

US EPA ARCHIVE DOCUMENT



**DRAFT REPORT
ROUND 10 DAM ASSESSMENT - MAY 23, 2011
DYNEGY MIDWEST GENERATION, INC. – HENNEPIN POWER STATION
ACTIVE EAST ASH POND SYSTEM, EAST ASH POND SYSTEM, WEST ASH POND
SYSTEM
HENNEPIN, ILLINOIS**

PREPARED FOR:



**U.S. Environmental Protection Agency
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PREPARED BY:



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DRAFT

March 15, 2012
GZA File No. 170142.30

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



RE: DRAFT Assessment of Dam Safety of Coal Combustion Surface Impoundments at the
Hennepin Power Station

Dear Mr. Hoffman,

In accordance with our proposal 01.P0000177.11 dated March 28, 2011, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-B115-00049, GZA GeoEnvironmental, Inc. (GZA) has completed our inspection of the Hennepin Power Station Coal Combustion Waste (CCW) Impoundments located in Hennepin, Illinois. The site visit was conducted on May 23, 2011. 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 (CERCLA) 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 Active East Ash Pond System, West Ash Pond System, and East Ash Pond System are currently in **POOR** condition in our opinion. Further discussion of our evaluation and recommended actions are presented in the Task 3 Dam Assessment Report. The report includes: (a) a completed Coal Combustion Dam Inspection Checklist Form for each Basin; (b) a field sketch; 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 Task 3 Dam Assessment Report.

Sincerely,

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PREFACE

The assessment of the general condition of the dams/impoundment structures reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dams and/or impoundment structures was 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 and/or impoundment structures depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported 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.

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CCW Impoundment
Dynergy Midwest Generation, Inc. –Hennepin Power Station

Date of Inspection: 5/23/11

DRAFT REPORT



EXECUTIVE SUMMARY



This Inspection Report presents the results of a visual inspection of the Dynegy Midwest Generation, Inc. (Dynegy) – Hennepin Power Station (HPS) Coal Combustion Waste (CCW) Impoundments located at 13498 E 800th Street, Hennepin, Illinois. These inspections were performed on May 23, 2011 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of Dynegy.

The HPS is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 310 Megawatts. Commercial operation of the facility began in the 1950's. Earthen and fly ash embankment CCW Impoundments (Active East Ash Pond System, East Ash Pond System, and West Ash Pond System) were constructed in conjunction with the HPS facility for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge.

The current HPS operations use the Active East Ash Pond (AEAPS) for disposal of CCW products. The AEAPS consists of three (3) pond units. The first two units, known as the Primary and Secondary Cells, were designed as two chambered wet ash ponds and placed in service in 1997. After several years of operation, the Primary Cell's settling efficiency was reduced due to ash deposition and a third pond, Pond 2 East (2E) was added to the system in 2010.

There are two impoundments areas at the HPS which have been decommissioned and include: 1) East Ash Pond System Ponds 2 and 4 (EAPS) which are located adjacent to AEAPS and have been out of service since 1995; and, 2) West Ash Pond System Ponds 1 and 3 (WAPS) which are located west of the HPS and have been out of service since 1997. Pond 2E was constructed within the eastern footprint of the decommissioned Pond 2 area of the EAPS. The remaining portion of the Pond 2 area of the EAPS has being permitted as a dry fly ash landfill facility.

Process water and sluiced CCW are currently discharged into the Primary Cell of the AEAPS, where the CCW is allowed to settle and water is discharged into Pond 2E. Solids are further settled in Pond 2E prior to water discharge to the adjoining Secondary Cell (refer to Figure 2). Water flows sequentially through the Primary Cell, Pond 2E, and the Secondary Cell prior to discharge through a 5 foot stoplog weir structure and into the system outlet works. The AEAPS final outlet works include a Parshall flume for flow measurement and a final sampling manhole. Flow is then discharged to the Illinois River through NPDES outfall 003.

For the purposes of this EPA-mandated inspection, the sizes of the impoundments were based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 18 feet and a storage volume of approximately 36 acre-feet, the WAPS is classified as a **Small** sized structure. Based on the maximum crest height of 52 feet and a storage volume of approximately 1,560 acre-feet, the AEAPS is classified as an **Intermediate** sized structure.



Because there was no pool area associated with the EAPS, no size classification was estimated for the EAPS.

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 are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the AEAPS, EAPS and the WAPS 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 and the potential environmental impacts outside of Utility owned property.

Assessments

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

1. Trees were present along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road; and,
3. The previous stability analysis completed April 29, 2010, indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted minimum value.

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

1. Minor potholes and rutting along the crest gravel access road;
2. Trees were present along the downstream slope of the northern embankment; and,
3. Similarly, the stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally minimum accepted value.

In general, the overall condition of the WAPS impoundment was judged to be **POOR**. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's inspection criteria, the impoundment has been given a POOR Condition Rating, because complete hydrologic/hydraulic analysis and geotechnical computations were not provided/available for GZA's for review. Thus, hydrologic/hydraulic adequacy of the impoundment(s) and the stability of the embankment(s) could not be independently verified. In summary, the WAPS impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;

CCW Impoundment

Dynegy Midwest Generation, Inc. – Hennepin Power Station

Dates of Inspection: 5/23/11

DRAFT REPORT



3. Erosion along the downstream slope of the northern embankment;
4. No seepage and/or stability analysis has been performed for the WAPS; and
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

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 permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

Studies and Analyses

GZA recommends that HPS/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the WAPS to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate minimum freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.
2. Perform a complete structural and seepage stability analysis of the WAPS impoundment embankments including static, seismic and liquefaction loading.
3. Generate a remedial design to address the inadequate factor of safety along the northern embankment of the EAPS and AEAPS adjacent to the Illinois River.

Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate inspections and reduce the risk of burrowing animals;
2. Repair wave action erosion on the downstream slope of the WAPS;
3. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,
4. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.



Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the WAPS to provide adequate capacity.
2. Pending the results of the complete seepage and stability analysis for the WAPS, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.
3. Based on the geotechnical results for the EAPS and AEAPS embankments, which produced inadequate minimum factors of safety, develop design modifications for those embankments along the Illinois River. These improvements are to result in the embankments meeting generally accepted factors of safety and protect the slope from future erosion.

Alternatives

There are no practical alternatives to the repairs itemized above.

ACTIVE EAST POND SYSTEM, EAST ASH POND SYSTEM AND WEST ASH POND
SYSTEM
DYNEGY MIDWEST GENERATION INC., HENNEPIN POWER STATION
HENNEPIN, ILLINOIS



TABLE OF CONTENTS

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 EAPS Impoundment and Appurtenances.....	3
1.2.5	Description of the AEAPS Primary Cell, Secondary Cell and Appurtenances .	4
1.2.6	Description of the AEAPS Pond 2E and Appurtenances.....	5
1.2.7	Description of the WAPS Impoundment and Appurtenances	6
1.2.8	Operations and Maintenance	6
1.2.9	Size Classification	7
1.2.10	Hazard Potential Classification.....	7
1.3	Pertinent Engineering Data.....	7
1.3.1	Drainage Area.....	7
1.3.2	Reservoir.....	8
1.3.3	Discharges at the Impoundment Sites.....	8
1.3.4	General Elevations (feet – MSL)	8
1.3.5	Design and Construction Records and History.....	9
1.3.6	Operating Records	9
1.3.7	Previous Inspection Reports	9
2.0	INSPECTION	9
2.1	Visual Inspection	9
2.1.1	EAPS Impoundment General Findings.....	10
2.1.2	EAPS Upstream Slope (Photos 18, 22, 24, and 74).....	10
2.1.3	EAPS Crest of Impoundment (Photos 32 though 35, 45, 52, 71 through 73)..	10
2.1.4	EAPS Downstream Slope (Photos 25 through 28, 55 through 57, 69, and 70)	10
2.1.5	EAPS Discharge Pipes (Photo 44).....	10
2.1.6	AEAPS Impoundment General Findings.....	11
2.1.7	AEAPS Upstream Slope (Photos 35 through 43, 45 through 53).....	11
2.1.8	AEAPS Crest of Impoundment (Photos 35 through 43, 45 through 53)	11
2.1.9	AEAPS Downstream Slope (Photos 29 through 31)	11
2.1.10	AEAPS Discharge Structures (Photos 58 through 68)	11
2.1.11	WAPS Impoundment General Findings	11
2.1.12	WAPS Upstream Slope (Photos 18, 22, and 24)	12
2.1.13	WAPS Crest of Impoundment (Photos 14 through 20)	12
2.1.14	WAPS Downstream Slope (Photos 1 through 13).....	12
2.1.15	WAPS Discharge Pipes (Photos 21 and 22)	12

ACTIVE EAST ASH POND SYSTEM, EAST ASH POND SYSTEM AND WEST ASH
POND SYSTEM
DYNEGY MIDWEST GENERATION INC., HENNEPIN POWER STATION
HENNEPIN, ILLINOIS



TABLE OF CONTENTS (CONT'D)

2.2	Caretaker Interview	12
2.3	Operation and Maintenance Procedures	12
2.4	Emergency Action Plan	13
2.5	Hydrologic/Hydraulic Data	13
2.6	Structural and Seepage Stability	13
3.0	ASSESSMENTS AND RECOMMENDATIONS	14
3.1	Assessments	14
3.2	Studies and Analyses	15
3.3	Recurrent Operation & Maintenance Recommendations	15
3.4	Repair Recommendations	15
3.5	Alternatives	16
4.0	ENGINEER'S CERTIFICATION	16

FIGURES

Figure 1	Site Location Map
Figure 2	Overall Ash Basin Plan
Figure 3	East Ash Pond Typical Sections of the 1989 Embankment Raise
Figure 4	East Ash Pond Additional Sections of the 1989 Embankment Raise
Figure 5	Boring Location Plan
Figure 6	AEAPS and EAPS
Figure 7	Pond 2E Profiles and Details
Figure 8	Pond 2E Structure Details
Figure 9	Typical Section of Liner Extension
Figure 10	WAPS

APPENDICES

Appendix A	Limitations
Appendix B	Definitions
Appendix C	Inspection Checklists
Appendix D	Previous Inspection Reports
Appendix E	Photographs
Appendix F	References

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 Dynegy Midwest Generation, Inc., (Dynegy, Owner) Hennepin Power Station (HPS, Site) Coal Combustion Waste (CCW) Impoundments in Putnam County, Illinois. 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-16, dated March 16, 2011 and EPA Contract No. EP10W001313, Order No. EP-B11S-00049. 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 impoundment and appurtenant structures; 2) perform a 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 HPS is located in Sections 26 and 27, Township 33 North, Range 2 West, in Putnam County, Illinois. The HPS is adjacent to the Illinois River at river mile 211.5, approximately four (4) miles north of Hennepin, Illinois. The HPS CCW impoundments are located to the east and west of the power plant. A Site locus of the impoundments and surrounding area is shown in **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. The impoundments can be accessed by vehicles from earthen access roads from the HPS.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Dynegy Midwest Generation, Inc. and operated by the HPS.

	Dam Owner/Caretaker
Name	Dynegy Midwest Generation, Inc, Hennepin Power Station
Mailing Address	13498 E 800th St Hennepin, IL 61327
City, State, Zip	Hennepin, Illinois 62327
Contact	Ted Lindenbusch
Title	Operations Manager
E-Mail	Ted.Lindenbusch@dynegy.com
Daytime Phone	815-339-9210
Emergency Phone	911

1.2.3 Purpose of the Impoundments

The HPS is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 310 Megawatts. Commercial operation of the facility began in the 1950's. Earthen and fly ash embankment CCW Impoundments (Active East Ash Pond System, East Ash Pond System, and West Ash Pond System) were constructed in conjunction with the HPS facility for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge.

The current HPS operations use the Active East Ash Pond (AEAPS) for disposal of CCW products. The AEAPS consists of three (3) pond units. The first two units, known as the Primary and Secondary Cells, were designed as two chambered wet ash ponds and placed in service in 1997. After several years of operation, the Primary Cell's settling efficiency was reduced due to ash deposition and a third pond, Pond 2 East (2E) was added to the system in 2010.

There are two impoundments areas at the HPS which have been decommissioned and include: 1) East Ash Pond System Ponds 2 and 4 (EAPS) which are located adjacent to AEAPS



and have been out of service since 1995; and, 2) West Ash Pond System Ponds 1 and 3 (WAPS) which are located west of the HPS and have been out of service since 1997. Pond 2E was constructed within the eastern footprint of the decommissioned Pond 2 area of the EAPS. The remaining portion of the Pond 2 area of the EAPS has been permitted as a dry fly ash landfill facility.

Process water and sluiced CCW are currently discharged into the Primary Cell of the AEAPS, where the CCW is allowed to settle and water is discharged into Pond 2E. Solids are further settled in Pond 2E prior to water discharge to the adjoining Secondary Cell (refer to Figure 2). Water flows sequentially through the Primary Cell, Pond 2E, and the Secondary Cell prior to discharge through a 5 foot stoplog weir structure and into the system outlet works. The AEAPS final outlet works include a Parshall flume for flow measurement and a final sampling manhole. Flow is then discharged to the Illinois River through outfall 003.

1.2.4 Description of the EAPS Impoundment and Appurtenances

The EAPS was designed by Illinois Power Company. However, available information regarding the original design and/or construction of the EAPS was limited to drawings related to subsequent embankment modifications and references in various documents prepared by Civil & Environmental Consultants, Inc. (CEC) for the design and construction of Pond 2E. The following description of the EAPS is based on the limited available information and observations made by GZA during our Site visit.

Based on the available information, the embankments surrounding the EAPS were constructed in three phases. The original embankments were constructed in 1958, with subsequent modifications in 1978 and 1989. The original embankments were constructed to about elevation 474 feet (MSL) and the north, east and west sides of the EAPS were tied into the bluff on the south side which is also the northern embankment of the Primary and Secondary Cells. In 1978, the embankments were raised to elevation 484 feet (MLS), and to elevation 494 feet (MLS) in 1989. Typical sections of the 1989 embankment extensions are shown on **Figures 3 and 4**.

Borings were performed in 2009 by CEC in the area of the EAPS as part of the design for Pond 2E. Seven of the borings were drilled through the top of the 1989 embankment (at approximate elevation 494 (MLS)) and two borings through the 1978 embankment (at approximate elevation 484 (MLS)). The borings encountered gravelly clays and sands interbedded with layers of loose to medium dense sand, gravel and gravelly sands and clays; stiff to very stiff sandy and silty clays; and loose to very loose, moist to wet, laminated silt with zones of fly ash with a consistency of fine and/or silty sand. Several other borings drilled in the EAPS disposal area encountered CCW materials to depths ranging from about 24 to 35 feet below the existing surface grades or elevations ranging about 456 to 453 (MSL), respectively. The boring locations are provided on **Figure 5**.

The original embankment slopes of the EAPS were variable and appear to have been constructed with downstream and upstream slopes that range from approximately 2.5H:1V to about 1.5H:1V. The EAPS crest length is approximately 1 mile with a maximum height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 52 feet corresponding to a crest elevation of 494.0 (MSL). The upstream and downstream slopes of the raised embankments sections were constructed at approximately 2.5H:1V.



A dry ash landfill has been permitted for construction on the western portion of the Pond 2 area of the EAPS. The landfill permit included construction of a liner placed on the existing ash fill that was subsequently covered with several feet of ash during construction of Pond 2E. The landfill is permitted to extend to a height of 66 feet above the current embankment corresponding to an elevation of approximately 560 feet (MSL). Please note that the embankments of the EAPS are not regulated as a dam by the Illinois Department of Water Resources.

1.2.5 Description of the AEAPS Primary Cell, Secondary Cell and Appurtenances

The embankments of the Primary Cell and Secondary Cells were designed by Illinois Power Company. The following description of the impoundment is based on information provided in various Illinois Power Company Drawings and Documents, various Design Documents prepared by Civil & Environmental Consultants, Inc. (CEC), other information received from HPS, and observations made by GZA during our Site visit.

The AEAPS Primary and Secondary Cells are located east of the HPS and were originally constructed by reshaping an area that was an existing gravel pit to form the current surface impoundment. The ground elevation surrounding most of gravel pit at the time of construction was described to be equal to or greater than the maximum elevation proposed for the impoundments. The northeast corner of the impoundment however required the construction of an embankment with a portion of it being approximately 20 feet above the existing ground level. This area was described as having uneven natural terrain and was stabilized by leveling the existing ground surface and adding fill to the leveled elevation. The natural slopes in this area gave the northeast corner a height of about 32 feet.

The AEAPS Primary and Secondary Cells function as sedimentation basins for coal combustion wastes (CCW) including bottom ash, fly ash, miscellaneous station low volume waste, and coal pile runoff streams which are piped from the plant and discharged into the impoundment. The CCW enters the Primary Cell through two 12 inch diameter HDPE pipes and two 10 inch diameter steel pipes which are located near the northeast corner of the Primary Cell. Miscellaneous station low volume waste streams and coal pile runoff also enter the Primary Cell to the west of the northeast corner. The CCW settles in the Primary Cell and flow through the pond is discharged into Pond 2E through an 18 inch diameter reinforced concrete pipe (RCP) outlet structure which is located near the northeast corner of the Primary Cell.

The Secondary Cell receives flow from Pond 2E through a 24 inch diameter RCP which is located near the northwest corner of the Secondary Cell. Flow from the Secondary Cell is discharged through a five foot stop log weir structure into a 36 inch diameter RCP which conveys the flows into the final outlet works and into the Illinois River through outfall structure 003. The locations of the discharge pipes and structures are shown in **Figure 6**. Details of the discharge pipes and structures are shown on **Figures 7 and 8**. Prior to the construction of Pond 2E, flow through the Primary Cell was discharged into the Secondary Cell through a five-foot stoplog decant structure. The decant structure was abandoned as part of the construction of Pond 2E.

The AEAPS Primary and Secondary Cells consist of sand and gravel earthen embankments with a crest length of approximately 0.6 miles and 0.4 miles, respectively and a



maximum height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 32 feet corresponding to a crest elevation of 494.0 Mean Sea Level (MSL). The bottom of the impoundments is at approximately Elevation 458.0 (MSL). The embankments of the cells were constructed in 1995 and 1996 and placed in service in 1997 with 4-foot horizontal to one-foot vertical (4H:1V) upstream and downstream slopes consisting of native sand and gravel materials. A 4-foot thick clay liner was constructed on the bottom of the cells and up the upstream side slopes of the cells to a height of approximately 20 feet above the base of the impoundments. The upper 12 feet of the upstream slopes were not lined at the time of the initial construction. After construction, operating water levels in the cells were maintained at or below the top elevation of the clay liner. Over the next several years, CCW filled the Primary Cell to levels that required that the upstream liner be raised to provide full depth operating levels for CCW transport, clarification and deposition. The liner in both cells was raised in 2003 by extending the existing liner up the upstream slopes from the original 20 foot level an additional 12 feet to the top of the crest. The construction of the extended liner consisted of 45-mil HDPE geomembrane over a 12-inch layer of compacted clay. A typical section for the liner extension is shown in **Figure 9**.

The intermediate embankment between the AEAPS Primary and Secondary Cells is regulated by the Illinois Department of Transportation, Division of Water Resources (IDOT/DWR) as a small-size, Class III dam under permit no. 21922, issued November 10, 1994. According to guidelines established by the DWR, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures. *Class III* structures are those for which failure has a low probability of causing loss of life or substantial environmental damage.

Instrumentation near the AEAPS Primary and Secondary Cells include six monitoring wells, numbered 12 through 16, which are located as shown on **Figure 6**.

1.2.6 Description of the AEAPS Pond 2E and Appurtenances

Pond 2E was constructed within the footprint of the eastern portion of Pond 2 of the EAPS and follows the same history as the EAPS, as discussed in Section 1.2.4, until 2009. Construction of Pond 2E began in 2009 and was completed in 2010. CCW flows are discharged directly from the Primary Cell into Pond 2E along with surface water runoff from EAPS Pond 2. Flow is routed from the Primary Cell through Pond 2E and into the Secondary Pond before discharging to the Illinois River through the system outlet works. According to HPS personnel, Pond 2E was designed to increase the efficiency of the existing pond system by adding additional storage and settling capacity. A permit application for a dry ash landfill has been submitted for approval which would be located on the EAPS west of Pond 2E. Once the dry ash landfill has been constructed, Pond 2E will provide sediment control, storm flow storage, and leachate detention.

Pond 2E is located on the eastern portion of the decommissioned EAPS Pond 2 and was constructed by excavating and removing a portion of the ash fill. Flow is routed from the AEAPS Primary Cell to Pond 2E through an 18 inch diameter reinforced concrete pressure pipe (RCPP) discharge culvert which was installed during the construction of Pond 2E. Operational flows exit Pond 2E through the principal spillway, a 2-foot wide by 1-foot tall orifice, of Pond 2E's concrete outlet structure. The concrete outlet structure includes an auxiliary spillway which is a 3-foot wide by 1-foot tall weir, and an emergency spillway which is a 6-foot by



4-foot drop inlet. The principal and auxiliary spillways were designed to pass the 100-year frequency storm without the emergency spillway functioning. Flows through all three spillways are discharged through a 24-inch diameter RCP into the Secondary Cell.

Pond 2E's earth embankment structure is approximately 11 feet to 52 feet high and 1300 feet long. It has a crest elevation of approximately 494 feet (MLS) and an upstream face with a 3H:1V (horizontal: vertical) slope. A 60-mil smooth HDPE geomembrane was installed on the bottom and upstream slopes of Pond 2E. The liner also caps the underlying ash along the eastern portion of the former ash impoundment. A concrete culvert and headwalls were installed on the southwest side of Pond 2E to allow inflow from the Primary Cell. A gate valve was installed on the Primary Cell headwall to provide flow control, if required, for repairs. A plan view and typical sections of the Pond 2E embankments and other details are provided on **Figures 7 and 8**.

Instrumentation near the AEAPS Pond 2E includes monitoring wells, numbered 12 through 16, which are located as shown on **Figure 6**.

1.2.7 Description of the WAPS Impoundment and Appurtenances

The WAPS is located to the west of the HPS and based on available records was designed by Illinois Power Company. The following description of the impoundment is based on information provided on various Illinois Power Company drawings, information received from Dynegy and observations made by GZA during our site visit. Information for the original design and construction of the WAPS was limited to drawings which were prepared for the 1989 raise of the original impoundment embankments.

The original WAPS was constructed in 1950's and designated as Ponds 1 and 3. The ponds appear to have been constructed as unlined earthen embankments which consist of sand and gravel materials. The north embankment of WAPS abuts the south bank of the Illinois River. The general height of the original embankments (from the lowest downstream toe elevation to the top of the impoundment) was about 10 feet, corresponding to a crest elevation of 460.0 (MSL). The WAPS embankments were raised in 1989 by adding an average of 5 feet of new fill to the existing embankments, increasing the crest elevation to 465.0 (MSL). The perimeter of the WAPS was also extended at that time to enclose Ponds 1 and 3 into a single pond. The crest length of the combined ponds is about 1.2 miles. The WAPS was decommissioned in 1995 and was not receiving or discharging flows at the time of GZA's site visit. The WAPS is not regulated as a dam by the DWR.

Instrumentation near the WAPS includes monitoring wells numbered as follows; 21 through 27, 31 through 36 and, L1 and L4, which are located as shown on **Figure 10**. The wells are monitored quarterly and as a condition of the 1996 IEPA approved Closure Work Plan (CWP) for the WAPS.

1.2.8 Operations and Maintenance

The impoundments are operated and maintained by HPS personnel. Operation of the Primary Cell, Secondary Cell and Pond 2E includes periodic adjustment of the decant elevations and includes monitoring of groundwater and repair of the gravel access roads as needed.



Operation and maintenance of the HPS facility, including the impoundments, is regulated by the EPA under the National Pollutant Discharge Elimination System (NPDES) Permit No. IL0001554. A portion of outer embankments of Primary and Secondary Cell are considered to be a dam that is regulated by the Illinois Department of Natural Resources, Office of Water Resources under permit number DS2004119. As part of the dam permit, there is an Operation and Maintenance Plan that was developed for the Primary and Secondary Cells. That plan includes regular mowing, vegetation management, semi-annual inspections, and inspections by a registered professional engineer every 5 years.

An operation and maintenance plan was developed by CEC for Pond 2E. The plan included information about the frequency and scope of periodic inspections. The plan requires inspection of the impoundment on a quarterly basis by HPS staff and every 5 years by a registered professional engineer. The plan also requires maintenance of an emergency drawdown pump at the facility.

1.2.9 Size Classification

For the purposes of this EPA-mandated inspection, the sizes of the impoundments were based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 18 feet and a storage volume of approximately 36 acre-feet, the WAPS is classified as a **Small** sized structure. Based on the maximum crest height of 52 feet and a storage volume of approximately 1,560 acre-feet, the AEAPS is classified as an **Intermediate** sized structure. Because there was no pool area associated with the EAPS, no size classification was estimated for the EAPS.

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 are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

1.2.10 Hazard Potential Classification

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the AEAPS, EAPS and the WAPS 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 and the potential environmental impacts outside of Utility owned property. The hazard rating for the AEAPS differs from the hazard rating given to the Primary and Secondary Cells by the DWR due to the inclusion of Pond 2E in the AEAPS since DWR rating.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

The existing impoundments are surrounded by exterior dikes with crest elevations that are above the surrounding geographical features. This confines the rainfall sub-basin areas to the impoundment areas themselves resulting in no additional overland flow being introduced to the system.



1.3.2 Reservoir

Based on estimates made by GZA², the WAPS has a surface area of 2 acres and a storage volume of approximately 36 acre feet at a pool elevation of 455.6 feet MSL. The AEAPS has a surface area of approximately 30 acres and a storage volume of approximately 1,560 acre feet at a pool elevation of 489.5 feet MSL. The EAPS no longer actively impounds water and therefore a reservoir volume was not calculated. The pool areas observed on GZA’s May 23, 2011 Site visit are consistent with the surfaces areas noted above.

1.3.3 Discharges at the Impoundment Sites

According to HPS personnel, under normal operating conditions, approximately 2.4 million gallons of water per day (MGD) are discharged from the Secondary Cell to the Illinois River.

1.3.4 General Elevations (feet – MSL)

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

AEAPS Impoundment

Primary Cell

A. Top of Embankment (Minimum)	± 494 feet
B. Upstream Water at Time of Inspection	± 489.5 feet
C. Downstream Tail Water at Time of Inspection	485.2 feet (Pond 2E)
D. Maximum Pond Water Elevation	489.5 feet

Secondary Cell

A. Top of Embankment (Minimum)	± 494 feet
B. Upstream Water at Time of Inspection	479.5 feet
C. Downstream Tail Water at Time of Inspection	448 feet (Illinois River)
D. Maximum Pond Water Elevation	480.5 feet

Pond 2E

A. Top of Embankment (Minimum)	±494 feet
B. Upstream Water at Time of Inspection	485.2 feet
C. Downstream Tail Water at Time of Inspection	479.5 feet (Secondary Cell)
D. Maximum Pond Water Elevation	480 feet

EAPS Impoundment

A. Top of Embankment (Minimum)	494 feet
B. Upstream Water at Time of Inspection	N/A
C. Downstream Tail Water at Time of Inspection	442 feet
D. Maximum Pond Water Elevation	Unknown

² Surface area estimates generated using Google Earth Professional software and available aerial photographs.



WAPS Impoundment

A. Top of Embankment (Minimum)	465.0 feet
B. Upstream Water at Time of Inspection	455.6 feet
C. Downstream Tail Water at Time of Inspection ³	± 448 feet
D. Maximum Pond Water Elevation	Unknown

1.3.5 Design and Construction Records and History

The EAPS and WAPS were designed by Illinois Power Company. However, available information regarding the original design and/or construction of the EAPS was limited to drawings related to subsequent embankment modifications and references in various documents prepared by CEC for the design and construction of Pond 2E. The documentation included information about the dimensions of the slopes and the materials used but not about the construction techniques or quality control during construction.

Construction of Pond 2E was documented in a December 2010 report generated by CEC. The report included documentation of the excavation of Pond 2E into the existing ash and construction of the liner on the upstream slopes. The construction did not include modification of the embankments of the existing pond.

1.3.6 Operating Records

No operating records of the impoundments were provided to GZA.

1.3.7 Previous Inspection Reports

The HPS personnel perform visual inspections of the impoundments on a weekly basis and the inspection results are documented in a field log book. Every 5 years the Primary and Secondary Cells are inspected by a consulting engineer. GZA was provided with the 5-year inspections reports from 2001, 2006, and 2010 in Appendix D. The inspection completed March 29, 2010 was conducted by Mr. Kenneth M. Berry, P.E. of URS and indicated no deficiencies for the Primary and Secondary Cells at that time. Observed deficiencies at the WAPS include thick vegetation and trees.

2.0 INSPECTION

2.1 Visual Inspection

The HSP impoundments were inspected on May 23, 2011 by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E. (Wisconsin), of GZA GeoEnvironmental, Inc., and accompanied by Phil Morris of Dynegy. The weather was partly cloudy with temperatures in the 70's to 80's Fahrenheit. Photographs to document the current conditions of the impoundments were taken during the inspection and are included in **Appendix E**. The water levels in the impoundments at the time of the inspection were as provided in Section 1.3.4. Underwater areas were not inspected, as this level of investigation was beyond of GZA's scope of services. Copies of the EPA Checklists are included in **Appendix C**.

³ Downstream tail water elevation based on visual estimates made by GZA during the Site Visit.



With respect to our visual inspection, there was no evidence of prior releases, failures, or repairs observed by GZA for most of the impoundment areas. It appeared that the downstream slope of the northwestern embankment of the WAPS had been regraded within the last year.

2.1.1 EAPS Impoundment General Findings

In general, the HPS EAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 6**.

2.1.2 EAPS Upstream Slope (Photos 18, 22, 24, and 74)

The northern portion of the EAPS has been permitted for a dry ash landfill and the upstream slopes are covered with ash along that portion of the impoundment. The southern portion of the EAPS that includes the former Pond 4 is no longer active. The upstream embankments along that portion of the EAPS were generally vegetated with grass that had not been recently mowed. Trees up to 12 inches in diameter were present on the slope.

2.1.3 EAPS Crest of Impoundment (Photos 32 through 35, 45, 52, 71 through 73)

The crest of the EAPS Impoundment generally had a gravel access road along the northern portion of the impoundment. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 494 feet MSL. No significant settlement was observed at the time of our inspection. There was no water present in the EAPS at the time of our inspection.

2.1.4 EAPS Downstream Slope (Photos 25 through 28, 55 through 57, 69, and 70)

The downstream slope of the impoundment was generally covered in thick grass vegetation making it difficult to observe during our inspections. In addition, the rough terrain and steep slopes along the northern portion of the impoundment created a personal safety risk to access the slope. Therefore, our observations along that portion of the impoundment were limited to that which could be observed from the crest of the 1979 embankment. Trees up to 24 inches in diameter generally characterized northern embankment along the Illinois River. No grass was present along that portion of the embankment. The western and southwestern embankment was generally covered with grass that had not been recently mowed. No unusual movement or displacement was observed on the slope.

2.1.5 EAPS Discharge Pipes (Photo 44)

The EAPS no longer functions as an active ash impoundment and no CCW sluice piping present. Storm water drains have been installed along portions of the perimeter of the permitted landfill as shown in Photo 44. The drains appeared to be in good condition at the time of our inspection.



2.1.6 AEAPS Impoundment General Findings

In general, the HPS AEAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 6**.

2.1.7 AEAPS Upstream Slope (Photos 35 through 43, 45 through 53)

The water surface elevation at the time of inspection was approximately at elevation 489.5 feet, 489.0 feet, and 479.5 feet MSL in the Primary Cell, Pond 2E and Secondary Cell, respectively. Therefore, the lower portion of the upstream slope was below the water level and not visible. Where visible, the upstream slope of Pond 2E was covered with a HDPE liner that was in good condition. The upstream slopes of the Primary and Secondary Cells were generally covered with grass above the water level.

2.1.8 AEAPS Crest of Impoundment (Photos 35 through 43, 45 through 53)

The crest of the AEAPS Impoundment was generally covered by a gravel access road. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 494 feet MSL. No significant settlement was observed at the time of our inspection. There was approximately 4 feet to 14 feet of free board at the time of our inspection.

2.1.9 AEAPS Downstream Slope (Photos 29 through 31)

The AEAPS Impoundment shares a common embankment with the EAPS along the western portion of the impoundment and is incised along the southern portion. Therefore, no downstream slope was visible or present along those portions of the impoundment. The northern embankment of the impoundment abuts the Illinois River and is characterized by trees up to 24-inches in diameter. The eastern embankment was covered with grass that had not been recently mowed.

2.1.10 AEAPS Discharge Structures (Photos 58 through 68)

GZA observed the outlet structures that transmit flow from the Primary Cell to Pond 2E and then to the Secondary Cell. Based on our observations, the structures appeared to be in good condition with no defects noted. GZA also observed the condition of the decant structure in the Secondary Cell and the partial flume. Both structures appeared to be in good condition based on our observations.

2.1.11 WAPS Impoundment General Findings

In general, the HPS WAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 10**.



2.1.12 WAPS Upstream Slope (Photos 18, 22, and 24)

The eastern portion of the WAPS has been filled with ash and the upstream slopes along that portion were not visible. The water surface elevation at the time of inspection was approximately at elevation 455.6 feet MSL along the western portion of the impoundment. Therefore, the lower portion of the upstream slope was below the water level and not visible. Where visible, the upstream slope was generally vegetated with grass that had not been recently mowed. Trees and shrubs up to 4 inches in diameter were noted along several portions of the upstream slope.

2.1.13 WAPS Crest of Impoundment (Photos 14 through 20)

The crest of the WAPS Impoundment was generally covered by a gravel access road. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 460 feet MSL. No significant settlement was observed at the time of our inspection. There was approximately 8 feet of free board at the time of our inspection.

2.1.14 WAPS Downstream Slope (Photos 1 through 13)

The downstream slope of the impoundment was generally wooded along the northern portion of the impoundment adjacent to the Illinois River. Trees up to 24-inches in diameter were present along the downstream slope of the northern embankment. The remaining embankments were generally covered with grass that had not been recently mowed. Trees up to 12 inches in diameter were noted along the southern embankment and smaller trees and shrubs were noted along the eastern embankment. There was erosion (likely due to wave action) of the downstream slope of the northern embankment.

2.1.15 WAPS Discharge Pipes (Photos 21 and 22)

The decant structure for the WAPS Impoundment consists of a 12-inch diameter steel pipe with a trash rack as shown in Photo 21. The pipe discharges into the Illinois River and the discharge pipe is shown in Photo 22. The decant and discharge portions of the pipe appeared to be in good condition at the time of our inspection.

2.2 Caretaker Interview

Maintenance of the impoundments is the responsibility of HPS personnel. GZA met with HPS personnel and discussed the operations and maintenance procedures, regulatory requirements, and the history of the impoundments since their construction. Information gathered during that discussion is reflected in this report.

2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.7, HPS personnel are responsible for the regular operations and maintenance of the impoundments. No formal maintenance plan has been developed for the WAPS and EAPS impoundments. An operation and maintenance plan for the Primary and Secondary Cells has been developed along with a separate operation and maintenance plan for



Pond 2E. Based on our discussions with HPS personnel, the roadways and slopes are repaired as needed.

2.4 Emergency Action Plan

An Emergency Action Plan (EAP) has not been developed for the impoundments. An emergency action plan is not required for Class III structure per Illinois regulations. Note that the hazard potential classification for the dam is discussed in Section 1.2.11.

2.5 Hydrologic/Hydraulic Data

Illinois Power Company performed a hydrologic/hydraulic analysis in 1994 for the AEAP Primary and Secondary Cells as part of the original impoundment design. The results are provided in the “Hennepin Power Station Ash Surface Impoundment, Hydrologic/Hydraulic Analysis” report. The analysis was used to determine the maximum discharge rates and water elevations the facility would obtain and also to size the discharge piping and determine the required freeboard.

A hydrologic/hydraulic analysis was also conducted in 2009 by CEC for the AEAP Primary and Secondary Cells and for Pond 2E. The results are provided in the “Engineering Basis of Design, Application for a Permit to Construct a New Leachate and Storm Water Runoff Collection Pond, Dynegy – Hennepin Power Station, Hennepin, Illinois” report. In addition to the HPS operating flows and the future effects from the new landfill portion of the EAPS, the ponds were determined by CEC to have sufficient capacity to safely pass the 24-hour 25-year and the 24-hour 100-year frequency rainfall events with a minimum free-board of more than 2 feet,

Based on the available information, a hydrologic/hydraulic analysis has not been performed for the WAPS.

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

Illinois Power Company performed a stability and seepage analysis for the AEAP Primary and Secondary Cells as part of the original impoundment design. The results are provided in the “Hennepin Power Station Ash Surface Impoundment, Geotechnical/Structural Design” report. Based on the results of the stability analysis, the factor of safety was calculated for several load conditions. The critical load conditions were determined to be the end of construction and rapid drawdown conditions. Both static and seismic conditions were evaluated. The results indicated minimum static and seismic factors of safety of 2.0 and 1.7, respectively for the upstream embankments and 2.3 and 2.0, respectively for the downstream embankments. These results are well within the range of acceptable factors of safety for the types of embankments and load conditions evaluated.

CEC performed a stability analysis for a section of the existing EAPS north embankment as part of the new landfill permit application. Based on the results provided, the calculated factor of safety against wedge failure of the 1978 embankment without seismic loading was 1.009.



This result is less than generally acceptable factors of safety for the types of embankments and load conditions evaluated, in GZA's opinion.

No engineering evaluation is available for the WAPS embankments which were designed by Illinois Power Company.

GZA did not perform an independent assessment of the structural and seepage stability for the impoundments as this was beyond our scope of services.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

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

1. Trees were present along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road; and,
3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value.

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

1. Minor potholes and rutting along the crest gravel access road;
2. Trees were present along the downstream slope of the northern embankment; and,
3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value.

In general, the overall condition of the WAPS impoundment was judged to be **POOR**. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's inspection criteria, the impoundment has been given a **POOR** Condition Rating, because complete hydrologic/hydraulic analysis and geotechnical computations were not provided/available for GZA's for review. Thus, the hydrologic/hydraulic adequacy of the impoundment(s) and the stability of the embankment(s) could not be independently verified. In summary the WAPS impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Erosion along the downstream slope of the northern embankment;
4. No seepage and/or stability analysis has been performed for the WAPS; and



5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

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 permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

3.2 Studies and Analyses

GZA recommends that HPS/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the WAPS to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.
2. Perform a complete structural and seepage stability analysis of the WAPS impoundment embankments including static, seismic and liquefaction loading.
3. Generate a remedial design to address the inadequate factor of safety along the northern embankment of the EAPS and AEAPS adjacent to the Illinois River.

3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate inspections and reduce the risk of burrowing animals;
2. Repair wave action erosion on the downstream slope of the WAPS;
3. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,
4. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.

3.4 Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the WAPS to provide adequate capacity.



2. Pending the results of the complete seepage and stability analysis for the WAPS, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.
3. Based on the geotechnical results for the EAPS and AEAPS embankments, which produced inadequate minimum factors of safety, develop design modifications for those embankments along the Illinois River. These improvements are to result in the embankments meeting generally accepted factors of safety and protect the slope from future erosion.

3.5 Alternatives

There are no practical alternatives to the repairs itemized above.

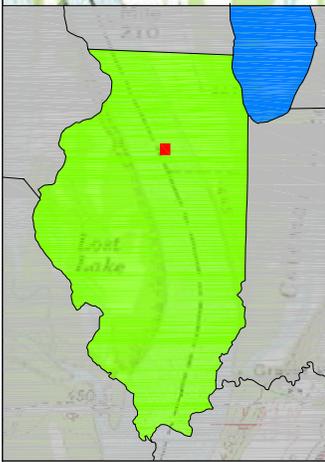
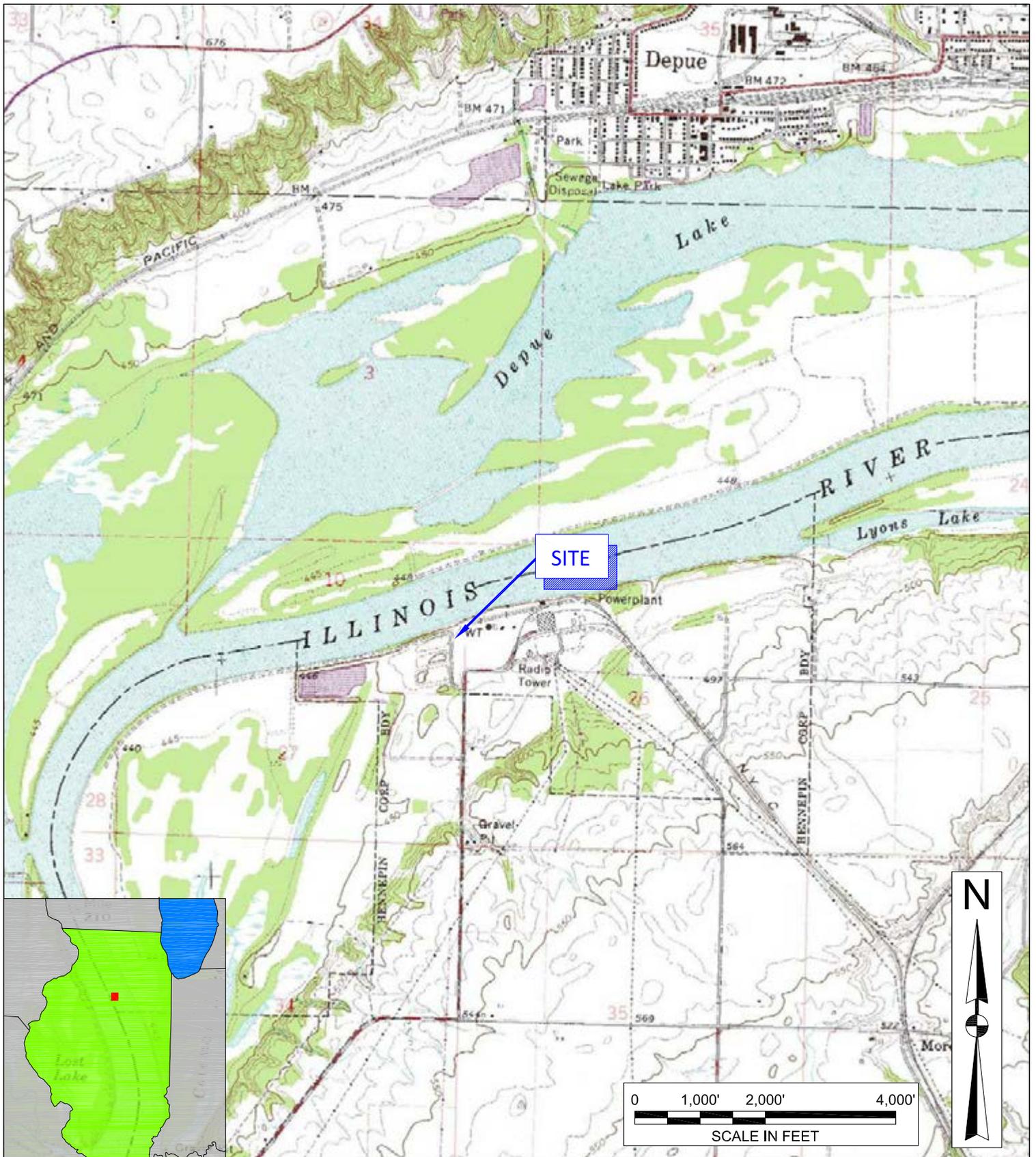
4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management unit referenced herein, the HPS WAPS, AEAPS, and EAPS Impoundments have been assessed to be in **POOR** condition on May 23, 2011.

Patrick J. Harrison, P.E.
Senior Consultant

J:\170,000-179,999\170142\170142-30 Round 10\Hennepin Power Station\Stability Calc Edits\2nd DRAFT_Hennepin Power Station.doc

FIGURES



SOURCE: U.S.G.S. QUADRANGLE MAP
 DEPUÉ, IL (1966)
 PHOTOREVISED (1979)

PREPARED BY:
 **GZA GeoEnvironmental, Inc.**
Engineers and Scientists
 20900 SWENSON DRIVE, SUITE 150
 WAUKESHA, WISCONSIN 53186
 (262) 754-2560

PREPARED FOR:
 DYNEGY MIDWEST GENERATION, INC.
 HENNEPIN POWER STATION
 HENNEPIN, ILLINOIS

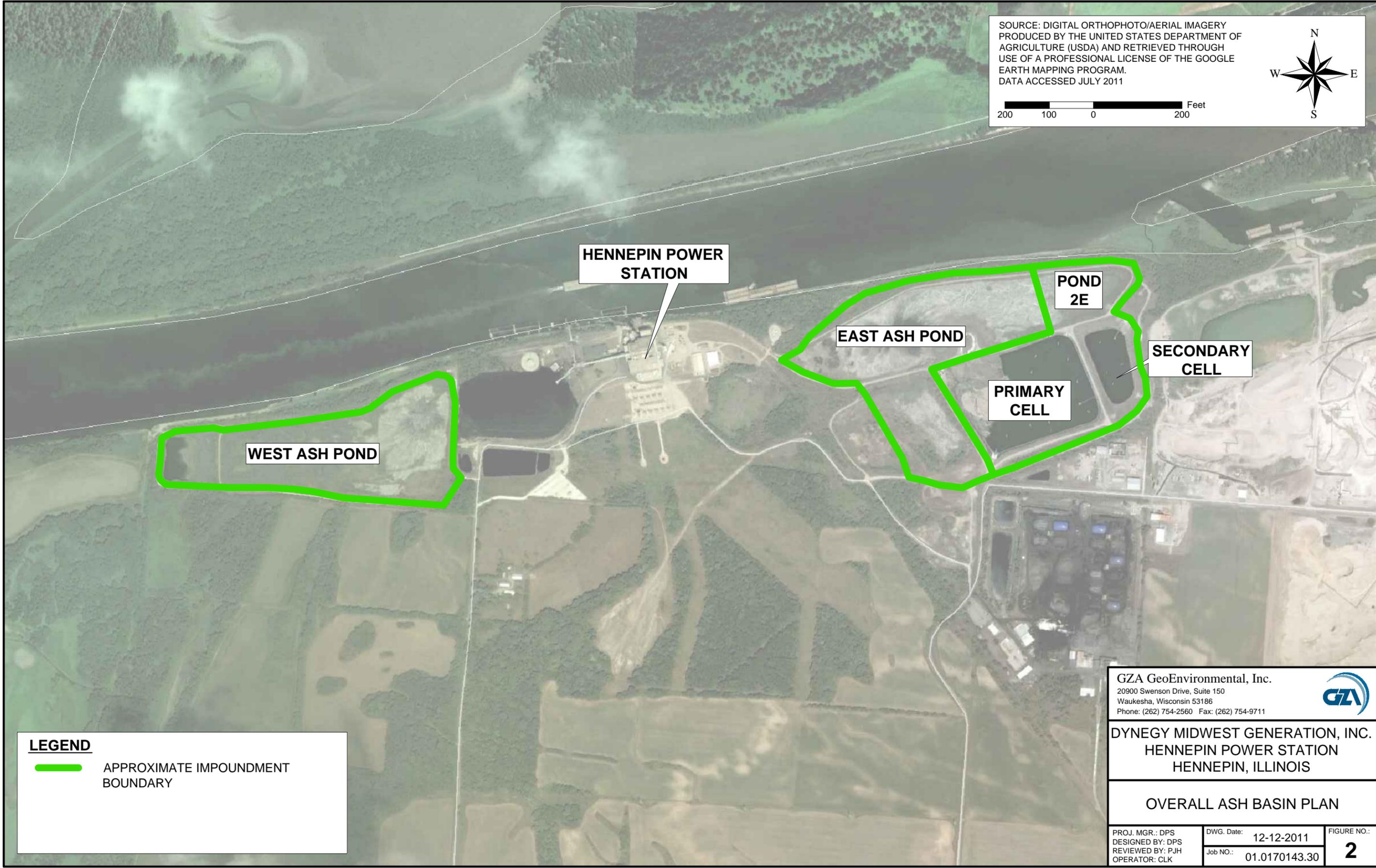
NO.	ISSUE/DESCRIPTION	BY	DATE

SITE LOCATION MAP

FIGURE
1
 SHEET NO.

PROJ MGR: DPS	REVIEWED BY: PJH	CHECKED BY: DS	DATE: 12/12/11	PROJECT NO: 01.0170142.30	REVISION NO:
DESIGNED BY: DS	DRAWN BY: CLK	SCALE: 1 : 24000			

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 EARTH MAPPING PROGRAM.
 DATA ACCESSED JULY 2011

200 100 0 200 Feet

**HENNEPIN POWER
STATION**

WEST ASH POND

EAST ASH POND

**PRIMARY
CELL**

**POND
2E**

**SECONDARY
CELL**

LEGEND

 APPROXIMATE IMPOUNDMENT
BOUNDARY

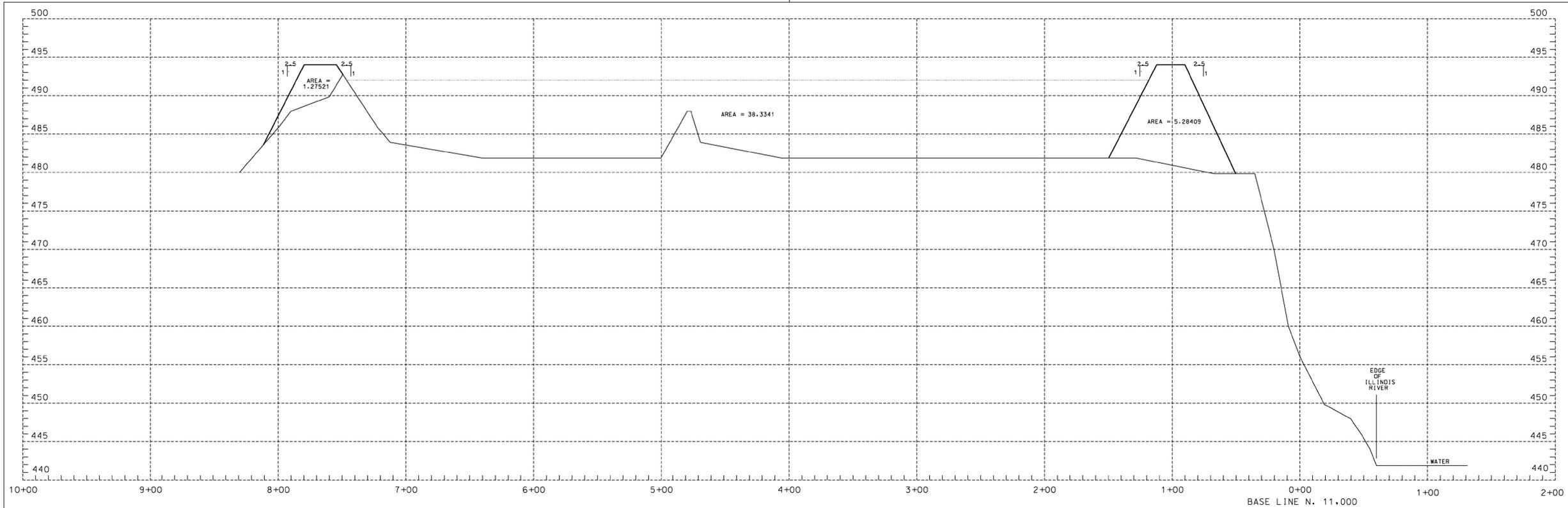
GZA GeoEnvironmental, Inc.
 20900 Swenson Drive, Suite 150
 Waukesha, Wisconsin 53186
 Phone: (262) 754-2560 Fax: (262) 754-9711



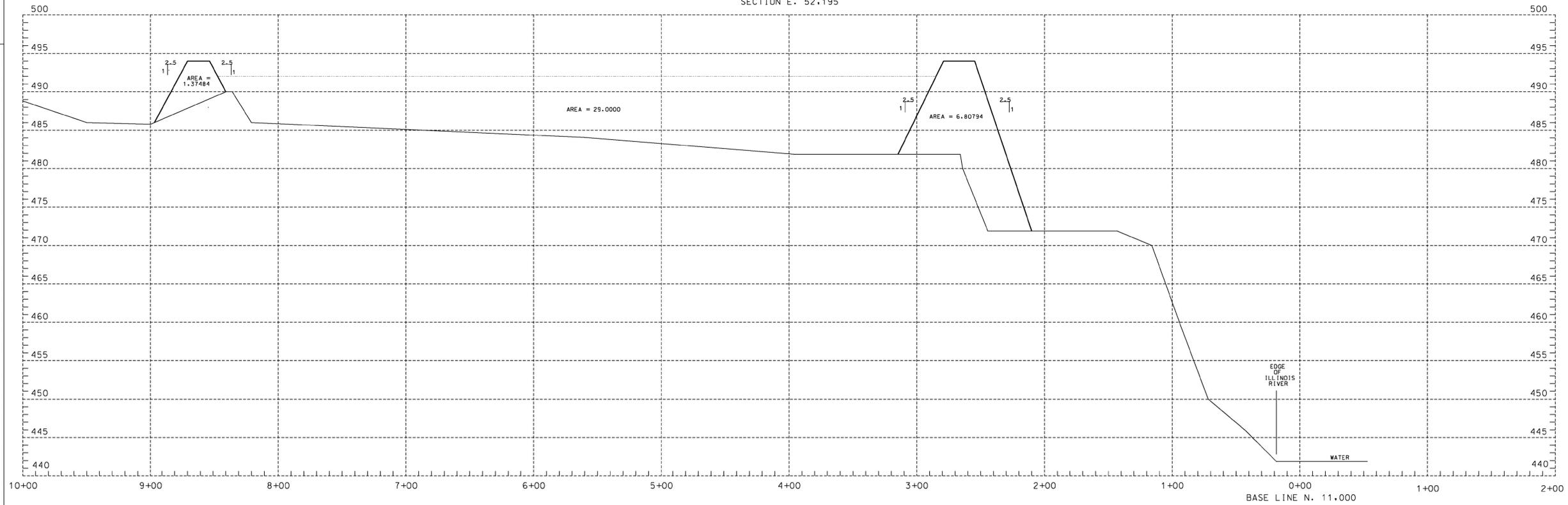
DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

OVERALL ASH BASIN PLAN

PROJ. MGR.: DPS	DWG. Date: 12-12-2011	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170143.30	2
REVIEWED BY: PJH		
OPERATOR: CLK		



SECTION E. 52.195



SECTION E. 51.920

NO	DATE	DRF	DESCRIPTION	E	C	A	NO	DATE	DRF	DESCRIPTION	E	C	A	NOTES
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														2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

REFERENCES

REVISION STATUS	DATE	BY	DESCRIPTION
□ - CONSTRUCTION			
○ - RECORD			

ILLINOIS POWER COMPANY			
DECATUR			
CROSS SECTIONS			
EAST ASH POND EXTENSION			
HENNEPIN POWER STATION			
DR	WJM	CAD	WJM
CHK	CKP	DATE	1-12-88
APP		SCALE	1"=6' V. 1"=30' H.
APP		PLOTTED	03-08-90
APP		DATE	CE-HEN1-B458-5

JOB NO.
01.0170142.30

FIGURE NO.
4

REV. NO.	DESCRIPTION	BY	DATE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PUH

OPERATOR: CLK
DATE: 12-12-11

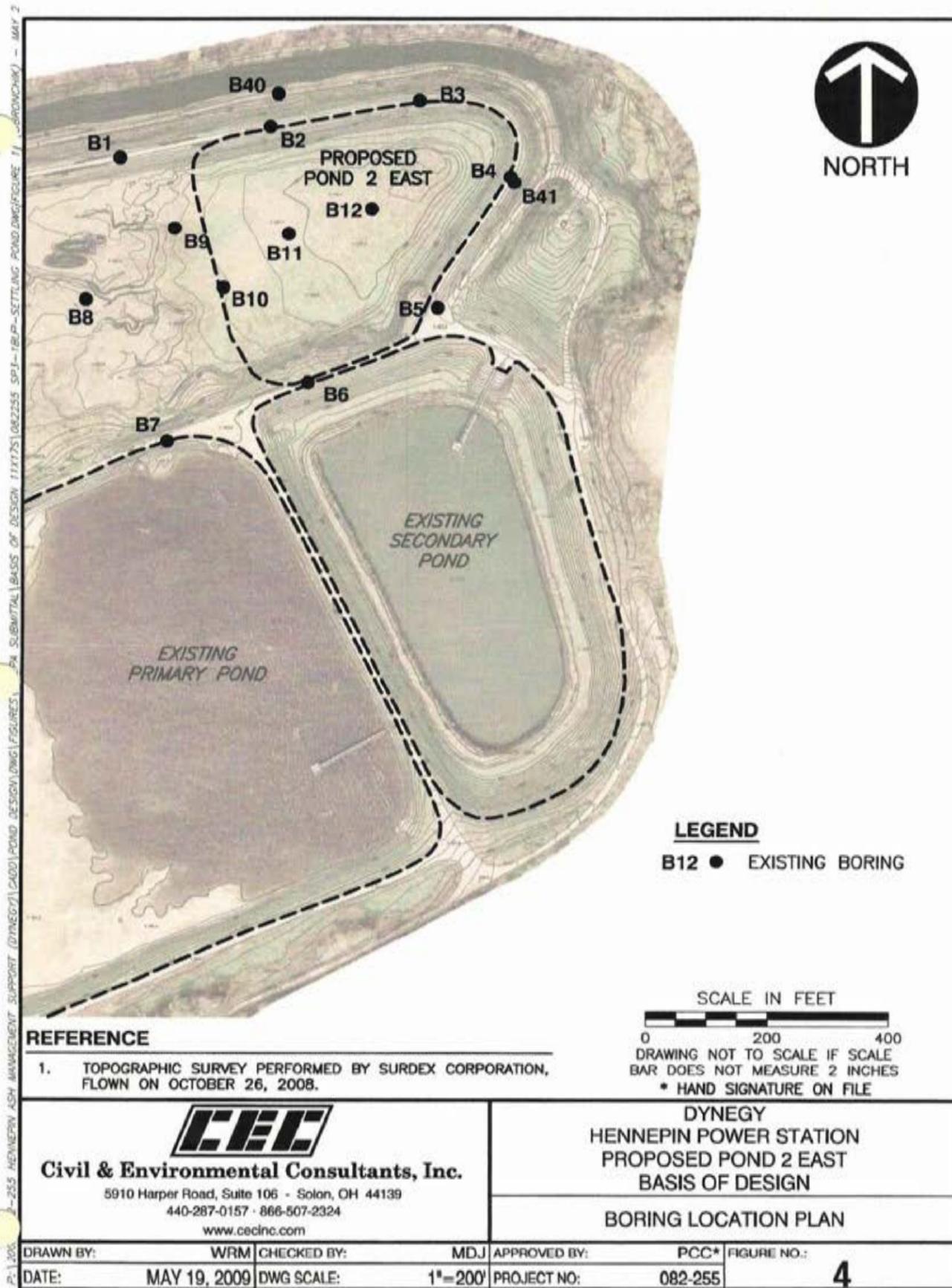
NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

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DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

EAST ASH POND ADDITIONAL
SECTIONS OF 1989 EMBANKMENT RAISE



P:\1304 2-255 HENNEPIN ASH MANAGEMENT SUPPORT (DYNEGY)\130401\POUND DESIGN.DWG FIGURES, Pa SUBMITTAL BASIS OF DESIGN FIGURES 11-11-09-SETTLING POND.DWG FIGURE 11 - BROWCHNIK - MAY 2

CEC
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 440-287-0157 · 866-507-2324
 www.ceclnc.com

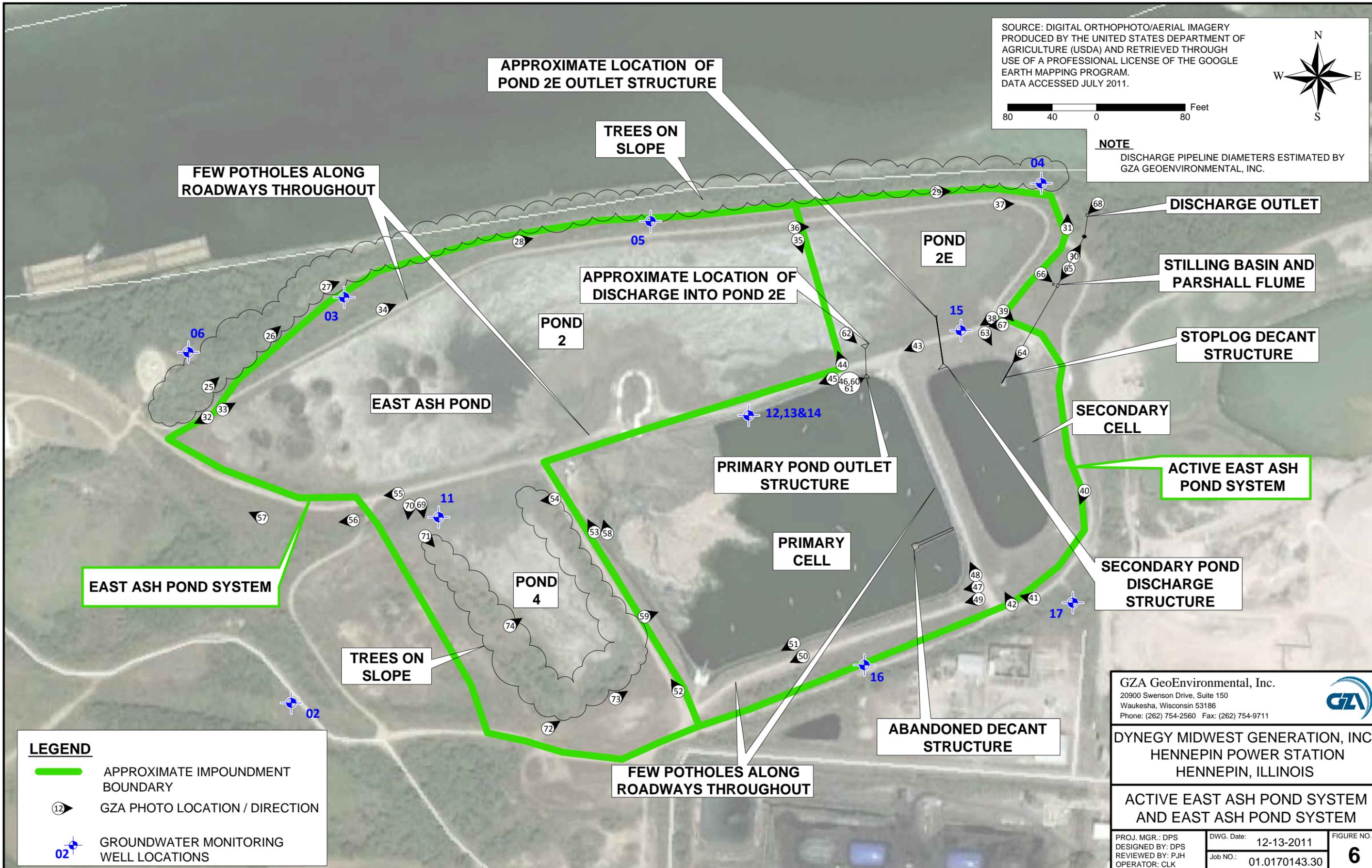
DYNEGY
HENNEPIN POWER STATION
PROPOSED POND 2 EAST
BASIS OF DESIGN

BORING LOCATION PLAN

DRAWN BY: WRM	CHECKED BY: MDJ	APPROVED BY: PCC*	FIGURE NO.: 4
DATE: MAY 19, 2009	DWG SCALE: 1"=200'	PROJECT NO: 082-255	

DYNEGY MIDWEST GENERATION, INC. HENNEPIN POWER STATION HENNEPIN, ILLINOIS		BORING LOCATION PLAN	
REV. NO.	DESCRIPTION	BY	DATE
	PROJ MGR: DPS DESIGNED BY: DPS REVIEWED BY: PJH	OPERATOR: CLK DATE: 12-12-11	
NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE			
JOB NO. 01.0170142.30			
FIGURE NO. 5			
GZA GeoEnvironmental, Inc. 20900 Swenson Drive, Suite 150 Waukesha, Wisconsin • 53186 • Phone (262) 754-2560 • Fax (262) 754-9711 www.gza.com			

GZA - J:\GZA_USA\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 8 - Hennepin\Drawings\Autocad\SITE PLANS.dwg [fig 6] December 13, 2011 - 11:07am 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 JULY 2011.



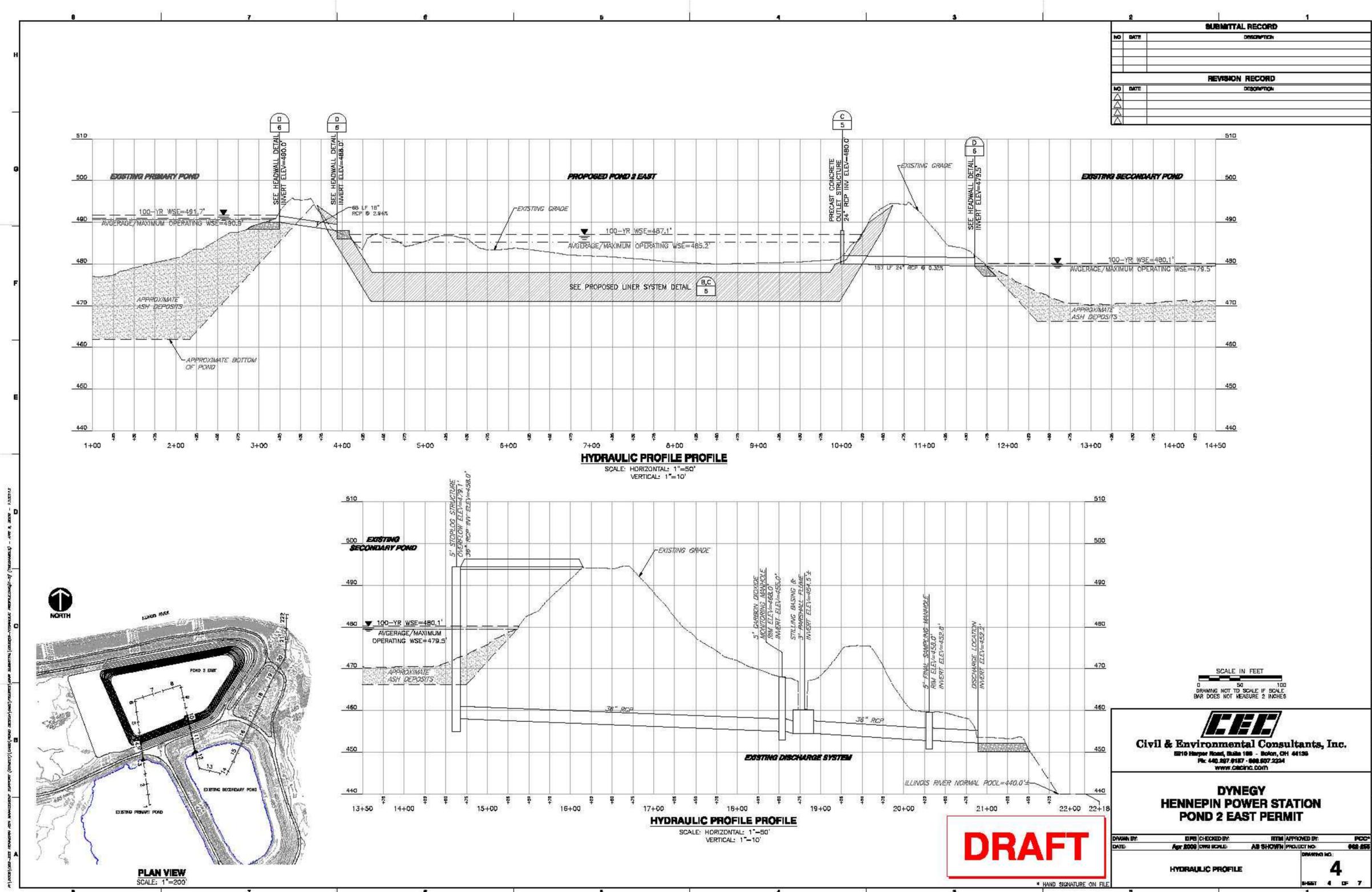
80 40 0 80 Feet

NOTE
 DISCHARGE PIPELINE DIAMETERS ESTIMATED BY
 GZA GEOENVIRONMENTAL, INC.

LEGEND

- APPROXIMATE IMPOUNDMENT BOUNDARY
- 12 GZA PHOTO LOCATION / DIRECTION
- + GROUNDWATER MONITORING WELL LOCATIONS

GZA GeoEnvironmental, Inc. 20900 Swenson Drive, Suite 150 Waukesha, Wisconsin 53186 Phone: (262) 754-2560 Fax: (262) 754-9711		
DYNEGY MIDWEST GENERATION, INC. HENNEPIN POWER STATION HENNEPIN, ILLINOIS		
ACTIVE EAST ASH POND SYSTEM AND EAST ASH POND SYSTEM		
PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: PJH OPERATOR: CLK	DWG. Date: 12-13-2011 Job NO.: 01.0170143.30	FIGURE NO.: 6



SUBMITTAL RECORD		
NO.	DATE	DESCRIPTION

REVISION RECORD		
NO.	DATE	DESCRIPTION

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

POND 2E PROFILES AND DETAILS

JOB NO.
01.0170142.30

FIGURE NO.
7

REV. NO.	DESCRIPTION	BY	DATE

NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PUJ

OPERATOR: CLK
DATE: 12-8-11



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

SCALE IN FEET
0 50 100
DRAWING NOT TO SCALE IF SCALE
BAR DOES NOT MEASURE 3 INCHES

C&E
Civil & Environmental Consultants, Inc.
12119 Harper Road, Suite 100 - Madison, WI 53718
Ph: 440.267.8187 • Fax: 608.827.5294
www.ccecinc.com

DYNEGY
HENNEPIN POWER STATION
POND 2 EAST PERMIT

DRAWN BY:	DPS	CHECKED BY:	RTM	APPROVED BY:	POC
DATE:	Apr 2009	DATE:	AS SHOWN	PROJECT NO.:	042-255

HYDRAULIC PROFILE

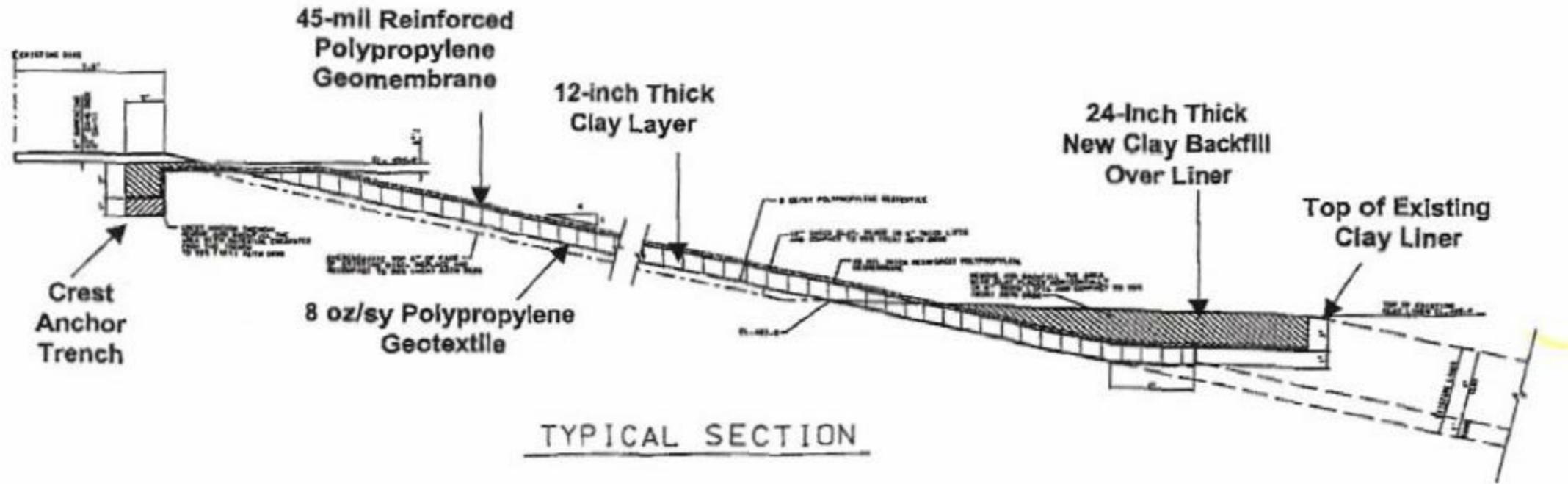
4

4 OF 7

Hennepin Power Station
Hennepin, IL

East Ash Pond System

Raising of Interior Impermeable Liners in Primary and Secondary Cells



DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

TYPICAL SECTION OF LINER EXTENSION

JOB NO.
01.0170142.30

FIGURE NO.
9

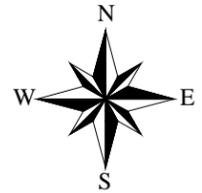
REV. NO.	DESCRIPTION	BY	DATE
	PROJ MGR: DPS DESIGNED BY: DPS REVIEWED BY: PJH	OPERATOR: CLK	DATE: 12-12-11

NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

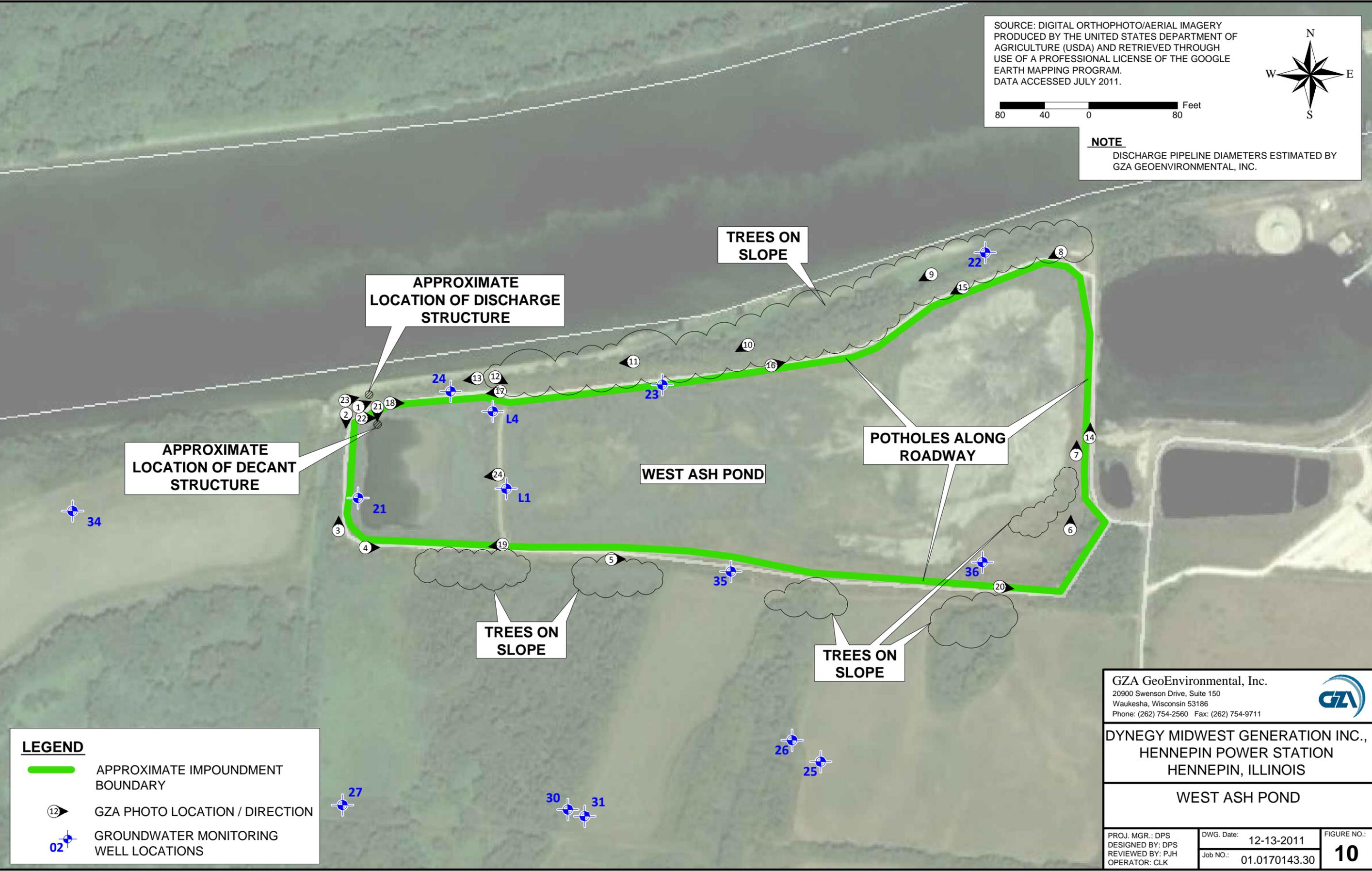


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GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin • 53186 • Phone
(262) 754-2560 • Fax (262) 754-9711
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NOTE
DISCHARGE PIPELINE DIAMETERS ESTIMATED BY GZA GEOENVIRONMENTAL, INC.



LEGEND

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

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



DYNEGY MIDWEST GENERATION INC.,
 HENNEPIN POWER STATION
 HENNEPIN, ILLINOIS

WEST ASH POND

PROJ. MGR.: DPS	DWG. Date: 12-13-2011	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170143.30	10
REVIEWED BY: PJH		
OPERATOR: CLK		

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 # IL 0001554
Date May 23, 2011

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

Impoundment Name East Ash Impoundment
Impoundment Company Dynergy Midwest Generation, Inc.
EPA Region Region V
State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

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

New X Update

Is impoundment currently under construction? Yes X No
Is water or ccw currently being pumped into the impoundment? No X
Dynergy is building a land-fill on the impoundment.

IMPOUNDMENT FUNCTION: This impoundment has been inactive since 1995 and stores CCW from plant operations prior to 1995.

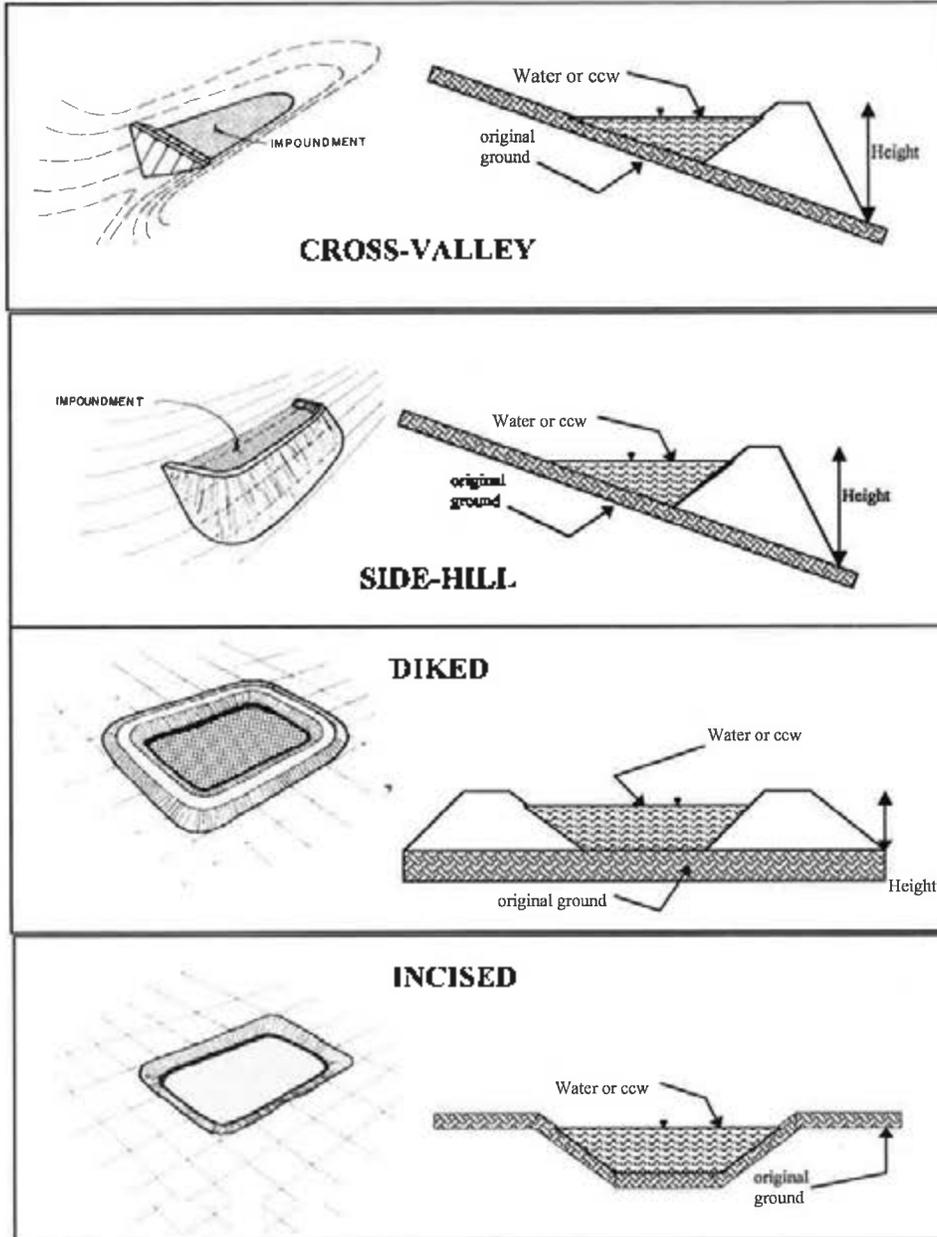
Nearest Downstream Town : Name Hennepin
Distance from the impoundment 4 miles

Impoundment Location: Longitude 89 Degrees 18 Minutes 28 Seconds
Latitude 41 Degrees 18 Minutes 10 Seconds
State IL County Putnam County

Does a state agency regulate this impoundment? YES X NO

If So Which State Agency? The Illinois Environmental Protection Agency regulates the environmental concerns associated with the impoundment through a Closure Protocol.

CONFIGURATION:



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

Embankment Height 52 feet Embankment Material Compacted Native Fill
 Pool Area No Pool acres Liner None Present
 Current Freeboard NA feet Liner Permeability _____

TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

 Trapezoidal

 Triangular

 Rectangular

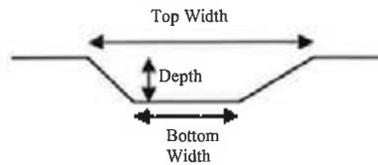
 Irregular

 depth

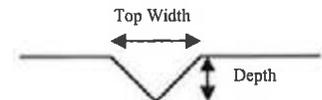
 bottom (or average) width

 top width

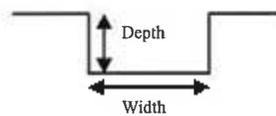
TRAPEZOIDAL



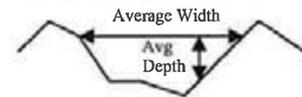
TRIANGULAR



RECTANGULAR



IRREGULAR



 Outlet

 inside diameter

Material

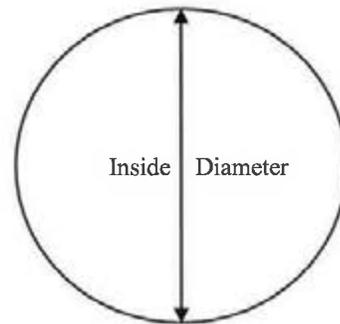
 corrugated metal

 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 Illinois Power Company _____



Site Name: Hennepin Power Station Date: 5/23/11
 Unit Name: Active Ash Impoundment Operator's Name: Dynergy Midwest Generation, Inc
 Unit I.D.: IL50363 Hazard Potential Classification: High Significant Low
 Inspector's Name: Patrick J. Harrison, P.E. and Doug P. Simon, P.E.

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

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)? See Note Below	489.5		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	489.5		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)? See Note Below			Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	494.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	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)?	✓		From underdrain?		✓
9. Trees growing on embankment? (if so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?	✓		From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

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
2.	There are three ponds that make up this impoundment. The elevation provided refers to that in the Primary pond which is also the highest elevation as referenced in the Operation and Maintenance Plan.
4.	No open channel spillway was present.
8.	Based on available soil borings.
9.	Largest tree diameter noted was approximately 30 inches.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL 0001554
Date May 23, 2011

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

Impoundment Name Active Ash Impoundment
Impoundment Company Dynergy Midwest Generation, Inc.
EPA Region Region V
State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

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

New Update

	Yes	No
Is impoundment currently under construction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is water or cew currently being pumped into the impoundment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

IMPOUNDMENT FUNCTION: Settlement of CCW that is sluiced into the impoundment.

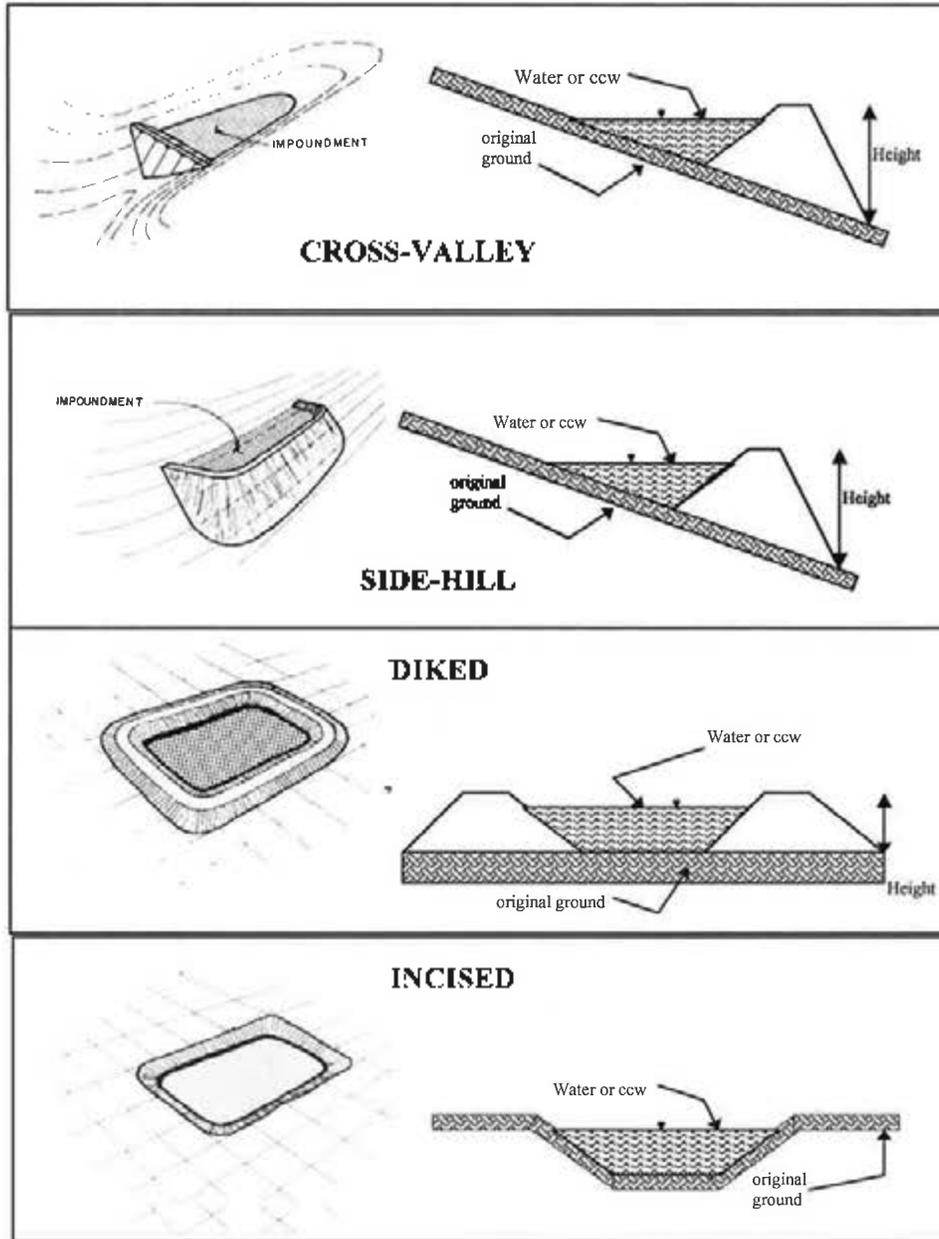
Nearest Downstream Town : Name Hennepin
Distance from the impoundment 4 miles

Impoundment Location: Longitude 41 Degrees 18 Minutes 00 Seconds
Latitude 89 Degrees 18 Minutes 13 Seconds
State IL County Putnam County

Does a state agency regulate this impoundment? YES NO

If So Which State Agency? The Illinois Department of Natural Resources regulates discharge of water through NPDES permit and a portion of the Impoundment as a regulated dam.

CONFIGURATION:



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

Embankment Height 52 feet Embankment Material Compacted Native Fill
 Pool Area 30 acres Liner Clay/HDPE
 Current Freeboard 3.5 feet Liner Permeability _____

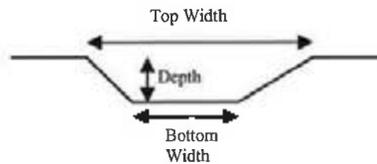
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

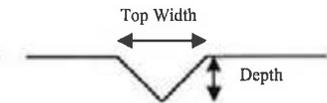
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

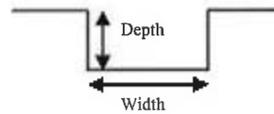
TRAPEZOIDAL



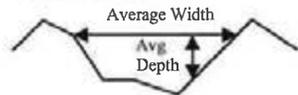
TRIANGULAR



RECTANGULAR



IRREGULAR

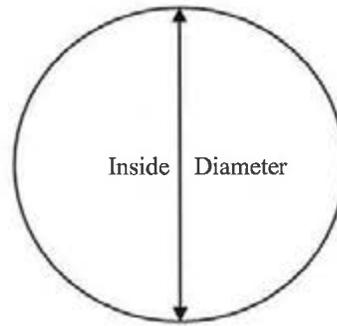


 X **Outlet**

 inside diameter
Varies: See Below.

Material

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



Is water flowing through the outlet? YES _____ NO X

 No Outlet There are three ponds that make up the active ash pond. The outlet diameters vary from approximately 12 inches to 30 inches.

 Other Type of Outlet (specify) _____

The Impoundment was Designed By _____



Site Name: Hennepin Power Station Date: 5/23/11
 Unit Name: West Ash Impoundment Operator's Name: Dynergy Midwest Generation, Inc
 Unit I.D.: NPDES IL 0001554 Hazard Potential Classification: High Significance Low
 Inspector's Name: Patrick J. Harrison, P.E. and Doug P. Simon, P.E.

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

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?		Quarterly	18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?		455.6	19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?		455.6	20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?		See Note Below	Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?		460.0	Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear? See Note Below		
7. Is the embankment currently under construction?		✓	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)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

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
4.	No open channel spillway was present.
8.	Based on boring logs and observations.
9.	Largest tree diameter noted was approximately 30 inches.
20(c).	No water was entering or exiting the impoundment.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL 0001554
Date May 23, 2011

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

Impoundment Name West Ash Impoundment

Impoundment Company Dynergy Midwest Generation, Inc.

EPA Region Region V

State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

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

New Update

	Yes	No
Is impoundment currently under construction?	<u> </u>	<u> X </u>
Is water or ccw currently being pumped into the impoundment?	<u> </u>	<u> X </u>

IMPOUNDMENT FUNCTION: This impoundment has been inactive since 1995 and stores CCW from plant operations prior to 1995.

Nearest Downstream Town : Name Hennepin, Illinois

Distance from the impoundment 4 miles

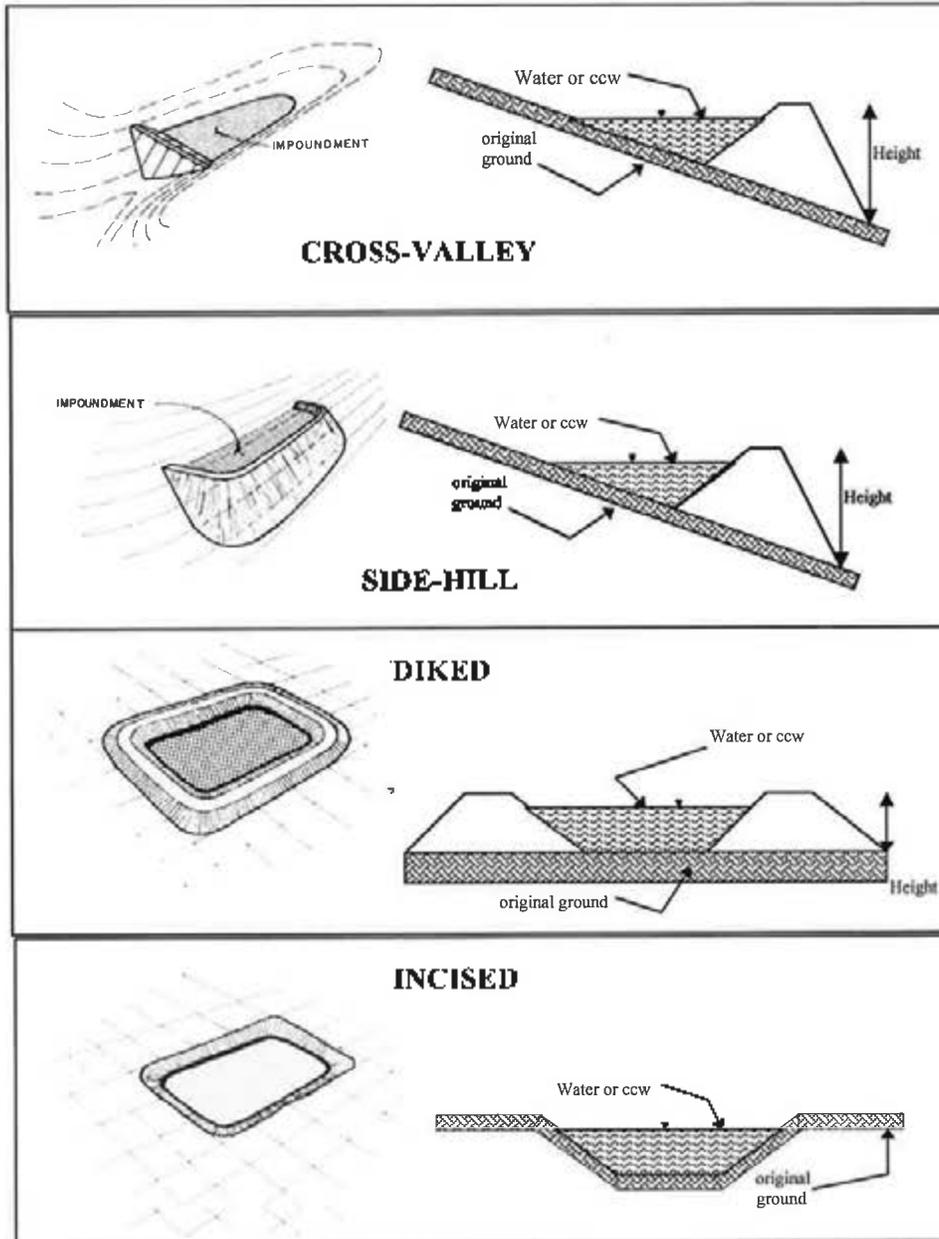
Impoundment

Location: Longitude 89 Degrees 19 Minutes 28 Seconds
 Latitude 41 Degrees 18 Minutes 00 Seconds
 State IL County Putnam

Does a state agency regulate this impoundment? YES NO

If So Which State Agency? The Illinois Environmental Protection Agency regulates discharge from the impoundment through the NPDES permit.

CONFIGURATION:



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

Embankment Height 18 feet Embankment Material Compacted Native Fill
 Pool Area 2 acres Liner None Present
 Current Freeboard 4.4 feet Liner Permeability Unknown

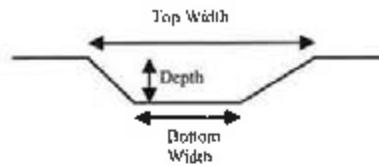
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

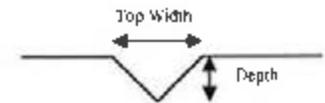
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

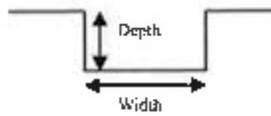
TRAPEZOIDAL



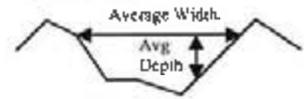
TRIANGULAR



RECTANGULAR



IRREGULAR

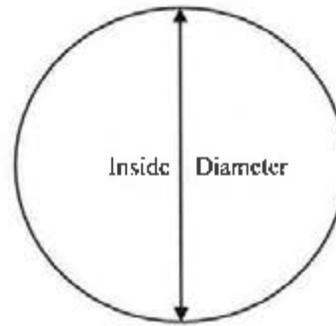


 X **Outlet**

12 in. inside diameter

Material

- corrugated metal
- X 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

APPENDIX D

PREVIOUS INSPECTION REPORTS

Dynegy Midwest Generation, Inc.
2828 North Monroe Street
Decatur, Illinois 62526-3269

December 31, 2001

Mr. Dennis L. Kennedy, P.E.
Senior Water Resources Engineer
Illinois Department of Natural Resources
Office of Water Resources
524 South Second Street
Springfield, IL 62701-1787



Dear Mr. Kennedy:

**Hennepin Power Station; East Ash Pond
Dam Safety Permit No. 21922
Dam I.D. No. IL50363**

2001 Five-Year Inspection Report

Enclosed is a signed copy of the 2001 inspection report for the Hennepin Power Station's east ash pond dam. Mr. Jeffrey Lamb, professional civil engineer with Dynegy-Illinois Power's Engineering and Technical Services Department, conducted the professional engineer inspection on November 27, 2001. This inspection is required by Section 702.40(b)(5) of the Rules for the Construction and Maintenance of Dams and the conditions of IDNR Permit No. 21922.

The inspection report shows that the overall condition of the facility is good. The only minor maintenance that needs to be conducted is the continued removal of sapling trees on the embankments. This will be conducted as a part of routine maintenance during next year. Sapling tree removal was also conducted as a part of routine maintenance during the previous five years as recommended in the 1996 inspection report.

An Owner's Maintenance Statement, signed by Mr. James G. Dodson, Plant Manager, Hennepin Power Station, is also included.

If you have any questions regarding this report, please contact me at 217/872-2359.

Sincerely,
Dynegy Midwest Generation

A handwritten signature in cursive script that reads "Thomas L. Davis".

Thomas L. Davis, P.E.
Senior Environmental Professional

bc: J.G.Dodson, w/att., S-10
J.P.Augspols w/att., S-10
B.J. Marshall/T.E. Tuttle/File: Hennepin PS Dam Inspection Reports, w/att.,
A-05

Illinois Power Company
500 South 27th Street
Decatur, IL 62521-2200

November 30, 2001

Mr. B. J. Marshall
Dynergy Midwest Generation
2828 N. Monroe St.
Decatur, IL 62526



RE: Hennepin Power Station
Hennepin Ash Surface Impoundment
2001 Dam Inspection

Dear Brett:

Enclosed is the dam inspection report for the Hennepin Ash Improvement. The inspection was performed on Wednesday, November 27, 2001. John Augspol from the plant accompanied me on the inspection.

The following items need attention (Condition Code IM or MM).

<u>Item</u>	<u>Issue</u>	<u>Remediation</u>
Embankment	Scattered trees/saplings on or near the clay liner around perimeter of primary & final ponds	Spray to kill, cut down later

Please forward the inspection form to the plant for execution of the Owner's Maintenance Statement by the Plant Manager.

If you have any questions, please call me.

Sincerely,

A handwritten signature in black ink, appearing to be "J. E. Lamb".

J. E. Lamb, P.E.
Manager - Civil Engineering

Enclosure

Cc: J. G. Dodson w/o attachments S-10
J. P. Augspol w/attachments S-10
CS 491417

Dam Inspection Report

Name of Dam Hennepin Ash Surface Impoundment Dam ID No. IL 50363

Permit Number 21922 Class of Dam III

Location NE 1/4 Section 26 Township 33 N Range ZW of 3rd PM

Owner Dynegy Midwest Generation 815-339-9210
Name Telephone Number (Day)

RR# 1 Box 200 AA 815-339-9215
Street Telephone Number (Night)

Hennepin 61327-9737 County Putnam
City Zip Code

Type of Dam Homogeneous Earthen Dam @ 4' clay liner on upstream face

Type of Spillway Drop Structure @ Stop logs

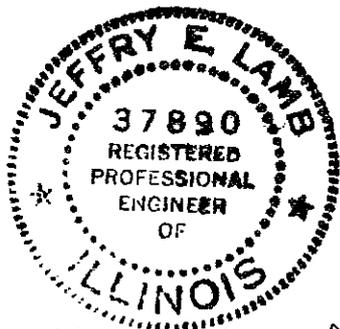
Date(s) Inspected November 28, 2001

Weather When Inspected Overcast @ mild wind

Temperature When Inspected 39° F

Pool Elevation When Inspected Primary 481.51 Final 479.59

Tailwater Elevation When Inspected NA



Jeffrey E. Lamb
11/28/01

Professional Engineer's Seal

Inspection Personnel:

Jeffrey E Lamb Manager Civil Engineering
Name Title

John P. Augspol Chemist
Name Title

Name Title

Name Title

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	GC	NE	
Vertical and Horizontal Alignment of Crest	GC	NE	
Unusual Movement or Cracking At or Beyond Toe	GC	NE	
Sloughing or Erosion of Embankment and Abutment Slopes	GC	OB	Small erosion rills @ SEc of primary Pond upstream & @ SWc of final pond upstream face
Upstream Face Slope Protection	GC	NE	
Seepage	GC	NE	
Filter and Filter Drains	NA		

EARTH EMBANKMENT

(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	GC	NE	
Embankment Drainage Ditches	GC	NE	
Vegetative Cover	GC	MM	Scattered small trees + Saplings on liner - Spray to Kill and remove after dead.
Other (Name)			
Other			
Other			
Other			

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage			
Structure to Abutment/ Embankment Junctions			
Water Passages			
Foundation		AN	
Surface Cracks in Concrete Surfaces			
Structural Cracking			
Vertical and Horizontal Alignment			

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints			
Contraction Joints			
Spalling of Concrete			FCI
Filters, Drains, etc.			
Riprap			
Other (Name)			

IF THE DAM IS GATED - Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris			
Side Slope Stability			
Slope Protection			
Other (Name)		NA	
Other			
Other			
Other			

PRINCIPAL SPILLWAY

Drop Inlet Spillway
Ponds 1+2

Overflow Spillway Structure

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	GC	OB	Beam Seats for walkway at drop structures have spalled or cracked surface concrete. Observe for any further spalling/cracking of concrete support.
Structure to Embankment Junction	NI underwater	NE	
Drains		NA	
Seepage Around or Into Structure			
Surface Cracks	GC	NE	
Structural Cracks	GC	NE	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

Drop Inlet Spillway
 Overflow Spillway Structure
 Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	GC	NE	
Construction Joints	GC	NE	
Filter and Filter Drains		/	
Trash Racks	NA		
Bridge and Piers	GC	OB	Surface rust beginning to appear on beams & bolts.
Differential Settlement	GC	NE	
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

Conduit

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	GC	NE	
Joint Separation	NI <i>buried & under water</i>	NE	
Seepage Around of Into Conduit	NI <i>buried & under water</i>	NE	
Surface Cracks	NI <i>buried & under water</i>	NE	
Structural Cracks	NI <i>buried & under water</i>	NE	
Trash Racks	NA		
Differential Settlement	GC	NE	
Alignment	GC	NE	
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Structure to Embankment Junction			
Construction Joints			
Expansion and Contraction Joints		N/A	
Differential Settlement			
Surface Cracks			
Structural Cracks			
Wall Alignment			
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

Dewatering Other:

Principal Spillway
Ponds 1 & 2 Stop Logs

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NI underwater	NE	
Gate Seals	NI underwater	NE	
Gate and Frame	GC	NE	
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)			
Other			

**OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE**

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Joint Separation			
Seepage Around or Into Conduit			
Intake Structure		NA	
Outlet Structure			
Outlet Channel			
Riprap			
Other (Name)			
Other			

Principal Spillway Type: ENERGY DISSIPATOR Outlet Works
36" ϕ RCC Pipe Discharges into a ripraped basin.

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	GC	NE	
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR

(Continued)

Principal Spillway Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	GC	NE	
Outlet Channel	NA		
Debris	NA		
Other (Name)			
Other			
Other			
Other			

EMERGENCY SPILLWAY

Earth

Other: Name _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion			
Weeds, Logs, Other Obstructions			
Side Slope Sloughing			
Vegetation		NA	
Sedimentation			
Riprap			
Settlement of Crest			
Downstream Channel			
Other (Name)			

SUMMARY OF MAINTENANCE DONE AND/OR
REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION November 28, 2001

DATE OF LAST INSPECTION November 12, 1996

1. EARTH EMBANKMENT DAMS

Repaired gate latch on primary pond outlet
structure noted in last inspection.

2. CONCRETE MASONRY DAMS

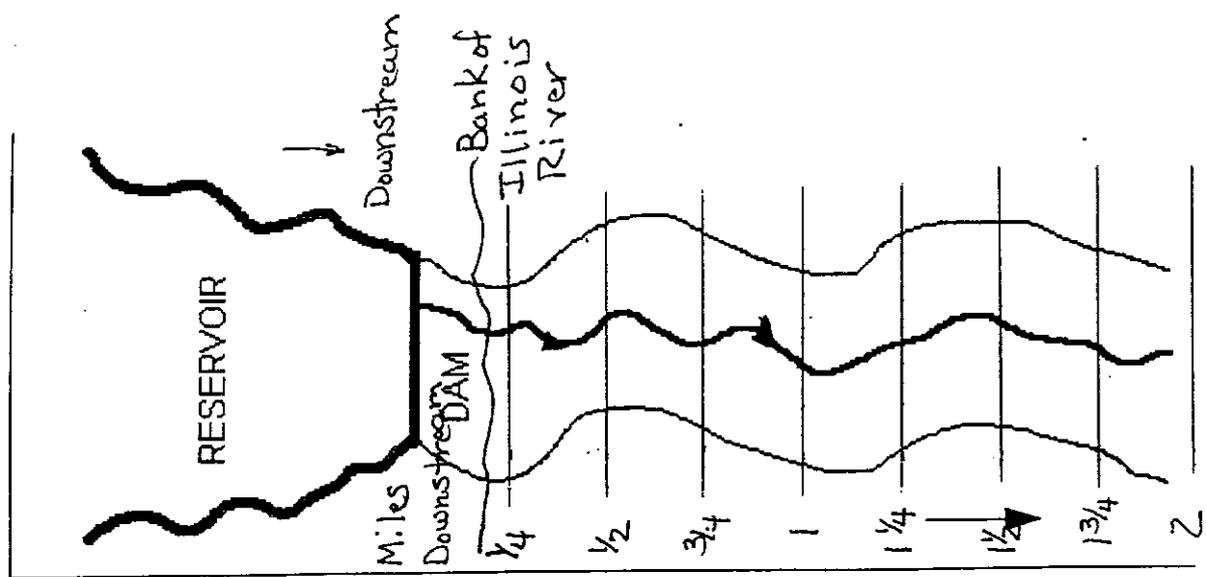
3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN < 1/4 MILES

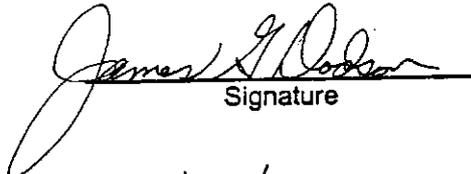
MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss of Life Potential			Economic Loss Potential		
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED
0 to 1/4													X			X		
1/4 to 1/2																		
1/2 to 3/4																		
3/4 to 1																		
1 to 1-1/4																		
1-1/4 to 1-1/2																		
1-1/2 to 1-3/4																		
1-3/4 to 2																		
OVER 2																		



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

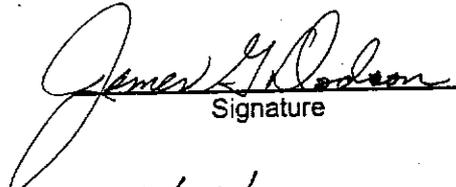
I, _____, owner of Hennepin Ash Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
am maintaining the dam in accordance with the accepted maintenance plan which is part of
Permit Number 21922.


Signature
12/27/01
Date

Owner's Operation and Maintenance Plan Statement

I, _____, owner of Hennepin Ash Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
have reviewed the operation and maintenance plan including the Emergency Action Plan (EAP),
which is part of, Permit Number 21922.

- I () have enclosed the appropriate revisions or
- () have determined that no revisions to the plan are necessary.


Signature
12/27/01
Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

Dynegy Midwest Generation, Inc.
2828 North Monroe Street
Decatur, IL 62526-3269
Phone 217.876.3900 Fax 217.876.7475
www.dynegy.com

December 11, 2006

Mr. Mike Diedrichsen, Acting Manager
Downstate Regulatory Programs
Division of Water Resources Management
Office of Water Resources
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271



Dear Mr. Diedrichsen:

**Hennepin Power Station; East Ash Pond
Dam Safety Permit No. DS2004119
Dam I.D. No. IL50363**

2006 Five-Year Inspection Report

Enclosed is a signed copy of the 2006 inspection report for the Hennepin Power Station's east ash pond dam. Mr. Joseph P. Kimlinger, an Illinois-registered professional civil engineer (no. 062-049181) with Dynegy Midwest Generation's Construction and Maintenance Department, conducted the professional engineer inspection of the embankments and outlet structures on November 20, 2006. This inspection is required by Section 3702.40(b)(5) of the Rules for the Construction and Maintenance of Dams and the conditions of IDNR Permit No. DS2004119.

The inspection report shows that the overall condition of the east ash pond system is good. The only minor maintenance that needs to be conducted is the continued removal of sapling trees on the embankments. This will be conducted as a part of routine maintenance during 2007. Sapling tree removal was also conducted as a part of the routine maintenance performed during the previous five years as recommended in the 2001 inspection report. Some spalling of concrete and rusting of steel walkway beams was also noted.

An Owner's Maintenance Statement, signed by Mr. James G. Dodson, Plant Manager, Hennepin Power Station, is also included.

If you have any questions regarding this report, please contact me at 217/872-2354 or Tom Davis at 217-872-2315.

Sincerely,
Dynegy Midwest Generation, Inc.

A handwritten signature in black ink, appearing to read "Rick D. Dierick". The signature is written in a cursive, flowing style with a large initial "R".

Rick D. Dierick
Sr. Director – Operations Environmental Compliance
Environmental Health and Safety

Dam Inspection Report

Name of Dam Hennepin PS, Ash Surface Impoundment Dam ID No. IL 50363

Permit Number DS2004119 Class of Dam III

Location NE 1/4 Section 26 Township 33N Range 2W of 3rd PM

Owner Dynegy Midwest Generation 815-339-9210

Name Telephone Number (Day)

RR1, Box 200 AA 815-339-9215

Street Telephone Number (Night)

Hennepin, IL 61327 County Putnam

City Zip Code

Type of Dam Homogeneous Earthen Dam with clay and geosynthetic/clay liner

Type of Spillway Drop structure and stop logs

Date(s) Inspected November 20, 2006

Weather When Inspected Sunny and Breezy

Temperature When Inspected 36 deg. F

Pool Elevation When Inspected Primary 481.5; Secondary 479.6

Tailwater Elevation When Inspected NA

Inspection Personnel:

<u>Joseph P. Kimlinger P.E.</u>	<u>Construction Manager</u>
Name	Title
<u>John Augspols</u>	<u>Sr. Env. & Chem. Engineer</u>
Name	Title
Name	Title
Name	Title



Professional Engineer's Seal

Joseph P. Kimlinger
12/17/06
LIC EXPIRES 11/20/07

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

CONDITION CODES

- NE - No evidence of a problem
- GC - Good condition
- MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled
- IM - Item needing immediate maintenance to restore or ensure its safety or integrity
- EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam
- OB - Condition requires regular observation to ensure that the condition does not become worse
- NA - Not applicable to this dam
- NI - Not inspected - list the reason for non-inspection under deficiencies

All Condition Codes will be listed with the following abbreviations:

P = Primary Cell

S = Secondary (polishing) Cell

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	GC	NA	
Upstream Face Slope Protection	GC	NA	
Seepage	NE	NA	
Filter and Filter Drains	NA		

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	GC	NA	
Vegetative Cover	OB	Some small trees and saplings near the embankment	Observe the small trees and saplings and spray to kill or remove as time allows. No issue at this time.
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment/ Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Construction Joints	NA		
Spalling of Concrete	NA		
Filters, Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED - Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

Drop Inlet Spillway

Overflow Spillway Structure

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	OB	Some spalling of concrete near walkway beam supports.	Observe the concrete condition in the outfall structures, primarily near the beam seats. Contact a certified engineer if condition worsens.
Structure to Embankment Junction	NI	Underwater	
Drains	NA		
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NE	NA	
Structural Cracks	NE	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

Drop Inlet Spillway Overflow Spillway Structure

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	GC	NA	
Filter and Filter Drains	NA		
Trash Racks	NA		
Bridge and Piers	OB	Rust forming on bridge beams and connections.	Observe and contact a certified engineer if condition worsens.
Differential Settlement	NE	NA	
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

Conduit Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Joint Separation	NE	NA	
Seepage Around of Into Conduit	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	
Trash Racks	NA		
Differential Settlement	NE	NA	
Alignment	GC	NA	
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

Principal Spillway

Dewatering

Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NI	Underwater	The sill and seals are located under stop logs and could not be inspected.
Gate Seats	NI	Underwater	
Gate and Frame	GC	NE	Stop logs and guides were in good condition.
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

Principal Spillway
Type:

Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spelling, Cavitation	NE	NA	
Structure to Embankment Junction	GC	NA	
Construction Joints	GC	NA	
Surface Cracks	NE	NA	
Structural Cracks	NE	NA	
Differential Alignment	NE	NA	
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR

(Continued)

Principal Spillway

Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	GC	NA	
Outlet Channel	GC	NA	
Debris	NE	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

Earth

Other: Name _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs, Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR
REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION November 20, 2006

DATE OF LAST INSPECTION November 28, 2001

1. EARTH EMBANKMENT DAMS

The pond level was raised in 2004 with the extension of the liner. The liner extension consisted of one foot of clay overlain with a polypropylene liner.

Minor erosion repairs, mowing and general maintenance have been performed during the last five years.

2. CONCRETE MASONRY DAMS

NA

3. PRINCIPAL SPILLWAY

NA

4. OUTLET WORKS

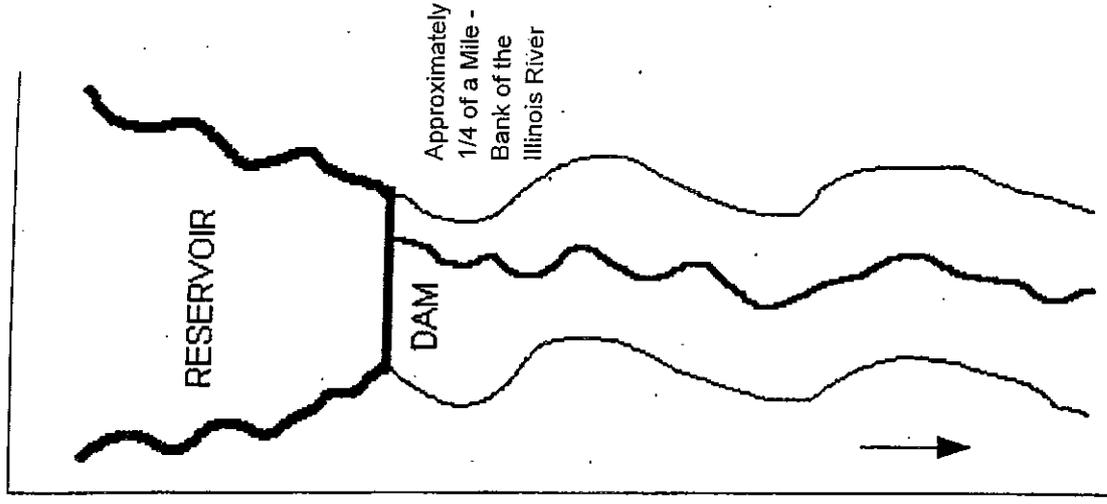
NA

5. EMERGENCY SPILLWAY

NA

DOWNSTREAM DEVELOPMENT
 APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 MILES

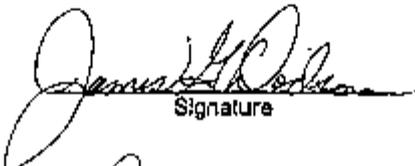
MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss of Life Potential			Economic Loss Potential			
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED	
0 to 1/4	0	0	0	0	0	0	0	0	0	0	0	0	0	X					
1/4 to 1/2																			
1/2 to 3/4																			
3/4 to 1																			
1 to 1-1/4																			
1-1/4 to 1-1/2																			
1-1/2 to 1-3/4																			
1-3/4 to 2																			
OVER 2																			



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

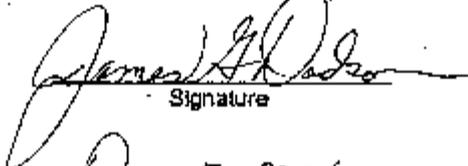
I, James G. Dodson, owner of Hennepin PS Ash Surface Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
am maintaining the dam in accordance with the accepted maintenance plan which is part of
Permit Number DS2004119.


Signature
Dec 7, 2006
Date

Owner's Operation and Maintenance Plan Statement

I, James G. Dodson, owner of Hennepin PS Ash Surface Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
have reviewed the operation and maintenance plan including the Emergency Action Plan (EAP),
which is part of, Permit Number DS2004119.

- have enclosed the appropriate revisions or
- have determined that no revisions to the plan are necessary.


Signature
Dec 7, 2006
Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as defined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3797.100 of the "Rules for Construction and Maintenance of Dams".

 Close Window

Tracking Detail

Your package has been delivered.

Tracking Number: 1Z V9W 975 03 4525 747 6
 Type: Package
 Status: **Delivered**
 Delivered on: 12/13/2006 9:51 A.M.
 Signed by: PATTERSON
 Location: MAIL ROOM
 Delivered to: US
 Shipped or Billed on: 12/12/2006
 Service Type: GROUND
 Weight: 1.00 lb

Package Progress

Location	Date	Local Time	Description
SPRINGFIELD, IL, US	12/13/2006	9:51 A.M.	DELIVERY
	12/13/2006	5:01 A.M.	OUT FOR DELIVERY
	12/13/2006	4:05 A.M.	ARRIVAL SCAN
DECATUR, IL, US	12/13/2006	1:26 A.M.	DEPARTURE SCAN
DECATUR, IL, US	12/12/2006	10:08 P.M.	ARRIVAL SCAN
	12/12/2006	8:30 P.M.	DEPARTURE SCAN
	12/12/2006	6:58 P.M.	ORIGIN SCAN
US	12/12/2006	2:52 P.M.	BILLING INFORMATION RECEIVED

Tracking results provided by UPS: 12/13/2006 3:26 P.M. EST (USA)

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**Dynegy Midwest Generation
DAILY SHIPMENT DETAIL REPORT
12/12/06 01:52 PM**

Pickup Date: 12/12/06
Pickup Record No.: 2819375 39 2

UPS Account No.: V9W975
Sorted By: Order of Shipment

Name/Address	Shipment Detail	Options	Reference Rate Charges
Ship To: James Eiseman Bluegrass Generation 3095 Commerce Parkway LA GRANGE KY 40031-8799	Service Type: UPS NEXT DAY AIR	Shipment Service Charge:	\$ 17.28
	Total Packages: 1 Hundredweight: No Billable Wt.: LTR Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750145360045	Package Service Charge:	\$ 17.28
	Package Type: UPS Letter	Shipper Amt:	\$ 17.28
		UPS Total Charge*:	\$ 17.28
Ship To: Deirdre K. Hirner IL Environmental Regulatory Group 3150 Roland Ave. SPRINGFIELD IL 62703	Service Type: UPS GROUND	Shipment Service Charge:	\$ 3.93
	Total Packages: 1 Hundredweight: No Billable Wt.: 1.0 Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750343581655	Package Service Charge:	\$ 3.93
	Package Type: Package	Shipper Amt:	\$ 3.93
	Weight: 1.0	UPS Total Charge*:	\$ 3.93
Ship To: Julie Armitage IL Environmental Protection Agency Bureau of Air 1021 North Grand Ave., East SPRINGFIELD IL 62794-9276	Service Type: UPS GROUND	Shipment Service Charge:	\$ 3.93
	Total Packages: 1 Hundredweight: No Billable Wt.: 1.0 Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750344879467	Package Service Charge:	\$ 3.93
	Package Type: Package	Shipper Amt:	\$ 3.93
	Weight: 1.0	UPS Total Charge*:	\$ 3.93
Ship To: Mr. Mike Diehdriksen Illinois Dept. of Natural Resources Office of Water Resources Division of Water Resources Mgmtmt One Natural Resources Way SPRINGFIELD IL 62702-1270	Service Type: UPS GROUND	Shipment Service Charge:	\$ 3.93
	Total Packages: 1 Hundredweight: No Billable Wt.: 1.0 Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750345257476	Package Service Charge:	\$ 3.93
	Package Type: Package	Shipper Amt:	\$ 3.93
	Weight: 1.0	UPS Total Charge*:	\$ 3.93
Ship To: Fiscal Svcs Section, Receipts #2 IL Environmental Protection Agency 1021 North Grand Ave., East SPRINGFIELD IL 62794-9276	Service Type: UPS GROUND	Shipment Service Charge:	\$ 3.93
	Total Packages: 1 Hundredweight: No Billable Wt.: 1.0 Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750345399680	Package Service Charge:	\$ 3.93
	Package Type: Package	Shipper Amt:	\$ 3.93
	Weight: 1.0	UPS Total Charge*:	\$ 3.93
Ship To: Dynegy Midwest Generation 22228 Network Place CHICAGO IL 60673-1222	Service Type: UPS GROUND	Shipment Service Charge:	\$ 4.02
	Total Packages: 1 Hundredweight: No Billable Wt.: 1.0 Billing Option: Prepaid		
	Tracking No.: 1ZV9W9750345270095	Package Service Charge:	\$ 4.02
	Package Type: Package	Shipper Amt:	\$ 4.02
	Weight: 1.0	UPS Total Charge*:	\$ 4.02

bc: J.G.Dodson, w/o att – Hennepin Station
J.P.Augspols w/att. - Hennepin Station
~~T.L.Davis~~/Hennepin PS Dam Inspection Reports, w/att., Decatur
Rick Diericx Reading File - Decatur

Dam Inspection Report

Name of Dam Hennepin PS, East Ash Surface Impoundment **Dam ID No.** IL 50363

Permit Number DS2004119 **Class of Dam** III

Location NE 1/4 Section 26 Township 33N Range 2W of 3rd PM

Owner Dynegy Midwest Generation 815-339-9210
Name **Telephone Number (Day)**

RR1, Box 200 AA 815-339-9215
Street **Telephone Number (Night)**

Hennepin, IL 61327 County Putnam
City **Zip Code**

Type of Dam Homogeneous Earth Dam with clay and geosynthetic/clay liner

Type of Spillway Drop structure and stop logs

Date(s) Inspected March 29, 2010

Weather When Inspected Sunny

Temperature When Inspected 60 degrees F

Pool Elevation When Inspected Primary 481.5, Secondary 479.6

Tailwater Elevation When Inspected NA

Inspection Personnel:

<u>Kenneth M Berry, P.E.</u>	<u>Sr Proj Engr (URS)</u>
Name	Title
<u>Phil L. Morris, P.E.</u>	<u>Environmental Professional</u>
Name	Title
<u>John Augspols</u>	<u>Plant Engineer</u>
Name	Title

Professional Engineer's Seal	Name	Title
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The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act. 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams."

CONDITION CODES

- NE - No evidence of a problem**
 - GC - Good condition**
 - MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled**
 - IM - Item needing immediate maintenance to restore or ensure its safety or integrity**
 - EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam**
 - OB - Condition requires regular observation to ensure that the condition does not become worse**
 - NA - Not applicable to this dam**
 - NI - Not inspected -list the reason for non-inspection under deficiencies**
-

All Condition Codes will be listed with the following abbreviations:

P = Primary Cell

S = Secondary (polishing) Cell

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	NE	NA	
Upstream Face Slope Protection	NA	NA	No slope protection
Seepage	NE	NA	
Filter and Filter Drains	NA	NA	No evidence of internal filters or drains

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	GC	NA	
Vegetative Cover	NE	NA	
Other (Name)	NA		
Other -	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment/ Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contraction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

Drop Inlet Spillway
 Overflow Spillway Structure
 Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Structure to Embankment Junction	NI	Underwater	
Drains	NA	NA	
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY

(Continued)

x Drop Inlet Spillway Overflow Spillway Structure Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NA	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA	
Bridge and Piers	NE	NA	
Differential Settlement	NE	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Joint Separation	NI	NA	
Seepage Around of Into Conduit	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	
Trash Racks	NA	NA	
Differential Settlement	NI	Underwater	
Alignment	NI	Underwater	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

Principal Spillway

Dewatering

Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill (Stoplogs)	NI	Underwater	
Gate Seals (Stoplogs)	NI	Underwater	
Gate and Frame (Stoplogs)	GC	NA	
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE*	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

x Outlet Works

Principal Spillway
Type:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Structure to Embankment Junction	NE	NA	
Construction Joints	NE	NA	
Surface Cracks	NE	NA	
Structural Cracks	NI	Underwater	
Differential Alignment	NE	NA	
Expansion and Contraction Joints	NI	Underwater	

ENERGY DISSIPATOR
(Continued)

Principal Spillway

Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NE	NA	
Outlet Channel	NE	NA	
Debris	NE	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

Earth

Other: Name _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs, Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR
REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION March 29, 2010

DATE OF LAST INSPECTION March 19, 2009

1. EARTH EMBANKMENT DAMS

Minor erosion repairs, mowing, tree cutting, and general maintenance have been performed.

2. CONCRETE MASONRY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 **MILES.**

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential			SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED	
0 to 1/4	0	0	0	0	0	0	0	0	0	0	0	0	x			x			
1/4 to 1/2																			
1/2 to 3/4																			
3/4 to 1																			
1 to 1 1/4																			
1 1/4 to 1 1/2																			
1 1/2 to 1 3/4																			
1 3/4 to 2																			
OVER 2																			

The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, Ted Lindenbusch, owner of Hennepin PS East Ash Surface Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
am maintaining the dam in accordance with the accepted maintenance plan
which is part of Permit Number DS2004119.

Signature

Date

Owner's Operation and Maintenance Plan Statement

I, Ted Lindenbusch, owner of Hennepin PS East Ash Surface Impoundment dam,
Dam Identification Number IL 50363, in Putnam County,
have reviewed the operation and maintenance plan including the Emergency
Action Plan (EAP), which is part of Permit Number DS2004119.

- I have enclosed the appropriate revisions or
- have determined that no revisions to the plan are necessary.

Signature

Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 IL CS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams."

Dam Inspection Report

Name of Dam Hennepin PS, West Ash Surface Impoundment Dam ID No. N/A

Permit Number N/A Class of Dam N/A

Location NE Section Township Range

Owner Dynegy Midwest Generation 815-339-9210
Name Telephone Number (Day)

RR1, Box 200 AA 815-339-9215
Street Telephone Number (Night)

Hennepin, IL 61327 County Putnam
City Zip Code

Type of Dam Homogeneous Earth Dam

Type of Spillway Drop structure

Date(s) Inspected March 29, 2010

Weather When Inspected Sunny

Temperature When Inspected 60 degrees F

Pool Elevation When Inspected Unknown

Tailwater Elevation When Inspected NA

Inspection Personnel:

Kenneth M Berry, P.E. Sr Proj Engr (URS)
Name Title

Phil L. Morris, P.E. Environmental Professional
Name Title

John Augspols Plant Engineer
Name Title

Professional Engineer's Seal Name Title



CONDITION CODES

- NE - No evidence of a problem**
 - GC - Good condition**
 - MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled**
 - IM - Item needing immediate maintenance to restore or ensure its safety or integrity**
 - EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam**
 - OB - Condition requires regular observation to ensure that the condition does not become worse**
 - NA - Not applicable to this dam**
 - NI - Not inspected -list the reason for non-inspection under deficiencies**
-

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NI	Underwater	
Sloughing or Erosion of Embankment and Abutment Slopes	OB/MM	Vegetation was high and thick – limited ability to observe.	Sporadic riverbank erosion observed towards the south. Recommend placement of rip rap to repair.
Upstream Face Slope Protection	OB	Vegetation was high and thick, so not able to observe.	Cut vegetation and observe.
Seepage	NE	Mostly underwater	
Filter and Filter Drains	NA	NA	

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	NE	NA	
Vegetative Cover	MM	High vegetation and Sporadic trees	Cut vegetation on interior to facilitate inspection and limit roots. Do not cut trees on river bank since they provide erosion protection from the river.
Other (Name)	NA		
Other --	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment! Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contraction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

x Drop Inlet Spillway Overflow Spillway Structure Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	High vegetation	
Structure to Embankment Junction	NI	High vegetation	
Drains	NA	NA	
Seepage Around or Into Structure	NI	High vegetation	
Surface Cracks	NI	High vegetation	
Structural Cracks	NI	High vegetation	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY

(Continued)

x Drop Inlet Spillway Overflow Spillway Structure Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NA	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA	
Bridge and Piers	NA	NA	
Differential Settlement	NA	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit

Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	Inaccessible	
Joint Separation	NI	Inaccessible	
Seepage Around of Into Conduit	NI	Inaccessible	
Surface Cracks	NI	Inaccessible	
Structural Cracks	NI	Inaccessible	
Trash Racks	NA	NA	
Differential Settlement	NI	Inaccessible	
Alignment	NI	Inaccessible	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

Chufe

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

Principal Spillway

Dewatering

Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NA		
Gate Seals	NA		
Gate and Frame	NA		
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE'	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

Principal Spillway
Type:

Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

Principal Spillway

Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NA		
Outlet Channel	NA		
Debris	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

Earth

Other: Name _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs. Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR
REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION March 29, 2010

DATE OF LAST INSPECTION March 19, 2009

1. EARTH EMBANKMENT DAMS

Unknown.

2. CONCRETE MASONARY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

**DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 MILES.**

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential			SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM	
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED		
0 to 1/4	0	0	0	0	0	0	0	0	0	0	0	0	0	x						
1/4 to 1/2																				
1/2 to 3/4																				
3/4 to 1																				
1 to 1 1/4																				
1 1/4 to 1 1/2																				
1 1/2 to 1 3/4																				
1 3/4 to 2																				
OVER 2																				

The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, Ted Lindenbusch, owner of Hennepin PS West Ash Surface Impoundment dam,
Dam Identification Number _____, in Putnam County,
am maintaining the dam in accordance with the accepted maintenance plan
which is part of Permit Number _____.

Signature

Date

Owner's Operation and Maintenance Plan Statement

I, Ted Lindenbusch, owner of Hennepin PS West Ash Surface Impoundment dam,
Dam Identification Number _____, in Putnam County,
have reviewed the operation and maintenance plan including the Emergency
Action Plan (EAP), which is part of Permit Number _____.

- I have enclosed the appropriate revisions or
- have determined that no revisions to the plan are necessary.

Signature

Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.100 of the "Rules for Construction and Maintenance of Dams."

APPENDIX E
PHOTOGRAPHS



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
1

Date:
5/23/11

Direction Photo Taken:
Northeast

Description:
Downstream slope of the West Ash Pond System (WAPS) Impoundment.



Photo No.
2

Date:
5/23/11

Direction Photo Taken:
South

Description:
Downstream slope of the WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
3

Date:
5/23/11

Direction Photo
Taken:
North

Description:
Downstream slope of the
WAPS.



Photo No.
4

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Downstream slope of the
WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
5

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Downstream slope of the
WAPS.



Photo No.
6

Date:
5/23/11

Direction Photo
Taken:
North

Description:
Crest and downstream slope
of the WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
7

Date:
5/23/11

Direction Photo
Taken:
North

Description:
Crest and downstream slope
of the WAPS.



Photo No.
8

Date:
5/23/11

Direction Photo
Taken:
West

Description:
Crest and downstream slope
of the WAPS.





Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30
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Photo No. 9	Date: 5/23/11
Direction Photo Taken: Southwest	

Description:
Downstream slope of the WAPS.



Photo No. 10	Date: 5/23/11
Direction Photo Taken: Southwest	

Description:
Downstream slope of the WAPS.





Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30
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Photo No. 11	Date: 5/23/11
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Direction Photo Taken:
Southwest

Description:
Downstream slope of the WAPS.



Photo No. 12	Date: 5/23/11
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Direction Photo Taken:
Southeast

Description:
Downstream slope of the WAPS.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
13

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Downstream slope of the
WAPS.



Photo No.
14

Date:
5/23/11

Direction Photo
Taken:
North

Description:
Toe access road along the
eastern portion of the
WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
15

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest of the WAPS.

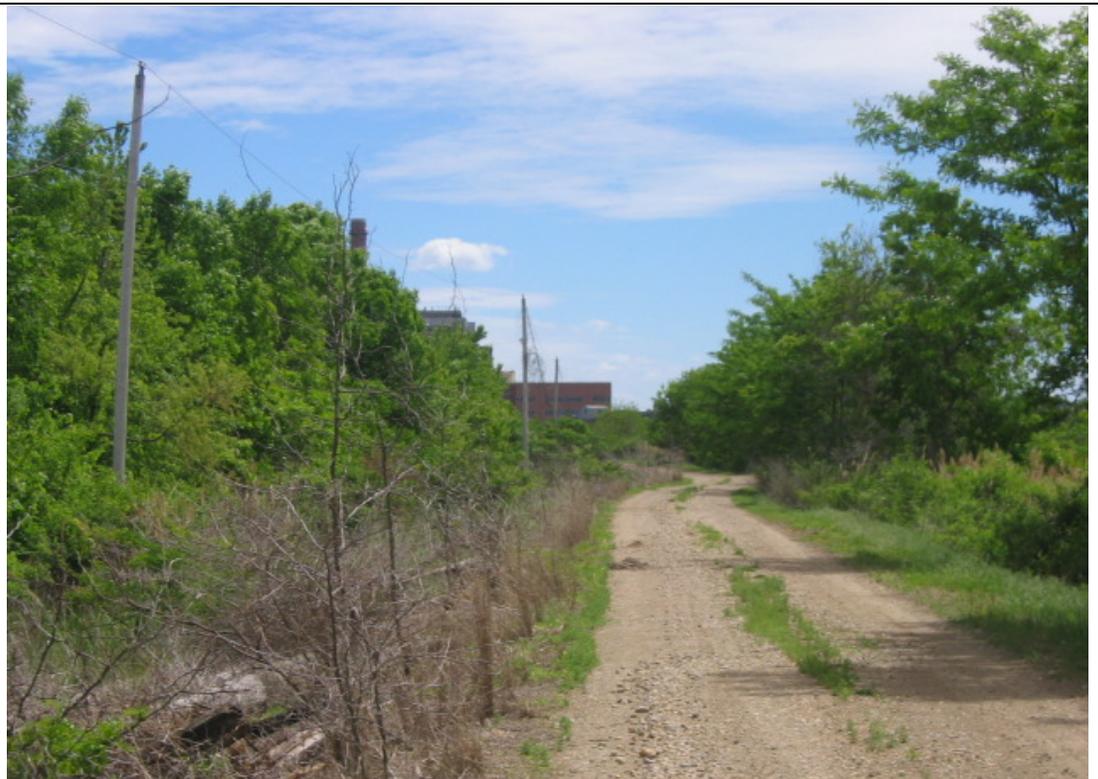


Photo No.
16

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
17

Date:
5/23/11

Direction Photo
Taken:
West

Description:
Crest of the WAPS.



Photo No.
18

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Crest and upstream slope of
the WAPS.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
19

Date:
5/23/11

Direction Photo
Taken:
West

Description:
Crest and upstream slope of
the WAPS.



Photo No.
20

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest and upstream slope of
the WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
21

Date:
5/23/11

Direction Photo
Taken:
South

Description:
Decant structure in the
WAPS.



Photo No.
22

Date:
5/23/11

Direction Photo
Taken:
Southeast

Description:
Decant structure in the
WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
23

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:

Discharge pipe from the
WAPS into the Illinois
River.



Photo No.
24

Date:
5/23/11

Direction Photo
Taken:
West

Description:

Upstream slope and ponded
water in the WAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
25

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Downstream slope of the
EAPS.



Photo No.
26

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Downstream slope of the
EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
27

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the 1978
embankment and
downstream slope of the
1995 embankment along the
EAPS.



Photo No.
28

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the 1978
embankment and
downstream slope of the
1995 embankment along the
EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
29

Date:
5/23/11

Direction Photo
Taken:
East

Description:

Crest of the 1978
embankment and
downstream slope of the
1995 embankment near Pond
2E.



Photo No.
30

Date:
5/23/11

Direction Photo
Taken:
North

Description:

Downstream slope of Pond
2E.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
31

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Downstream slope of Pond
2E along crest of the 1978
embankment.



Photo No.
32

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest of the EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
33

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest and upstream slope of
the EAPS.



Photo No.
34

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest and upstream slope of
the EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
35

Date:
5/23/11

Direction Photo
Taken:
South

Description:

Crest of embankment
between the EAPS and Pond
2E.



Photo No.
36

Date:
5/23/11

Direction Photo
Taken:
East

Description:

Crest and upstream slope of
Pond 2E.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30
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Photo No. 37	Date: 5/23/11
Direction Photo Taken: Southeast	

Description:
Crest and upstream slope of Pond 2E.



Photo No. 38	Date: 5/23/11
Direction Photo Taken: West	

Description:
Crest of the embankment between Pond 2E and Secondary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
39

Date:
5/23/11

Direction Photo
Taken:
Southeast

Description:
Crest and upstream slope of
the Secondary Cell.



Photo No.
40

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest and upstream slope of
the Secondary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
41

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Crest and upstream slope of
the Secondary Cell.



Photo No.
42

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Crest and upstream slope of
the Secondary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
43

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:

Crest of the embankment
between Pond 2E and the
Secondary Cell.



Photo No.
44

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:

Upstream slope of the EAPS.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
45

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest and upstream slope of
the Primary Cell.



Photo No.
46

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Upstream slope of the
Primary Cell.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
47

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Upstream slope of the
Primary Cell.



Photo No.
48

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Upstream slope of the
Primary Cell near the decant
structure.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
49

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest and upstream slope of
the Primary Cell.



Photo No.
50

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Crest and upstream slope of
the Primary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
51

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:
Upstream slope of the
Primary Cell.



Photo No.
52

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Crest and upstream slope of
the Primary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
53

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Crest and upstream slope of
the Primary Cell.



Photo No.
54

Date:
5/23/11

Direction Photo
Taken:
West

Description:
Downstream slope of the
EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
55

Date:
5/23/11

Direction Photo
Taken:
West

Description:

Crest and downstream slope
of the EAPS.



Photo No.
56

Date:
5/23/11

Direction Photo
Taken:
West

Description:

Downstream slope of the
EAPS.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
57

Date:
5/23/11

Direction Photo
Taken:
Northwest

Description:
Downstream slope of the
EAPS.



Photo No.
58

Date:
5/23/11

Direction Photo
Taken:
North

Description:
Discharge pipe into the
northwest portion of the
Primary Cell.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
59

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Old decant structure in the
Primary Cell.



Photo No.
60

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Discharge pipe into the
Primary Cell near the
northeast corner.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
61

Date:
5/23/11

Direction Photo
Taken:
East

Description:
Decant structure in the
Primary Cell.



Photo No.
62

Date:
5/23/11

Direction Photo
Taken:
Southeast

Description:
Discharge pipe from the
Primary Cell to Pond 2E.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
63

Date:
5/23/11

Direction Photo
Taken:
South

Description:
Decant structure in the
Secondary Cell.



Photo No.
64

Date:
5/23/11

Direction Photo
Taken:
Down

Description:
Decant structure in the
Secondary Cell.





Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30
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Photo No. 65	Date: 5/23/11
Direction Photo Taken: Southwest	

Description:
Surface features of the flume structure in the discharge line from the Secondary Cell to the Illinois River.



Photo No. 66	Date: 5/23/11
Direction Photo Taken: Down	

Description:
Flume structure in the discharge line from the Secondary Cell to the Illinois River.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
67

Date:
5/23/11

Direction Photo
Taken:
West

Description:

Crest of the interior
embankment in the AEAPS
with the Pond 2E decant
structure shown.



Photo No.
68

Date:
5/23/11

Direction Photo
Taken:
Southwest

Description:

Outfall at the Illinois River.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
69

Date:
5/23/11

Direction Photo
Taken:
Southeast

Description:
Downstream slope of EAPS
near Pond 4.



Photo No.
70

Date:
5/23/11

Direction Photo
Taken:
South

Description:
Downstream slope of the
EAPS near Pond 4.





Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
71

Date:
5/23/11

Direction Photo
Taken:
Southeast

Description:
Crest of the EAPS near Pond
4.



Photo No.
72

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the EAPS near Pond
4.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hennepin Power Station
Hennepin, Illinois

Project No.
01.0170142.30

Photo No.
73

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the EAPS looking
over the Primary Cell.



Photo No.
74

Date:
5/23/11

Direction Photo
Taken:
Northeast

Description:
Crest of the EAPS near Pond
4.



APPENDIX F

REFERENCES

REFERENCE LIST HENNEPIN POWER STATION

Civil & Environmental Consultants, Inc. "Application for a Permit to Construct a New Leachate and Storm Water Runoff Collection Pond, Dynegy-Hennepin Power Station Hennepin, Illinois". Date July 2009.

Civil & Environmental Consultants, Inc. "Pond 2 East Construction Completion Report, Hennepin Power Station, Hennepin, Putnam County, Illinois". Date December 2010.

Sargent & Lundy Engineers. "Roadways at Plant Site, General Location Plan, Hennepin, Power Station, Illinois Power Company, Hennepin, Illinois," Drawing No.B-9. Dated March 27, 1953.

Sargent & Lundy Engineers. "Roadways at Plant Site, General Location Plan, Hennepin, Power Station, Illinois Power Company, Hennepin, Illinois," Drawing No.B-11. Dated March 27, 1953.

Illinois Power Company. "Hennepin Power Station Ash Surface Impoundment Hydrologic/Hydraulic Analysis" Dated September 1994.

Illinois Power Company. "Hennepin Power Station Ash Surface Impoundment Geotechnical/Structural Design" Dated September 1994.

Illinois Power Company, Decatur. "West Ash Pond Topographic Survey, Hennepin Power Station." Drawing No. E-HEN1-B451. Dated September 29, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B452. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B453. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B454. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B455. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B456. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B457. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-1. Dated January 11, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-2. Dated January 12, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-3. Dated January 12, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-4. Dated January 12, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-5. Dated January 12, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-6. Dated January 12, 1989.

Illinois Power Company, Decatur. "Cross Sections, East Ash Pond Extension" Hennepin Station." Drawing No. CE-HEN1-B458-7. Dated January 12, 1989.

Illinois Power Company, Decatur. "East Ash Pond Topographic Survey, Hennepin Power Station." Drawing No. E-HEN1-B450. Dated September 27, 1987.

Illinois Power Company, Decatur. "Area Site Plan, Hennepin Power Station." Drawing No. CE-HEN1-C4. Dated January 10, 1994.

Illinois Power Company, Decatur. "Survey Plan Ash Impoundment", Hennepin Station." Drawing No. CE-HEN1-C5.1. Dated September 20 1994.

Illinois Power Company, Decatur. "Survey Plan Ash Impoundment", Hennepin Station." Drawing No. CE-HEN1-C5.2. Dated September 20 1994.

Illinois Power Company, Decatur. "Survey Plan Ash Impoundment", Hennepin Station." Drawing No. CE-HEN1-C5.3. Dated September 20 1994.

Illinois Power Company, Decatur. "Cross Sections, 1995 Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7-1. Dated October 12, 1993.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.9. Dated October 5, 1994.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.10. Dated October 5, 1994.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.12. Dated July 21, 1994.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.12A. Dated July 24, 1994.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.12B. Dated July 24, 1994.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.15. Dated October 10, 1993.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.16. Dated October 12, 1993.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.17. Dated October 12, 1993.

Illinois Power Company, Decatur. "Plan and Ash Pond Cross Section, Proposed Ash Facility", Hennepin Station." Drawing No. CE-HEN1-C7.18. Dated October 12, 1993.