCATION / DIRECTION

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711



COLUMBIA GENERATING STATION
W8375 MURRAY ROAD
PARDEEVILLE, WISCONSIN

**PRIMARY AND SECONDARY
ASH POND IMPOUNDMENTS**

PROJ. MGR.: DPS
DESIGNED BY: DPS
REVIEWED BY: DPS
OPERATOR: JAH
DWG. Date: 10-25-2010
Job NO.: 01.0170142.20
FIGURE NO.: **3**

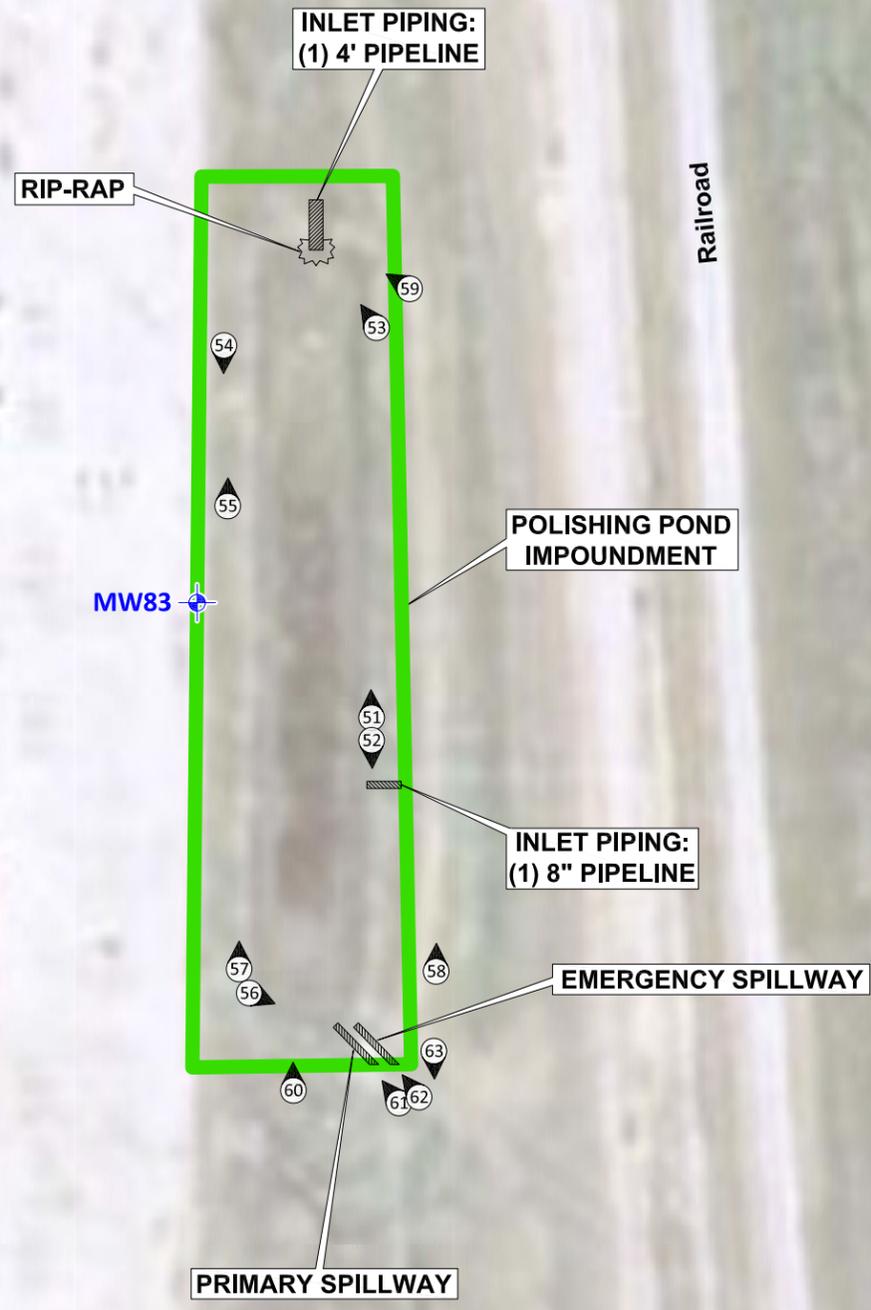
GZA-U:\GZA_USA#01.0170142.2 Ash Impoundments\Columbia, WI\DRAWINGS\AutoCAD\MATCHED - SITE PLANS.dwg [POLISH] November 08, 2010 - 2:01pm justin.hegarty

**COLUMBIA
GENERATING STATION**

SOURCE: DIGITAL ORTHOPHOTO/AERIAL IMAGERY
PRODUCED BY THE UNITED STATES DEPARTMENT OF
AGRICULTURE (USDA) AND RETRIEVED THROUGH
USE OF A PROFESSIONAL LICENSE OF THE GOOGLE
EARTH MAPPING PROGRAM.
DATA ACCESSED OCTOBER 2010



NOTE
DISCHARGE PIPELINE DIAMETERS ESTIMATED BY
GZA GEOENVIRONMENTAL, INC.



LEGEND

	APPROXIMATE IMPOUNDMENT BOUNDARY
	GZA PHOTO LOCATION / DIRECTION
	GROUNDWATER MONITORING WELL LOCATION

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711



COLUMBIA GENERATING STATION
W8375 MURRAY ROAD
PARDEEVILLE, WISCONSIN

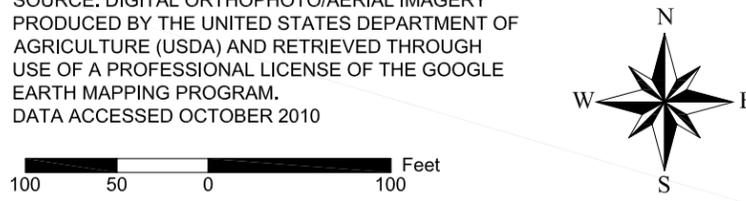
POLISHING POND IMPOUNDMENT

PROJ. MGR.: DPS	DWG. Date: 10-25-2010	FIGURE NO.: 4
DESIGNED BY: DPS	Job NO.: 01.0170142.20	
REVIEWED BY: DPS		
OPERATOR: JAH		

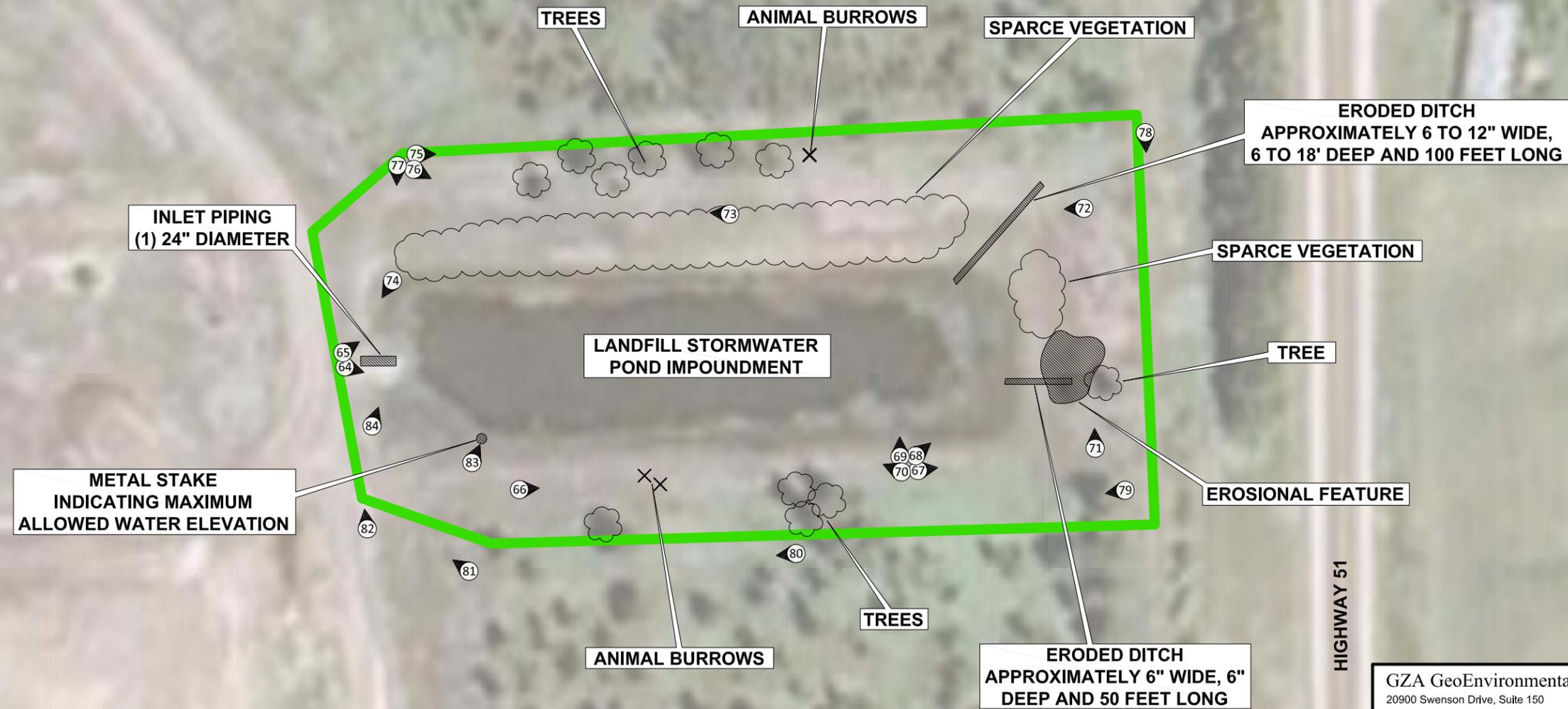
IN
ALLO

GZA-U:\GZA_USA#01.0170142.2 Ash Impoundments\Columbia, WI\Drawings\AutoCAD\MATCHED - SITE PLANS.dwg [STORM] November 08, 2010 - 2:02pm justin.hegarty

SOURCE: DIGITAL ORTHOPHOTO/AERIAL IMAGERY
 PRODUCED BY THE UNITED STATES DEPARTMENT OF
 AGRICULTURE (USDA) AND RETRIEVED THROUGH
 USE OF A PROFESSIONAL LICENSE OF THE GOOGLE
 EARTH MAPPING PROGRAM.
 DATA ACCESSED OCTOBER 2010



100 50 0 100 Feet



LEGEND

- APPROXIMATE IMPOUNDMENT BOUNDARY
-  GZA PHOTO LOCATION / DIRECTION

HIGHWAY 51

GZA GeoEnvironmental, Inc. 20900 Swenson Drive, Suite 150 Waukesha, Wisconsin 53186 Phone: (262) 754-2560 Fax: (262) 754-9711		
COLUMBIA GENERATING STATION W8375 MURRAY ROAD PARDEEVILLE, WISCONSIN		
LANDFILL STORMWATER POND IMPOUNDMENT		
PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: DPS OPERATOR: JAH	DWG. Date: 10-25-2010 Job NO.: 01.0170142.20	FIGURE NO.: <div style="font-size: 24pt; font-weight: bold; text-align: center;">5</div>



Appendix A

Limitations

DAM ENGINEERING & VISUAL INSPECTION LIMITATIONS

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of described services.
2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Alliant Energy (and their affiliates) as well as Federal, state, and local officials and other parties referenced therein. GZA has also relied on other parties which were available to GZA at the time of the inspection. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.
3. In reviewing this Report, it should be noted that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. The observations of conditions at the dam reflect only the situation present at the specific moment in time the observations were made, under the specific conditions present. It may be necessary to reevaluate the recommendations of this report when subsequent phases of evaluation or repair and improvement provide more data.
4. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions may be detected.
5. Water level readings have been reviewed and interpretations have been made in the text of this report. Fluctuations in the level of the groundwater and surface water may occur due to variations in rainfall, temperature, and other factors different than at the time measurements were made.
6. GZA's comments on the hydrology, hydraulics, and embankment stability for the dam are based on a limited review of available design documentation available from Alliant Energy and the Wisconsin Department of Natural Resources. Calculations and computer modeling used in these analyses were not available and were not independently reviewed by GZA.
7. This report has been prepared for the exclusive use of US EPA for specific application to the existing dam facilities, in accordance with generally accepted dam engineering practices. No other warranty, express or implied, is made.
8. This dam inspection verification report has been prepared for this project by GZA. This report is for broad evaluation and management purposes only and is not sufficient, in and of itself, to prepare construction documents or an accurate bid.



Appendix B

Definitions

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to references published by the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, the Department of the Interior Bureau of Reclamation, or the Federal Emergency Management Agency.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate there from, including but not be limited to, spillways; reservoirs and their rims; low level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

General

EAP – Emergency Action Plan - Shall mean a predetermined plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam break.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the crest of the dam.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Condition Rating

SATISFACTORY - No existing or potential management unit safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable criteria. Minor maintenance items may be required.

FAIR - Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR - A management unit safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

UNSATISFACTORY - Considered unsafe. A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

Hazard Potential

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

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

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

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

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



Appendix C
Inspection Checklists



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # WI0002780 Date 9/28/10

INSPECTOR Doug Simon, P.E. Patrick J. Harrison, P.E.

Impoundment Name Primary Ash Pond
Impoundment Company Wisconsin Power & Light
EPA Region Region V
State Agency (Field Office) Address WDNR - 2514 Morse Street Janesville, WI 53545

Name of Impoundment Primary Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update x

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

IMPOUNDMENT FUNCTION: Settling of Ash, Decanting Water

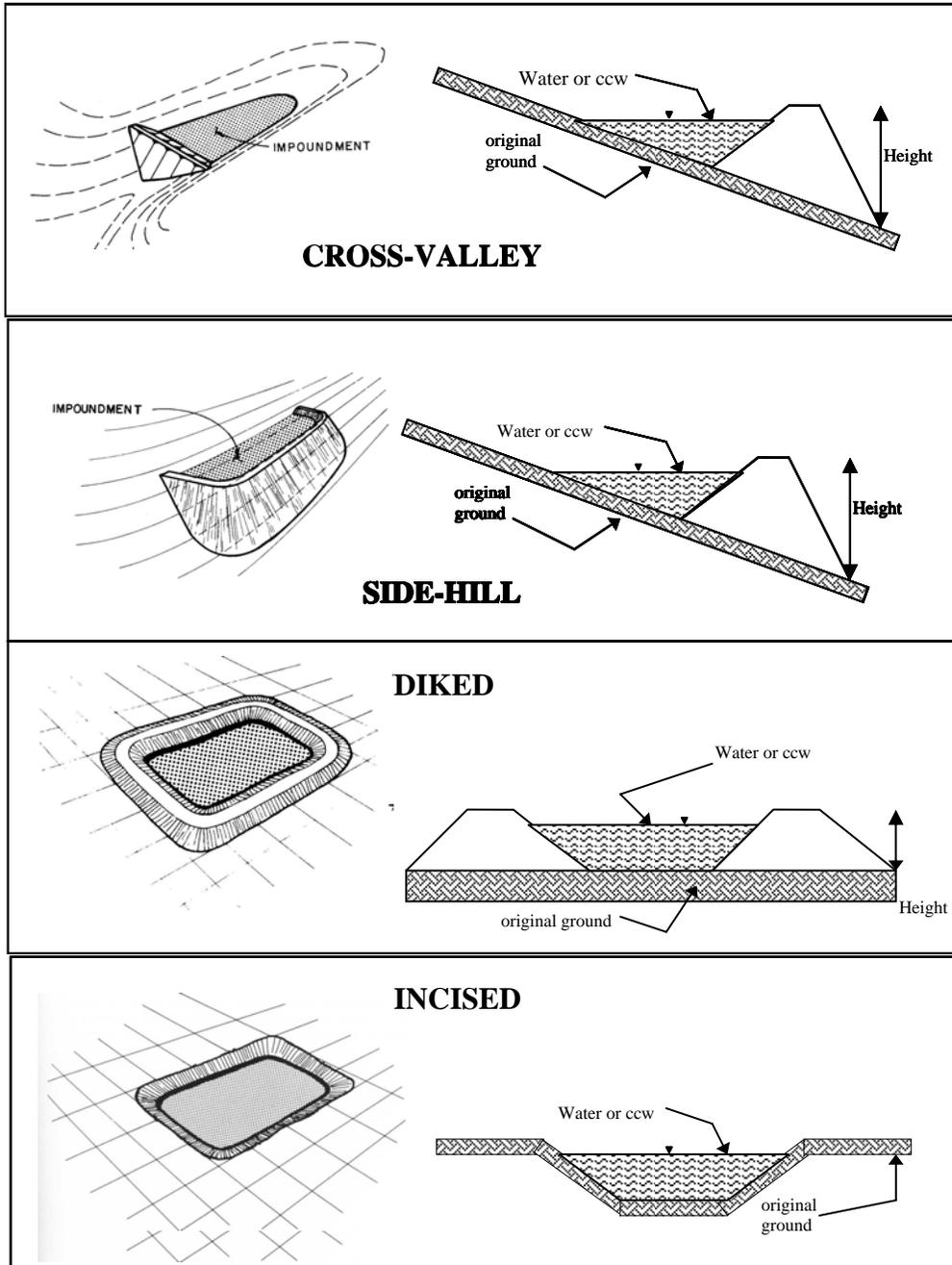
Nearest Downstream Town : Name Poynette, WI
Distance from the impoundment 10 miles
Impoundment Location: Longitude 43 Degrees 29 Minutes 35 Seconds
Latitude 89 Degrees 25 Minutes 10 Seconds
State WI County Columbia

Does a state agency regulate this impoundment? YES x NO

If So Which State Agency? Wisconsin Department of Natural Resources, Solid Waste Division

US EPA ARCHIVE DOCUMENT

CONFIGURATION:



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

Embankment Height 23 feet Embankment Material Native Sand and Gravel
 Pool Area 8.5 acres Liner None Observed or Reported
 Current Freeboard 9 feet Liner Permeability NA

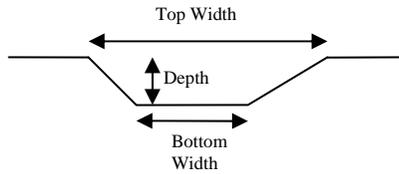
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

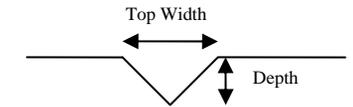
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

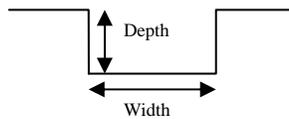
TRAPEZOIDAL



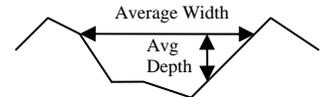
TRIANGULAR



RECTANGULAR



IRREGULAR

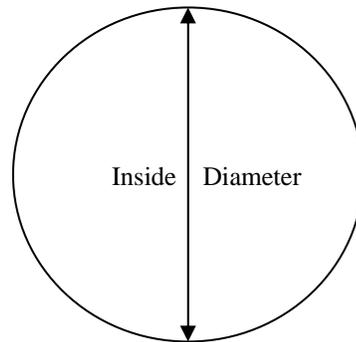


 Outlet

 inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO _____

 x **No Outlet** Water is recycled and returned to plant from pump house.

 Other Type of Outlet (specify) _____

The Impoundment was Designed By Sargent & Lundy Engineers; Chicago, IL



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # WI0002780 Date 9/28/10

INSPECTOR Doug Simon, P.E. Patrick J. Harrison, P.E.

Impoundment Name Secondary Ash Pond
Impoundment Company Wisconsin Power & Light
EPA Region Region V
State Agency (Field Office) Address WDNR - 2514 Morse Street Janesville, WI 53545

Name of Impoundment Secondary Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update x

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

IMPOUNDMENT FUNCTION: Inactive Since 2004; Secondary Settling Pond Prior to 2004

Nearest Downstream Town : Name Poynette, WI
Distance from the impoundment 10 miles
Impoundment Location: Longitude 43 Degrees 29 Minutes 32 Seconds
Latitude 89 Degrees 25 Minutes 39 Seconds
State WI County Columbia

Does a state agency regulate this impoundment? YES x NO

If So Which State Agency? Wisconsin Department of Natural Resources, Solid Waste Division

US EPA ARCHIVE DOCUMENT

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

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

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

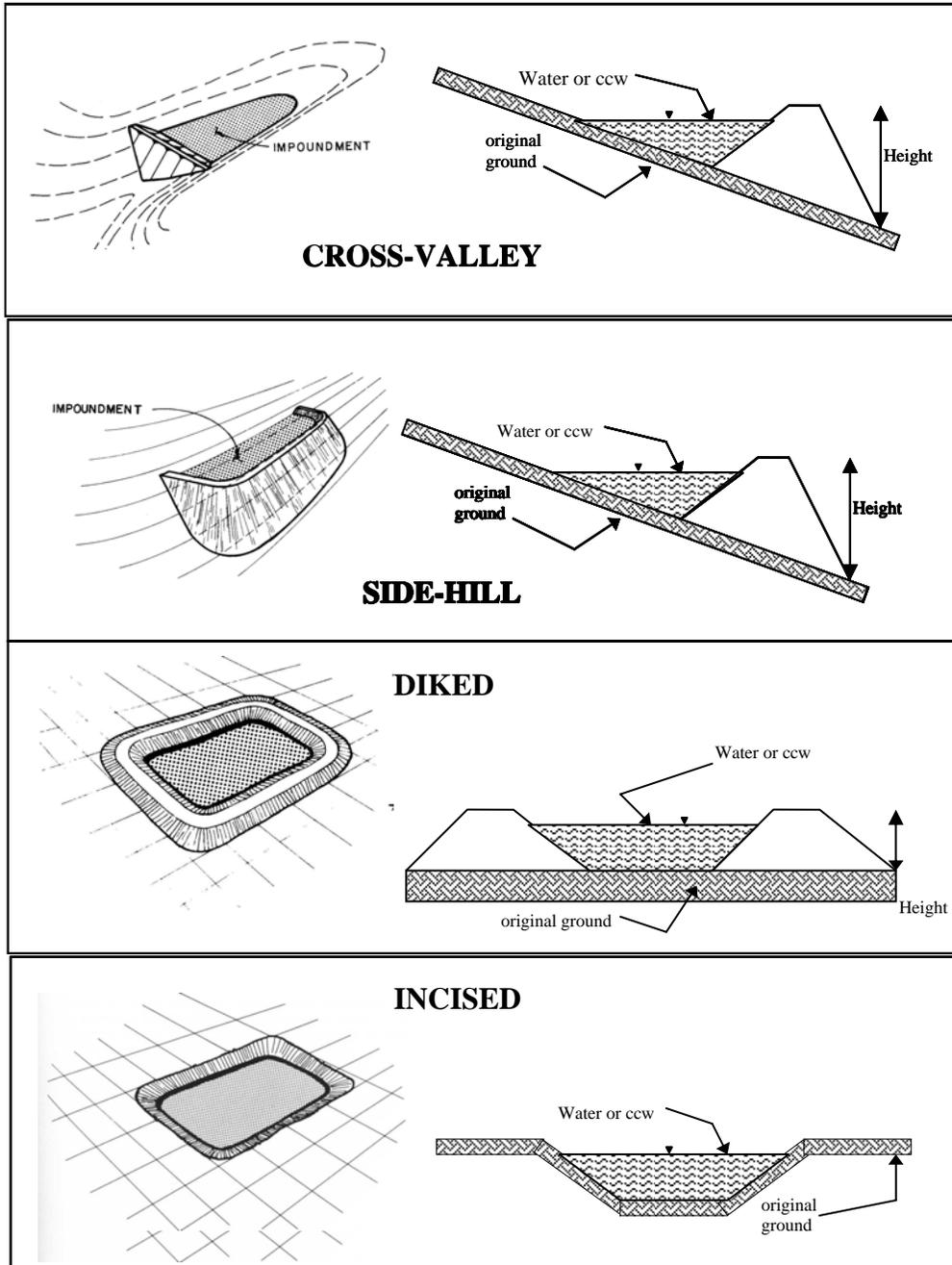
x _____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

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

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

The impoundment is currently inactive and receives only direct rainfall and limited stormwater runoff. However, if pond is made active, failure could result in economic loss and environmental damage. Therefore, it is our opinion that the impoundment has a significant hazard potential.

CONFIGURATION:



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

Embankment Height 23 feet Embankment Material Native Sand and Gravel
 Pool Area 16 acres Liner None Observed or Reported
 Current Freeboard About 15 feet Liner Permeability NA

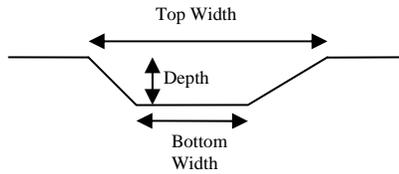
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

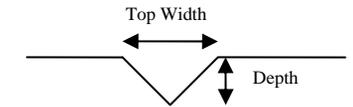
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

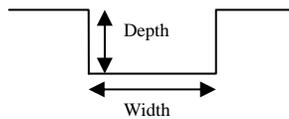
TRAPEZOIDAL



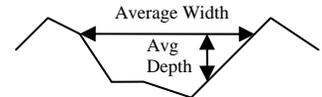
TRIANGULAR



RECTANGULAR



IRREGULAR

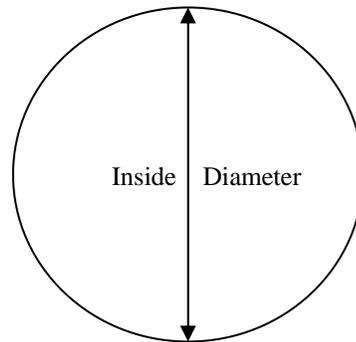


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO _____

 x **No Outlet**

 Other Type of Outlet (specify) _____

The Impoundment was Designed By Sargent & Lundy Engineers; Chicago, IL



Site Name:	Columbia Generating Station	Date:	September 28, 2010
Unit Name:	Polishing Pond	Operator's Name:	Wisconsin Power & Light
Unit I.D.:	Hazard Potential Classification: High Significant Low		
Inspector's Name: Doug Simon, P.E. & Patrick J. Harrison, P.E.			

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

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

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

Inspection Issue #	Comments
--------------------	----------

- 1) This impoundment has been inactive since 2004. Regularly scheduled inspections are not currently performed. A visual inspection was performed on March 10, 2009 by an internal plant team. Plant personnel are developing a plan for an internal evaluation program including periodic inspections.
- 2) No water was present in the impoundment.
- 3) Crest elevation data was not available at the time of checklist completion.
- 4) No water was present in the impoundment.

US EPA ARCHIVE DOCUMENT



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # WI0002780 Date 9/28/10

INSPECTOR Doug Simon, P.E. Patrick J. Harrison, P.E.

Impoundment Name Polishing Pond
Impoundment Company Wisconsin Power & Light
EPA Region Region V
State Agency (Field Office) Addresss WDNR - 2514 Morse Street Janesville, WI 53545

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

New Update x

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

IMPOUNDMENT FUNCTION: Inactive Since 2004; Previously Used to Polish Water Prior to Discharge

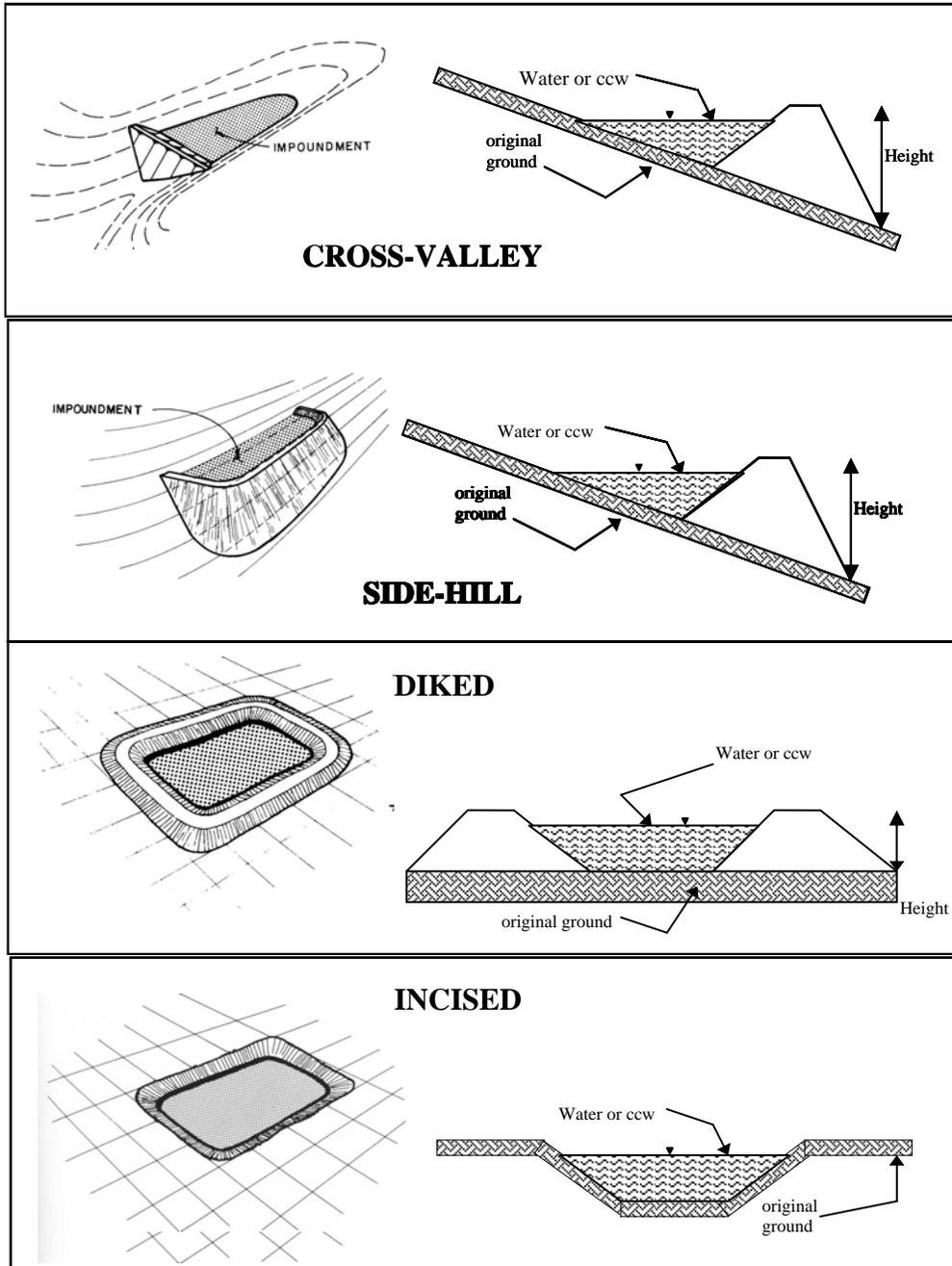
Nearest Downstream Town : Name Poynette, WI
Distance from the impoundment 10 miles
Impoundment Location: Longitude 43 Degrees 10 Minutes 14 Seconds Latitude 89 Degrees 24 Minutes 57 Seconds State WI County Columbia

Does a state agency regulate this impoundment? YES x NO

If So Which State Agency? Wisconsin Department of Natural Resources, Solid Waste Division

US EPA ARCHIVE DOCUMENT

CONFIGURATION:



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

Embankment Height 10 feet Embankment Material Native Soils
 Pool Area 1 acres Liner None Observed or Reported
 Current Freeboard 10 feet Liner Permeability Unknown

TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

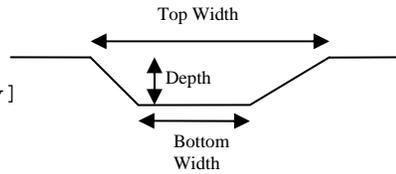
 Trapezoidal

 Triangular

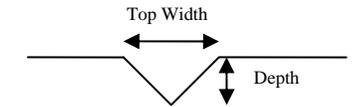
 X 2 Rectangular Primary [Emergency]

 Irregular

TRAPEZOIDAL



TRIANGULAR

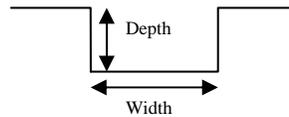


36" [24"] depth

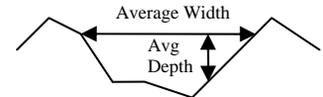
66" [36"] bottom (or average) width

66" [36"] top width

RECTANGULAR



IRREGULAR



 Outlet

 inside diameter

Material

 corrugated metal

 welded steel

 concrete

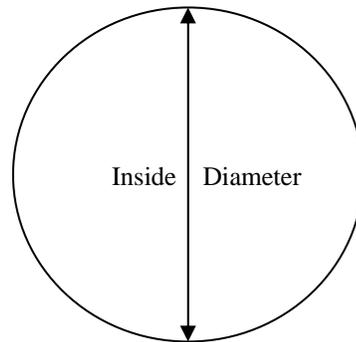
 plastic (hdpe, pvc, etc.)

 other (specify) _____

Is water flowing through the outlet? YES _____ NO X

 No Outlet

 Other Type of Outlet (specify) _____



The Impoundment was Designed By Sargent & Lundy Engineers; Chicago, IL



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # WI0002780 Date 9/28/10

INSPECTOR Doug Simon, P.E. Patrick J. Harrison, P.E.

Impoundment Name Landfill Stormwater Pond
Impoundment Company Wisconsin Power & Light
EPA Region Region V
State Agency (Field Office) Address WDNR - 2514 Morse Street Janesville, WI 53545

Name of Impoundment Landfill Stormwater Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update x

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

IMPOUNDMENT FUNCTION: Collection of Stormwater Runoff from Ash Landfill

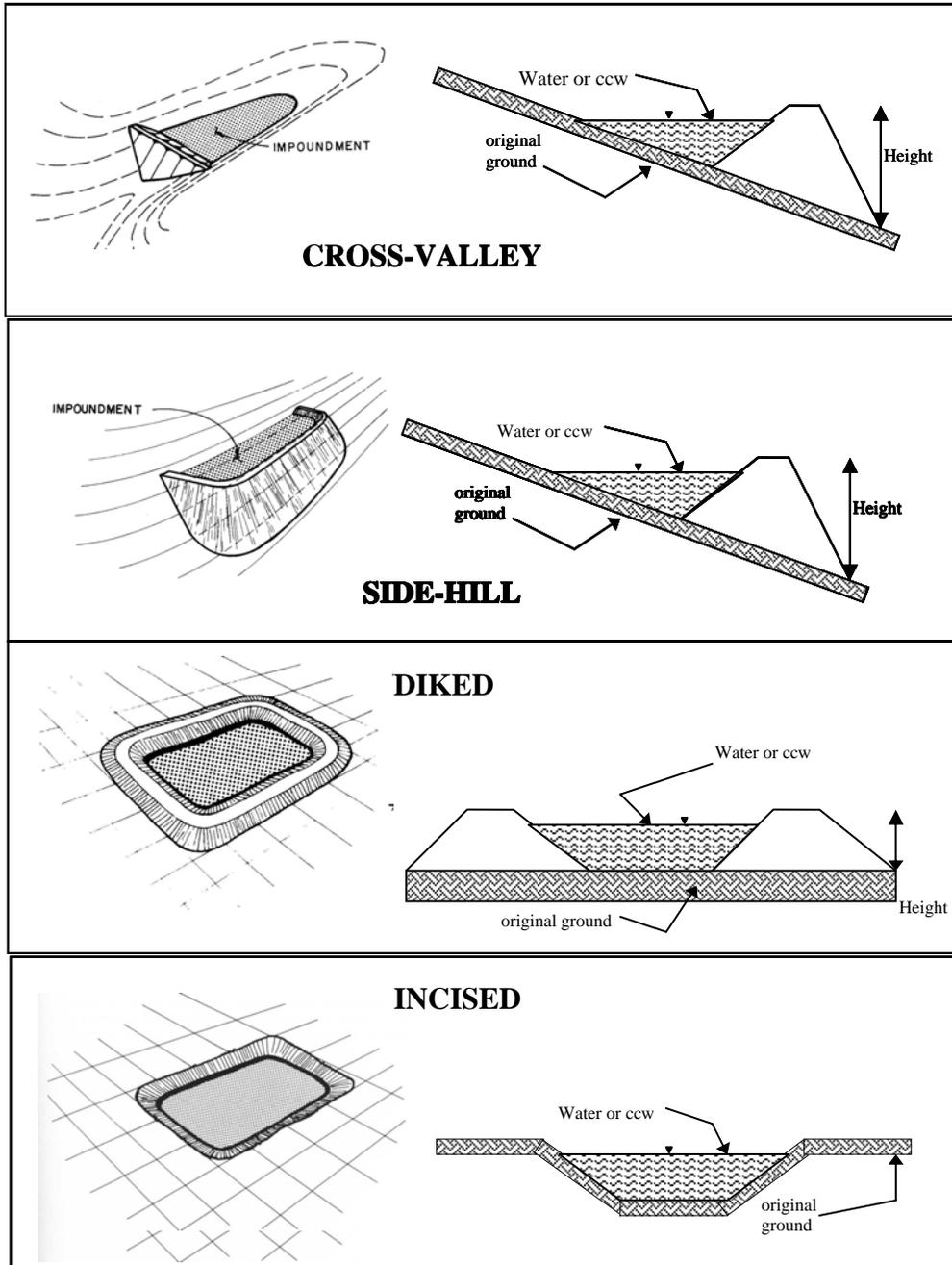
Nearest Downstream Town : Name Poynette, WI
Distance from the impoundment 10 miles
Impoundment Location: Longitude 43 Degrees 29 Minutes 10 Seconds
Latitude 89 Degrees 24 Minutes 39 Seconds
State WI County Columbia

Does a state agency regulate this impoundment? YES x NO

If So Which State Agency? Wisconsin Department of Natural Resources, Solid Waste Division

US EPA ARCHIVE DOCUMENT

CONFIGURATION:



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

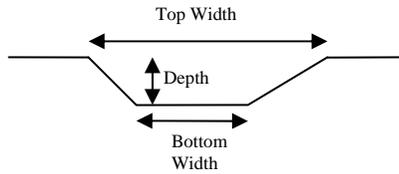
Embankment Height 10 feet Embankment Material Native Soils
 Pool Area 10.8 acres Liner HDPE
 Current Freeboard 2 feet Liner Permeability <10⁻¹⁰ cm/s

TYPE OF OUTLET (Mark all that apply)

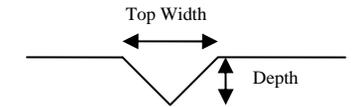
 Open Channel Spillway

- Trapezoidal
- Triangular
- Rectangular
- Irregular

TRAPEZOIDAL

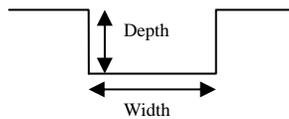


TRIANGULAR

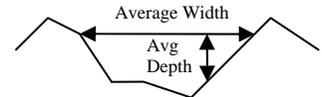


- depth
- bottom (or average) width
- top width

RECTANGULAR



IRREGULAR

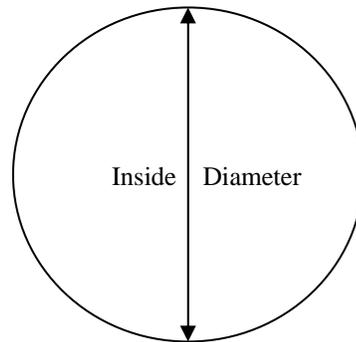


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO _____

 x **No Outlet** Water is primarily removed by evaporation. A pump truck is used during high precipitation periods.

 Other Type of Outlet (specify) _____

The Impoundment was Designed By Warzyn Engineering

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Primary Ash Pond Impoundment</u>	STATE ID #: <u>WI0002780</u>
REGISTERED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	NID ID #: _____
STATE SIZE CLASSIFICATION: <u>Small</u>	STATE HAZARD CLASSIFICATION: <u>Significant</u> CHANGE IN HAZARD CLASSIFICATION REQUESTED?: _____
<u>DAM LOCATION INFORMATION</u>	
CITY/TOWN: <u>Pardeeville, WI</u>	COUNTY: <u>Columbia County, WI</u>
DAM LOCATION: <u>W8375 Murray Road</u> (street address if known)	ALTERNATE DAM NAME: _____
USGS QUAD.: <u>Poynette, WI (1984), Portage, WI (1984)</u>	LAT.: <u>43 29' 35"</u> LONG.: <u>89 25' 10"</u>
DRAINAGE BASIN: _____	RIVER: <u>N/A</u>
IMPOUNDMENT NAME(S): <u>Primary Ash Pond Impoundment</u>	
<u>GENERAL DAM INFORMATION</u>	
TYPE OF DAM: <u>Incised and bermed Ash Impoundments</u>	OVERALL LENGTH (FT): <u>4,200</u>
PURPOSE OF DAM: <u>Ash Impoundment</u>	NORMAL POOL STORAGE (ACRE-FT): <u>72</u> (Estimated)
YEAR BUILT: <u>1970's</u>	MAXIMUM POOL STORAGE (ACRE-FT): <u>100</u>
STRUCTURAL HEIGHT (FT): <u>23</u>	EL. NORMAL POOL (FT): <u>796.0</u>
HYDRAULIC HEIGHT (FT): <u>14</u>	EL. MAXIMUM POOL (FT): <u>802.0</u>

YES

NO

YES

NO

NAME OF DAM: <u>Primary Ash Pond Impoundment</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
<u>INSPECTION SUMMARY</u>			
DATE OF INSPECTION: <u>September 28, 2010</u>		DATE OF PREVIOUS INSPECTION: _____	
TEMPERATURE/WEATHER: <u>Sunny, 70 degrees Fahrenheit</u>		ARMY CORPS PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
CONSULTANT: <u>GZA GeoEnvironmental, Inc</u>		PREVIOUS DCR PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
BENCHMARK/DATUM: <u>Mean Sea Level</u>			
OVERALL PHYSICAL CONDITION OF DAM: <u>FAIR</u>		DATE OF LAST REHABILITATION: <u>N/A</u>	
SPILLWAY CAPACITY: <u>0-50% of the SDF or Unknown</u>			
EL. POOL DURING INSP.: <u>796</u>		EL. TAILWATER DURING INSP.: <u>N/A</u>	
<u>PERSONS PRESENT AT INSPECTION</u>			
<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>	
<u>William Skalitzky</u>	<u>Senior Env. Specialist</u>	<u>Alliant Energy</u>	
<u>Phil Tegen</u>	<u>Sr. Env and Safety Specialist</u>	<u>Alliant Energy</u>	
<u>Jim Kralick</u>	<u>Hydrogeologist</u>	<u>Wisconsin Department of Natural Resources</u>	
<u>Doug Simon</u>	<u>Geological Engineering</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>Patrick Harrison, P.E.</u>	<u>Senior Geotechnical Eng.</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>EVALUATION INFORMATION</u>			
		Click on box to select E-code	Click on box to select E-code
E1) TYPE OF DESIGN	<input type="text" value="3"/>	E8) LOW-LEVEL OUTLET CONDITION	<input type="text" value="1"/>
E2) LEVEL OF MAINTENANCE	<input type="text" value="4"/>	E9) SPILLWAY DESIGN FLOOD CAPACITY	<input type="text" value="1"/>
E3) EMERGENCY ACTION PLAN	<input type="text" value="2"/>	E10) OVERALL PHYSICAL CONDITION	<input type="text" value="3"/>
E4) EMBANKMENT SEEPAGE	<input type="text" value="5"/>	E11) ESTIMATED REPAIR COST	<input type="text"/>
E5) EMBANKMENT CONDITION	<input type="text" value="5"/>	ROADWAY OVER CREST	<input type="text" value="NO"/>
E6) CONCRETE CONDITION	<input type="text" value="N/A"/>	BRIDGE NEAR DAM	<input type="text" value="NO"/>
E7) LOW-LEVEL OUTLET CAPACITY	<input type="text" value="1"/>		
NAME OF INSPECTING ENGINEER: <u>Patrick Harrison, P.E.; Doug Simon</u>		SIGNATURE: _____	

NAME OF DAM: <u>Primary Ash Pond Impoundment</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
OWNER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>	CARETAKER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>
NAME/TITLE		NAME/TITLE	<u>Jerald Lokenvitz/Plant Manager</u>
STREET	<u>W8375 Murray Road</u>	STREET	<u>W8375 Murray Road</u>
TOWN, STATE, ZIP	<u>Pardeeville, WI</u>	TOWN, STATE, ZIP	<u>Pardeeville, WI</u>
PHONE	<u>608-742-0715</u>	PHONE	<u>608-742-0715</u>
EMERGENCY PH. #	<u>608-751-3886</u>	EMERGENCY PH. #	<u>608-751-3886</u>
FAX		FAX	
EMAIL		EMAIL	<u>geraldlokvitz@alliantenergy.com</u>
OWNER TYPE	<u>Private</u>		
PRIMARY SPILLWAY TYPE <u>None Present, water Piped back to facility</u>			
SPILLWAY LENGTH (FT)	<u>N/A</u>	SPILLWAY CAPACITY (CFS)	<u>N/A</u>
AUXILIARY SPILLWAY TYPE	<u>N/A</u>	AUX. SPILLWAY CAPACITY (CFS)	<u>N/A</u>
NUMBER OF OUTLETS	<u>None Present</u>	OUTLET(S) CAPACITY (CFS)	<u>N/A</u>
TYPE OF OUTLETS	<u>N/A</u>	TOTAL DISCHARGE CAPACITY (CFS)	<u>N/A</u>
DRAINAGE AREA (SQ MI)	<u>None outside impoundment</u>	SPILLWAY DESIGN FLOOD (PERIOD/CFS)	<u>N/A</u>
HAS DAM BEEN BREACHED OR OVERTOPPED	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, PROVIDE DATE(S)	
FISH LADDER (LIST TYPE IF PRESENT)	<u>N/A</u>		
DOES CREST SUPPORT PUBLIC ROAD?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD NAME:	
PUBLIC BRIDGE WITHIN 50' OF DAM?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD/BRIDGE NAME:	
		MHD BRIDGE NO. (IF APPLICABLE)	

NAME OF DAM: Primary Ash Pond Impoundment STATE ID #: WI0002780
 INSPECTION DATE: September 28, 2010 NID ID #: 0

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel Road		X	
	2. SURFACE CRACKING	None Observed	X		
	3. SINKHOLES, ANIMAL BURROWS	None Observed	X		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	No depressions Observed	X		
	5. HORIZONTAL ALIGNMENT	No problems observed	X		
	6. RUTS AND/OR PUDDLES	Some potholes			X
	7. VEGETATION (PRESENCE/CONDITION)	Grass	X		
	8. ABUTMENT CONTACT	N/A	X		

ADDITIONAL COMMENTS: Potholes in gravel access road should be repaired and regraded.

NAME OF DAM: Primary Ash Pond Impoundment

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO	MONITOR	REPAIR
			ACTION		
D/S SLOPE	1. WET AREAS (NO FLOW)	None Observed	X		
	2. SEEPAGE	None Observed	X		
	3. SLIDE, SLOUGH, SCARP	None Observed	X		
	4. EMB.-ABUTMENT CONTACT	N/A	X		
	5. SINKHOLE/ANIMAL BURROWS	None Observed	X		
	6. EROSION	Wave Action Erosion on eastern embankment, erosion ditch			X
	7. UNUSUAL MOVEMENT	None Observed	X		
	8. VEGETATION (PRESENCE/CONDITION)	Grass, well maintained. Tree stumps on northern embankment	X		

ADDITIONAL COMMENTS: Large erosion ditch on east side should be repaired. Other erosion features should be monitored.
Tree stumps should be removed.

NAME OF DAM: Primary Ash Pond Impoundment

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed	x		
	2. SLOPE PROTECTION TYPE AND COND.	None observed	x		
	3. SINKHOLE/ANIMAL BURROWS	None observed	x		
	4. EMB.-ABUTMENT CONTACT	N/A	x		
	5. EROSION	Wave action erosion		X	
	6. UNUSUAL MOVEMENT	None observed	x		
	7. VEGETATION (PRESENCE/CONDITION)	Grass	x		

ADDITIONAL COMMENTS: Extent of erosion should be evaluated.

NAME OF DAM: Primary Ash Pond Impoundment STATE ID #: WI0002780
 INSPECTION DATE: September 28, 2010 NID ID #: 0

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	None present	X		
	2. OBSERVATION WELLS	M3, M4R	X		
	3. STAFF GAGE AND RECORDER	At pump house	X		
	4. WEIRS	None Present	X		
	5. INCLINOMETERS	None Present	X		
	6. SURVEY MONUMENTS	None present	X		
	7. DRAINS	None Present	X		
	8. FREQUENCY OF READINGS	No measurements are taken	X		
	9. LOCATION OF READINGS		X		

ADDITIONAL COMMENTS: _____

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Secondary Ash Pond</u>	STATE ID #: <u>WI0002780</u>
REGISTERED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	NID ID #: _____
STATE SIZE CLASSIFICATION: <u>Small</u>	STATE HAZARD CLASSIFICATION: <u>Significant</u>
	CHANGE IN HAZARD CLASSIFICATION REQUESTED?: _____

DAM LOCATION INFORMATION

CITY/TOWN: <u>Pardeeville, WI</u>	COUNTY: <u>Columbia County, WI</u>
DAM LOCATION: <u>5699 Colby Lake Road, Hoyt Lakes, Minnesota</u> (street address if known)	ALTERNATE DAM NAME: _____
USGS QUAD.: <u>Poynette, WI (1984), Portage, WI (1984)</u>	LAT.: <u>43 29' 32"</u> LONG.: <u>89 25' 39"</u>
DRAINAGE BASIN: <u>15 acres</u>	RIVER: <u>N/A</u>
IMPOUNDMENT NAME(S): <u>Secondary Ash Pond Impoundment</u>	

GENERAL DAM INFORMATION

TYPE OF DAM: <u>Incised and bermed Ash Impoundments</u>	OVERALL LENGTH (FT): <u>4,000</u>
PURPOSE OF DAM: <u>Ash Impoundment</u>	NORMAL POOL STORAGE (ACRE-FT): <u>204</u> (Estimated)
YEAR BUILT: <u>1970's</u>	MAXIMUM POOL STORAGE (ACRE-FT): <u>275</u>
STRUCTURAL HEIGHT (FT): <u>23</u>	EL. NORMAL POOL (FT): <u>790.0</u>
HYDRAULIC HEIGHT (FT): <u>8</u>	EL. MAXIMUM POOL (FT): <u>802.0</u>

YES

NO

YES

NO

NAME OF DAM: <u>Secondary Ash Pond</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
<u>INSPECTION SUMMARY</u>			
DATE OF INSPECTION: <u>September 28, 2010</u>		DATE OF PREVIOUS INSPECTION: _____	
TEMPERATURE/WEATHER: <u>Sunny, 70 degrees Fahrenheit</u>		ARMY CORPS PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
CONSULTANT: <u>GZA GeoEnvironmental, Inc</u>		PREVIOUS DCR PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
BENCHMARK/DATUM: <u>Mean Sea Level</u>			
OVERALL PHYSICAL CONDITION OF DAM: <u>FAIR</u>		DATE OF LAST REHABILITATION: <u>N/A</u>	
SPILLWAY CAPACITY: <u>0-50% of the SDF or Unknown</u>			
EL. POOL DURING INSP.: <u>790</u>		EL. TAILWATER DURING INSP.: <u>N/A</u>	
<u>PERSONS PRESENT AT INSPECTION</u>			
<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>	
<u>William Skalitzky</u>	<u>Senior Env. Specialist</u>	<u>Alliant Energy</u>	
<u>Phil Tegen</u>	<u>Sr. Env and Safety Specialist</u>	<u>Alliant Energy</u>	
<u>Jim Kralick</u>	<u>Hydrogeologist</u>	<u>Wisconsin Department of Natural Resources</u>	
<u>Doug Simon</u>	<u>Geological Engineering</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>Patrick Harrison, P.E.</u>	<u>Senior Geotechnical Eng.</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>EVALUATION INFORMATION</u>			
		Click on box to select E-code	Click on box to select E-code
E1) TYPE OF DESIGN	<input type="text" value="3"/>	E8) LOW-LEVEL OUTLET CONDITION	<input type="text" value="1"/>
E2) LEVEL OF MAINTENANCE	<input type="text" value="4"/>	E9) SPILLWAY DESIGN FLOOD CAPACITY	<input type="text" value="1"/>
E3) EMERGENCY ACTION PLAN	<input type="text" value="2"/>	E10) OVERALL PHYSICAL CONDITION	<input type="text" value="3"/>
E4) EMBANKMENT SEEPAGE	<input type="text" value="5"/>	E11) ESTIMATED REPAIR COST	<input type="text"/>
E5) EMBANKMENT CONDITION	<input type="text" value="5"/>	ROADWAY OVER CREST	<input type="text" value="NO"/>
E6) CONCRETE CONDITION	<input type="text" value="N/A"/>	BRIDGE NEAR DAM	<input type="text" value="NO"/>
E7) LOW-LEVEL OUTLET CAPACITY	<input type="text" value="1"/>		
NAME OF INSPECTING ENGINEER: <u>Patrick Harrison, P.E.; Doug Simon, P.E.</u> SIGNATURE: _____			

NAME OF DAM: <u>Secondary Ash Pond</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
OWNER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>	CARETAKER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>
NAME/TITLE		NAME/TITLE	<u>Jerald Lokenvitz/Plant Manager</u>
STREET	<u>W8375 Murray Road</u>	STREET	<u>W8375 Murray Road</u>
TOWN, STATE, ZIP	<u>Pardeeville, WI</u>	TOWN, STATE, ZIP	<u>Pardeeville, WI</u>
PHONE	<u>608-742-0715</u>	PHONE	<u>608-742-0715</u>
EMERGENCY PH. #	<u>608-751-3886</u>	EMERGENCY PH. #	<u>608-751-3886</u>
FAX		FAX	
EMAIL		EMAIL	<u>geraldlokvitz@alliantenergy.com</u>
OWNER TYPE	<u>Private</u>		
PRIMARY SPILLWAY TYPE <u>None Present, water Piped back to facility</u>			
SPILLWAY LENGTH (FT)	<u>N/A</u>	SPILLWAY CAPACITY (CFS)	<u>N/A</u>
AUXILIARY SPILLWAY TYPE	<u>N/A</u>	AUX. SPILLWAY CAPACITY (CFS)	<u>N/A</u>
NUMBER OF OUTLETS	<u>None Present</u>	OUTLET(S) CAPACITY (CFS)	<u>N/A</u>
TYPE OF OUTLETS	<u>N/A</u>	TOTAL DISCHARGE CAPACITY (CFS)	<u>N/A</u>
DRAINAGE AREA (SQ MI)	<u>None outside impoundment</u>	SPILLWAY DESIGN FLOOD (PERIOD/CFS)	<u>N/A</u>
HAS DAM BEEN BREACHED OR OVERTOPPED	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, PROVIDE DATE(S)	
FISH LADDER (LIST TYPE IF PRESENT)	<u>N/A</u>		
DOES CREST SUPPORT PUBLIC ROAD?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD NAME:	
PUBLIC BRIDGE WITHIN 50' OF DAM?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD/BRIDGE NAME:	
		MHD BRIDGE NO. (IF APPLICABLE)	

NAME OF DAM: Secondary Ash Pond STATE ID #: WI0002780
 INSPECTION DATE: September 28, 2010 NID ID #: 0

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel Road		X	
	2. SURFACE CRACKING	None Observed	X		
	3. SINKHOLES, ANIMAL BURROWS	None Observed	X		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	No depressions Observed	X		
	5. HORIZONTAL ALIGNMENT	No problems observed	X		
	6. RUTS AND/OR PUDDLES	Some potholes			X
	7. VEGETATION (PRESENCE/CONDITION)	Grass	X		
	8. ABUTMENT CONTACT	N/A	X		

ADDITIONAL COMMENTS: Potholes in gravel access road should be repaired and regraded.

NAME OF DAM: Secondary Ash Pond

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO		
			ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)	None Observed	X		
	2. SEEPAGE	None Observed	X		
	3. SLIDE, SLOUGH, SCARP	None Observed	X		
	4. EMB.-ABUTMENT CONTACT	N/A	X		
	5. SINKHOLE/ANIMAL BURROWS	None Observed	X		
	6. EROSION	Wave action erosion		X	
	7. UNUSUAL MOVEMENT	None Observed	X		
	8. VEGETATION (PRESENCE/CONDITION)	Grass	X		

ADDITIONAL COMMENTS: Extent of erosion should be evaluated.

NAME OF DAM: Secondary Ash Pond

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed	x		
	2. SLOPE PROTECTION TYPE AND COND.	None observed	x		
	3. SINKHOLE/ANIMAL BURROWS	None observed	x		
	4. EMB.-ABUTMENT CONTACT	N/A	x		
	5. EROSION	Wave action erosion		X	
	6. UNUSUAL MOVEMENT	None observed	x		
	7. VEGETATION (PRESENCE/CONDITION)	Grass	x		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Secondary Ash Pond

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	None present	X		
	2. OBSERVATION WELLS	MW57, MW59	X		
	3. STAFF GAGE AND RECORDER	At pump house	X		
	4. WEIRS	None Present	X		
	5. INCLINOMETERS	None Present	X		
	6. SURVEY MONUMENTS	None present	X		
	7. DRAINS	None Present	X		
	8. FREQUENCY OF READINGS	No measurements are taken	X		
	9. LOCATION OF READINGS		X		

ADDITIONAL COMMENTS: _____

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Polishing Pond Impoundments</u>		STATE ID #: <u>WI0002780</u>	
REGISTERED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		NID ID #: _____	
STATE SIZE CLASSIFICATION: <u>Small</u>		STATE HAZARD CLASSIFICATION: <u>Low</u>	
		CHANGE IN HAZARD CLASSIFICATION REQUESTED?: _____	
<u><i>DAM LOCATION INFORMATION</i></u>			
CITY/TOWN: <u>Pardeeville, WI</u>		COUNTY: <u>Columbia County, WI</u>	
DAM LOCATION: <u>W8375 Murray Road</u> (street address if known)		ALTERNATE DAM NAME: _____	
USGS QUAD.: <u>Poynette, WI (1984), Portage, WI (1984)</u>		LAT.: <u>43 10' 14"</u>	LONG.: <u>89 24' 57"</u>
DRAINAGE BASIN: _____		RIVER: <u>N/A</u>	
IMPOUNDMENT NAME(S): <u>Polishing Pond Impoundment</u>			
<u><i>GENERAL DAM INFORMATION</i></u>			
TYPE OF DAM: <u>Incised</u>		OVERALL LENGTH (FT): <u>1,050</u>	
PURPOSE OF DAM: <u>Polish Water Prior to Discharge</u>		NORMAL POOL STORAGE (ACRE-FT): <u>0</u>	
YEAR BUILT: <u>1970's</u>		MAXIMUM POOL STORAGE (ACRE-FT): <u>5</u>	
STRUCTURAL HEIGHT (FT): <u>10</u>		EL. NORMAL POOL (FT): <u>805.0</u>	
HYDRAULIC HEIGHT (FT): <u>0</u>		EL. MAXIMUM POOL (FT): <u>Not operational / no water present</u>	

YES

NO

YES

NO

NAME OF DAM: <u>Polishing Pond Impoundments</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
<u>INSPECTION SUMMARY</u>			
DATE OF INSPECTION: <u>September 28, 2010</u>		DATE OF PREVIOUS INSPECTION: _____	
TEMPERATURE/WEATHER: <u>Sunny, 70 degrees Fahrenheit</u>		ARMY CORPS PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
CONSULTANT: <u>GZA GeoEnvironmental, Inc</u>		PREVIOUS DCR PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES, date _____	
BENCHMARK/DATUM: <u>Mean Sea Level</u>			
OVERALL PHYSICAL CONDITION OF DAM: <u>SATISFACTORY</u>		DATE OF LAST REHABILITATION: <u>N/A</u>	
SPILLWAY CAPACITY: <u>0-50% of the SDF or Unknown</u>			
EL. POOL DURING INSP.: <u>no water present</u>		EL. TAILWATER DURING INSP.: <u>N/A</u>	
<u>PERSONS PRESENT AT INSPECTION</u>			
<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>	
<u>William Skalitzky</u>	<u>Senior Env. Specialist</u>	<u>Alliant Energy</u>	
<u>Phil Tegen</u>	<u>Sr. Env and Safety Specialist</u>	<u>Alliant Energy</u>	
<u>Jim Kralick</u>	<u>Hydrogeologist</u>	<u>Wisconsin Department of Natural Resources</u>	
<u>Doug Simon</u>	<u>Geological Engineering</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>Patrick Harrison, P.E.</u>	<u>Senior Geotechnical Eng.</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>EVALUATION INFORMATION</u>			
		Click on box to select E-code	Click on box to select E-code
E1) TYPE OF DESIGN	<input type="text" value="3"/>	E8) LOW-LEVEL OUTLET CONDITION	<input type="text" value="1"/>
E2) LEVEL OF MAINTENANCE	<input type="text" value="4"/>	E9) SPILLWAY DESIGN FLOOD CAPACITY	<input type="text" value="1"/>
E3) EMERGENCY ACTION PLAN	<input type="text" value="2"/>	E10) OVERALL PHYSICAL CONDITION	<input type="text" value="4"/>
E4) EMBANKMENT SEEPAGE	<input type="text" value="5"/>	E11) ESTIMATED REPAIR COST	<input type="text"/>
E5) EMBANKMENT CONDITION	<input type="text" value="5"/>	ROADWAY OVER CREST	<input type="text" value="NO"/>
E6) CONCRETE CONDITION	<input type="text" value="N/A"/>	BRIDGE NEAR DAM	<input type="text" value="NO"/>
E7) LOW-LEVEL OUTLET CAPACITY	<input type="text" value="1"/>		
NAME OF INSPECTING ENGINEER: <u>Patrick Harrison, P.E.; Doug Simon</u>		SIGNATURE: _____	

NAME OF DAM: <u>Polishing Pond Impoundments</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
OWNER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>	CARETAKER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>
NAME/TITLE		NAME/TITLE	<u>Jerald Lokenvitz/Plant Manager</u>
STREET	<u>W8375 Murray Road</u>	STREET	<u>W8375 Murray Road</u>
TOWN, STATE, ZIP	<u>Pardeeville, WI</u>	TOWN, STATE, ZIP	<u>Pardeeville, WI</u>
PHONE	<u>608-742-0715</u>	PHONE	<u>608-742-0715</u>
EMERGENCY PH. #	<u>608-751-3886</u>	EMERGENCY PH. #	<u>608-751-3886</u>
FAX		FAX	
EMAIL		EMAIL	<u>geraldlokvitz@alliantenergy.com</u>
OWNER TYPE	<u>Private</u>		
PRIMARY SPILLWAY TYPE <u>uncontrolled concrete</u>			
SPILLWAY LENGTH (FT)	<u>37.5</u>	SPILLWAY CAPACITY (CFS)	<u>Unknown</u>
AUXILIARY SPILLWAY TYPE	<u>uncontrolled concrete</u>	AUX. SPILLWAY CAPACITY (CFS)	<u>Unknown</u>
NUMBER OF OUTLETS	<u>N/A</u>	OUTLET(S) CAPACITY (CFS)	<u>Unknown</u>
TYPE OF OUTLETS	<u>N/A</u>	TOTAL DISCHARGE CAPACITY (CFS)	<u>Unknown</u>
DRAINAGE AREA (SQ MI)	<u>None outside impoundment</u>	SPILLWAY DESIGN FLOOD (PERIOD/CFS)	<u>Unknown</u>
HAS DAM BEEN BREACHED OR OVERTOPPED	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, PROVIDE DATE(S)	
FISH LADDER (LIST TYPE IF PRESENT)	<u>N/A</u>		
DOES CREST SUPPORT PUBLIC ROAD?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD NAME:	
PUBLIC BRIDGE WITHIN 50' OF DAM?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF YES, ROAD/BRIDGE NAME:	
		MHD BRIDGE NO. (IF APPLICABLE)	

NAME OF DAM: Polishing Pond Impoundments STATE ID #: WI0002780
 INSPECTION DATE: September 28, 2010 NID ID #: 0

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel Road, grassy area		X	
	2. SURFACE CRACKING	None Observed	x		
	3. SINKHOLES, ANIMAL BURROWS	None Observed	x		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	No depressions Observed	x		
	5. HORIZONTAL ALIGNMENT	No problems observed	x		
	6. RUTS AND/OR PUDDLES	None Observed	x		
	7. VEGETATION (PRESENCE/CONDITION)	Grass	x		
	8. ABUTMENT CONTACT	N/A	x		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Polishing Pond Impoundments

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)	N/A	X		
	2. SEEPAGE	N/A	X		
	3. SLIDE, SLOUGH, SCARP	N/A	X		
	4. EMB.-ABUTMENT CONTACT	N/A	X		
	5. SINKHOLE/ANIMAL BURROWS	N/A	X		
	6. EROSION	N/A	X		
	7. UNUSUAL MOVEMENT	N/A	X		
	8. VEGETATION (PRESENCE/CONDITION)	N/A	X		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Polishing Pond Impoundments

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed	X		
	2. SLOPE PROTECTION TYPE AND COND.	None observed	X		
	3. SINKHOLE/ANIMAL BURROWS	None observed	X		
	4. EMB.-ABUTMENT CONTACT	N/A	X		
	5. EROSION	None observed	X		
	6. UNUSUAL MOVEMENT	None observed	X		
	7. VEGETATION (PRESENCE/CONDITION)	Grass - NOT regularly mowed	X		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Polishing Pond Impoundments

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	None present	X		
	2. OBSERVATION WELLS	MW83	X		
	3. STAFF GAGE AND RECORDER	SG4	X		
	4. WEIRS	None Present	X		
	5. INCLINOMETERS	None Present	X		
	6. SURVEY MONUMENTS	None present	X		
	7. DRAINS	None Present	X		
	8. FREQUENCY OF READINGS	No measurements are taken	X		
	9. LOCATION OF READINGS		X		

ADDITIONAL COMMENTS: _____

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Landfill Stormwater Pond Impoundment</u>		STATE ID #: <u>WI0002780</u>	
REGISTERED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		NID ID #: _____	
STATE SIZE CLASSIFICATION: <u>Small</u>		STATE HAZARD CLASSIFICATION: <u>Low</u>	
		CHANGE IN HAZARD CLASSIFICATION REQUESTED?: _____	
<i><u>DAM LOCATION INFORMATION</u></i>			
CITY/TOWN: <u>Pardeeville, WI</u>		COUNTY: <u>Columbia County, WI</u>	
DAM LOCATION: <u>W8375 Murray Road</u> (street address if known)		ALTERNATE DAM NAME: _____	
USGS QUAD.: <u>Poynette, WI (1984), Portage, WI (1984)</u>		LAT.: <u>43 29' 10"</u>	LONG.: <u>89 24' 39"</u>
DRAINAGE BASIN: <u>19 acres</u>		RIVER: <u>N/A</u>	
IMPOUNDMENT NAME(S): <u>Landfill Stormwater Pond</u>			
<i><u>GENERAL DAM INFORMATION</u></i>			
TYPE OF DAM: <u>Incised</u>		OVERALL LENGTH (FT): <u>1,750</u>	
PURPOSE OF DAM: <u>Stormwater storage and evaporation basin</u>		NORMAL POOL STORAGE (ACRE-FT): <u>11</u> (Estimated)	
YEAR BUILT: <u>1980's</u>		MAXIMUM POOL STORAGE (ACRE-FT): <u>11</u>	
STRUCTURAL HEIGHT (FT): <u>35</u>		EL. NORMAL POOL (FT): <u>796.0</u>	
HYDRAULIC HEIGHT (FT): <u>2</u>		EL. MAXIMUM POOL (FT): <u>798.0</u>	

YES

NO

YES

NO

NAME OF DAM: <u>Landfill Stormwater Pond Impoundment</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
<i><u>INSPECTION SUMMARY</u></i>			
DATE OF INSPECTION: <u>September 28, 2010</u>		DATE OF PREVIOUS INSPECTION: _____	
TEMPERATURE/WEATHER: <u>Sunny, 70 degrees Fahrenheit</u>	ARMY CORPS PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If YES, date _____	
CONSULTANT: <u>GZA GeoEnvironmental, Inc</u>	PREVIOUS DCR PHASE I: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If YES, date _____	
BENCHMARK/DATUM: <u>Mean Sea Level</u>			
OVERALL PHYSICAL CONDITION OF DAM: <u>SATISFACTORY</u>		DATE OF LAST REHABILITATION: <u>N/A</u>	
SPILLWAY CAPACITY: <u>0-50% of the SDF or Unknown</u>			
EL. POOL DURING INSP.: <u>796</u>		EL. TAILWATER DURING INSP.: <u>N/A</u>	
<i><u>PERSONS PRESENT AT INSPECTION</u></i>			
<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>	
<u>William Skalitzky</u>	<u>Senior Env. Specialist</u>	<u>Alliant Energy</u>	
<u>Phil Tegen</u>	<u>Sr. Env and Safety Specialist</u>	<u>Alliant Energy</u>	
<u>Jim Kralick</u>	<u>Hydrogeologist</u>	<u>Wisconsin Department of Natural Resources</u>	
<u>Doug Simon</u>	<u>Geological Engineering</u>	<u>GZA GeoEnvironmental, Inc</u>	
<u>Patrick Harrison, P.E.</u>	<u>Senior Geotechnical Eng.</u>	<u>GZA GeoEnvironmental, Inc</u>	
<i><u>EVALUATION INFORMATION</u></i>			
E1) TYPE OF DESIGN	Click on box to select E-code <input type="text" value="3"/>	E8) LOW-LEVEL OUTLET CONDITION	<input type="text" value="1"/>
E2) LEVEL OF MAINTENANCE	<input type="text" value="4"/>	E9) SPILLWAY DESIGN FLOOD CAPACITY	<input type="text" value="1"/>
E3) EMERGENCY ACTION PLAN	<input type="text" value="2"/>	E10) OVERALL PHYSICAL CONDITION	<input type="text" value="4"/>
E4) EMBANKMENT SEEPAGE	<input type="text" value="5"/>	E11) ESTIMATED REPAIR COST	<input type="text"/>
E5) EMBANKMENT CONDITION	<input type="text" value="5"/>	ROADWAY OVER CREST	<input type="text" value="NO"/>
E6) CONCRETE CONDITION	<input type="text" value="N/A"/>	BRIDGE NEAR DAM	<input type="text" value="NO"/>
E7) LOW-LEVEL OUTLET CAPACITY	<input type="text" value="1"/>		
NAME OF INSPECTING ENGINEER: <u>Patrick Harrison, P.E.; Doug Simon</u>		SIGNATURE: _____	

NAME OF DAM: <u>Landfill Stormwater Pond Impoundment</u>		STATE ID #: <u>WI0002780</u>	
INSPECTION DATE: <u>September 28, 2010</u>		NID ID #: <u>0</u>	
OWNER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>	CARETAKER: ORGANIZATION	<u>Alliant, WP&L, MG&E</u>
NAME/TITLE		NAME/TITLE	<u>Jerald Lokenvitz/Plant Manager</u>
STREET	<u>W8375 Murray Road</u>	STREET	<u>W8375 Murray Road</u>
TOWN, STATE, ZIP	<u>Pardeeville, WI</u>	TOWN, STATE, ZIP	<u>Pardeeville, WI</u>
PHONE	<u>608-742-0715</u>	PHONE	<u>608-742-0715</u>
EMERGENCY PH. #	<u>608-751-3886</u>	EMERGENCY PH. #	<u>608-751-3886</u>
FAX		FAX	
EMAIL		EMAIL	<u>geraldlokvitz@alliantenergy.com</u>
OWNER TYPE	<u>Private</u>		
PRIMARY SPILLWAY TYPE <u>N/A</u>			
SPILLWAY LENGTH (FT) <u>N/A</u>		SPILLWAY CAPACITY (CFS) <u>N/A</u>	
AUXILIARY SPILLWAY TYPE <u>N/A</u>		AUX. SPILLWAY CAPACITY (CFS) <u>N/A</u>	
NUMBER OF OUTLETS <u>None Present</u>		OUTLET(S) CAPACITY (CFS) <u>N/A</u>	
TYPE OF OUTLETS <u>N/A</u>		TOTAL DISCHARGE CAPACITY (CFS) <u>N/A</u>	
DRAINAGE AREA (SQ MI) <u>None outside impoundment</u>		SPILLWAY DESIGN FLOOD (PERIOD/CFS) <u>N/A</u>	
HAS DAM BEEN BREACHED OR OVERTOPPED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PROVIDE DATE(S) _____			
FISH LADDER (LIST TYPE IF PRESENT) <u>N/A</u>			
DOES CREST SUPPORT PUBLIC ROAD? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		IF YES, ROAD NAME: _____	
PUBLIC BRIDGE WITHIN 50' OF DAM? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		IF YES, ROAD/BRIDGE NAME: _____	
MHD BRIDGE NO. (IF APPLICABLE) _____			

NAME OF DAM: Landfill Stormwater Pond Impoundment STATE ID #: WI0002780
 INSPECTION DATE: September 28, 2010 NID ID #: 0

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel Road, grass	X		
	2. SURFACE CRACKING	None Observed	x		
	3. SINKHOLES, ANIMAL BURROWS	None Observed	x		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	No depressions Observed	x		
	5. HORIZONTAL ALIGNMENT	No problems observed	x		
	6. RUTS AND/OR PUDDLES	No problems observed			X
	7. VEGETATION (PRESENCE/CONDITION)	un-mowed grass and trees up to 15 inches in diameter	x		
	8. ABUTMENT CONTACT	N/A	x		

ADDITIONAL COMMENTS: Trees should be removed and grass regularly cut

NAME OF DAM: Landfill Stormwater Pond Impoundment

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)	N/A	X		
	2. SEEPAGE	N/A	X		
	3. SLIDE, SLOUGH, SCARP	N/A	X		
	4. EMB.-ABUTMENT CONTACT	N/A	X		
	5. SINKHOLE/ANIMAL BURROWS	N/A	X		
	6. EROSION	N/A	X		
	7. UNUSUAL MOVEMENT	N/A	X		
	8. VEGETATION (PRESENCE/CONDITION)	N/A	X		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Landfill Stormwater Pond Impoundment

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed	x		
	2. SLOPE PROTECTION TYPE AND COND.	None observed	x		
	3. SINKHOLE/ANIMAL BURROWS	animal burrows present			x
	4. EMB.-ABUTMENT CONTACT	N/A	x		
	5. EROSION	Two erosional ditches and additional minor erosional features			x
	6. UNUSUAL MOVEMENT	None observed	x		
	7. VEGETATION (PRESENCE/CONDITION)	un-mowed grass, sparse vegetation, and trees up to 15 inches in diameter			x

ADDITIONAL COMMENTS: Trees should be removed and grass regularly cut
animal burrows should be filled
erosional ditches should be repaired

NAME OF DAM: Landfill Stormwater Pond Impoundment

STATE ID #: WI0002780

INSPECTION DATE: September 28, 2010

NID ID #: 0

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	None present	X		
	2. OBSERVATION WELLS	MW91A, MW91B	X		
	3. STAFF GAGE AND RECORDER	None Present	X		
	4. WEIRS	None Present	X		
	5. INCLINOMETERS	None Present	X		
	6. SURVEY MONUMENTS	metal stake water level marker	X		
	7. DRAINS	None Present	X		
	8. FREQUENCY OF READINGS	No measurements are taken	X		
	9. LOCATION OF READINGS		X		

ADDITIONAL COMMENTS: _____



Appendix D

Photographs



Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 1	Date: 9/28/10
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Direction Photo Taken:
Southwest

Description:
Upstream slope of Primary Ash Pond Impoundment (PAP).



Photo No. 2	Date: 9/28/10
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Direction Photo Taken:
South

Description:
Upstream slope of PAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 3	Date: 9/28/10
Direction Photo Taken: Northeast	



Description:
PAP Discharge Pipelines:
(2) 12" Diameter

Photo No. 4	Date: 9/28/10
Direction Photo Taken: Northwest	



Description:
Discharge Pipeline (behind
12" Diameter pipeline):
(1) 18" Diameter in PAP



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
5

Date:
9/28/10

Direction Photo
Taken:
South



Description:
Upstream slope of PAP.

Photo No.
6

Date:
9/28/10

Direction Photo
Taken:
South



Description:
Upstream slope, top of
embankment of PAP, and
discharge pipelines.



Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 7	Date: 9/28/10
Direction Photo Taken: Southeast	

Description:
Upstream slope of PAP and water treatment sump discharge pipeline:
(1) 24" Diameter.



Photo No. 8	Date: 9/28/10
Direction Photo Taken: East	

Description:
Upstream slope of PAP, ash recovery operations, and discharge pipelines.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 9	Date: 9/28/10
Direction Photo Taken: Northeast	

Description:
Discharge Pipelines in southeast portion of PAP:
(2) 12" Diameter,
(2) 8" Diameter.



Photo No. 10	Date: 9/28/10
Direction Photo Taken: Southeast	

Description:
Upstream slope of PAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
11

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Upstream slope of PAP



Photo No.
12

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Upstream slope of PAP.





Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 13	Date: 9/28/10
Direction Photo Taken: Northeast	

Description:
Upstream slope of PAP and downstream slope of Secondary Ash Pond Impoundment (SAP).



Photo No. 14	Date: 9/28/10
Direction Photo Taken: Northeast	

Description:
Upstream slope of PAP, downstream slope of SAP and PAP pump house.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
15

Date:
9/28/10

Direction Photo
Taken:
Northeast

Description:

Upstream slope of PAP and
downstream slope of SAP.



Photo No.
16

Date:
9/28/10

Direction Photo
Taken:
North

Description:

Upstream slope of PAP and
downstream slope of SAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
17

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Upstream slope of PAP.



Photo No.
18

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Upstream slope of PAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
19

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Upstream slope of PAP.



Photo No.
20

Date:
9/28/10

Direction Photo
Taken:
Northeast

Description:
Crest of embankment
separating PAP and SAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
21

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Crest of embankment
separating PAP and SAP.



Photo No.
22

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Crest of PAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
23

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Crest of PAP.



Photo No.
24

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Downstream slope of PAP



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
25

Date:
9/28/10

Direction Photo Taken:
West

Description:
Downstream slope of PAP



Photo No.
26

Date:
9/28/10

Direction Photo Taken:
Northwest

Description:
Downstream slope of PAP





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
27

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Downstream slope of PAP



Photo No.
28

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Downstream slope of PAP
and concrete lined ditch





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
29

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Downstream slope of PAP
and concrete lined ditch



Photo No.
30

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Upstream slope of SAP,
downstream slope of PAP,
and 8" discharge pipeline
and concrete spillway.





Client Name: U.S. EPA	Site Location: Columbia Generating Station Pardeeville, WI	Project No. 01.0170142.20
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Photo No. 31	Date: 9/28/10
Direction Photo Taken: North	

Description:
Upstream slope of SAP and downstream slope of PAP.



Photo No. 32	Date: 9/28/10
Direction Photo Taken: South	

Description:
Upstream slope of SAP and downstream slope of PAP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
33

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Upstream slope of SAP and
downstream slope of PAP.



Photo No.
34

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Upstream slope of SAP,
downstream slope of PAP,
and large erosional feature.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
35

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Erosional feature in SAP.



Photo No.
36

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Upstream slope of SAP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
37

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Downstream slope of PAP
and animals/bird burrows.



Photo No.
38

Date:
9/28/10

Direction Photo
Taken:
Southeast

Description:
Upstream slope of SAP and
SAP pump house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
39

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Upstream slope of SAP and
SAP pump house.



Photo No.
40

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of SAP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
41

Date:
9/28/10

Direction Photo
Taken:
Southeast

Description:
Upstream slope of SAP and
equipment shed.



Photo No.
42

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of SAP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
43

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Upstream slope of SAP.



Photo No.
44

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Upstream slope of SAP and
PAP pump house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
45

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Upstream slope of SAP and
downstream slope of PAP
and crest.



Photo No.
46

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Crest of SAP and SAP pump
house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
47

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Crest of SAP.



Photo No.
48

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Crest of SAP and SAP pump
house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
49

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Crest of SAP



Photo No.
50

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Crest of SAP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
51

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of Polishing
Pond Impoundment (PP).



Photo No.
52

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Upstream slope of PP and
(1) 8" inlet pipe.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
53

Date:
9/28/10

Direction Photo
Taken:
North West

Description:
Upstream slope of PP and
(1) 4' inlet pipe.



Photo No.
54

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Upstream slope of PP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
55

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of PP.



Photo No.
56

Date:
9/28/10

Direction Photo
Taken:
Southeast

Description:
Crest of PP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
57

Date:
9/28/10

Direction Photo
Taken:
North

Description:

Upstream slope and crest of
PP.



Photo No.
58

Date:
9/28/10

Direction Photo
Taken:
North

Description:

Upstream slope and crest of
PP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
59

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Crest of PP.



Photo No.
60

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope and crest of
PP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
61

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
PP emergency spillway.



Photo No.
62

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
PP primary Spillway.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
63

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Drainage ditch south of PP.



Photo No.
64

Date:
9/28/10

Direction Photo
Taken:
Southeast

Description:
Upstream slope of the
Landfill Stormwater Pond
Impoundment (LSP).





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
65

Date:
9/28/10

Direction Photo
Taken:
Northeast

Description:
Upstream slope of LSP.



Photo No.
66

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Upstream slope of LSP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
67

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Upstream slope of LSP.



Photo No.
68

Date:
9/28/10

Direction Photo
Taken:
Northeast

Description:
Upstream slope of LSP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
69

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of LSP.



Photo No.
70

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
Upstream slope of LSP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
71

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Upstream slope of LSP.



Photo No.
72

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Upstream slope of LSP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
73

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Upstream slope of LSP.



Photo No.
74

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Upstream slope of LSP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
75

Date:
9/28/10

Direction Photo
Taken:
East

Description:
Crest of LSP.



Photo No.
76

Date:
9/28/10

Direction Photo
Taken:
Southeast

Description:
Crest of LSP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
77

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Upstream slope and crest of
LSP.



Photo No.
78

Date:
9/28/10

Direction Photo
Taken:
South

Description:
Crest of LSP.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
79

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Crest of LSP.



Photo No.
80

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Crest of LSP.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
81

Date:
9/28/10

Direction Photo
Taken:
West

Description:
Crest of LSP.



Photo No.
82

Date:
9/28/10

Direction Photo
Taken:
North

Description:
Crest of LSP.





Client Name: U.S. EPA

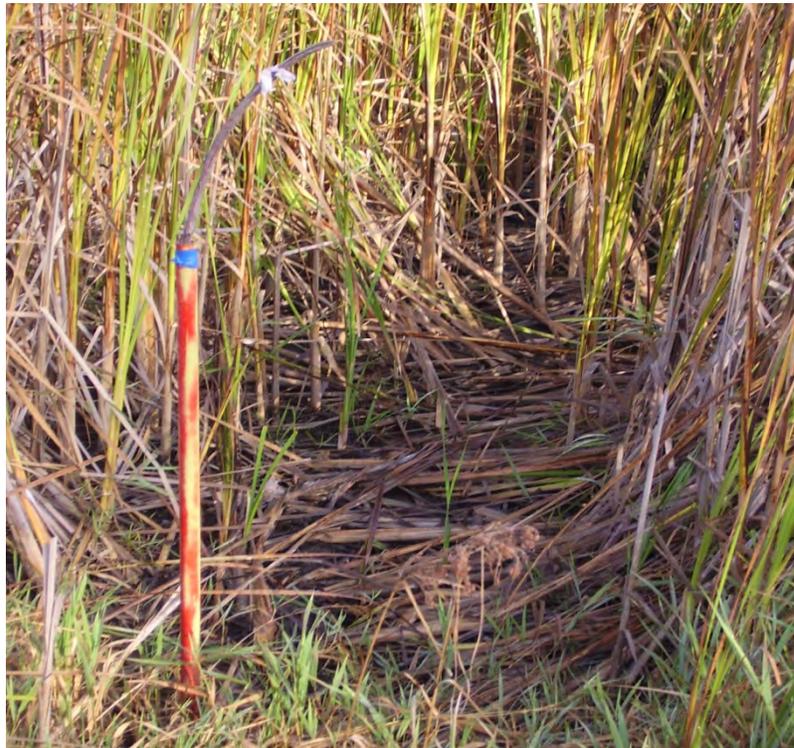
Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
83

Date:
9/28/10

Direction Photo
Taken:
Northeast



Description:
Metal Stake Water level
marker in LSP.

Photo No.
84

Date:
9/28/10

Direction Photo
Taken:
Northeast



Description:
Upstream slope and crest of
PP.



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
85

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
PAP pump house.



Photo No.
86

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
PAP pump house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
87

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
Electronic Water Level
monitor on the PAP Pump
house.



Photo No.
88

Date:
9/28/10

Direction Photo
Taken:
East

Description:
PAP pump house.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
89

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
SAP pump house intake.



Photo No.
90

Date:
9/28/10

Direction Photo
Taken:
South

Description:
SAP pump house.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
91

Date:
9/28/10

Direction Photo
Taken:
North

Description:
SAP pump house.



Photo No.
92

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
SAP pump house.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
93

Date:
9/28/10

Direction Photo
Taken:
Northwest

Description:
SAP downstream slope.



Photo No.
94

Date:
9/28/10

Direction Photo
Taken:
Southwest

Description:
SAP downstream slope.





Client Name: U.S. EPA

Site Location: Columbia Generating Station
Pardeeville, WI

Project No.
01.0170142.20

Photo No.
95

Date:
9/28/10

Direction Photo Taken:
Southwest

Description:
SAP downstream slope.





Appendix E

Reference List

**REFERENCE LIST
COLUMBIA GENERATING STATION
ROUND 7 DAM ASSESSMENT**



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