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Coal Combustion Waste Impoundment

Round 7 - Dam Assessment Report

Burlington Generating Station (Site 017)

Fly Ash Impoundment Dikes
Alliant Energy
Burlington, Iowa

Prepared for:

United States Environmental Protection Agency
Office of Resource Conservation and Recovery

Prepared by:

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INTRODUCTION, SUMMARY CONCLUSIONS AND RECOMMENDATIONS

The release of over five million cubic yards from the Tennessee Valley Authority's Kingston, Tennessee facility in December 2008, which flooded more than 300 acres of land, damaging homes and property, is a wake-up call for diligence on coal combustion waste disposal units. We must marshal our best efforts to prevent such catastrophic failure and damage. A first step toward this goal is to assess the stability and functionality of the ash impoundments and other units, then quickly take any needed corrective measures.

This assessment of the stability and functionality of the Burlington Generating Station Fly Ash management units is based on a review of available documents and on the site assessment conducted by Dewberry personnel on Thursday, October 7, 2010 .We found the supporting technical documentation lacking critical information (Section 1.1.3). Sections 1.2.1, 1.2.2 and 1.2.3 provide recommendations for providing the critical technical documentation required to upgrade the fly ash management units from POOR to SATISFACTORY. As detailed in Section 1.2.6, there are three recommendations based on field observations that may help to maintain a safe and trouble-free operation.

In summary, the embankments of the Burlington Generating Station fly ash management units are **POOR** for continued safe and reliable operation, with no recognized existing or potential management unity safety deficiencies.

PURPOSE AND SCOPE

The U.S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of Coal Combustion Surface Impoundments (i.e., management unit) from occurring at electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impounded slurry. The EPA initiative is intended to identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures (if present); to note the extent of deterioration (if present), status of maintenance and/or a need for immediate repair; to evaluate conformity with current design and construction practices; and to determine the hazard potential classification for units not currently classified by the management unit owner or by a state or federal agency. The initiative will address management units that are classified as having a Less-than-Low, Low, Significant or High Hazard Potential ranking. (For Classification, see pp. 3-8 of the 2004 Federal Guidelines for Dam Safety)

In February 2009, the EPA sent letters to coal-fired electric utilities seeking information on the safety of surface impoundments and similar facilities that receive liquid-borne material that store or dispose of coal combustion waste. This letter was issued under the authority of the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e), to assist the Agency in assessing the structural stability and functionality of such management units, including which facilities should be visited to perform a safety assessment of the berms, dikes, and dams used in the construction of these impoundments.

EPA requested that utility companies identify all management units including surface impoundments or similar diked or bermed management units or management units designated as landfills that receive liquid-borne material used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. Utility companies provided information on the size, design, age and the amount of material placed in the units. The EPA used the information received from the utilities to determine preliminarily which management units had or potentially could have High Hazard Potential ranking.

The purpose of this report is **to evaluate the condition and potential of waste release from management units that have not been rated for hazard potential classification**. This evaluation included a site visit. Prior to conducting the site visit, a two-person team reviewed the information submitted to EPA, reviewed any relevant publicly available information from state or federal agencies regarding the unit hazard potential classification (if any) and accepted information provided via telephone communication with the management unit owner. Also, after the field visit, additional information was received by Dewberry & Davis LLC about the Burlington Generating Station fly ash management units that were reviewed and used in preparation of this report.

Factors considered in determining the hazard potential classification of the management units(s) included the age and size of the impoundment, the quantity of coal combustion residuals or by-products that were stored or disposed of in these impoundments, its past operating history, and its geographic location relative to down gradient population centers and/or sensitive environmental systems.

This report presents the opinion of the assessment team as to the potential of catastrophic failure and reports on the condition of the management unit(s).

LIMITATIONS

The assessment of dam safety reported herein is based on field observations and review of readily available information provided by the owner/operator of the subject coal combustion waste management unit(s). Qualified Dewberry engineering personnel performed the field observations and review and made the assessment in conformance with the required scope of work and in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is made with regard to our assessment of dam safety.

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1.0 CONCLUSIONS AND RECOMMENDATIONS

1.1 CONCLUSIONS

Conclusions are based on visual observations from a one-day site visit, Thursday October 7, 2010, and review of technical documentation provided by Alliant Energy.

1.1.1 Conclusions Regarding the Structural Soundness of the Management Unit(s)

Based on the lack of documentation of critical engineering data to verify design slope stability analyses, the structural soundness of the management units is considered to be POOR.

1.1.2 Conclusions Regarding the Hydrologic/Hydraulic Safety of the Management Unit(s)

Based on the lack of documentation of critical hydrologic/hydraulic data to verify adequate impoundment capacity to prevent overtopping, the hydrologic/hydraulic soundness of the management units is considered to be POOR.

1.1.3 Conclusions Regarding the Adequacy of Supporting Technical Documentation

The supporting technical documentation is inadequate. Technical documentation lacks critical engineering analyses to slope stability of the dikes. The supporting technical documentation also lacks critical hydrologic/hydraulic analyses of the capacity on the impoundments to store the design precipitation event.

1.1.4 Conclusions Regarding the Description of the Management Unit(s)

The description of the management units provided by Alliant Energy was an accurate representation of what Dewberry observed in the field.

1.1.5 Conclusions Regarding the Field Observations

Dewberry staff was provided access to all areas in the vicinity of the management units required to conduct a thorough field observation. The visible parts of the embankment dikes and outlet structures were observed to have no signs of overstress, significant settlement, shear failure, or other signs of instability, although visual observations were hampered by the presence of thick vegetation in some areas.

The Ash Pond 2 dike and outlet structure were inundated by flood water from the Mississippi River at the time of Dewberry's sit visit. The flood water prevented Dewberry from observing the Ash Pond 2 dike and outlet structure.

The observed embankments appear to be structurally sound. There are no apparent indications of unsafe conditions or needed remedial actions.

1.1.6 Conclusions Regarding the Adequacy of Maintenance and Methods of Operation

The current maintenance and methods of operation appear to be adequate. Other than evidence of a recent rehabilitation of the Ash Pond 1 dike to repair wave erosion damage, and installation of a slurry wall at the Ash Seal Pond in 2007 there was no evidence of other significant repairs. There was no evidence of releases observed during the field inspection.

1.1.7 Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

The surveillance program appears to be adequate. Dikes forming the management units are not instrumented. Installation of a dike instrumentation program are not warranted at this time, based on the size of the dikes, the portion of the impoundments currently used to store wet ash and storm water runoff, the history of satisfactory performance, and the ongoing current inspection program.

1.1.8 Classification Regarding Suitability for Continued Safe and Reliable Operation

The facility is POOR for continued safe and reliable operation. The classification is due to the lack of critical documentation of engineering analyses verifying slope stability safety factors for the dikes of the management units, and hydrologic/hydraulic analyses verifying the capacity of the management units to handles the design precipitation event without overtopping the dikes.

1.2 RECOMMENDATIONS

1.2.1 Recommendations Regarding the Structural Stability

Although observations made during the site visit do not indicate signs of overstress, significant settlement, shear failure, or other signs of instability, the structural stability of the ponds cannot be evaluated without reviewing the results of engineering analyses of the slope stability factors of safety under various loading conditions. It is recommended that if the original design analyses cannot be located, a new geotechnical engineering evaluation be conducted. The new geotechnical engineering evaluation should be based on current standards, including seismic loading conditions.

1.2.2 Recommendations Regarding the Hydrologic/Hydraulic Safety

Although observations made during the site visits and discussions with the participants did not indicate that impoundment dikes, except for Ash Pond 2, have not been overtopped in previous storms that produced flooding in the Mississippi River, the hydrologic/hydraulic safety of the impoundments cannot be evaluated without reviewing hydrologic/hydraulic analyses of the management units. It is recommended that if the original hydrologic/hydraulic analyses cannot be located, a new engineering evaluation be conducted. The new hydrologic/hydraulic analyses should be based on current design criteria for design storm events.

1.2.3 Recommendations Regarding the Supporting Technical Documentation

Continued efforts to locate the original slope stability design and hydrologic/hydraulic documentation are recommended. If the original documentation cannot be located within a reasonable period of time, a new geotechnical evaluation and hydrologic/hydraulic study are recommended to verify the embankment has an acceptable factor of safety for all anticipated loading conditions, including seismic loading, and that the impoundments, other than Ash Pond 2, can store the design precipitation event without overtopping.

If new analyses are conducted, the slope stability and hydrologic/hydraulic studies should integrate with the impacts of periodic overtopping of the Ash Pond 2 dike by flood waters from the Mississippi.

1.2.4 Recommendations Regarding the Description of the Management Unit(s)

No recommendations appear warranted at this time.

1.2.5 Recommendations Regarding the Field Observations

No recommendations appear warranted at this time.

1.2.6 Recommendations Regarding the Maintenance and Methods of Operation

Although the maintenance program appears to be adequate, the following recommendations should improve maintenance and ensure trouble-free operation:

- Develop a written operations and maintenance plan
- Clear tall vegetation from the crest of the Bottom Ash Dikes
- Remove trees from the downstream slopes of the Ash Seal Pond and Bottom Ash Pond dikes.

1.2.7 Recommendations Regarding the Surveillance and Monitoring Program

No recommendations appear warranted at this time.

1.2.8 Recommendations Regarding Continued Safe and Reliable Operation

No recommendations appear warranted at this time.

1.3 PARTICIPANTS AND ACKNOWLEDGEMENT

1.3.1 List of Participants

William P. Skalitzky, Alliant Energy
Buddy Hansen, Alliant Energy
Robin Nelson, Alliant Energy
Mark Hoskins, P.E., Dewberry
Joseph P. Klein, III, P.E., Dewberry

1.3.2 Acknowledgement and Signature

We acknowledge that the management units for the Burlington Generating Station referenced herein were assessed on October 29, 2010

Mark Hoskins, P.E. (IA #19301)

Joseph P. Klein, III, P.E.

2.0 DESCRIPTION OF THE COAL COMBUSTION WASTE MANAGEMENT UNIT(S)

2.1 LOCATION AND GENERAL DESCRIPTION

The Burlington Generating Station is located on the west bank of the Mississippi River, approximately 5 miles south of Burlington, Iowa (See Appendix A – Document 1). The plant is operated by Alliant Energy. The fly ash management system consists of five impoundments. The impoundment locations are shown in Figure 2.1-1.

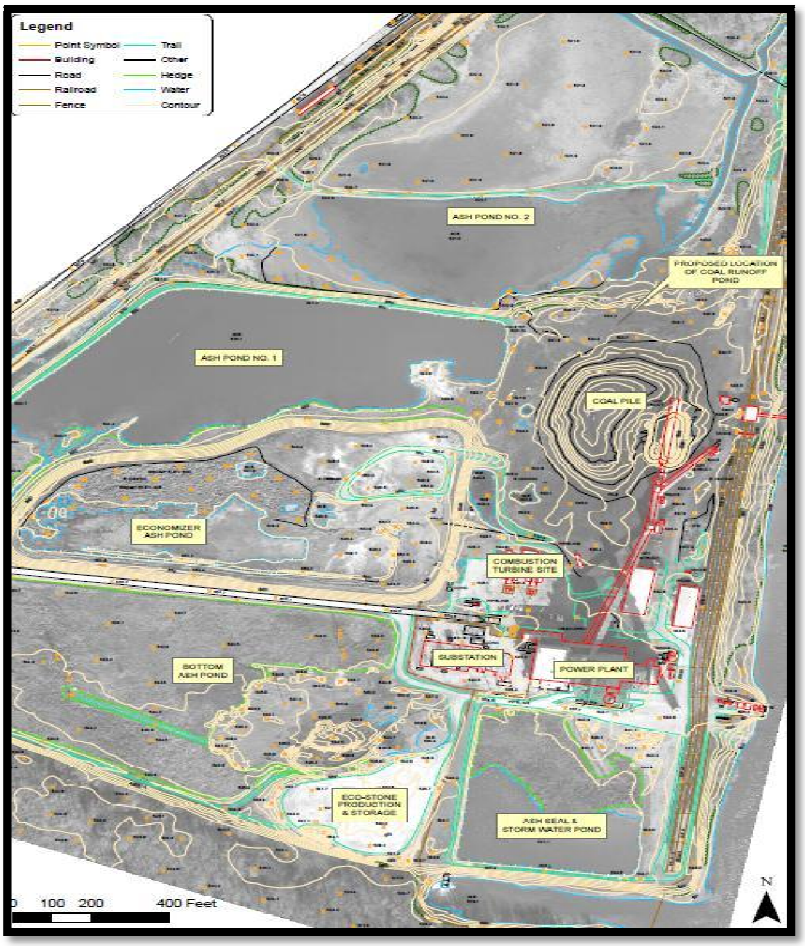


Figure 2.1-1: Burlington Generating Station Site Plan

The impoundment names indicated on the Site Plan are, in some cases, different than used in other technical documents. A cross-walk of impoundment names used on the site plan and other technical documents is provided in Table 2.1a. As plant personnel use the

Site Plan impoundment names, this report also uses the impoundment names indicated on the site plan.

Table 2.1a Coal Combustion Waste Impoundment Reference Names					
Site Plan	Ash Seal Pond	Bottom Ash Pond	Economizer Ash Pond	Ash Pond 1	Ash Pond 2
Technical Documents	Ash Seal Pond	Main Ash Pond	Economizer Ash Pond	Upper Ash Pond	Lower Ash Pond

The Ash Seal Pond was designed in the 1960s by Black & Veatch Consulting Engineers. The Ash Seal Pond was constructed as part of the general site fill placed to form the plant building pad (See Appendix A – Document 2). Design information for the other ponds was not provided to Dewberry for review.

Pond-related Information provided indicated that Ash Ponds 1 and 2 were commissioned in 1971 and the Main Ash Pond commissioned in 1980. The Economizer Ash Pond was commissioned in 1986 and appears to have been formed by dividing Ash Pond 1 into two sections with an interior dike. (See Appendix A – Document 3).

The Ash Seal Pond has a spillway riser that discharges to a canal that empties into the Mississippi River on the east site of the plant. The Main Ash Pond and Economizer Ash Pond each discharge to Ash Pond 1 which discharges to Ash Pond 2. Ash Pond 2 discharges to an open drainage way flowing to the Mississippi River. An aerial photograph of the plant site and impoundments is provided in Appendix A – Document 4.

Table 2.1b: Summary of Dam Dimensions and Size[1]					
	Ash Seal Pond	**Bottom Ash Pond**	**Economizer Ash Pond**	**Ash Pond 1**	**Ash Pond 2**
Dam Height (ft)	15	5	10	5	3
Crest Width (ft)	21[2]	10	15	12[3]	N/A[4]
Length (ft)	550	2,100	1,400	2,100	700
Side Slopes (upstream) H:V	*Data Not Available (DNA)*				
Side Slopes (downstream) H:V	3:1	3:1	3:1	5:1	DNA

[1] Based on Site Plan Drawing (Figure 2.1-1)
[2] *Burlington Generating Station Berm/Seep Investigation,* Hard Hat Services, August 31, 2007 (See Appendix A –Document 5)
[3] *Upper Ash Pond 2009 Work Summary,* Klingner & assoc., July 4, 2010 (See Appendix A – Document 6)
[4] Lower Ash Pond dike was inundated by flooding from the Mississippi River at the time of Dewberry's site inspection.

2.2 SIZE AND HAZARD CLASSIFICATION

The classification for size, based on the height of the embankment and the impoundment storage, of each impoundment is "Small" based on the U.S. Army Corps of Engineers (USACE) Recommended Guidelines for Safety Inspection of Dams ER 1110-26 criteria summarized in Table 2.2.2.

Table 2.2a: USACE ER 1110-2-106 Size Classification

Category	Impoundment	
	Storage (Ac-ft)	Height (ft)
Small	50 and < 1,000	25 and < 40
Intermediate	1,000 and < 50,000	40 and < 100
Large	> 50,000	> 100

Dewberry conducted a qualitative hazard classification based on the Federal Guidelines for Dam Safety, dated April, 2004. The hazard assessment classifications are summarized on Table 2.2.b

Table 2.2b: FEMA Federal Guidelines for Dam Safety Hazard Classification

	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None Expected	Low and generally limited to owner
Significant	None Expected	Yes
High	Probable. One or more expected	Yes (but not necessary for classification)

There are no residences within 2 miles down-gradient of the fly-ash impoundments. Based on dike heights ranging from 3 to 15 feet and the impoundments location on the edge of the Mississippi River or contributory drainage ways, the failure or misoperation of the dikes is not expected to result in the loss of human life. The economic impact is expected to be limited to the cost of removing released fly ash from portions of the Mississippi River and short stretches of contributing tributaries forming the boundary of the plant.

Based on the relatively small size of the impoundments, and no loss of life or significant economic damages are expected in the event of a failure or misoperation

of the impoundments, Dewberry evaluated **each ash impoundment as "LOW hazard potential".**

2.3 AMOUNT AND TYPE OF RESIDUALS CURRENTLY CONTAINED IN THE UNIT(S) AND MAXIMUM CAPACITY

Materials stored in the Ash Seal Pond include fly ash; bottom ash; economizer ash; boiler seal water; boiler water wash; storm water runoff from the plant site; storm water runoff from the hydrated fly ash (product name C-Stone, or Eco-Stone) storage pile, and plant floor drains (See Appendix A – Document 6).

Material stored in the Bottom Ash Pond include fly ash; bottom ash; ash transport water; boiler water wash; air heater wash (fly ash); storm water runoff from the plant site; storm water runoff from the hydrated fly ash (market name C-Stone, or Eco-Stone) storage pile, and plant floor drains (See Appendix A – Document 6).

Materials stored in the Economizer Ash Pond include fly ash; bottom ash; economizer ash; boiler water wash; air heater wash (fly ash); steam grade production wastewaters; storm water runoff from the plant site; storm water runoff from the hydrated fly ash (market name C-Stone, or Eco-Stone) storage pile; plant floor drains; Solids Contacts Units sludge for the treatment of Mississippi River Water; coal pile runoff, and boiler blowdown (See Appendix A – Document 6).

Materials stored in Ash Ponds 1 and 2 include fly ash; bottom ash; economizer ash; boiler water wash; air heater wash (contains fly ash); steam grade production wastewaters; storm water runoff from the plant site; storm water runoff from the hydrated fly ash (market name C-Stone, or Eco-Stone) storage pile; plant floor drains; Solids Contacts Units sludge for the treatment of Mississippi River Water; coal pile runoff, and boiler blowdown (See Appendix A – Document 6).

Information on the surface area and storage capacity, and elevation for each pond is summarized in Table 2.3.

Table 2.3: Maximum Capacity of Unit					
Ash Pond Name	**Ash Seal Pond**	**Bottom Ash Pond**	**Economizer Ash Pond**	**Ash Pond 1**	**Ash Pond 2**
Surface Area (acre)[1]	4.5	17.0	11.0	13.3	22.9
Current Storage Capacity (cubic yards)[1]	73,389	110,000	249,405	107,000	110,000
Current Storage Capacity (acre-feet)	45.9	68.2	154.6	66.3	68.2
Total Storage Capacity (cubic yards)[1]	110,083	137,214	267,219	215,000	184,000
Total Storage Capacity (acre-feet)	68.2	85.1	165.8	133.1	114.4
Crest Elevation (feet)	533.7	533.8	540	530	527.7
Normal Pond Level (feet)[2]	531.1	530.3	NA	529.1	521.5

[1] Data taken from Alliant Energy May 22, 2010 letter to EPA (See Appendix A – Document 6)
[2] Data taken from Site Plan with Elevations (See Appendix A – Document 3)

2.4 PRINCIPAL PROJECT STRUCTURES

2.4.1 Earth Embankments

Ash Seal Pond - was constructed at the south end of the plant building pad (Appendix A – Document 2) in the mid- to late-1960s. The Ash Seal Pond was constructed by extending fill to form two parallel dikes extending approximately 550 feet south from the main fill pad. The impoundment was enclosed by a 500 foot long east-west dike at the south end. The embankment forming the east dike is part of the main building pad and supports three parallel railroad tracks and a vehicle access drive. The south embankment crest width is approximately 21 feet. The west embankment original crest width originally was about 15 feet, but appears to have been widened in conjunction with construction of the abutting Bottom Ash Pond.

Bottom Ash Pond - was constructed in the late 1970s by impounding the area on the west side of the Ash Seal Pond. The Bottom Ash Pond was formed by constructing an approximately 2,100 ft. "L" shaped dike abutting the Ash Seal Pond and the main plant access road embankment in the southeast and northwest corner of the Bottom Ash Pond, respectively (Appendix A - Document 3). The Bottom Ash Pond crest width is approximately 10 feet.

Ash Pond 1 - was constructed in the late 1960s and early 1970s by impounding the area on the north side of the main plant access road. Ash

Pond 1 was formed by constructing an approximately 2,100 ft. "L" shaped dike abutting the main plant access road and the plant fill pad in the southwest and northeast corners of Ash Pond 1, respectively (Appendix Document 3). The Ash Pond 1 dike crest width is approximately 12 feet.

Ash Pond 2 - was also constructed in the late 1960s and early 1970s by impounding the area adjacent to and north of Ash Pond 1. (Appendix A - Document 3). Ash Pond 2 was formed by construction of a 700-ft. long dike between the embankment carrying the plant railroad tracks along the Mississippi River and the main line railroad embankment to the west of the plant (Appendix A – Document 3).

Economizer Ash Pond - was constructed in the mid 1980s by dividing Ash Pond 1 into two sections. The Economizer Ash Pond is the southern portion of the original Ash Pond 1. The Economizer Ash Pond was formed by the construction of a diagonal dike from the abutting the main plant access road and the plant fill pad at in the southwest and northeast potions of Ash Pond 1, respectively (Appendix Document 3). The east abutment of the Economizer Ash Pond is located approximately 400 feet south of the Ash Pond 1 abutment. The Economizer Pond west abutment is approximately 300 ft. east of the Ash Pond 1 abutment. The crest width of the Economizer Ash Pond is approximately 15 feet.

2.4.2 Outlet Structures

The *Ash Seal Pond* primary outlet consists of a metal pipe riser with an invert elevation of approximately 531 ft. The spillway discharge is piped through the south dike and discharges into the adjacent drainage canal which discharges directly into the Mississippi River.

The *Bottom Ash Pond* primary outlet consists of two 18-inch diameter corrugated metal pipes located in the northwest corner of the impoundment. The pipes carry water through the main plant access road embankment into Ash Pond 1.

The *Economizer Ash Pond* primary outlet consists of two 18-inch diameter concrete pipes located in the southwest corner of the impoundment. The pipes carry water through the Economizer Ash Pond dike into Ash Pond 1.

The *Ash Pond 1* primary outlet is a riser located in the northeast corner of the impoundment. The outlet discharges into Ash Pond 2. The Ash Pond

1 spillway was submerged at the time of Dewberry's site visit, preventing observation of the spillway configuration.

The *Ash Pond 2* spillway outlet is located in the northeast corner of the impoundment. The outlet discharges into the Mississippi River. The Ash Pond 2 spillway was submerged at the time of Dewberry's site visit, preventing observation of the spillway configuration.

2.5 CRITICAL INFRASTRUCTURE WITHIN FIVE MILES DOWN GRADIENT

Critical infrastructure information was not provided to Dewberry for review.

Based on the available topographic maps (See Appendix A –Document 7) surface drainage at the plant is toward the ash pond network which drains to the Mississippi River through the Ash Seal Pond and Ash Pond 2. Based on available aerial photographs (See Appendix A – Document 4) and a brief driving tour of the area, Dewberry did not identify critical infrastructure assets within 5 miles down gradient of the fly ash ponds.

There is a main railroad line along the west side and cross gradient to the Bottom Ash, Ash Pond 1 and Ash Pond 2 impoundments. Based on the heights of the dikes along the western boundaries of those impoundments and the presences of a substantial drainage ditch between the dikes and the railroad, it is not expected that a failure of a western dike would have a significant impact on the neighboring railroad. Figure 2.5- 1 shows the railroad tracks relative to the west boundary of Ash Pond 1. The Ash Pond 1 dike has a height of approximately 5 feet.

Figure 2.5-1: Railroad Right of Way along West Boundary of Ash Pond 1.

3.0 SUMMARY OF RELEVANT REPORTS, PERMITS, AND INCIDENTS

Alliant Energy provided a pond inspection report conducted by plant personnel on March 4, 2009 (See Appendix A - Document 8). The report identified several issues concerning each impoundment. The issues were generally associated with signs of animal activity on the dike slopes, and trees and other woody type vegetation growing on the slopes.

Other issues identified in the inspection report include:

- Build up of settled ash near dike walls or discharge structure in the Economizer Ash Pond
- Visual seeps through the dike wall, erosion of dike on outside slope, and ponding water outside the dike wall of Ash Pond 1

The inspection report (See Appendix A - Document 8) included three recommendations

- Repair damage to Ash Pond 1 caused by animal activity.
- Dredge the Economizer Pond to restore capacity
- Remove trees from dikes.

Documentation provided to Dewberry for review indicated that the impoundments have not been rated by federal or state regulatory agencies and safety inspections by federal or state agencies have been neither conducted nor planned.

3.1 SUMMARY OF LOCAL, STATE, AND FEDERAL ENVIRONMENTAL PERMITS.

Water discharge from the Burlington Generating Station is regulated by the Iowa Department of Natural Resources (DNR). Iowa DNR has issued a National Pollutant Discharge Elimination System (NPDES) Permit, Iowa permit number 2900101 (See Appendix A – Document 9). The permit was issued on September 5, 2006 and expires on September 4, 2011.

The NPDES permit includes six outfalls:

- 001 – Discharge from Ash Pond Treatment System
- 002 – Discharge from plant septic tank and wastewater treatment system

- 004 – Condenser cooling water, non-contact cooling water and water intake screen backwash
- 005 – Discharge of chemical metal cleanings wastes
- 006 – Discharge from Ash Seal Pond
- 007 – Discharge from Coal Pile Runoff Retention Pond

The NPDES permit does not include an outfall designated 003.

The Ash Seal Pond discharges to a drainage canal along the south dike. The canal flows directly into the Mississippi River. The Bottom Ash Pond and Economize Ash Pond discharge into Ash Pond 1 which discharges into Ash Pond 2. Ash Pond 2 discharges into the Mississippi River. (See Appendix A – Document 10).

3.2 SUMMARY OF SPILL/RELEASE INCIDENTS

Data reviewed by Dewberry did not indicate any spills, unpermitted releases, or other performance problems with the embankments over the last 10 years.

4.0 SUMMARY OF HISTORY OF CONSTRUCTION AND OPERATION

4.1 SUMMARY OF CONSTRUCTION HISTORY

4.1.1 Original Construction

The Burlington Generating Station Ash Seal Pond was designed in the mid-1960s by Black & Veatch Consulting Engineers. The Ash Seal Pond was formed as part of the site original plant construction site preparation, which included construction of a fill pad for the plant (See Appendix A – Document 2).

The other impoundments were added to the coal combustion waste management system between 1971 and 1980. The sequence of construction for the additional ponds was (See Appendix A – Document 6):

- Ash Pond 1 and Ash Pond 2 – commissioned 1971
- Bottom Ash Pond – commissioned 1980
- Economizer Ash Pond – commissioned 1986.

4.1.2 Significant Changes/Modifications in Design since Original Construction

Data provided to Dewberry for review indicated the Economizer Ash Pond was modified in 1990 and 1992. Specific information on the scope of the modifications was not provided.

The other impoundments have not been significantly changed or modified since their original construction.

4.1.3 Significant Repairs/Rehabilitation since Original Construction

Documentation provided to Dewberry for review included engineering data pertaining to repairs of dikes at the Ash Seal Pond and Ash Pond 1.

In the summer of 2007 a geotechnical investigation was conducted along the south dike of the Ash Seal Pond in response to apparent embankment seepage identified by plant personnel. The geotechnical investigation included soil test borings, soil strength tests conducted in the field, ground water level measurements and slope stability analyses (Appendix A – Document 5). The investigation concluded that the calculated slope

stability safety factor of 1.5 was adequate to "support the typical loads from normal site operations at the facility". The investigation also concluded that the shallow seeps were the result of sand seams in the clay fill used to construct the embankment.

In response to recommendations included in the geotechnical report, a 275-ft. long, approximately 8-ft. deep slurry cut-off wall was designed (Appendix A – Document 11) and constructed (Appendix A – Document 12) at the eastern end of the Ash Seal Pond south dike.

In early 2010, the Ash Pond 1 dike underwent rehabilitation to correct the effects of wave erosion. The rehabilitation included excavation of the damaged areas; importing clay to regarded the levee crest and upstream slope; placing a geotextile membrane on the new subgrade, placing riprap along the upstream slope, and placing crushed stone on the crest (Appendix A – Document 13).

Documentation provided suggests that a similar rehabilitation was planned for Ash Pond 2 (Appendix A – Document 14). As the Ash Pond 2 dike was inundated by flood waters from the Mississippi River at the time of Dewberry's site inspection, verification that the work had been completed was not possible.

4.2 SUMMARY OF OPERATIONAL PROCEDURES

4.2.1 Original Operational Procedures

The *Ash Seal Pond*, commissioned in 1968, was the initial coal combustion waste management unit at the Burlington Generating Station. The Ash Seal Pond stored wet fly ash, wet bottom ash, process water from various plant sources and storm runoff from the south end of the plant. Decant water from the Ash Seal Pond discharges to a drainage canal abutting the south dike. The drainage canal discharges directly into the Mississippi River.

Ash Ponds 1 and 2, commissioned in 1971, stored wet fly ash, wet bottom ash, wet economizer ash, process water from various plant sources, coal pile runoff and storm runoff from the north end of the plant. Ash Pond 1 was the primary settlement pond and Ash Pond 2 was used to provide additional settlement time prior to discharge to the Mississippi River.

The *Bottom Ash Pond*, commissioned in 1980, to store fly ash, bottom as, process water from various plant sources, and runoff from the hydrated ash (product name C-Stone) storage pile.

The *Economizer Ash Pond*, commissioned in 1986, stored wet fly ash, wet bottom ash, wet economizer ash, process water from various plant sources, coal pile runoff and storm runoff from the north end of the plant.

Decant water from the Bottom Ash and Economizer Ash Ponds are routed to Ash Pond 1 and then to Ash Pond 2.

4.2.2 Significant Changes in Operational Procedures and Original Startup

Documentation provided to Dewberry for review indicated that the operational procedures of the Economizer Ash Pond were modified in 1990 and 1992 (Appendix A – Document 6). Information provided during the Dewberry's site visit indicated that the Economizer Ash Pond began to be used primarily to store dry ash. Wet ash was sluiced to a sump in the northeast corner of the Economizer Ash Pond. Perimeter ditches conducted decant water along the interior perimeter to a spillway at the southwest corner of the impoundment for discharge to Ash Pond 1. The majority of the Economizer Ash Pond footprint became used for storage of dry ash.

4.2.3 Current Operational Procedures

No significant changes in operational procedures have been made to the Ash Seal Pond, Bottom Ash Pond, Ash Pond 1 or Ash Pond 2 since the commissioning of the ponds.

No significant changes in operational procedures have been made to the Economizer Pond since 1992.

4.2.4 Other Notable Events since Original Startup

No additional information was provided to Dewberry concerning other notable events impacting operation of the Ash Seal Pond, Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1 or Ash Pond 2.

5.0 FIELD OBSERVATIONS

5.1 PROJECT OVERVIEW AND SIGNIFICANT FINDINGS

Dewberry personnel Mark Hoskins, P.E. and Joseph P. Klein, III, P.E. performed a site visit on Thursday October 7, 2010 in company with the participants listed in Section 1.3.

The site visit began at 8:00 AM. The weather was sunny and warm. Photographs were taken of conditions observed. Please refer to photographs in Appendix B and the Dam Inspection Checklist forms in Appendix C. Selected photographs are included here for ease of visual reference. All pictures were taken by Dewberry personnel during the site visit.

Based on the observations during the site visit no significant findings were noted. The site observations did not include the Ash Pond 2 dike which was inundated by flood water from the Mississippi River at the time of the site visit.

5.2 ASH SEAL POND

5.2.1 Crest

The north boundary of the Ash Seal Pond is formed by the south end of the plant fill pad, making the crest part the main plant site.

The east boundary of the Ash Seal Pond is formed by an embankment having a crest that supports a wide grassy area, a gravel covered vehicle roadway and three lines of railroad tracks. The crest had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Figure 5.2.1-1 shows the Ash Seal Pond east dike crest.

The Ash Seal Pond south dike crest is paved with a gravel surface roadway. The crest had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Figure 5.2.1-2 shows the Ash Seal Pond south dike crest.

Figure 5.2.1-1: Ash Seal Pond East Dike Crest

Figure 5.2.1-2: Ash Seal Pond South Dike Crest

The Ash Seal Pond west dike is also the west edge of the plant fill pad. The crest is covered with grass and gravel surface roadway for vehicle access. The crest had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Figure 5.2.1-3 shows the Ash Seal Pond west dike crest.

Figure 5.2.1-3: Ash Seal Pond West Dike Crest and Inside Slope.

5.2.2 Upstream/Inside Slope

The inside slopes of the Ash Seal Pond dikes are vegetated with various species of grass and weeds. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figure 5.2.2-1 shows typical vegetation conditions of the inside slopes of Ash Seal Pond embankments.

Figure 5.2.2-1: Ash Seal Pond Typical Inside Slope Vegetation Cover

5.2.3 Downstream/Outside Slope and Toe

The Ash Pond north boundary is the south edge of the plant fill pad with no outside slope impacting the impoundment. Similarly, the width of the east dike is such that the outside slope does not impact the 15 ft. high impoundment.

The outside slope of the Ash Seal Pond south dike is vegetated with grass and weeds near the crest and small to medium trees beginning a short distance below the crest. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figure 5.2.3-1 shows the outside slope of the Ash Seal Pond south dike.

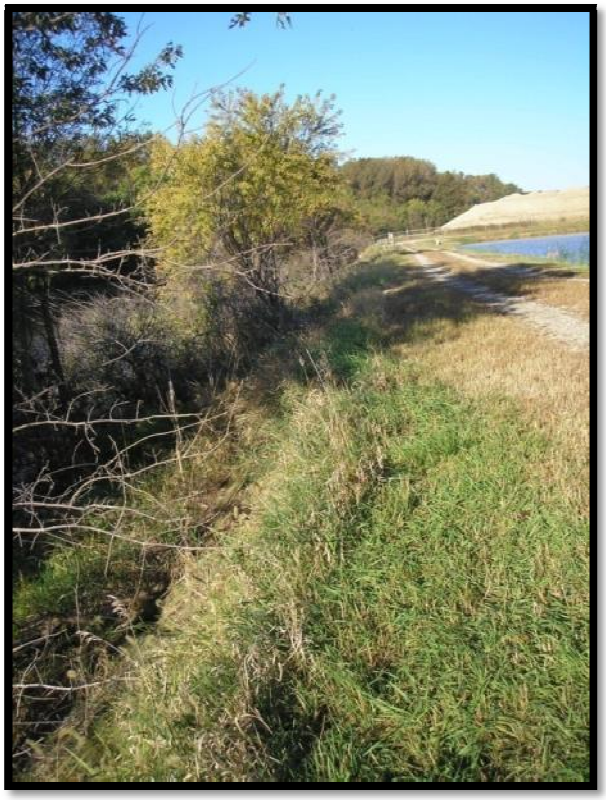


Figure 5.2.3-1: Ash Seal Pond South Dike Outside Slope

The Ash Seal Pond south dike is bordered by a drainage canal that empties directly into the Mississippi River. At the time of Dewberry's site visit, flooding of the Mississippi River raised the water level in the canal to reach the toe of the outside slope of the dike. Figure 5.2.3-2 shows the canal against the slope of the embankment.

Figure 5.2.3-2: Ash Seal Pond South Dike: Canal High Water against Toe of Outside Slope

The area adjacent to the outside slope of the Ash Seal Pond west dike had been filled to serve as Eco-Stone (local product name for hydrated fly ash) storage. The Eco-Stone pile at the outside slope of the Ash Seal Pond west dike is shown in Figure 5.2.3-3.

Figure 5.2.3-3: Eco-Stone Storage Pile over Outside Slope Ash Seal Pond West Dike

5.2.4 Abutments and Groin Areas

The Ash Seal Pond is a diked impoundment formed by fill on four sides; therefore there are no abutments. Neither erosion nor uncontrolled seepage was observed along the groins. Groin slopes are protected with the same vegetative cover as the adjoining slopes. Figure 5.2.4-1 shows typical conditions observed at inside groins.

Figure 5.2.4-1: Ash Seal Pond Inside Groin at Southeast Corner

5.3 BOTTOM ASH POND

5.3.1 Crest

The north boundary of the Bottom Ash Pond is the fill embankment constructed as part of the structural site preparation work. The embankment was originally constructed as the traffic access road to the plant. The crest is paved with rigid concrete pavement. The crest had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Photograph 5.3.1-1 shows the Bottom Ash north dike crest.

Figure 5.3.1-1: Bottom Ash Pond North Dike Crest

The Bottom Ash Pond east dike is also the west dike of the Ash Seal Pond. Dewberry's observations of the crest of that dike are presented in Section 5.2.1.

The crest of the Bottom Ash Pond south dike is heavily vegetated with weeds and swamp vegetation, much of which in over 6-ft. high making observation of surface conditions problematic. Figure 5.3.1-2 shows the conditions over much of the crest of the Bottom Ash Pond south dike.

Figure 5.3.1-2: Bottom Ash Pond South Dike Crest.

Similar vegetative conditions were observed at the Bottom Ash Pond west dike, except at the northern end of the dike. Figure 5.3.1-3 shows conditions at the northern end of the Bottom Ash Pond west dike. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability where observations were possible.

Figure 5.3.1-3: Bottom Ash Pond North End of West Dike

5.3.2 Upstream/Inside Slope

The upstream slope of the Bottom Ash Pond north dike is vegetated with grass, except near the normal pool elevation. Near the normal pool elevation vegetation consisted of small trees and bushes. Figure 5.3.2-1 shows conditions along the upstream slope of the Bottom Ash Pond north dike.

Figure 5.3.2-1: Bottom Ash Pond North Dike - Upstream Slope on Left Side of Photo

The upstream slope of the Bottom Ash Pond east dike is the downstream slope of the Ash Seal Pond west dike. Dry fly ash (product name Eco Stone) is stored along the downstream slope of the Bottom Ash Pond east dike to an elevation above the dike crest. Figure 5.3.2.-2 shows the area along the Bottom Ash Pond east dike upstream slope.

Figure 5.3.2-2: Dry Fly Ash Storage Pile on Bottom Ash East Dike Upstream Slope

The upstream slopes of the Bottom Ash Pond south and west dikes were generally vegetated with marsh grasses, bamboo and small trees. Figure 5.3.2-3 shows conditions typical of the upstream slope of the west dike.

Figure 5.3.2-3: Bottom Ash Pond Upstream Slopes South and West Dikes

5.3.3 Downstream/Outside Slope and Toe

The downstream slope of the Bottom Ash Pond north dike is the upstream slope of the Economizer Ash Pond south dike. Fly ash stored in the Economizer Ash Pond is above the crest elevation of the Bottom Ash Pond north dike so that the downstream slope is not visible. In Figure 5.3.2-1 the embankment on the right side of the photograph is the downstream side of the Bottom Ash Pond north dike.

The downstream slope of the Bottom Ash Pond east dike is the upstream slope of the Ash Seal Pond west dike which is vegetated with grass. Figure 5.2.3-3 shows the Bottom Ash Pond east dike downstream slope on the left side of the photograph.

The downstream slope of the Bottom Ash Pond south dike was vegetated with tall grass and weeds, and small bushes. Figure 5.3.3-1 shows typical conditions of the downstream slope of the Bottom Ash south dike.

Figure 5.3.3-1: Bottom Ash Pond Downstream Slope South Dike

Flooding of the Ash Seal Pond discharge canal resulted in a back-up of the canal to along the toe of the Bottom Ash Pond south dike downstream slope. Figure 5.3.3-2 shows the canal water along the slope toe.

Figure 5.3.3-2: Bottom Ash Pond South Embankment: Discharge Canal Flooding back-up to Downstream Slope Toe

The downstream slope of the Bottom Ash Pond west slope is vegetated with tall plants and small trees. Figure 5.3.3-3 shows conditions along the Bottom Ash Pond west dike downstream embankment. No areas of seepage were observed along the toe of the downstream slope.

Figure 5.3.3-3: Bottom Ash Pond West Dike Downstream Slope

5.3.4 Abutments and Groin Areas

The documentation provided to Dewberry for review indicates the Bottom Ash Pond was impounded by constructing the south and west dikes to abut the north and east dikes which were constructed as part of the original structural site preparation.

Neither erosion nor seepage was observed along the groins or abutments. Groin slopes are protected with the same vegetation cover as the adjoining slopes. Figure 5.3.2-2 shows the upstream groin between the Bottom Ash Pond south and west dikes.

5.4 ECONOMIZER ASH POND

5.4.1 Crest

The crest of the Economizer Ash Pond had no signs of significant depressions, tension cracks or other indications of settlements or shear failure. The crest is gravel covered to provide access for service vehicles. Figure 5.4.4-1 shows typical crest conditions.

Figure 5.4.4-1: Economizer Ash Pond Crest and Upstream Slope

5.4.2 Upstream/Inside Slope

The upstream slope of the Economizer Ash Pond is vegetated with various species of grass and weeds. Figure 5.4.4-1 shows the upstream slope of the Economizer Ash Pond. The upstream slope is shown in the left side of the photograph.

5.4.3 Downstream/Outside Slope and Toe

The downstream slope of the Economizer Ash Pond forms the southern boundary of Ash Pond 1. Above the water line the slope is vegetated with grass, weeds and small trees.

The toe of the Economizer Ash Pond dike downstream slope was below the Ash Pond 1 water level and was not observed.

5.4.4 Abutments and Groin Areas

The Economizer Ash Pond east abutment area was filled with dry fly ash. As the west abutment was the location of the gravity discharge to Ash Pond 1, standing water was present. Figure 5.4.4-2 shows standing water at the western abutment of the Economizer Ash Pond dike.

Figure 5.4.4-2: Economizer Ash Pond West Abutment and Pipe Spillway Invert

5.5 ASH POND 1

5.5.1 Crest

The crest Ash Pond 1 dike had no significant depressions, tension cracks or other indications of settlements or shear failure. The crest of Ash Pond 1 dike is gravel paved for service vehicle access, see Figure 5.5.1-1.

Figure 5.5.1-1: Ash Pond 1 Crest at Southwest End

5.5.2 Upstream/Inside Slope

The upstream slope of the Ash Pond 1 dike was protected by crushed stone riprap. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figure 5.5.2-1 shows a representative section of the upstream slope of the embankment.

Figure 5.5.2-1: Ash Pond 1 Embankment
Upstream Slope

5.5.3 Downstream/Outside Slope and Toe

At the east and center portion of Ash Pond 1 the downstream slope is the southern boundary of Ash Pond 2. Above the Ash Pond 2 water level the downstream slope of the embankment is vegetated with small weeds. Figure 5.5.3-1 shows the conditions of the eastern and central portion of Ash Pond 1 dike downstream slope. Ash Pond 2 is on the right side of the photograph.

Figure 5.5.3-1: Ash Pond 1 Dike Eastern and Central Section Downstream Slope

The western portion of the Ash Pond 1 dike is bordered by a railroad drainage ditch. Figure 5.5.3-2 shows the conditions along the western portion of the dike downstream slope.

Figure 5.5.3-2: Ash Pond 1 West Section Downstream Slope

The toe of the downstream slope along the entire length of the Ash Pond 1 dike is submerged either by Ash Pond 2 or the railroad drainage ditch.

5.5.4 Abutments and Groin Areas

No erosion was observed at the abutments or groins. No seepage was observed above the water elevation at the abutments. Potential seepage below the water level could not be observed. Figure 5.5.4-1 shows conditions at the Ash Pond 1 west abutment.

Figure 5.5.4-1: Ash Pond 1 West Abutments

5.6 ASH POND 2

5.6.1 Crest

The Ash Pond 2 dike was overtopped by flood waters from the Mississippi river. Flood flow into a drainage way on the discharge side of Ash Pond 2 was back flowing over the 3-ft. high Ash Pond 2 dike at the time of the site visit. Figure 5.6.1-1 shows the location of the ash pond dike; the elevated pipeline is supported by foundation along the ash pond 2 dike crest.

Figure 5.6.1-1: Ash Pond 2 Dike Crest Location beneath Pipe Support Columns.

5.6.2 Upstream/Inside Slope

Due to flood waters overtopping the Ash Pond 2 dike, observations of the upstream slope were not possible at the time of Dewberry's site visit.

5.6.3 Downstream/Outside Slope and Toe

Due to flood waters overtopping the Ash Pond 2 dike, observations of the downstream slope and toe were not possible at the time of Dewberry's site visit.

5.6.4 Abutments and Groins

Due to flood waters overtopping the Ash Pond 2 dike, observations of the abutments and groins slope were not possible at the time of Dewberry's site visit.

5.7 OUTLET STRUCTURES

5.7.1 Overflow Structures

The Ash Seal Pond overflow structure is located in the southwest corner of the impoundment at the intersection of the south and west dikes. The overflow structure is located in an area separated from the main pond by a low elevation interior dike that forms a secondary settling basin. At the time of Dewberry's site visit the water level in the Ash Seal Pond was below the top of the interior dike and water was not entering the spillway. Figure 5.7.1-1 shows the overflow structure.

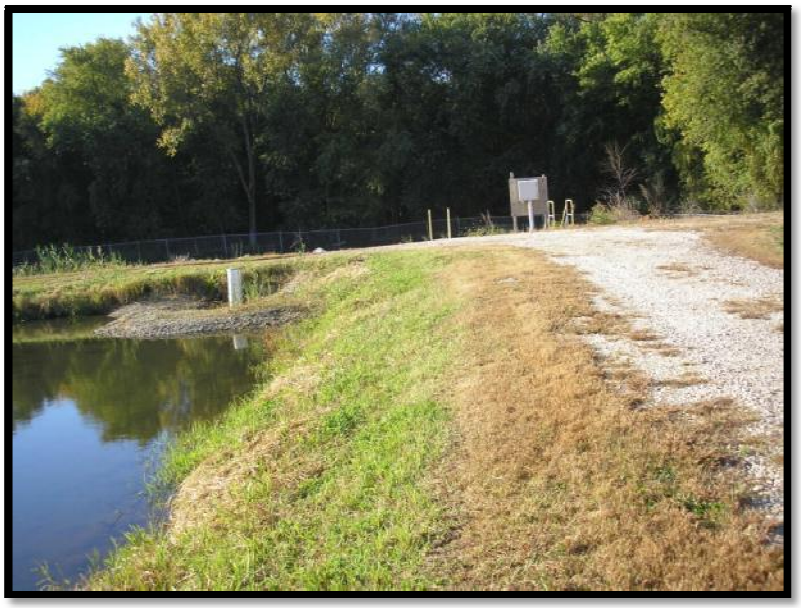


Figure 5.7.1-1: Ash Seal Pond Primary Overflow Structure

Water in the Bottom Ash Pond is routed by interior ditches to the south and west, then north to the main plant access road embankment, which also serves as the north dike of the Bottom Ash Pond. Water then flows from the Bottom Ash Pond through two 18-inch diameter corrugated metal pipes through the access road embankment. Figure 5.7.1-2 shows the Bottom Ash Pond spillway structures.

Figure 5.7.1-2: Bottom Ash Pond Primary Spillway Structure

Water in the Economizer Ash Pond is routed by interior ditches to the southwest corner of the impoundment. Water flows through an inlet structure to two 18-inch diameter concrete pipes. At the time of Dewberry's site visit the Economizer Ash Pond water level had submerged the spillway inlet. Figure 5.7.1-3 shows the Economizer Ash Pond spillway inlet location.

Figure 5.7.1-3: Economizer Ash Pond Spillway Location

The Ash Pond 1 primary spillway is located in the northeast corner of the impoundment. The spillway area is bordered by wire fencing serving as a trash rack. A manually operated screw lift stop log is used to control discharge from Ash Pond 1. Figure 5.7.1-4 shows the Ash Pond 1 spillway inlet location.

Figure 5.7.1-4: Ash Pond 1 Spillway Location

The Ash Pond 2 spillway is located in the northeastern portion of the impoundment. As floodwater from the Mississippi River had overtopped the Ash Pond 2 dike, only the top of the spillway stop log was visible during Dewberry's site inspection. Figure 5.7.1-5 shows the top of the manually operated spillway stop log device.

Figure 5.7.1-5: Ash Pond 2 Top of Spillway Stop Log Device

5.7.2 Outlet Conduit

The outlet conduit of the Ash Seal Pond discharges to a drainage canal along the south dike. At the time of Dewberry's site visit high water in the canal caused by Mississippi River flooding submerged the outlet conduit. As a result Dewberry was unable to observe the Ash Seal Pond outlet conduit.

The Bottom Ash Pond discharges into an interior drainage ditch at the southwest corner of Ash Pond 1. Figure 5.7.2-1 shows the Bottom Ash Pond spillway outlet discharge pipes.

Figure 5.7.2-1: Bottom Ash Pond Spillway Outlet Conduits

The Economizer Ash Pond spillway pipes also discharge into the interior drainage ditch at the southwest corner of Ash Pond 1. Figure 5.7.2-2 shows the Economizer Ash Pond spillway discharge pipes.

Figure 5.7.2-2: Economizer Ash Pond Spillway Outlet Conduits

The spillway outlet for Ash Pond 1 discharges into Ash Pond 2. The outlet was submerged at the time of Dewberry's site inspection and could not be observed.

The Ash Pond 2 spillway outlet conduits carry flow through an embankment along the river and discharge into for Mississippi River. The embankment is not part of the Ash Pond 2 structure. High water in the Mississippi River prevented Dewberry's observation of the Ash Pond 2 spillway outlet.

5.7.3 Emergency Spillway

None of the Burlington Generating Station ash ponds have an emergency spillway.

5.7.4 Low Level Outlet

None of the Burlington Generating Station ash ponds had a low level outlet.

6.0 HYDROLOGIC/HYDRAULIC SAFETY

6.1 SUPPORTING TECHNICAL DOCUMENTATION

6.1.1 Flood of Record

No documentation has been provided concerning the flood of record.

6.1.2 Inflow Design Flood

No documentation has been provided about the inflow design flood for the Ash Seal Pond, Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2.

6.1.3 Spillway Rating

No documentation has been provided about the Ash Seal Pond, Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2 spillway ratings.

6.1.4 Downstream Flood Analysis

No downstream flood analysis data were provided to Dewberry for review.

6.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

The technical documentation provided to Dewberry lacks critical hydrologic and hydraulic analyses data to assess the hydrologic/hydraulic safety of the Ash Seal Pond, Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2. If the original hydrologic/hydraulic calculations cannot be located, new analyses should be conducted to verify the existing impoundments have adequate capacity to prevent overtopping during the design precipitation event.

6.3 ASSESSMENT OF HYDROLOGIC/HYDRAULIC SAFETY

Based on the lack of technical documentation, the hydrologic and hydraulic safety of the Ash Seal Pond, Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2 cannot be determined and is rated POOR.

7.0 STRUCTURAL STABILITY

7.1 SUPPORTING TECHNICAL DOCUMENTATION

7.1.1 Stability Analyses and Load Cases Analyzed

Documentation of slope stability analyses for the Ash Seal Pond south dike was provided to Dewberry for review. The documentation was provided in the August 31, 2007 report *Burlington Generating Station Berm/Seep Investigation*, prepared by Hard Hat Services (See Appendix A – Document 5).

The stability analyses included only one, long-term loading condition. The report concluded that the calculated safety factor of 1.5 is adequate to support typical loads from normal site operations at the facility. The slope stability analyses lacks documentation of safety factors for impoundment rapid drawdown and seismic loading necessary to complete the assessment of slope stability structural integrity.

No stability analyses of the Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1 or Ash Pond 2 were provided to Dewberry for review.

7.1.2 Design Parameters and Dam Materials

The Ash Seal Pond stability analyses were based on parameters developed during the geotechnical investigation (see Appendix A - Document 5). The documentation indicated the stability analyses assumed three strata: soft clay, sand and firm clay. The material properties used in the analyses are shown in Table 7.1.2

Table 7.1.2: Summary of Soil Properties Used in the Stability Analyses

Soil Strata	Total Unit Weight (pounds per cubic foot)	Saturated Unit Weight (pounds per cubic foot)	Cohesion (pounds per square foot)	Friction Angle (degrees)
Soft Clay	120	120	500	0
Sand	130	130	0	30
Firm Clay	125	125	1250	0

No data pertaining to the Ash Seal Pond embankment original design parameters were provided to Dewberry for review.

No data pertaining to the embankment design for the Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1, or Ash Pond 2 was provided to Dewberry for review.

7.1.3 Uplift and/or Phreatic Surface Assumptions

The Ash Seal Pond slope stability documentation provided to Dewberry did not specifically identify uplift forces acting on the base of the dike. However, the documentation indicates the analyses were conducted using STABL5M 2-D software which includes uplift pressures in the algorithms used to compute stability factors of safety.

The phreatic surface used in the analyses used the pool elevation at the upstream slope and the level of the reported shallow seep at the downstream slope (Appendix A – Document 5).

No data pertaining to the uplift or phreatic surface assumption for the Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1, or Ash Pond 2 were provided to Dewberry for review.

7.1.4 Factors of Safety and Base Stresses

The safety factor computed in the slope stability report (Appendix A – Document 5) are listed in table 7.1.4

Table 7.1.4 Slope Stability Factors of Safety Burlington Generating Station Ash Seal Pond

Loading Condition	Required Safety Factor (U.S. Army Corps of Engineers)[1]	Ash Seal Pond
Long-Term Stability	1.5	1.5
Rapid Drawdown Stability	1.2	Not Calculated
Seismic Stability	1.2	Not Calculated

[1] U.S. Army Corps of Engineers Engineering Manual 1110-2-1903 *Slope Stability*, 31 October 2003

No data pertaining to the factor of safety of base stresses for the Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1, or Ash Pond 2 were provided to Dewberry for review

7.1.5 Liquefaction Potential

No documentation of soil liquefaction analyses was provided to Dewberry for review.

7.1.6 Critical Geological Conditions

Documentation provided for the Ash Seal Pond included a geologic cross section of the south dike. The cross section included three strata: soft clay, sand and firm clay (See Appendix A – Document 5)

No documentation of critical geologic conditions for the Bottom Ash Pond, Economizer Ash Pond, Ash Pond 1 or Ash Pond 2 was provided to Dewberry for review.

7.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

The technical documentation provided to Dewberry lacks critical engineering analyses data required to assess structural stability. Technical documentation for the Ash Seal Pond is incomplete and no technical documentation has been provided for the Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2 embankments. If the original slope stability calculations cannot be located new geotechnical engineering analyses should be conducted to verify that the existing slope stability safety factors meet or exceed acceptable standards.

7.3 ASSESSMENT OF STRUCTURAL STABILITY

Based on the lack of technical documentation, the structural stability of the Ash Seal Pond, Bottom Ash Pond, Economizer Pond, Ash Pond 1 or Ash Pond 2 is rated as POOR.

8.0 ADEQUACY OF MAINTENANCE AND METHODS OF OPERATION

8.1 OPERATING PROCEDURES

The Ash Seal Pond is operated for the storage of wet fly ash, bottom ash and economizer ash as well as water from other plant sources including boiler seal water, boiler wash water, storm runoff from the plant site, storm runoff from the C-Stone (product name for hydrated fly ash) storage pile, and plant floor drains (See Appendix A – Document 6). Decant water flows to the primary spillway located in the southwest corner of the impoundment. A low dike around the spillway riser provides another settling basin prior to water entering the spillway. Figure 8.1-1 shows the location of the low interior dike and the primary spillway entrance.

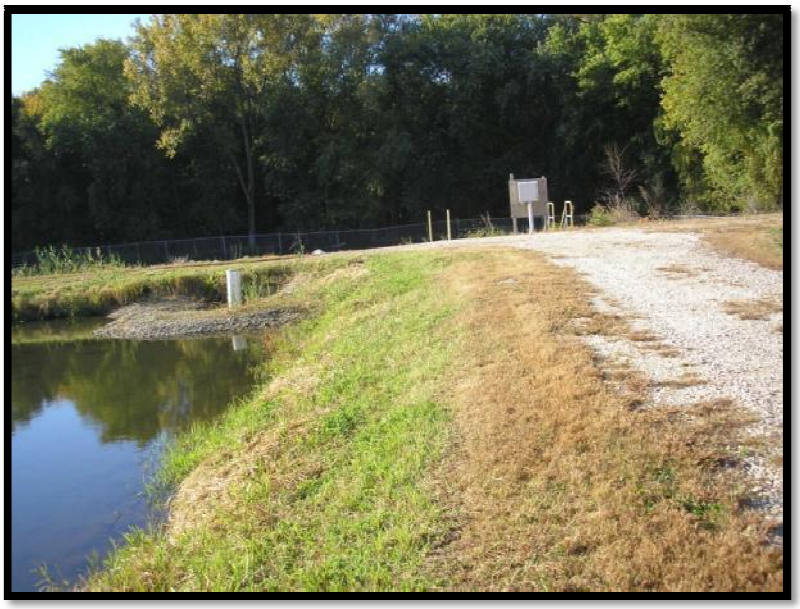


Figure 8.1-1: Ash Seal Pond Interior Low Dike and Spillway Riser

The Bottom Ash Pond is operated to store fly ash; bottom ash; ash transport water; boiler wash water; air heater wash; storm runoff from the plant site; storm runoff for C-Stone Storage Pile and plant floor drains (See Appendix A – Doc 6).Water collected in the Bottom Ash Pond is routed through interior drainage ditches to the northwest corner of the impoundment where is flows through a spillway consisting of two 18-inch diameter corrugated metal pipes beneath the main plant access road embankment into Ash Pond 1. Figure 8.1-2 shows the spillway inlet.

Figure 8.1-2: Bottom Ash Pond Primary Spillway Inlet

The Economized Ash Pond is operated to store fly ash; bottom ash; economizer ash; ash transport water; boiler wash water; air heater water; steam grade water production wastewater; storm runoff from plant site; storm water runoff from C-Stone Storage Pile; plant floor drains; Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff, and boiler blowdown (See Appendix A – Document 6). Water in the Economizer Ash Pond is routed to the south and west with interior perimeter ditches to the southwest corner of the impoundment. The water flows through two 18-inch diameter concrete pipes beneath the Economizer Ash Pond dike discharging into an Ash Pond 1 interior drainage ditch. Figure 8.1-3 shows the Economizer Ash Pond spillway inlet.

Figure 8.1-3: Economizer Ash Pond Spillway Inlet

Ash Pond 1 is operated to store fly ash; bottom ash; economizer ash; ash transport water; boiler wash water; air heater water; steam grade water production wastewater; storm runoff from plant site; storm water runoff from C-Stone Storage Pile; plant floor drains; Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff, and boiler blowdown (See Appendix A – Document 6). Ash Pond 1 decant water flows to the primary spillway located in the northeast corner of the impoundment. Figure 8.1-4 shows the location of the low interior dike and the primary spillway entrance.

Figure 8.1-4: Ash Pond 1 Primary Spillway Riser

Ash Pond 2 is operated to store fly ash; bottom ash; economizer ash; ash transport water; boiler wash water; air heater water; steam grade water production wastewater; storm runoff from plant site; storm water runoff from C-Stone Storage Pile; plant floor drains; Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff, and boiler blowdown (See Appendix A – Document 6). Ash Pond 2 Decant water flows to the primary spillway located in the northeast corner of the impoundment. The spillway structure was inundated at the time of Dewberry's site visit preventing and could not be observed.

8.2 MAINTENANCE OF THE DAM AND PROJECT FACILITIES

Documentation of an operations and maintenance plan was not provided to Dewberry for review.

During the site visit the crests of the Ash Seal Pond, Economizer Ash Pond and Ash Pond 1 were generally clear of vegetation except for occasional short grass along the edge of the crests. The crest of the south and west dikes of the Bottom Ash Pond were heavily vegetated with tall weeds and bamboo over 6-feet tall. At the time of Dewberry's site visit the crest of Ash Pond 2 dike was inundated by flood water from the Mississippi River and could not be observed.

The downstream slopes of the Ash Seal Pond and Bottom Ash Pond were vegetated with tall weeds and small to medium trees. The downstream slope of the Economizer Pond was vegetated with various species of tall grass and weeds. The downstream slope of Ash Pond 1 is covered by course crushed stone with occasional weeds. At the time of Dewberry's site visit the Ash Pond 2 dike was inundated by flood water from the Mississippi River and could not be observed.

8.3 ASSESSMENT OF MAINTENANCE AND METHODS OF OPERATIONS

8.3.1 Adequacy of Operating Procedures

Based on the assessments of this report, operating procedures appear to be adequate.

8.3.2 Adequacy of Maintenance

Although the current maintenance program appears to be adequate for the Economizer Ash Pond and Ash Pond 1, several recommendations are provided to improve maintenance and ensure a trouble free operation:

- Develop a written operations and maintenance plan
- Clear tall vegetation from the crest of the Bottom Ash Dikes
- Remove trees from the downstream slopes of the Ash Seal Pond and Bottom Ash Pond dikes.

9.0 ADEQUACY OF SURVEILLANCE AND MONITORING PROGRAM

9.1 SURVEILLANCE PROCEDURES

Surveillance procedures are specified in the Alliant Energy "Genco Standard Guide for Pond Inspections, Procedure No. GENCO-0-OP-402-01" dated April 30, 2009 (See Appendix A – Document 15). The program requirements include:

- Inspections by knowledgeable plant personnel at intervals determined based on physical construction and arrangement, and local operating conditions, including spring snow melt and flooding. Inspections must be conducted at least annually.
- Additional corporate environmental staff pond inspection conducted a minimum of once a year. The most recent documented inspection was March 2009 (See Appendix A Document 8).

9.2 INSTRUMENTATION MONITORING

None of the Burlington Generating Station's five coal waste management impoundment embankments have an instrumentation monitoring system.

9.3 ASSESSMENT OF SURVEILLANCE AND MONITORING PROGRAM

9.3.1 Adequacy of Inspection Program

Based on the data reviewed by Dewberry, including observations during the site visit, the inspection program is adequate.

9.3.2 Adequacy of Instrumentation Monitoring Program

None of the Burlington Generating Station's five coal waste management impoundment embankments have an instrumentation monitoring system

Based on the size of the embankments, the current inspection program, and the observations made during the site visit, an embankment monitoring program is not needed at this time.

APPENDIX A

DOCUMENTS

Alliant Energy Burlington Generating Station
Burlington, Iowa
Site Location Plan

NOTES:
ADD 500 TO NUMBER SHOWN ON CONTOURS FOR ELEVATION IN FEET M.S.L., 1929 ADJUSTMENT
EXISTING CONTOURS SHOWN THUS ——20——
FINISH CONTOURS SHOWN THUS ——20——
CONCRETE MONUMENTS SHOWN THUS □
SEE SHEET S-50 FOR BASE LINE LOCATIONS.

ALLIANT ENERGY.

DWG. NO.	SHT.	REV.	INITIAL/DATE
1-2015-1-0-C3501		3	5/29/02

APPROVED
FOR CONSTRUCTION

SCALE 1" = 100'

NO.	DATE	REVISION	BY	CK.	APP.
	12-11-63				
2	8-12-65	REVISED ENTRY ROAD AND RAILROAD	VS	VHS	
1	6/8/64	INCREASE FILL ONE FOOT.	GPJ		
	12/6/63	ISSUED FOR CONSTRUCTION			

IOWA SOUTHERN UTILITIES COMPANY
CENTERVILLE, IOWA
BURLINGTON GENERATING STATION — UNIT 1

STRUCTURAL
SITE PREPARATION
GRADING PLAN

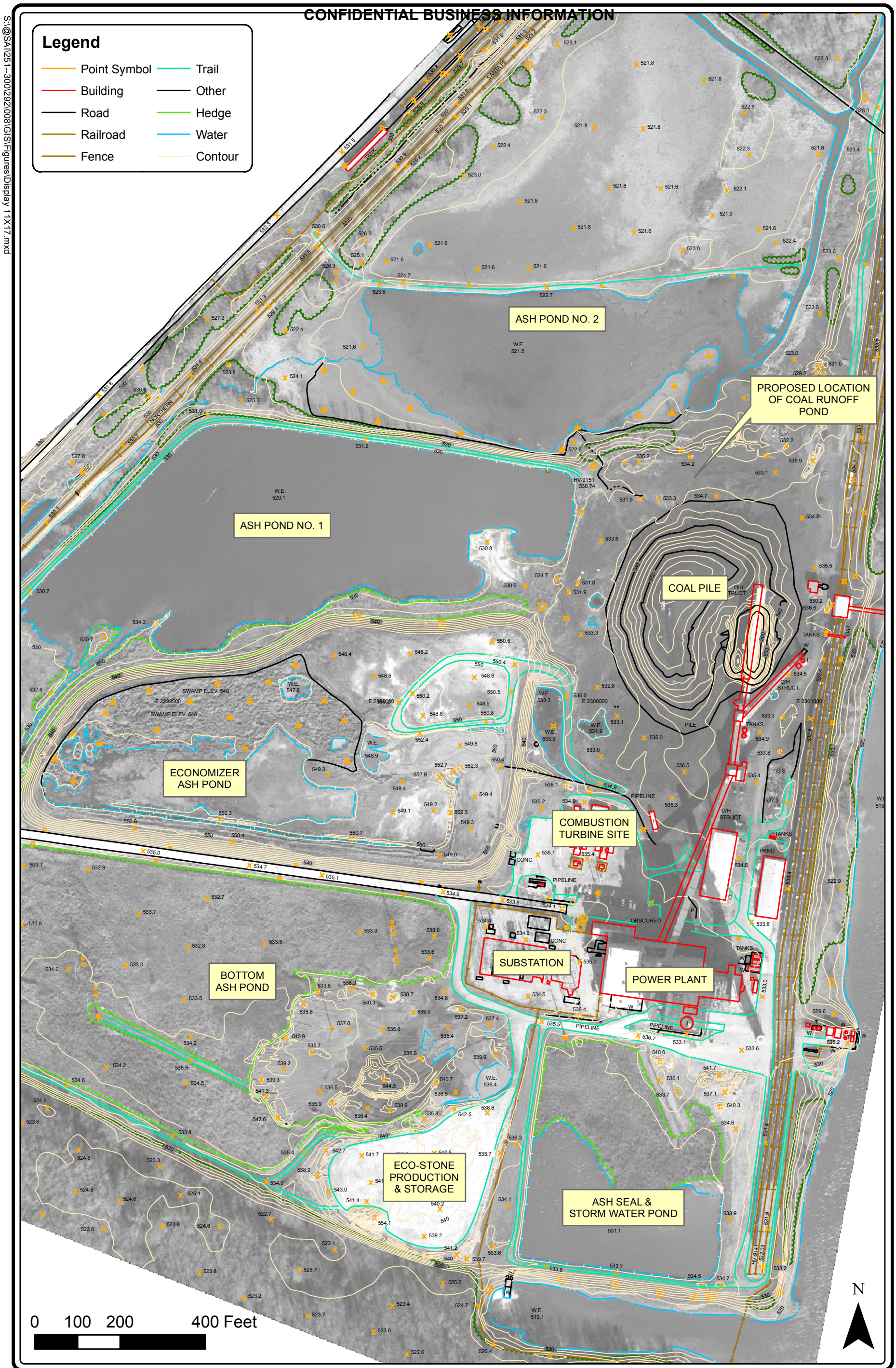
APPROVED FOR CONSTRUCTION	DEPT. HEAD	DES. ENGR.	CHECKED	DRAWN	PROJ. NO.
BY [signature] DATE	CLM	VHS	VHS	JGD	3849

BLACK & VEATCH
CONSULTING ENGINEERS — KANSAS CITY, MISSOURI
DRAWING NO. S-51

30" x 42" = 8.75 SQ. FT.

S:\@SAI\251--300\292\008\GIS\Figures\Display 11X17.mxd

CONFIDENTIAL BUSINESS INFORMATION



BURLINGTON GENERATING STATION SITE

IP&L ALLIANT ENERGY
BURLINGTON, IOWA

FIGURE 1
1-292.008

STRAND ASSOCIATES, INC.® ENGINEERS


© 2010 Google
Image USDA Farm Service Agency
©2009 Google
Imagery Dates: Jun 20, 2009 - Jun 28, 2009
40°44'37.78" N 91°07'04.40" W elev 525 ft
Eye alt 5435 ft

HARD HAT SERVICES
Engineering, Construction and Management Solutions
940 E. Diehl Road Suite 150, Naperville, IL 60563
Phone (630) 637-9470 Fax (630) 637-9471
www.hardhatinc.com

August 31, 2007

Robin R. Nelson
Environmental & Safety Specialist
Alliant Energy/Interstate Power & Light Co.
4282 Sullivan Slough Road
Burlington, IA 52601-9015

Re: Burlington Generating Station Berm/Seep Investigation
Interstate Power & Light Co.

Introduction

Interstate Power & Light Co. (IP&L) retained Hard Hat Services (HHS) to investigate the stability of the berm that isolates the settling pond from the drainage channel, which discharges directly in the Mississippi River, and to determine the origin of the seep that was observed by IP&L in the southeast corner of the settling pond (Figure 1).

Investigation Activities

The investigative activities were conducted on Tuesday, August 7, 2007 and included advancing nine soil borings at the Burlington Generating Station (BGS) to depths between 6 and 15 feet. The borings were completed on the berm that separates the BGS's settling pond from the discharge channel to the Mississippi River. A photographic log has been included in Exhibit A.

A licensed geologist logged the borings in the field. Water bearing zones and the presence of groundwater were also recorded. In most borings 1-inch diameter schedule 40 PVC piezometers with 5-foot screens were installed. Water levels from the piezometers were measured and the borings and piezometers were surveyed for relative elevations (Exhibit B). The south end of west rail was used as the benchmark elevation. Soil boring logs are provided in Exhibit C.

Soil lithology starting at ground surface generally consists of 2 to 3 feet of brown, fine to coarse grained ash. Underlying the ash, to an approximate depth of 10 feet below ground surface, is a dark grayish-brown, low to high plasticity clay. At most soil boring locations the clay contained several thin (approximately $1/16^{th}$ inch thick) sand seams, which appeared wet. In soil borings SB-1, SB-5, SB-6, and SB-8 a black, medium to coarse grained, wet sand was encountered at 10 feet below ground surface. Based on borings SB-1 and SB-5, the sand is between 3.5 and 4 feet thick. Also based on borings SB-1 and SB-5, the sand is underlain by a black, high plasticity, highly organic clay.

Depth to water in the piezometers was surveyed on Tuesday, August 7 and again on Tuesday, August 14, 2007. Water was not present in all piezometers on August 7, but after allowing them to equilibrate for seven days, water was found to be present in all piezometers. Groundwater elevations in the piezometers varied between 2.5 to 8 feet BGS (Exhibit D).

The collected geotechnical and groundwater information was used to determine slope stability of the berm. The slope stability calculations have been completed based on a conservative approach using the STABL5M 2-D limit equilibrium slope stability program

from Purdue University (1996). A conservative dike/soil profile using conservative soil strengths were entered into the slope stability program. The program showed an acceptable slope stability Factor of Safety of approximately 1.5 (The factor of safety is equal to the soil shear strength/soil shear stress along the most critical potential shear surface). The ten most critical surfaces analyzed are shown in Exhibit E along with the soil strengths and dike/sub-surface geometry. The analysis conservatively assumed;

- Dike side slope of 2:1 with a 3:1 side slope into the ash pond,
- Top of dike is approximately 21 feet wide,
- Ash pond water level near the top at elevation 101' with relatively high pore pressure through out the dike as shown by the "W1" water table/piezometric surface,
- Cohesionless materials are assumed to only have a relatively low 30-degree angle of internal fiction (which is appropriate for loose fine sand whereas much is medium to coarse grained), and
- Cohesive materials have been assigned the lowest non-zero shear strength results found based on field pocket penetrometer testing in all nine borings. For the clay above the "deep" sand layer, 500 PSF shear strength/cohesion was assumed whereas 1,250 PSF cohesion was specified below the deep sand layer.

Conclusions

Berm Slope Stability – Based on the slope stability calculations, the berm will be adequate to support the typical loads from normal site operations at the facility, although the area of the seeps should be regraded to avoid further erosion after the shallow seeps are stopped. If the shallow seeps not stopped, the leakage over time may cause increased erosion and could have detrimental impacts to the stability of the berm.

Shallow Seeps – While on site, the berm bank along the water discharge channel was inspected and several shallow seeps were observed. The shallow seep, observed by IP&L near the southeast corner of the settling pond berm, appears to be fed from the settling pond through sand seams that exist within the clay berm. The sand seams exit the south side of the berm at the exact elevation where the shallow seep is first observed. This information is conclusive that the seeps originate from the settling pond. As a result, the Iowa Department of Natural Resources would most likely consider this a non-permitted discharge from the pond and would require that IP&L conduct repair work to prevent the seeps from occurring.

Deep Seeps – Because the Mississippi River elevation was sufficiently low, a deeper seep was observed along the southern base of the berm slope that extended for about 250 feet. At that elevation, the 3.5 to 4 foot sand seam was exposed at the ground surface. This sand seam produced groundwater seeping onto the toe of slope. It is unclear if the liquids from the lower sand seam were from natural groundwater discharge or influenced by the settling pond. Because the depth and construction of the settling pond is unknown, HHS cannot determine if the settling pond is hydraulically connected through the sand seam unless further testing is completed or additional information is provided by IP&L.

Suggested Approach

After carefully assessing the site geology and hydrogeology, HHS recommends the following:

Shallow Seeps – IP&L should prevent the water from discharging through the shallow sand seams. By stopping water from traveling through the shallow sand seams, the seeps observed on the southern slope of the berm would be eliminated.

Deep Seeps – The groundwater discharging through the deep sand seam should be left unchanged. HHS recommends leaving the deep sand seam because if it were isolated, significant hydraulic pressure may build up and could potentially create a larger problem at a different location along the berm.

Suggested Solution

Our suggested method for preventing the flow of water through the shallow sand seams would be to construct a shallow slurry wall comprised of native soil and a combination of fly ash and/or bentonite powder to create a low permeability barrier along the majority of the length of the settling pond. Slurry walls must be carefully designed and constructed to ensure that a constant mixture of materials is used to create a barrier that will prevent the groundwater flow, which will in turn eliminate the shallow seeps along the southern berm.

Please feel free to call me if you have any questions with this investigation report.

Sincerely,
HARD HAT SERVICES

Mark W. Loerop, P.E.
Project Manager

Cc: John McDonough – Via Email
Bill Skalitzky – Via Email

O:\154 - Alliant Energy\154.002 Burlington\002 - Berm Investigation\Burlington - Berm Investigation.doc

CONFIDENTIAL BUSINESS INFORMATION

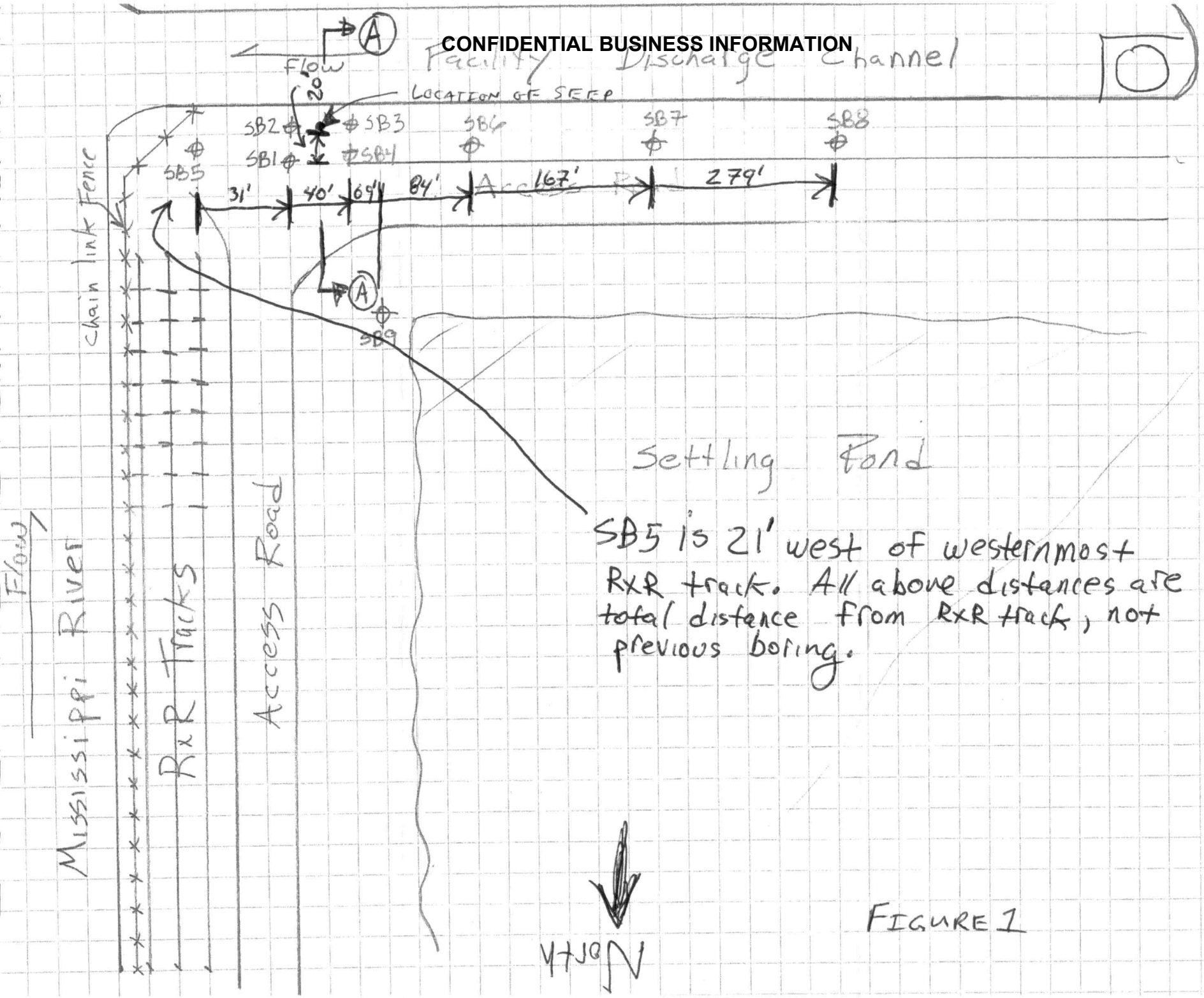
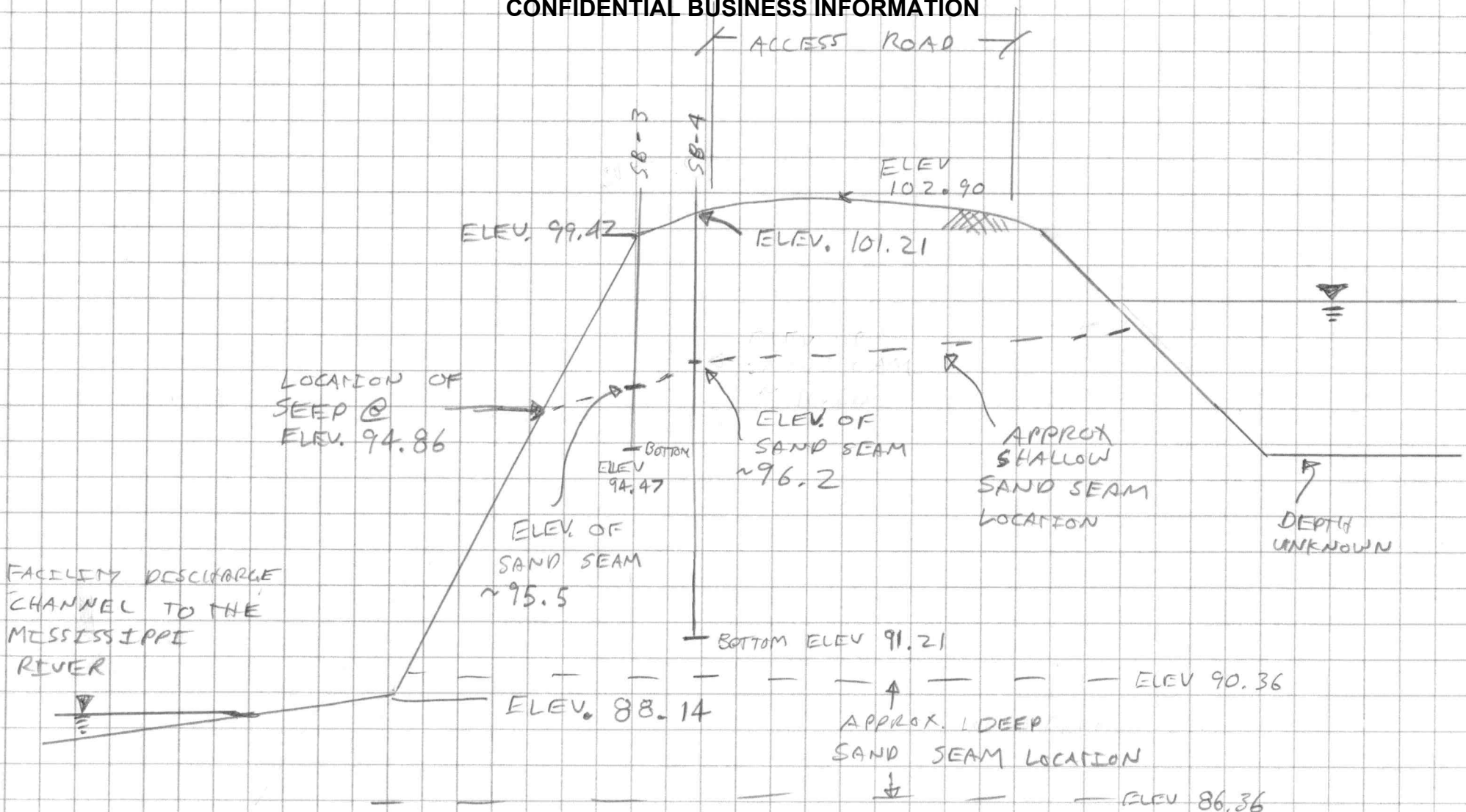


FIGURE 1

CONFIDENTIAL BUSINESS INFORMATION



SECTION A-A

NTS

FIGURE 2

Exhibit A – Photographic Log

Photo 1) Southeast – Facility Discharge Channel Toward the Mississippi River

Photo 2) South – Seep Location in from Berm

Photo 3) East - Facility Discharge Channel Toward the Mississippi River

Photo 4) West – Facility Discharge Channel; Continuous Wet Ground after Dry Weather

Photo 5) Soil Core from Geoprobe

Photo 6) Soil Core from Geoprobe

Exhibit B – Elevation Survey

Borehole and Temp. Well Survey Data
Allinat Energy Plant
Burlington, IA
August 7, 2007

Location	B.M.	B.S.	F.S.	Elevation	Notes
Rail	100.00			100.00	Top or westernmost steel RxR rail.
H.I.			6.82	106.82	Height of instrument
SB1		6.46		100.36	Groundsurface
SB2		7.56		99.26	Groundsurface
SB2		3.84		102.98	TOC
SB3		7.35		99.47	Groundsurface
SB3		5.75		101.07	TOC
SB4		5.61		101.21	Groundsurface
SB4		4.60		102.22	TOC
SB5		7.06		99.76	Groundsurface
SB6		4.54		102.28	Groundsurface
SB6		1.90		104.92	TOC
SB7		4.92		101.90	Groundsurface
SB7		1.80		105.02	TOC
SB8		5.20		101.62	Groundsurface
SB8		2.22		104.60	TOC
SB9		4.72		102.10	Groundsurface
SB9		3.82		103.00	TOC
Seep		11.96		94.86	Groundsurface @ flowing seep approx. halfway down slope
Base of slope		18.68		88.14	Groundsurface @ base of slope below seep

Exhibit C – Soil Boring Logs

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt COORDINATES: N NOT SURVEYED E NOT SURVEYED

PROJECT: Alnt - Burlington

BORING NO.: *SB-1*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *100.36*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	3.5'/5'				2.75 2.0		0		ASH; well graded; fine to coarse grained; dry.
						4.0		-5		CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter. @ 4.5' and 5.0' are thin (1/16" thick) sand seams, wet.
	SP2	5'/5'				1.0 1.0 1.25 1.0		-10		SAND; black; medium to coarse grained; graded; wet.
	SP3	5'/5'				1.25 2.0		-15		CLAY; black; high plasticity; moist; trace to some organic matter. Bottom of boring @ 15'. Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide). Boring backfilled to groundsurface w/ bentonite chips and hydrated on 8-7-07.
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-2*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *99.26*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
⊠	SP1	3'/4'				2.5		0		ASH; well graded; fine to coarse grained; dry.
						2.75				CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter.
						2.75				@ 3' and 4' are a thin 1/16" thick sand seams, wet, trace satl deopsit in sand.
	SP2	2'/2'				2.75		-5		
						2.75				Bottom of boring @ 6'.
										Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide).
								-10		1-inch PVC temp. well installed to 6-feet bgs w/ 5' screen on 8-7-07. TOC elevation = 102.98
								-15		
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt Mat

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-3*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *99.47*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
⊠	SP1	4'/5'				4.0 3.5 3.0		0 -5 -10 -15 -20		ASH; well graded; fine to coarse grained; dry. CLAY; dark grayish brown; low to high plasticity; moist to wet; trace sand, gravel and organic matter. @ 1.5' water is present and confined to an approximate 1-inch seam. @ 3.5' to 4.0' are three 1/16-inch thin sand seams, wet. Bottom of boring @ 5'. Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide). 1-inch PVC temp. well installed to 5-feet bgs w/ 5' screen on 8-7-07. TOC elevation = 101.07

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt - Burlington

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-4*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *101.21*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	4'/5'				1.0		0		ASH; well graded; fine to coarse grained; dry.
						0.5				CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter.
						0.5		-5		SAND, GRAVEL & ASH; brown to black; fine to coarse grained; graded; wet; trace to some silt and clay.
	SP2	4'/5'				1.0				CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter.
						1.5				
						2.0		-10		Bottom of boring @ 10'.
										Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide).
								-15		1-inch PVC temp. well installed to 10-feet bgs w/ 5' screen on 8-7-07. TOC elevation = 102.22
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Hard Hat

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-5*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *99.76*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
								0		ASH; well graded; fine to coarse grained; dry.
⊠	SP1	4'/5'				3.0 1.5		-5		CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter. @ 4.5' is a 2-inch brown, fine sand, moist.
⊠	SP2	4'/5'				1.25 1.0 0.5 1.5		-10		SAND; black; med to coarse grained; graded; wet.
	SP3	5'/5'				2.0 2.0		-15		CLAY; black; high plasticity; some (high) organic matter. Bottom of boring @ 15'. Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide).
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt Inc. COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington **BORING NO.:** *SB-6*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *102.28*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
⊠	SP1	4'/5'				2.5		0		ASH; well graded; fine to coarse grained; dry.
						2.5		-5		CLAY; dark grayish brown; low to high plasticity; moist; trace sand, gravel and organic matter. @ 4.5' and 5' is a 1-inch brown, fine sand, wet.
	SP2	4'/5'				2.5				
						2.5				
						2.0		-10		SAND; black; med to coarse grained; graded; wet.
										Bottom of boring @ 10'.
								-15		Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide).
										Boring backfilled w/ bentonite chips from 10' bgs to 5' bgs. 1-inch PVC screen set to 5' bgs on 8-7-07. TOC Elevation = 104.92.
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt Inc. COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington **BORING NO.:** *SB-7*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *101.90*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
⊠	SP1	4'/5'						0		CLAY; dark brown to black; non-plastic to low plasticity; dry to moist; trace sand, gravel and ash.
	SP2	4'/5'						-5		Interbeded SAND & CLAY
								-10		Bottom of boring @ 10'.
								-15		Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide).
								-20		1-inch PVC screen set to 10' bgs w/ 5' screen on 8-7-07. TOC Elevation = 105.02.

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Alnt

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-8*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *101.62*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
	SP1	4'/5'				2.5 2.25 2.25		0 -5		CLAY; dark brown to black; non-plastic to low plasticity; dry to moist; trace sand, gravel and ash.
	SP2	4'/5'						-10		SAND; 1st 1.5-inches stained orange-red then grades gray to black; fine to coarse grained; well graded; wet.
								-15		Bottom of boring @ 10'. Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide). 1-inch PVC screen set to 10' bgs w/ 5' screen on 8-7-07. TOC Elevation = 104.60.
								-20		

CABENO

Environmental Field Services, LLC

BORING LOG

CONFIDENTIAL BUSINESS INFORMATION

CLIENT: Hard Hat

COORDINATES: *N NOT SURVEYED* *E NOT SURVEYED*

PROJECT: Alnt - Burlington

BORING NO.: *SB-9*

LOGGED BY: *John Noyes*
EDITED BY: *John Noyes*
CHECKED BY: *Mark Lorep*
DATE BEGAN: *8-7-07*
DATE FINISHED: *8-7-07*
GROUND SURFACE ELEVATION: *102.10*

DEPTH TO WATER WHILE DRILLING	SAMPLE NO. AND TYPE	SAMPLE RECOVERY	SAMPLE INFROMATION	PID READINGS (PPM)	PID vs. DEPTH	POCKET PENETROMETER (TSF)	CONSISTENCY vs. DEPTH	DEPTH IN FEET	PROFILE	DESCRIPTION
▽	SP1	4'/5'				0.5 1.25 1.0 1.0 0.5 0.5		0 -5		CLAY; dark brown to black; non-plastic to low plasticity; dry to moist; trace sand, gravel and ash. @ 4.5' is a wet seam, approx. 1-inch thick.
	SP2	4'/5'				0 0 1.0 1.25		-10		@ 7' is a wet seam, approx. 1.5-inch thick. Bottom of boring @ 10'.
								-15		Boring advanced w/ track mounted Geoprobe Model 6610DT using Macrocore soil sampling system (60"long x 1.5" wide). 1-inch PVC screen set to 10' bgs w/ 5' screen on 8-7-07. TOC Elevation = 103.00.
								-20		

Exhibit D – Water Levels

CONFIDENTIAL BUSINESS INFORMATION

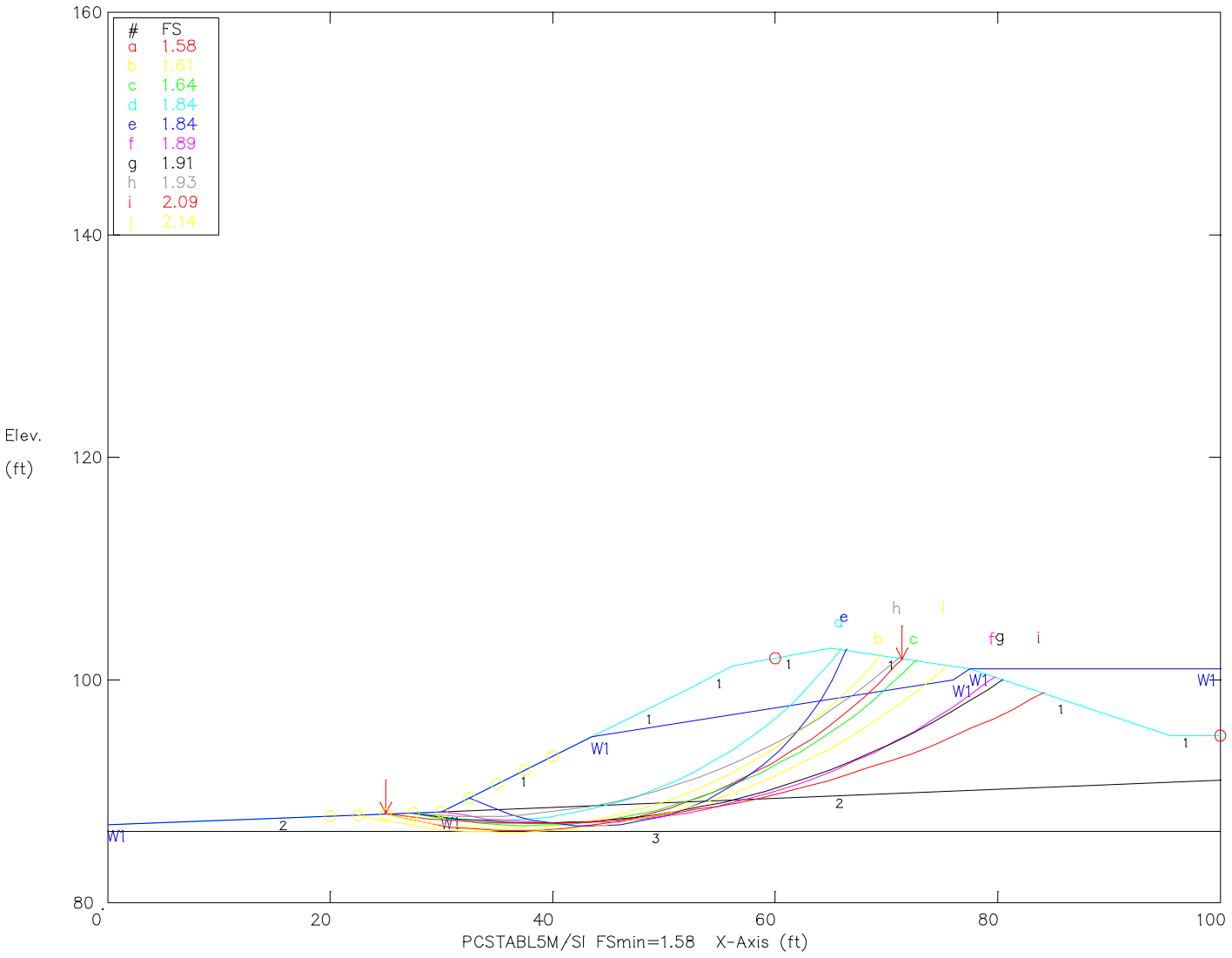
Water Level Data
Alliant Energy - Burlington, IA
August 2007

8-7-07 Water Levels			
Location	Depth to Water (TOC)	TOC Elevation	GW Elevation
SB2	dry	102.98	NA
SB3	dry	101.07	NA
SB4	9.48	102.22	92.74
SB6	dry	104.92	NA
SB7	9.37	105.02	95.65
SB8	12.06	104.60	92.54
SB9	6.85	103.00	96.15
8-14-07 Water Levels			
Location	Depth to Water (TOC)	TOC Elevation	GW Elevation
SB2	8.57	102.98	94.41
SB3	4.74	101.07	96.33
SB4	6.75	102.22	95.47
SB6	7.20	104.92	97.72
SB7	9.42	105.02	95.60
SB8	11.80	104.60	92.80
SB9	6.85	103.00	96.15

Exhibit E – Slope Stability Calculations

CONFIDENTIAL BUSINESS INFORMATION

Burlington Generating Station Berm All Clay above deep seam
Ten Most Critical. C:154HHS01.PLT By: Tom Wells 08-30-07 3:49pm



PCSTABL5M/SI FSmin=1.58 X-Axis (ft)

Soil Type No.	Label	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	Clay	120	120	500	0	0	0	W1
2	Sand	130	130	0	30	0	0	W1
3	Clay	125	125	1250	0	0	0	W1

Alliant Energy Corporate Services, Inc.
Legal Department
200 First Street SE
P.O. Box 351
Cedar Rapids, IA 52406-0351

Office: 319.786.4505
www.alliantenergy.com

May 22, 2009

VIA OVERNIGHT DELIVERY – TUESDAY DELIVERY

Mr. Richard Kinch
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Dr.
5th Floor: N-5738
Arlington, VA 22202-2733

RE: Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act

Dear Mr. Kinch:

On May 4, 2009, the Burlington Generating Station, a facility owned and operated by Interstate Power and Light Company ("IPL"), on whose behalf this response is submitted, received a "Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act" (hereinafter "Request") from the United States Environmental Protection Agency ("EPA"). EPA's Request was undated. EPA's Request required a response within 10 business days of receipt. During a telephone conversation on May 12, 2009, EPA granted a five (5) working day time extension. Therefore, this response is timely filed.

EPA's Request seeks information relating to Burlington Generating Station's surface impoundments or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material from a surface impoundment used for storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. EPA seeks responses to ten specific questions set forth in Enclosure A to the Request.

This letter and the enclosed documents respond to EPA's Request. IPL has made diligent and good faith efforts to provide documents and information that are in its possession and which IPL could reasonably collect and prepare for production within the timeframe allotted.

A. General Objections

Based on its review of and good-faith efforts to respond timely to the Request, IPL wishes to note for the record that it has several objections to the form and content of the Request.

IPL objects to the Request on the grounds that it is unduly burdensome and overly broad, seeks irrelevant information, is vague and unclear in its scope, requires legal conclusions to be made, and is otherwise unreasonable, thereby exceeding EPA's authority under CERCLA Section 104(e).

IPL objects to the Request to the extent that it seeks information beyond the scope of EPA's authority under Section 104(e) of CERCLA. Section 104(e) authorizes EPA to request, upon reasonable notice, information or documents relating to the following:

1. The identification, nature, and quantity of materials which have been or are generated, treated, stored, or disposed of at a vessel or facility or transported to a vessel or facility.
2. The nature or extent of a release or threatened release of a hazardous substance or pollutant or contaminant at or from a vessel or facility.
3. Information relating to the ability of a person to pay for or to perform a cleanup.

IPL does not object to questions relating to the (1) type and quantity of materials stored, temporarily or permanently, in the surface impoundments and (2) nature and extent of actual releases or threatened releases; however, IPL believes that the other questions in the Request, e.g., structural integrity, dates of commissioning/expansion, PE certifications, etc., are beyond the scope of EPA's authority under Section 104(e).

IPL also objects to the extent that the Request seeks information that may be subject to attorney-client privilege or other applicable privilege, or which constitutes protected attorney work product, or which is otherwise not discoverable.

Where the questions in the Request are vague, ambiguous, overbroad, or beyond the scope of EPA's CERCLA Section 104(e) authority, IPL has made appropriate and reasonable efforts to provide responsive information to the best of its ability to interpret the questions. Subject to and without waiving its objections, IPL states that it is providing information at this time based on its review conducted in response to the specific items in the Request. In the event that IPL discovers additional responsive material, it will submit such material to EPA as soon as reasonably possible.

Because EPA has requested that IPL respond to this request within the short timeframe of 15 business days, IPL has not had the opportunity to determine whether the responsive contents of this letter constitute **"confidential business information,"** as defined by 40

CFR Part 2, Subpart B. Therefore, with the exception of the Iowa Department of Natural Resources inspection report provided in response to item number 6 of EPA's Enclosure A, IPL requests that **EPA treat this letter and the narrative responses within as "confidential business information."**

Finally, IPL objects to the following phrase as vague, unclear, and ambiguous: "surface impoundment or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material for storage or disposal of residual or by-products from the combustion of coal." For purposes of this Request, IPL interprets this phrase to mean:

1. Any surface impoundment that directly receives coal combustion by-products (CCB) in a liquid-borne manner (i.e., water mixed with ash) from the coal combustion process in the boiler, as well as any subsequent surface impoundments through which this CCB and water mixture may pass before the water exits the CCB management units via the NPDES permitted discharge point. This includes current operating CCB management units, as well as any surface impoundments which historically received CCB and which still contain free liquids.
2. IPL's interpretation of this phrase does not include storm water retention ponds, coal pile runoff retention ponds, cooling water ponds, etc. which may contain small incidental amounts of CCB which was transmitted via rain waters or as fugitive dust. These ponds and impoundments were neither designed nor intended for temporary or long-term storage or disposal of CCB.

B. Specific Responses to Items in Enclosure A

1. Relative to the National Inventory of Dams criteria for High, Significant, Low, or less-than-Low Hazard Potential, please provide the potential hazard rating for each management unit and indicate who established the rating, what the basis of the rating is, and what federal or state agency regulates the unit(s). If the unit(s) does not have a rating, please note that fact.

a. Main Ash Pond: Based on its review of readily available records and interviews with long term staff, IPL has not identified that this pond was ever rated relative to the "National Inventory of Dams" criteria by any federal or state regulatory agency.

b. Upper Ash Pond: Based on its review of readily available records and interviews with long term staff, IPL has not identified that this pond was ever rated relative to the "National Inventory of Dams" criteria by any federal or state regulatory agency.

c. Lower Ash Pond: Based on its review of readily available records and interviews with long term staff, IPL has not identified that this pond was ever rated relative to the "National Inventory of Dams" criteria by any federal or state regulatory agency.

d. Ash Seal Pond: Based on its review of readily available records and interviews with long term staff, IPL has not identified that this pond was ever rated relative to the "National Inventory of Dams" criteria by any federal or state regulatory agency.

e. Economizer Ash Pond: Based on its review of readily available records and interviews with long term staff, IPL has not identified that this pond was ever rated relative to the "National Inventory of Dams" criteria by any federal or state regulatory agency.

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2. What year was each management unit commissioned and expanded?

a. Main Ash Pond: Commissioned in 1980

b. Upper Ash Pond: Commissioned in 1971;

c. Lower Ash Pond: Commissioned in 1971

d. Ash Seal Pond: Commissioned in 1968

e. Economizer Ash Pond: Commissioned in 1986; modified in 1990 and 1992

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3. What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (1) fly ash; (2) bottom ash: (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other", please specify the other types of materials that are temporarily or permanently contained in the unit(s).

a. Main Ash Pond: Materials temporarily or permanently contained are:
   - Fly ash
   - Bottom ash
   - Other: ash transport water, boiler water wash, air heater wash (fly ash), storm water runoff from plant site, storm water runoff from C-Stone (hydrated flyash) Storage Pile; and plant floor drains.

b. Upper Ash Pond: Materials temporarily or permanently contained are:
   - Fly ash
   - Bottom ash

- Economizer Ash
- Other: ash transport water, boiler water wash, air heater wash (fly ash), steam grade water production wastewaters, storm water runoff from plant site, storm water runoff from C-Stone (hydrated flyash) Storage Pile; plant floor drains, Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff; and boiler blowdown (steam/water).

c. Lower Ash Pond: Materials temporarily or permanently contained are:
   - Fly ash
   - Bottom ash
   - Economizer Ash
   - Other: ash transport water, boiler water wash, air heater wash (fly ash), steam grade water production wastewaters, storm water runoff from plant site, storm water runoff from C-Stone (hydrated flyash) Storage Pile; plant floor drains, Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff; and boiler blowdown (steam/water).

d. Ash Seal Pond: Materials temporarily or permanently contained are:
   - Fly ash
   - Bottom ash
   - Economizer Ash
   - Other: Boiler Seal Water; boiler water wash, storm water runoff from plant site, storm water runoff from C-Stone (hydrated flyash) Storage Pile; and plant floor drains.

e. Economizer Ash Pond: Materials temporarily or permanently contained are:
   - Fly ash
   - Bottom ash
   - Economizer Ash
   - Other: ash transport water, boiler water wash, air heater wash (fly ash), steam grade water production wastewaters, storm water runoff from plant site, storm water runoff from C-Stone (hydrated flyash) Storage Pile; plant floor drains, Solids Contact Units sludge for the treatment of Mississippi River water; coal pile runoff; and boiler blowdown (steam/water).

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4. Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management (s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste management unit(s) under the supervision of a Professional Engineer?'

a. Main Ash Pond:

- Based on its review of readily available records, IPL believes the pond was designed by a Professional Engineer.
- Based on its review of readily available records, IPL believes the pond was constructed under the supervision of a Professional Engineer.
- Inspection and monitoring of the safety of the pond is not under the supervision of a Professional Engineer

b. Upper Ash Pond:

- Based on its review of readily available records, IPL believes the pond was designed by a Professional Engineer.
- Based on its review of readily available records, IPL believes the pond was constructed under the supervision of a Professional Engineer.
- Inspection and monitoring of the safety of the pond is not under the supervision of a Professional Engineer

c. Lower Ash Pond:

- Based on its review of readily available records, IPL believes the pond was designed by a Professional Engineer.
- Based on its review of readily available records, IPL believes the pond was constructed under the supervision of a Professional Engineer.
- Inspection and monitoring of the safety of the pond is not under the supervision of a Professional Engineer

d. Ash Seal Pond:

- Based on its review of readily available records, IPL believes the pond was designed by a Professional Engineer.
- Based on its review of readily available records, IPL believes the pond was constructed under the supervision of a Professional Engineer.
- Inspection and monitoring of the safety of the pond is not under the supervision of a Professional Engineer

e. Economizer Ash Pond:

- Based on its review of readily available records, IPL believes the pond was designed by a Professional Engineer.
- Based on its review of readily available records, IPL believes the pond was constructed under the supervision of a Professional Engineer.
- Inspection and monitoring of the safety of the pond is not under the supervision of a Professional Engineer

5. When did the company last assess or evaluate the safety (i. e., structural integrity) of the management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective actions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected to occur?

a. Main Ash Pond:

- IPL conducted a visual structural inspection on March 4, 2009.
- The assessment team inspecting the pond on March 4, 2009, consisted of a Civil Engineer; Senior Environmental Specialist; and a Plant Manager with an Engineering Degree.
- The March 4, 2009, inspection recommended some animal activity control improvements. This work will be accomplished or issue resolved by plant personnel or contractors working under the direct supervision of plant personnel by December 31, 2009.
- IPL currently has no future assessment/evaluation scheduled, but has developed an internal evaluation program that includes periodic inspections.

b. Upper Ash Pond:

- IPL conducted a visual structural inspection on March 4, 2009.
- The assessment team inspecting the pond on March 4, 2009, consisted of a Civil Engineer; Senior Environmental Specialist; and a Plant Manager with an Engineering Degree.
- The March 4, 2009, inspection recommended some tree removal and erosion repair of the berm that separates the upper and lower ash ponds; and some animal activity control improvements. This work will be accomplished or issue resolved by plant personnel or contractors working under the direct supervision of plant personnel by December 31, 2009.
- IPL currently has no future assessment/evaluation scheduled, but has developed an internal evaluation program that includes periodic inspections.

c. Lower Ash Pond:

- IPL conducted a visual structural inspection on March 4, 2009.
- The assessment team inspecting the pond on March 4, 2009, consisted of a Civil Engineer; Senior Environmental Specialist; and a Plant Manager with an Engineering Degree.

- The March 4, 2009, inspection recommended some tree removal and erosion repair of the berm that separates the upper and lower ash ponds; and some animal activity control improvements. This work will be accomplished or issue resolved by plant personnel or contractors working under the direct supervision of plant personnel by December 31, 2009.
- IPL currently has no future assessment/evaluation scheduled, but has developed an internal evaluation program that includes periodic inspections.

d. Ash Seal Pond:

- IPL conducted a visual structural inspection on March 4, 2009.
- The assessment team inspecting the pond on March 4, 2009, consisted of a Civil Engineer; Senior Environmental Specialist; and a Plant Manager with an Engineering Degree.
- The March 4, 2009, inspection recommended some tree removal on the inside portion of the berm. This work will be accomplished by plant personnel or contractors working under the direct supervision of plant personnel by December 31, 2009.
- IPL currently has no future assessment/evaluation scheduled, but has developed an internal evaluation program that includes periodic inspections.

e. Economizer Ash Pond:

- IPL conducted a visual structural inspection on March 4, 2009.
- The assessment team inspecting the pond on March 4, 2009, consisted of a Civil Engineer; Senior Environmental Specialist; and a Plant Manager with an Engineering Degree.
- The March 4, 2009, inspection recommended some tree removal on the inside portion of the berm and to continue efforts within the pond to increase the wastewater treatment capabilities. This work will be accomplished or issue resolved by plant personnel or contractors working under the direct supervision of plant personnel by December 31, 2009.
- IPL currently has no future assessment/evaluation scheduled, but has developed an internal evaluation program that includes periodic inspections.

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6. When did a State or a Federal regulatory official last inspect or evaluate the safety (structural integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation.
Please provide a copy of the most recent official inspection report or evaluation.

a. Main Ash Pond:

- This pond is part of a wastewater management unit subject to an NPDES permit. The Iowa Department of Natural Resources performed a Facility Wastewater Inspection on December 2007. The inspection report does not include an evaluation of the structural integrity of the pond.
- IPL is not aware of any planned state or federal regulatory agency future inspection to evaluate the safety (structural integrity) of this pond.
- A copy of the Iowa Department of Natural Resources Facility Wastewater Inspection report is attached for your awareness.

b. Upper Ash Pond:

- This pond is part of a wastewater management unit subject to an NPDES permit. The Iowa Department of Natural Resources performed a Facility Wastewater Inspection on December 2007. The inspection report does not include an evaluation of the structural integrity of the pond.
- IPL is not aware of any planned state or federal regulatory agency future inspection to evaluate the safety (structural integrity) of this pond.
- A copy of the Iowa Department of Natural Resources Facility Wastewater Inspection report is attached for your awareness.

c. Lower Ash Pond:

- This pond is part of a wastewater management unit subject to an NPDES permit. The Iowa Department of Natural Resources performed a Facility Wastewater Inspection on December 2007. The inspection report does not include an evaluation of the structural integrity of the pond.
- IPL is not aware of any planned state or federal regulatory agency future inspection to evaluate the safety (structural integrity) of this pond.
- A copy of the Iowa Department of Natural Resources Facility Wastewater Inspection report is attached for your awareness.

d. Ash Seal Pond:

- This pond is part of a wastewater management unit subject to an NPDES permit. The Iowa Department of Natural Resources performed a Facility Wastewater Inspection on December 2007. The inspection report does not include an evaluation of the structural integrity of the pond.
- IPL is not aware of any planned state or federal regulatory agency future inspection to evaluate the safety (structural integrity) of this pond.
- A copy of the Iowa Department of Natural Resources Facility Wastewater Inspection report is attached for your awareness.

e. Economizer Ash Pond:

- This pond is part of a wastewater management unit subject to an NPDES permit. The Iowa Department of Natural Resources performed a Facility Wastewater Inspection on December 2007. The inspection report does not include an evaluation of the structural integrity of the pond.
- IPL is not aware of any planned state or federal regulatory agency future inspection to evaluate the safety (structural integrity) of this pond.
- A copy of the Iowa Department of Natural Resources Facility Wastewater Inspection report is attached for your awareness.

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7. Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safety issue(s) with the management unit(s), and if so, describe the actions that have been or are being taken to deal with the issue or issues.
Please provide any documentation that you have for these actions.

a. Main Ash Pond: There have been no assessments, evaluations, or inspections by a state or federal regulatory agency within the past year.

b. Upper Ash Pond: There have been no assessments, evaluations, or inspections by a state or federal regulatory agency within the past year.

c. Lower Ash Pond: There have been no assessments, evaluations, or inspections by a state or federal regulatory agency within the past year.

d. Ash Seal Pond: There have been no assessments, evaluations, or inspections by a state or federal regulatory agency within the past year.

e. Economizer Ash Pond: There have been no assessments, evaluations, or inspections by a state or federal regulatory agency within the past year.

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8. What is the surface area (acres) and total storage capacity of each of the management units? What is the volume of materials currently stored in each of the management unit(s). Please provide the date that the volume measurement was taken. Please provide the maximum height of the management unit(s). The basis for determining maximum height is explained later in this Enclosure.

a. Main Ash Pond:

- Surface area: 17.0 acres
- Total storage capacity: 137,214 cubic yards; measurement date – April 2009.

- Volume of materials stored: 110,000 cubic yards; measurement date – April 2009.
- Maximum height of management unit: 5 feet

b. Upper Ash Pond:
- Surface area: 13.3 acres
- Total storage capacity: 215,000 cubic yards; measurement date – April 2009.
- Volume of materials stored: 107,000 cubic yards; measurement date – 2008.
- Maximum height of management unit: 5 feet

c. Lower Ash Pond:
- Surface area: 22.9 acres
- Total storage capacity: 184,000 cubic yards; measurement date – April 2009.
- Volume of materials stored: 110,000 cubic yards; measurement date – 2008.
- Maximum height of management unit: 3 feet

d. Ash Seal Pond:
- Surface area: 4.54 acres
- Total storage capacity: 110083 cubic yards; measurement date – April 2009.
- Volume of materials stored: 73,389 cubic yards; measurement date – 2008.
- Maximum height of management unit: 15 feet

e. Economizer Ash Pond:
- Surface area: 11 acres.
- Total storage capacity: 267,219 cubic yards; measurement date – April 2009.
- Volume of materials stored: 249, 405 cubic yards; measurement date – 2008.
- Maximum height of management unit: 10 feet

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9. Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years, whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to surface water or to the land (do not include releases to groundwater).

a. Main Ash Pond: IPL is not aware of any known spills or unpermitted releases from this pond within the past 10 years. For purposes of this question, all discharges exiting the pond via the discharge point governed under the NPDES permit, including any water quality exceedances, are interpreted to be "permitted releases".

b. Upper Ash Pond: IPL is not aware of any known spills or unpermitted releases from this pond within the past 10 years. For purposes of this question, all discharges exiting the pond via the discharge point governed under the NPDES permit, including any water quality exceedances, are interpreted to be "permitted releases".

c. Lower Ash Pond: IPL is not aware of any known spills or unpermitted releases from this pond within the past 10 years. For purposes of this question, all discharges exiting the pond via the discharge point governed under the NPDES permit, including any water quality exceedances, are interpreted to be "permitted releases".

d. Ash Seal Pond: IPL is not aware of any known spills or unpermitted releases from this pond within the past 10 years. For purposes of this question, all discharges exiting the pond via the discharge point governed under the NPDES permit, including any water quality exceedances, are interpreted to be "permitted releases".

e. Economizer Ash Pond; IPL is not aware of any known spills or unpermitted releases from this pond within the past 10 years. For purposes of this question, all discharges exiting the pond via the discharge point governed under the NPDES permit, including any water quality exceedances, are interpreted to be "permitted releases".

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10. Please identify all current legal owner(s) and operator(s) at the facility.

a. The Operator is: Interstate Power and Light Company

b. The Owner is: Interstate Power and Light Company

C. Confidentiality of IPL's Response.

As noted above, IPL requests that EPA treat the information submitted herein as "confidential business information".

* * * *

Please find attached the affidavit of John Larsen, Vice President-Generation, that is being submitted with this response to the information request. Please feel free to contact me at (319) 786-4686 if you have any questions concerning this response.

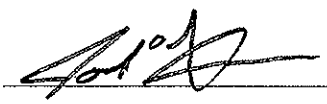
Very truly yours,

Daniel L. Siegfried
Managing Attorney

Enclosure: Iowa DNR Wastewater Compliance Inspection Report dated January 22, 2008

Certification

I certify that the information contained in this response to EPA's request for information and the accompanying documents is, based on my personal belief and my knowledge of the actions taken to respond to the information request and subject to the explanation that follows, true, accurate, and complete. The response points out ambiguities and other difficulties in responding to the request, and where that is true, a good faith effort has been made to provide information that is reasonably available and responsive to the request. As to the portions of this response for which I cannot personally verify their accuracy, I certify under penalty of law that this response and all attachments were prepared in accordance with a system designed to reasonably assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: 

Name: John O. Larsen

Title: Vice President - Generation

Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

January 22, 2008

Vernon Hasten, Plant Manager
Alliant Energy
Burlington Generating Station
4282 Sullivan Slough Rd.
Burlington, IA 52601-9015

SUBJECT: Wastewater Inspection Report
Facility No. 6-29-00-1-00

Dear Mr. Hasten:

On 12-17-2007, I conducted a wastewater inspection at the Burlington Generating Station. Enclosed is a copy of my inspection report which you will find to be self-explanatory.

If you have any further questions, feel free to contact me at this office.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Paul Brandt

Paul Brandt
Environmental Specialist Senior

J:/pbrandt/ww/burl-gen0108-ltr NOV.doc

Encl. Inspection Report

xc: DNR Records Section, DNR, Des Moines
Robin Nelson, E&S Specialist, Burlington Generating Station, 4282 Sullivan Slough Rd., Burlington, IA 52601
William Skalitzky, Senior Environmental Specialist, Alliant Energy P.O. Box 77007, Madison, WI 53707-1007
File - Alliant Industrial

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
WASTEWATER TREATMENT FACILITY INSPECTION

NPDES Permit #: 6-29-00-1-00

FACILITY	NAME: Alliant Energy – Burlington Generating Station		OWNER: Interstate Light & Power Co.		
	ADDRESS: 4282 Sullivan Slough Rd.	CITY: Burlington	STATE: Iowa	ZIP: 52601-9015	PHONE: 319-758-5304 (24 Hr. number)
RECEIVING STREAM	STREAM NAME: Mississippi River				
INSPECTION	DATE THIS INSPECTION: 12-17-2007		DATE LAST INSPECTION: 3-23-2006		
PURPOSE	Compliance Evaluation Inspection				
DESIGN CAPACITY	MGD: NA	POUNDS BOD/DAY: NA	PE (BOD) : NA		
NOW TREATING	MGD (average daily) : NA	POUNDS BOD: NA	PE (BOD) : NA		
	POPULATION SERVED: NA				
SAMPLES COLLECTED	TYPE: (none collected)	LAB DATA ATTACHED? [ ]Yes [ ] No			
ATTACHMENTS	PLANT DESCRIPTION CARD: [X] On File [ ] Attached to DNR copy	CERTIFICATION UPDATE MEMO: [ ] Attached [ ] No change in Responsible Op			
	SIGNIFICANT INDUSTRIAL CONTRIBUTOR FORM: [ ] Attached [ ] On file [ ] No Sig. Contr.				
RESPONSIBLE OPERATOR	NAME: Vernon Hasten, Plant Manager	GRADE: NA	CERTIFICATION NUMBER: NA		
PERSONS INTERVIEWED	NAME: Robin Nelson	TITLE: E&S Specialist			
	NAME: Vernon Hasten	TITLE: Plant Manager			
TREATMENT PROCESS	[ ] TRICKLING FILTER [ ] ACTIVATED SLUDGE = > MODIFICATION: [ ] LAGOON [ ] AERATED LAGOON [X] OTHER/SUPPLEMENTARY: **Settling Ponds**				
PROCESS WASTE DESCRIPTION	Electrical power plant cooling water, ash transport and associated waste streams				

PERMIT COMPLIANCE SUMMARY

EFFLUENT LIMITATIONS	SELF-MONITORING RESULTS: [X] Sat. [ ] Marg.* [ ] Unsat.*	SAMPLES THIS INSPECTION: [ ] Sat. [ ] Marg.* [ ] Unsat.* [X] None Collected
	VISUAL APPEARANCE OF EFFLUENT: Clear	VISUAL APPEARANCE OF RECEIVING STREAM: Normal – ice forming

SELF-MONITORING	Operation Reports submitted: [X] Sat. [ ] Marg.* [ ] Unsat.*	REQUIRED DATA ON REPORT: [X] Sat. [ ] Marg.* [ ] Unsat.*	TESTING ADEQUACY: [X] Sat. [ ] Marg.* [ ] Unsat.*

COMPLIANCE SCHEDULE	COMPLIANCE WITH SCHEDULE: [X] Sat. [ ] Marg.* [ ] Unsat.*	NEXT ITEM DUE: All items completed (Iron Study)	DATE DUE: NA

* Explain in Comments and Recommendations Section

AUTHENTICATION	INSPECTOR: Paul Brandt	DATE: 1-18-08	REVIEWER: James T. Stevens	DATE: 1/22/08	

General Description:
On 12-17-2007, I conducted a wastewater inspection of the Interstate Power & Light, Burlington Generating Station (BGS). Prior to the inspection, I reviewed monthly operating reports for the period 1-07 through 11-07. At the facility, I observed all the outfalls and associated treatment processes. No samples were collected during this inspection.

The Burlington Generating Station's NPDES permit lists 6 outfalls:

001 – ash pond treatment system
002 – sanitary waste plant
003 – (there is no 003)
004 – once through non-contact condenser cooling water
005 – chemical metal cleaning wastewater (never used)
006 – ash seal pond treatment system
007 – coal pile runoff retention pond

Storm water is discharged through outfalls 001 & 006; however, a storm water inspection was not conducted at this time.

Monitoring & Reporting:
Monthly operating reports are submitted to Field Office #6. Reports are on time (by the 15th) and contain all required data, sampled at the specified frequencies. Most of the testing is sent out to a contract lab, Test America, which is a DNR certified laboratory (#7).

Outfall 001 (ash pond) – is regulated for TSS, pH, Fe, O/G and effluent toxicity. One TSS exceedence was noted for Sept. 07. This was due to silt in the discharge channel from earlier flooding. One O/G exceedence was noted in August '07 for unknown reasons. The O/G is always less than detection and the sample had appeared normal at the time of collection. The average flow at this outfall ranges from about 1 to 2 MGD.

Outfall 002 is a septic tank/recirculating textile media filter/UV disinfection system for the sanitary wastes. Average flow is about 1000 GPD and no discharge violations were noted.

Outfall 004 is the non-contact cooling water and by far the largest volume of discharge, running from about 76 MGD up to 112 MGD in the summer. No discharge violations were noted.

Outfall 005 – Chemical cleaning of the boiler; this is never used.

Outfall 006 (ash seal pond) – is regulated for the same parameters as 001 (TSS, pH, Fe, O/G, eff. tox.). Average flow is lower than 001, ranging from about 0.50 to 0.90 MGD. No violations noted.

Outfall 007 is the coal pile runoff retention pond. It is sampled for pH & TSS when there is a discharge. This is more of a batch discharge since a valve must be manually opened to drain the pond. All discharges were within limits.

Site Inspection:

Outfall 001 (ash pond) There is an upper and lower ash pond. The lower ash pond is a somewhat marshy area. The discharge channel runs to a culvert under the railroad and to the Mississippi River. Effluent samples are collected at the end of the discharge channel. When the Mississippi is flooding, water will back up into the discharge channel and sampling has to be moved to the upper ash pond discharge.

The upper ash pond discharges into the lower pond through a concrete discharge structure. Flow is measured here for the 001 discharge. The effluent looked clear at this point. The lower ash pond outfall to the Mississippi River was not observed, due to a train parked on the tracks.

Outfall 002 (sanitary wastewater plant) Stopped to look at this plant. It has been operating normally. The septic tank is checked twice per year. It has not been necessary to remove any sludge yet.

Outfalls 004/006 These two outfalls discharge into a stub channel, running about 200 yards back from the Mississippi main channel. Outfall 004 is a large pipe for cooling water return to the river, while 006 is a small pipe (~12" diameter) from the adjacent ash seal pond.

We observed the SE corner of the ash seal pond, where the slurry wall was installed late last fall. The wall had been installed to address seepage through the pond berm, but during construction it was discovered that the seepage was actually coming from a tile line from up along the railroad siding. The tile line outlet had apparently been buried in the lagoon berm at some point. The slurry wall was installed and the tile line outlet has been exposed to drain to the ground surface now and runs down into the river.

Outfall 007 This is the discharge from the coal pile runoff retention basin. There is a closed valve on the outlet line, so it must be opened manually to discharge. It runs into the lower ash pond, and is sampled for TSS and pH when discharged.

Intake Structure I observed the intake structure - nothing unusual here. Ice was forming on the Mississippi River and floating by in large, unconsolidated rafts. Zebra mussel control has not been conducted here in over 6 years, and the utility has not experienced any problems with them.

Administrative Issues:

Intake Structure, Comprehensive Design Study (CDS) Under the NPDES permit, the intake structure is required to meet national performance standards to reduce impingement mortality of fish and shellfish. A CDS was due 1-7-2008 for this facility as well as some other Alliant facilities. The study was completed and submitted to the DNR central office on 12-20-2007.

Monitoring Well Testing For many years, Alliant has been testing two monitoring wells on the plant grounds - an up-gradient and down-gradient well. They are sampled in April and October and the groundwater is analyzed for pH, TDS and specific conductance. At some point, the requirement for this has become lost. I reviewed old files at Field Office #6. Iowa Southern Utilities, in a letter dated 10-3-1990, asked permission to make some modifications to the ash pond. The department responded (letter of Wayne Farrand, dated 10-29-1990) that the proposed modification was OK, but due to the unknown liner quality of the existing pond and concern for impact on local ground water, Iowa Southern was required to install these 2 wells. Once installed, they were to be sampled for pH, TSS and specific conductivity every April and October thereafter.

I looked at some of the data. The earliest report on file was for October, 1992. This data is compared to the October, 2007 report in the following table.

Down-gradient Well			
	pH	TDS	Specific Cond.
Date			
Oct. 1992	7.7	764	1200
Oct. 2007	7.19	720	991

Up-gradient Well			
	pH	TDS	Specific Cond.
Date			
Oct. 1992	7.4	618	783
Oct. 2007	7.03	1040	1420

While there have been a few fluctuations over the years, overall, there has been no significant change in these parameters. The up gradient well has actually increased over the years to where it is now more similar to the down-gradient well, but this increase is still of minor magnitude. Based on the data, there does not appear to have been an impact to the ground water quality thus far, and continued monitoring at a semi-annual interval is probably not necessary (see comments in Conclusion Section).

Compliance Schedule – Iron Study There is a compliance schedule in the new NPDES permit regarding iron limits for outfalls 001/006. The schedule is:

09-05-2006	begin sampling for 12 months (raw/final, 1/month grab)
03-05-2007	progress report summarizing ability to meet limits
10-06-2007	submit report summarizing all data and conclusion as to whether facility can comply or not
10-06-2007	limits become final if that is the conclusion

Alliant began sampling as required. The 03-05-2007 progress report was submitted on 2-26-2007. By this time in the study, Alliant had realized that iron levels in the Mississippi River had a direct bearing on iron in the 001/006 effluent and that the total iron limits could be periodically exceeded. And so, they decided to develop site-specific total iron limits (this is an option in the compliance schedule) and submitted a study plan for review/approval on 02-12-2007. The plan was approved by DNR Wastewater Permits staff on 03-06-2007.

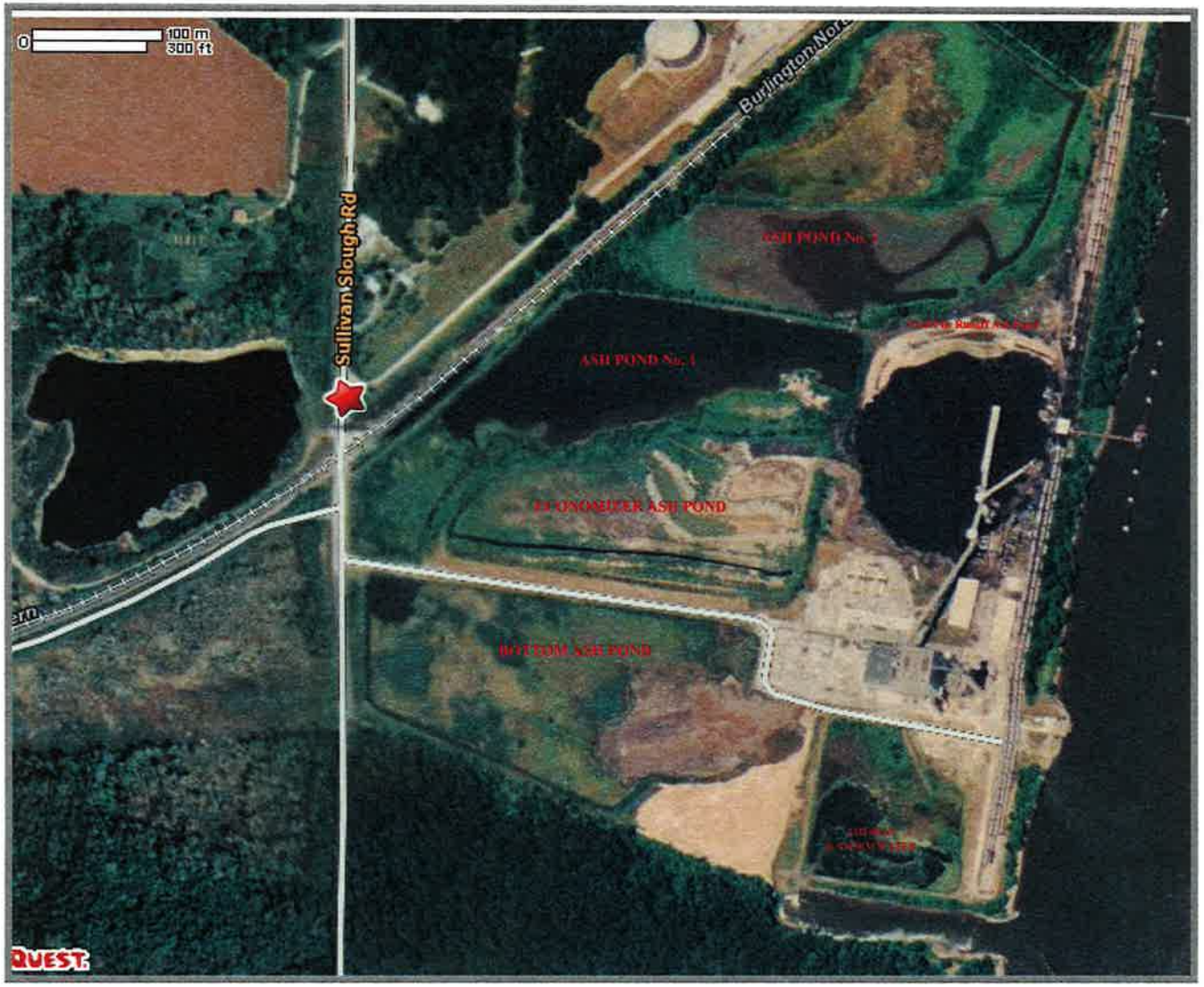
A final report was submitted on 08-15-2007. Alliant's conclusion was that iron discharge limits on 001/006 should not be required – iron limits well in excess of the current limits would be protective of the receiving stream. At the time of this writing, Alliant is awaiting a reply from the DNR in this matter.

Conclusions:

- Wastewater monitoring is being conducted according to the frequencies specified in the permit, and reported to the DNR field office monthly.
- During the review period (1-07 through 11-07) there were two minor discharge violations, one TSS and one O/G, both from outfall 001.
- The intake structure Comprehensive Design Study has been completed and submitted to the Department.
- The Iron Study (compliance schedule) has been completed and submitted to the department. Alliant is awaiting a response on this matter.
- Monitoring Wells – sampling and submitting reports for the two ash pond monitoring wells can be suspended. It is recommended however, that the utility continue to check a sample every few years to verify that nothing unusual is occurring.
- No further recommendations are made at this time.

Alliant Energy Burlington Generating Station
Burlington, Iowa
Site Location Topographic Map

Burlington Generating Station Ash Ponds Satellite View
By Using Map Quest



ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	Wednesday, March 04, 2009	Ash Pond No.1, Ash Pond No.2, Economizer, Bottom Ash Pond, Ash Seal Water
INSPECTOR(S): List Below	WEATHER CONDITIONS:	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	HIGH TEMP: 54^{0}F	
Plant Manager: Vernon Hasten	LOW TEMP: 26^{0}F	
Operations Manager: Kermit Smith	WIND: -	PRESS: 0 inches
Maintenance Manager: Steve Conrad	SIGNATORY REVIEW:	
E&S Specialist: Robin Nelson		

Description:

On Wednesday, March 4, 2009 the Alliant Energy inspection team visited Burlington Generating Station. During our inspection of the Ash Ponds at BGS we noted numerous issues and are most concerned with the erosion and physical condition of the levee associated with Ash Pond No.1. This pond has the significant animal activities (e.g., beaver and muskrat) along the northwest of the levee wall, erosion, and a lot of trees. The inspection team believes that a significant damage occurred to this levee during the major flooding the plant experienced in 2008. This ash pond needs immediate attention to prevent future levee breaches.

Additionally, the Economizer Ash Pond is completely full of ash and is no longer able to be used as a settling pond for the plant's ash. This is causing ash to carryover to the lower pond systems and is impacting the flow of water and sediment in the lower pond systems. The Economizer Ash Pond needs to be dredged to restore it to a settling pond to alleviate the ash loading on the lower pond system.

Based on the Independent Levee Investigation Team: Trees that are planted on top of or adjacent to the levee structure can result in significant damage. Trees that are blown over in ***high wind conditions***, not only create a large void that can destabilize the levee or like, but t***he root systems associated with the tree can result in preferred piping channels if the roots are pulled out of the dike or levee*** (such as if a tree is blown over in a strong wind storm.) ***To mitigate possible impacts of tree damage on levees or dikes***, design and maintenance guidelines generally specify that trees be ***kept clear of the dike or levee structure***.

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	March 4, 2009	Ash Pond No. 1
INSPECTOR(S): List Below	**WEATHER CONDITIONS: Describe Weather Conditions**	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	**SIGNATORY REVIEW:**	
Plant Manager: Vernon Hasten E&S Specialist: Robin Nelson		

1. Dike/Levee Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?	X		Yes
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?	X		Yes
Any areas of eroison caused either by wind eroison; storm water runoff into or outside the dike wall?	X		Yes
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?	X		Yes
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?	X		Yes
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?	X		Yes
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

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ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	March 4, 2009	Ash Pond No. 2
INSPECTOR(S): List Below	**WEATHER CONDITIONS: Describe Weather Conditions**	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	**SIGNATORY REVIEW:**	
Plant Manager: Vernon Hasten		
E&S Specialist: Robin Nelson		

1. Dike/Levee Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?		X	
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of eroison caused either by wind eroison; storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	March 4, 2009	Economizer Ash Pond
INSPECTOR(S): List Below	**WEATHER CONDITIONS: Describe Weather Conditions**	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	**SIGNATORY REVIEW:**	
Plant Manager: Vernon Hasten E&S Specialist: Robin Nelson		

1. Dike/Levee Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?	X		Yes
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of eroison caused either by wind eroison; storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?	X		Yes

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	March 4, 2009	Bottom Ash Pond
INSPECTOR(S): List Below	**WEATHER CONDITIONS: Describe Weather Conditions**	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	**SIGNATORY REVIEW:**	
Plant Manager: Vernon Hasten		
E&S Specialist: Robin Nelson		

1. Dike/Levee Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?	X		Yes
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of eroison caused either by wind eroison; storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED:
Burlington Generating Station	March 4, 2009	Ash Seal Storm Water
INSPECTOR(S): List Below	**WEATHER CONDITIONS: Describe Weather Conditions**	
Bill Skalitzky, Bielka Liriano, and Buddy Hasten	Mostly Cloudy	
PLANT MANAGEMENT REVIEW(if applicable): Spell Name	**SIGNATORY REVIEW:**	
Plant Manager: Vernon Hasten E&S Specialist: Robin Nelson		

1. Dike/Levee Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?	X		Yes
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		Yes
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of eroison caused either by wind eroison; storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

NOTES or OBSERVATIONS

Provide a description of the issue or observation below:

ISSUE	Description and Location of Issue	Maximo Work Order #	Due Date	Date Completed
Trees along the levee	On the northwest side and west side wall on the Ash Pond No.1 need to be remove			
Animals activities	Monitor the beavers activities locate on the west side and northwest side on the Ash Pond No.1			
Erosion	Monitor the erosion on the west and northwest of the Ash Pond No.1 along the wall			

Review this Sheet Prior to each Inspection

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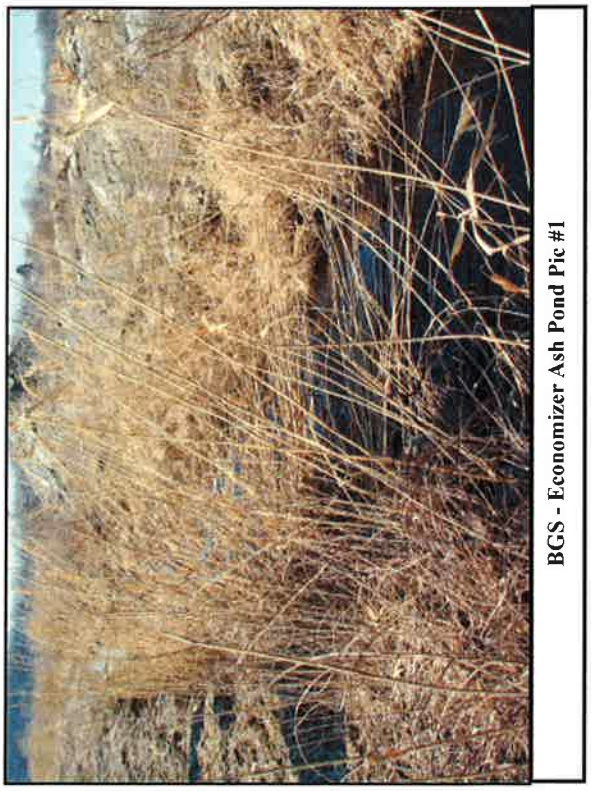
BGS - Economizer Ash Pond Pic #2

BGS - Bottom Ash Pond Pic #4



BGS - Economizer Ash Pond Pic #1

BGS - Bottom Ash Pond Pic #3

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BGS - Ash Pond No.1 Pic #6

BGS - Ash Pond No.1 Pic #8

BGS - Ash Pond No.1 Pic #5

BGS - Ash Pond No.1 Pic #7

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BGS - Ash Pond No.1 Pic #10

BGS - Ash Pond No.1 Pic #12

BGS - Ash Pond No.1 Pic #9

BGS - Ash Pond No.1 Pic #11

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BGS - Ash Pond No.1 Pic #14

BGS - Ash Pond No.1 Pic #16

BGS - Ash Pond No.1 Pic #13

BGS -Ash Pond No.1 Pic #15

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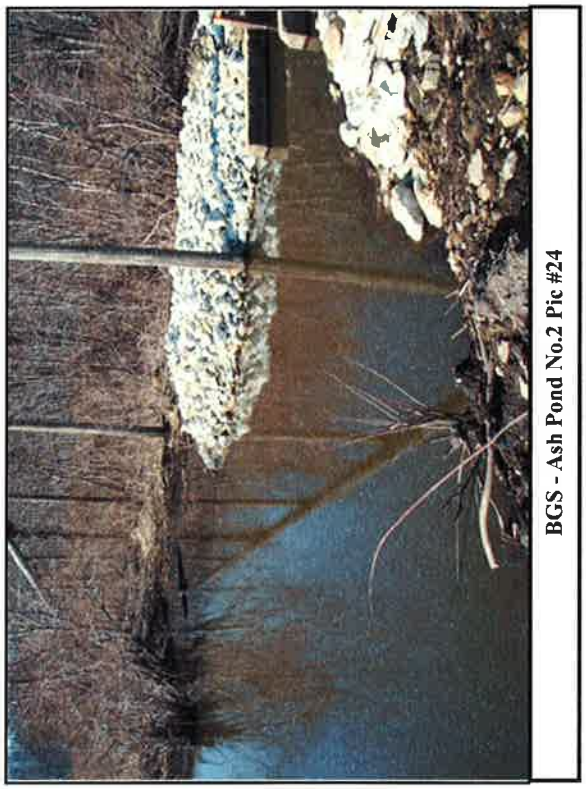
BGS - Ash Pond No.1 Pic #18

BGS - Ash Pond No.1 Pic #20

BGS - Ash Pond No.1 Pic #17

BGS - Ash Pond No.1 Pic #19

BGS - Seal Ash Pond Pic #22



BGS - Ash Pond No.2 Pic #24

BGS - Seal Ash Pond Pic #21

BGS - Seal Ash Pond Pic #23

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND PHOTO LOG

PLANT NAME: Burlington Generating Station

DATE	PHOTO NUMBER	DESCRIPTION of the PHOTO
3/4/2009	BGS Pic #1	Economizer Ash Pond picture shows shrubs along the channel
3/4/2009	BGS Pic #2	Economizer Ash Pond picture shows the erosion
3/4/2009	BGS Pic #3	Bottom Ash Pond picture shows animals burrow
3/4/2009	BGS Pic #4	Bottom Ash Pond picture shows erosion
3/4/2009	BGS Pic #5	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #6	Ash Pond No.1 picture shows flood letf over
3/4/2009	BGS Pic #7	Ash Pond No.1 picture shows soft soil
3/4/2009	BGS Pic #8	Ash Pond No.1 picture shows erosion
3/4/2009	BGS Pic #9	Ash Pond No.1 picture shows erosion
3/4/2009	BGS Pic #10	Ash Pond No.1 picture shows beaver mound
3/4/2009	BGS Pic #11	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #12	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #13	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #14	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #15	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #16	Ash Pond No.1 picture shows beaver mound
3/4/2009	BGS Pic #17	Ash Pond No.1 picture shows erosion
3/4/2009	BGS Pic #18	Ash Pond No.1 picture shows erosion
3/4/2009	BGS Pic #19	Ash Pond No.1 picture shows erosion
3/4/2009	BGS Pic #20	Ash Pond No.1 picture shows animals burrow
3/4/2009	BGS Pic #21	Seal Ash Pond picture shows animals burrow
3/4/2009	BGS Pic #22	Seal Ash Pond picture shows trees on the inside of the levee
3/4/2009	BGS Pic #23	Seal Ash Pond picture shows trees on the inside of the levee
3/4/2009	BGS Pic #24	Ash Pond No.2 - No coment

CONFIDENTIAL BUSINESS INFORMATION

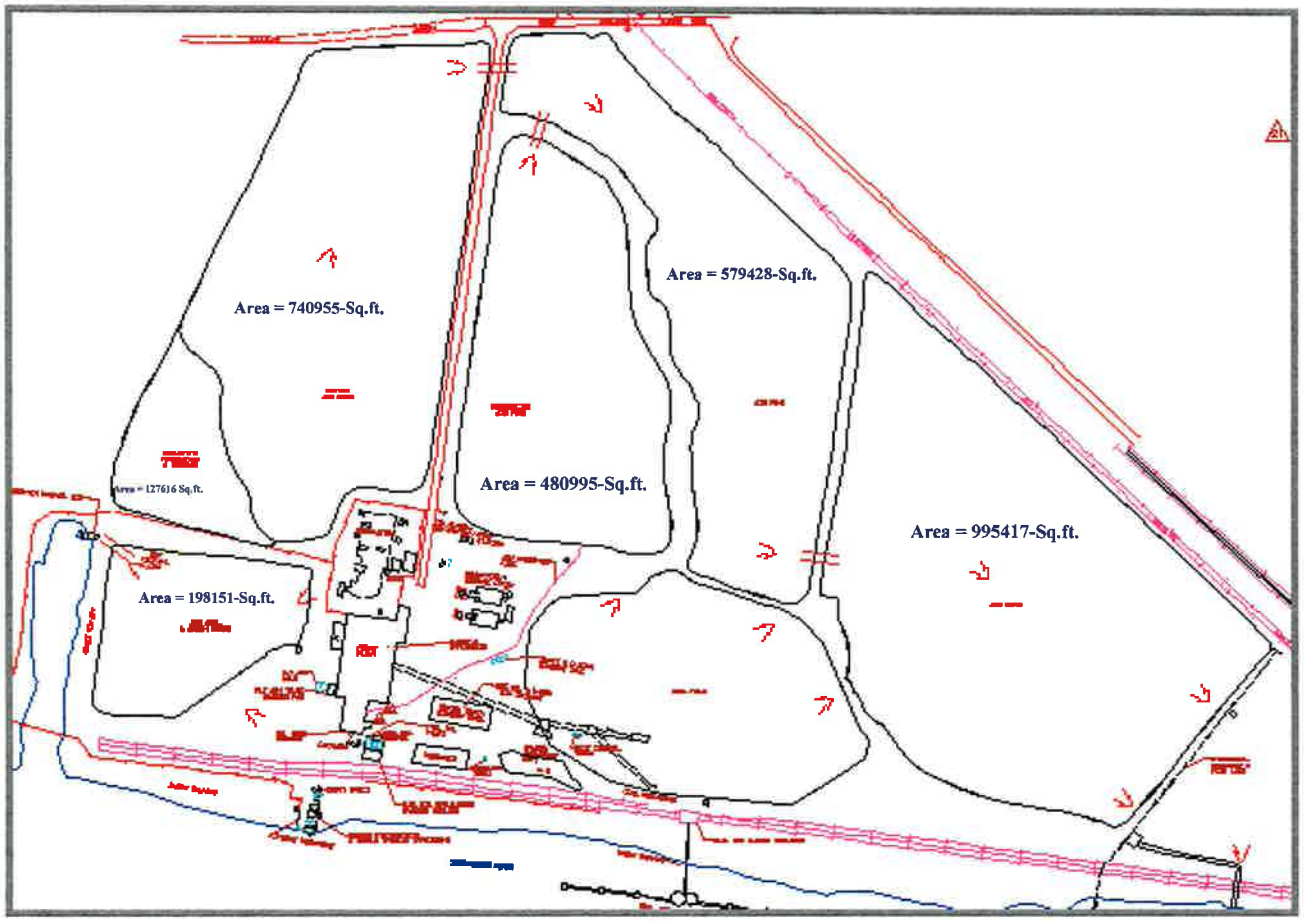
INSPECTION FORM INSTRUCTIONS

1)	**Plant Name**	Insert name of facility being inspected
2)	**Date**	List date of when inspection was completed
3)	**List Pond Inspected**	List plant name of pond being inspected. For plants with multiple ponds, use one inspection form per pond. Example: Coal Pile Runoff Pond
4)	**Inspectors**	List name of employee(s) who performed the inspection
5)	**Weather Conditions**	List the current weather conditions (cloud cover/precip/temp/wind strength) If there was a substantial rain or runoff event, please note as well
6)	**Plant Mgmt Review**	Plant Management staff is required to review and sign off on the inspection form. It is advisible that 1 member of the plant management team review the report with the inspector(s)
7)	**Signatory Review**	Each plant management staff must sign off on the report
8)	**Inspection Process**	Physically walk around each side of the pond looking for conditions present on the report Answer each question and note any issues on page 2. If any issue is discovered, please note the location of the area in question and the steps taken to resolve the issue Examples: For animal caused issues, contracted with a Alliant Approved Company to remove/relocate the animals For erosion/dead vegitation issues, filled in the area and applied grass seed For large trees and woody shrubs, removed or cut down the trees/shrubs For wind erosion, used clean rip/rap to prevent futher eroison For seepage/dike integrity issues, try to determine the source of the issue and eliminate. If seepage continues, may need to perform soil structual analysis and repair dike.

CONFIDENTIAL BUSINESS INFORMATION

INSPECTION PROCESS	
Inspection Frequency	Minimum inspection frequency is as follow: Spring/Summer/Fall. Inspections can be combined with other inspections
Additional Inspection Frequencies	In addition to item #1 above, inspections should take (at the descretion of the Plant Manager) during these events Large Rain Event or meltoff and flood events (other than typical spring events)
Pictures	Pictures are a great opportunity to capture existing condtions and allows a site to compare from year to year Pictures shall be taken during the initial inspection and then during each Spring Inspection Pictures shall be taken at the same location each year. These areas will be defined during the initial inspection Pictures shall be taken to show areas of concern that are observed during each inspection and attached to the report
Addressing Items of Concern	Inspectors will review the pictures and the inspection form with Plant Management Staff. Decisions shall be made to address the current issue. Corporate Environmental shall be contacted regarding the issue; review of solutions; and determine if any type of Permitting or Approval is required, prior to commencing the work, from the State Agency; Federal Agenicies; or County Agencies Engineering shall be contacted regarding structural concerns of a dike or what might the impact be to the integrity of the Dike if a trees or other living objects are removed (root concerns)
Review of Records	Prior to a new year of inspections, plant staff shall review the previous year inspections to review past issues and if they were resolved Total Suspended Soilds (TSS) analysis from past Discharge Monitoring Reports shall be reviewed each year to determine if the ponds require more intensive dredging

Burlington Generating Station - Ash Pond
Total Area Calculations by using AutoCAD LT 2007 Software



CONFIDENTIAL BUSINESS INFORMATION

Bielka A. Liriano
Projects Engineer - Central
1000 Main St
Dubuque, IA 52003
(563) 584-7337 (Office)
(563) 513-8145 (Cell)

9/28/2010
6:44 PM

Burlington Generating Station - Ash Pond
Total Area Calculations by using the Bentley View V8i Software

CONFIDENTIAL BUSINESS INFORMATION

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1000 Main St
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9/28/2010
6:58 PM

Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

April 10, 2009

RECEIVED
APR 2 0 2009

Mr. Bill Skalitsky
Senior Environmental Specialist
Alliant Energy
4902 North Biltmore Lane
Madison, WI 53707-1007

Subject: Final NPDES Permit Amendment
NPDES Permit No.: 29-00-1-01

Dear Mr. Skalitsky:

Enclosed is a final amendment to the National Pollutant Discharge Elimination System (NPDES) permit issued to the Interstate Power & Light Burlington Generating Station on September 5, 2006. This amendment deletes all interim effluent limitations from the permit, deletes the effluent limitations and monitoring requirements for iron at outfall 001, revises the mass limits for iron at outfall 006 and replaces the schedule of compliance with a schedule for eliminating all discharges from outfall 006 by November 1, 2009. The basis for these changes was described in some detail in our January 20, 2009 letter and is further described in the rationale for this amendment which can be found at https://programs.iowadnr.gov/wwpie.

You submitted several comments in response to our public notice of the draft amendment dated February 24, 2009. I replied to those comments by email on March 31, 2009 and I repeat your comments and my responses here.

Comment: In the permit rationale dated 2/20/09 it is stated that the iron limit for Outfall 006 is 5.1 mg/l yet the draft NPDES permit lists 1.44 mg/l. Will the limit be 5.1 mg/l and if "yes" the mass limits will need to be changed accordingly.

Response: If outfall 006 was going to remain an active outfall it is possible that the permit limit for iron could be raised to 5.1 mg/l. That was the water quality-based limit calculated using data from toxicity testing performed in 2007. The current limit is 1.44 mg/l and outfall 006 has so far consistently met this limit. Since the outfall meets the current concentration limit and because the outfall is going to be eliminated there is no reason to adjust the concentration limits today. The mass limits for iron have been increased based on new information on discharge flow rates that was not available at the time the permit was issued because the facility has not, and likely cannot, comply with the current mass limits in the interim until this outfall is eliminated. Once the outfall is eliminated the permit will need to be amended again to delete all limits and monitoring for outfall 006.

Comment: With the higher flows listed in the permit rationale, it would appear the 30 day monthly average and the maximum daily mass limits should increase due to the higher flow. I believe the flow used to calculate the mass for iron was 1.29 MGD. This would change the 30 day average mass limit from 100 lbs/day to 323 lbs/day and the daily maximum from 334 lbs/day to 1075 lbs/day.

Response: I believe the same argument for not changing the iron concentration limits applies to not changing the mass limits for TSS or Oil & grease at outfall 006. The current limits are being met and there is every reason to expect that they will continue to be met in the interim period until this outfall is eliminated. Thus, there is no justification for increasing the mass limits at this time. Once the outfall is eliminated the permit will need to be amended again to delete all limits and monitoring for outfall 006.

The final amendment reflects several other minor changes that were not included in the draft. These include the deletion of all interim limits and the compliance schedule from the permit. With the issuance of this amendment and the revised iron limits the facility should now be in compliance with all final effluent limits making the interim limits and compliance schedule unnecessary. Also, the title on page 27 has been changed from "Compliance Schedule" to "Outfall Elimination Schedule" to reflect that the department is not requiring that this outfall be eliminated in order to achieve compliance but that Interstate Power and Light Co. has elected to do so for other reasons.

I recommend you provide a copy of the amendment to each person who received a copy of the original permit and that the original of the amendment be attached to the original permit in your files.

Please call 515-281-8884 or e-mail me at steve.williams@dnr.iowa.gov if you have questions concerning the permit or this amendment.

Sincerely yours,

Steven N. Williams

Steven N. Williams
Environmental Specialist, Sr.
NPDES Section

Enclosure: Final NPDES Permit Amendment

c: Field Office #6

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STATE OF IOWA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROGRAM
AMENDMENT TO NPDES PERMIT

Iowa NPDES Permit No: 29-00-1-01
Date of Issuance: September 5, 2006
Date of Expiration: September 4, 2011
Date of this Amendment: April 10, 2009

EPA NUMBER: IA0001783

Name and Mailing Address of Applicant:

Interstate Power and Light Company
Burlington Generating Station
4282 Sullivan Slough Road
Burlington, Iowa 52601-9015

Identity and Location of Facility:

Interstate Power and Light Company
Burlington Generating Station
Section 29, Township 69N, Range 02W
Des Moines County, Iowa

Pursuant to the authority of Iowa Code Section 455B.174, and of Rule 567--64.3, Iowa Administrative Code, the Director of the Iowa Department of Natural Resources has issued the above referenced permit. Pursuant to the same authority the Director hereby amends said permit for the reason(s) stated below:

The permit is modified to delete all interim effluent limits, to include a schedule which requires elimination of outfall 006 by November 1, 2009, to revise the mass limits for iron at outfall 006 based on new and more accurate discharge flow information and to delete the iron limits and monitoring at outfall 001 based on the results of toxicity testing and effluent data showing the discharge has no reasonable potential to cause or contribute to a violation of water quality standards due to iron. Replace pages 4, 6, 7, 8, 10, 12, 14, 15, 16 and 27 of the permit with the attached pages.

For the Department of Natural Resources

Steven N. Williams

Steven N. Williams
NPDES Section
ENVIRONMENTAL SERVICES DIVISION

Enclosure

c: Field Office #6

IOWA DEPARTMENT OF NATURAL RESOURCES
National Pollutant Discharge Elimination System (NPDES) Permit

OWNER NAME & ADDRESS

INTERSTATE POWER & LIGHT COMPANY
200 FIRST STREET SE
P.O. BOX 351
CEDAR RAPIDS, IA 52406 - 0351

FACILITY NAME AND ADDRESS

IP&L-BURLINGTON GENERATING STATION
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601 - 9015

Section 29, T 69N, R 02W
DES MOINES County

IOWA NPDES PERMIT NUMBER: 2900101

DATE OF ISSUANCE: 9/5/2006

DATE OF EXPIRATION: 9/4/2011

YOU ARE REQUIRED TO FILE FOR RENEWAL OF THIS PERMIT BY: 3/8/2011

EPA NUMBER: IA0001783

This permit is issued pursuant to the authority of section 402(b) of the Clean Water Act (33 U.S.C 1342(b)), Iowa Code section 455B.174, and rule 567--64.3, Iowa Administrative Code. You are authorized to operate the disposal system and to discharge the pollutants specified in this permit in accordance with the effluent limitations, monitoring requirements and other terms set forth in this permit.

You may appeal any condition of this permit by filing a written notice of appeal and request for administrative hearing with the director of this department within 30 days of your receipt of this permit.

Any existing, unexpired Iowa operation permit or Iowa NPDES permit previously issued by the department for the facility identified above is revoked by the issuance of this permit. This provision does not apply to any authorization to discharge under the terms and conditions of a general permit issued by the department or to any permit issued exclusively for the discharge of stormwater.

FOR THE DEPARTMENT OF NATURAL RESOURCES

By _____

John Warren
NPDES Section
ENVIRONMENTAL SERVICES DIVISION

Facility Nar. P&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Outfall Number	Outfall Description
001	DISCHARGE FROM THE ASH POND TREATMENT SYSTEM CONSISTING OF BOILER BLOWDOWN, ASH TRANSPORT WATER; REVERSE OSMOSIS/DEMINERALIZER REJECT WATERS; WATER TREATMENT BLOWDOWN; PLANT FLOOR SUMPS (PROCESSED THROUGH OIL/WATER SEPARATOR); STORM WATER RUNOFF FROM PORTIONS OF THE PLANT INCLUDING, PARKING LOTS, ROOF DRAINS, TRACTOR SHED, AND THE COAL PILE RUNOFF RETENTION POND.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow:

002 DISCHARGE FROM A SEPTIC TANK AND RECIRCULATION TEXTILE MEDIA FILTER WASTEWATER TREATMENT SYSTEM.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow:

004 DISCHARGE CONSISTS OF ONCE THROUGH NON-CONTACT CONDENSER COOLING WATER, NON-CONTACT COOLING WATER OF VARIOUS PLANT EQUIPMENT, AND WATER INTAKE SCREEN BACKWASH.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow:

005 DISCHARGE OF CHEMICAL METAL CLEANING WASTES.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow: ASH POND TO MISSISSIPPI RIVER

006 DISCHARGE FROM THE ASH SEAL POND TREATMENT SYSTEM CONSISTING OF ASH SEAL WATER; AN ALTERNATE EMERGENCY FLOOR SUMP DISCHARGE; AND STORM WATER RUNOFF FROM PORTIONS OF THE PLANT INCLUDING, FLYASH LOADING AREA, AND PLANT GROUNDS.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow:

Facility Na: P&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

007 DISCHARGE FROM THE COAL PILE RUNOFF RETENTION POND.

Receiving Stream: MISSISSIPPI RIVER

Route of Flow: ASH POND TO MISSISSIPPI RIVER

The permit was written to protect warm water game fish populations along with a resident aquatic community that includes a variety of native nongame fish and invertebrate species. The permit also protects for recreational or other uses that may result in prolonged and direct contact with the water, involving considerable risks of ingesting water in quantities sufficient to pose a health hazard. Such activities would include, but not be limited to, swimming, diving, water skiing, and water contact recreational canoeing.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 001 DISCHARGE FROM THE ASH POND TREATMENT SYSTEM CONSISTING OF BOILER BLOWDOWN, ASH TRANSPORT WATER, REVERSE OSMOSIS/DEMINERALIZER REJECT WATERS, WATER TREATMENT BLOWDOWN, PLANT FLOOR SUMPS (PROCESSED THROUGH OIL/WATER SEPARATOR), STORM WATER RUNOFF FROM PORTIONS OF THE PLANT INCLUDING, PARKING LOTS, ROOF DRAINS, TRACTOR SHED, AND THE COAL PILE RUNOFF RETENTION POND.

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type of Limit	% Removal	EFFLUENT LIMITATIONS							
				Concentration				Mass			
				7 Day Average/Min	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
TOTAL SUSPENDED SOLIDS	YEARLY	FINAL			30.0	100.0	MG/L		751.0	2,502.0	LBS/DAY
PH (MINIMUM - MAXIMUM)	YEARLY	FINAL		6.0		9.0	STD UNITS				
OIL AND GREASE	YEARLY	FINAL			15.0	20.0	MG/L		375.0	500.0	LBS/DAY
ACUTE TOXICITY, CERIODAPHNIA	YEARLY	FINAL							1.0		NO TOXICITY
ACUTE TOXICITY, PIMEPHALES	YEARLY	FINAL							1.0		NO TOXICITY

Note: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

Facility N. .: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Non-Standard Effluent Limitations

OUTFALL NO.: 001 DISCHARGE FROM THE ASH POND TREATMENT SYSTEM CONSISTING OF BOILER BLOWDOWN; ASH TRANSPORT WATER; REVERSE OSMOSIS/DEMINERALIZER REJECT WATERS; WATER TREATMENT BLOWDOWN; PLANT FLOOR SUMPS (PROCESSED THROUGH OIL/WATER SEPARATOR); STORM WATER RUNOFF FROM PORTIONS OF THE PLANT INCLUDING, PARKING LOTS, ROOF DRAINS, TRACTOR SHED, AND THE COAL PILE RUNOFF RETENTION POND.

The effluent limitations for total suspended solids specified on page 4 of this permit are net limits. The permittee is authorized to deduct the amount of total suspended solids in river water used for ash transport that subsequently discharge through outfall 001. The net discharge shall be calculated as follows:

$$(Q_d \times 8.34 \times C_d) - (Q_{at} \times 8.34 \times C_i) = \frac{\text{Net discharge (lbs/day)}}{8.34 \times Q_d} = \text{Net discharge (mg/L)}$$

Where:

Q_d = Flow rate from outfall 001 (mgd)
C_d = Concentration of total suspended solids measured in outfall 001 (mg/L)
Q_{at} = Flow rate of river water used for ash transport (mgd)
C_i = Concentration of total suspended solids measured in intake water (mg/L)

Note! The net discharge may never be less than zero. All measurements needed to calculate the net discharge of total suspended solids must be made a minimum of 24 hours since the last measurable storm event. Additionally, the water intake sample shall be collected 24 hours prior to the collection of the discharge sample from the ash pond.

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pH

When the pH of the intake water from the Mississippi River, prior to any chemical addition, exceeds 9.0 pH units the maximum pH effluent limitation shall be equal to or less than that of the intake water.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 002 DISCHARGE FROM A SEPTIC TANK AND RECIRCULATING TEXTILE MEDIA FILTER WASTEWATER TREATMENT SYSTEM.

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type of Limit	% Removal	EFFLUENT LIMITATIONS							
				Concentration				Mass			
				7 Day Average/Min	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
CBOD5	YEARLY	FINAL		40.0	25.0		MG/L	0.33	0.21		LBS/DAY
TOTAL SUSPENDED SOLIDS	YEARLY	FINAL		45.0	30.0		MG/L	0.38	0.25		LBS/DAY
PH (MINIMUM - MAXIMUM)	YEARLY	FINAL		6.0		9.0	STD UNITS				
COLIFORM,FECAL	SUMMER	FINAL			200.0	373.0	#/100 ML				

Note: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

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Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 004 DISCHARGE CONSISTS OF ONCE THROUGH NON-CONTACT CONDENSER COOLING WATER, NON-CONTACT COOLING WATER OF VARIOUS PLANT EQUIPMENT, AND WATER INTAKE SCREEN BACKWASH.

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type	EFFLUENT LIMITATIONS							
			Concentration				Mass			
			7 Day Average	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
*TEMPERATURE , VARIABLE	YEARLY	FINAL	-	-	-	-	-	-	-	-
TEMPERATURE, FIXED	JAN	FINAL			104	FAHRENHEIT				
TEMPERATURE, FIXED	FEB	FINAL			104	FAHRENHEIT				
TEMPERATURE, FIXED	MAR	FINAL			104	FAHRENHEIT				
TEMPERATURE, FIXED	APR	FINAL			104	FAHRENHEIT				
TEMPERATURE, FIXED	NOV	FINAL			104	FAHRENHEIT				
TEMPERATURE, FIXED	DEC	FINAL			104	FAHRENHEIT				
CHLORINE, TOTAL RESIDUAL	YEARLY	FINAL			0.2	MG/L			188	LBS/DAY
DURATION OF CHLORINE DISCHARGE	YEARLY	FINAL							2.0	HOURS/DAY

*Compliance with the flow variable temperature limit shall be determined using the formulas specified on pages #21 and #22 of this permit. The variable temperature limits shall only be applied during the months of May through October. The fixed temperature limits are applicable to the remaining months, November through April.

NOTE: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 005 DISCHARGE OF CHEMICAL METAL CLEANING WASTES.

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type of Limit	% Removal	EFFLUENT LIMITATIONS							
				Concentration				Mass			
				7 Day Average/Min	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
PH (MINIMUM - MAXIMUM)	YEARLY	FINAL		6.0		9.0	STD UNITS				
COPPER,TOTAL (AS CU)	YEARLY	FINAL				1.0	MG/L			1.7	LBS/DAY
IRON,TOTAL (AS FE)	YEARLY	FINAL				1.0	MG/L			1.7	LBS/DAY

Note: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Non-Standard Effluent Limitations

OUTFALL NO.: 005 DISCHARGE OF CHEMICAL METAL CLEANING WASTES.

The effluent limitations for total iron specified on page 8 of this permit are net limits and apply directly to the chemical metal cleaning wastes prior to mixing with other wastestreams. The permittee is authorized to deduct the amount of total iron in river water used for chemical metal cleaning wastes. The net discharge shall be calculated for total iron as follows:

$$(Q_d \times 8.34 \times C_d) - (Q_{mc} \times 8.34 \times C_i) = \frac{\text{Net discharge (lbs/day)}}{8.34 \times Q_d} = \text{Net discharge (mg/L)}$$

Where:

Q_d = Flow rate from metal cleaning wastes (mgd)
C_d = Concentration of total iron in chemical metal cleaning wastes (mg/L)
Q_{mc} = Flow rate of river water used for the chemical metal cleaning wastes (mgd)
C_i = Concentration of total iron measured in intake water (mg/L)

Note! The net discharge may never be less than zero. All measurements needed to calculate the net discharge of total iron must be made on the same day.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 006 DISCHARGE FROM THE ASH SEAL POND TREATMENT SYSTEM CONSISTING OF ASH SEAL WATER, AN ALTERNATIVE EMERGENCY FLOOR SUMP DISCHARGE, AND STORM WATER RUNOFF FROM PORTIONS OF THE PLANT INCLUDING, FLY ASH LOADING AREA, AND PLANT GROUNDS.

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type of Limit	% Removal	EFFLUENT LIMITATIONS							
				Concentration				Mass			
				7 Day Average/Min	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
TOTAL SUSPENDED SOLIDS	YEARLY	FINAL			30.0	100.0	MG/L		100.0	334.0	LBS/DAY
PH (MINIMUM - MAXIMUM)	YEARLY	FINAL		6.0		9.0	STD UNITS				
IRON,TOTAL (AS FE)	YEARLY	FINAL			1.44	1.44	MG/L		15.6	15.6	LBS/DAY
OIL AND GREASE	YEARLY	FINAL			15.0	20.0	MG/L		50.0	67.0	LBS/DAY

Note: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

Facility Na... .. IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Non-Standard Effluent Limitations

OUTFALL NO.: 006 DISCHARGE FROM THE ASH SEAL POND TREATMENT SYSTEM CONSISTING OF ASH SEAL WATER; AN ALTERNATE EMERGENCY FLOOR SUMP DISCHARGE; AND STORM WATER RUNOFF FROM A PORTION OF THE PLANT, FLYASH LOADING AREA, AND PLANT GROUNDS.

The effluent limitations for total suspended solids specified on page 10 of this permit are net limits. The permittee is authorized to deduct the amount of total suspended solids in river water used for ash seal water that subsequently discharge through outfall 006. The net discharge shall be calculated as follows:

$$(Q_d \times 8.34 \times C_d) - (Q_{as} \times 8.34 \times C_i) = \frac{\text{Net discharge (lbs/day)}}{8.34 \times Q_d} = \text{Net discharge (mg/L)}$$

River − Pond − River

Where:

Q_d = Flow rate from outfall 006 (mgd)
C_d = Concentration of total suspended solids measured in outfall 006 (mg/L)
Q_{as} = Flow rate of river water used for ash seal water (mgd)
C_i = Concentration of total suspended solids measured in intake water (mg/L)

Note! The net discharge may never be less than zero. All measurements needed to calculate the net discharge of total suspended solids must be made a minimum of 24 hours since the last measurable storm event. Additionally, the water intake sample shall be collected 24 hours prior to the collection of the discharge sample from the ash seal pond.

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pH

When the pH of the intake water from the Mississippi River, prior to any chemical addition, exceeds 9.0 pH units the maximum pH effluent limitations shall be equal to or less than that of the intake water.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Effluent Limitations

Outfall No.: 007 DISCHARGE FROM THE COAL PILE RUNOFF RETENTION POND.

Interim Limits Start: 09/05/2006 Interim Limits End: 10/05/2007

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

Wastewater Parameter	Season	Type of Limit	% Removal	EFFLUENT LIMITATIONS							
				Concentration				Mass			
				7 Day Average/Min	30 Day Average	Daily Maximum	Units	7 Day Average	30 Day Average	Daily Maximum	Units
TOTAL SUSPENDED SOLIDS	YEARLY	FINAL				50.0	MG/L				
PH (MINIMUM - MAXIMUM)	YEARLY	FINAL		6.0		9.0	STD UNITS				

Note: If seasonal limits apply, summer is from March 15 through November 15, and winter is from November 16 through March 14.

Facility Name IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Non-Standard Effluent Limitations

OUTFALL NO.: 007 DISCHARGE FROM THE COAL PILE RUNOFF RETENTION POND.

Wastewater Parameter	Non-Standard Limits
TOTAL SUSPENDED SOLIDS	Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the total suspended solids limitation.

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized.

(c) Chapter 63 of the Iowa Administrative Code provides you with further explanation of your monitoring requirements.

(d) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. Also, flow data shall be reported in million gallons per day (MGD).

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the department by the fifteenth day following the close of the reporting period. Your reporting period is on a monthly basis, ending on the last day of each reporting period.

Outfall Number	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
001	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	GRAB	INTAKE FROM STREAM
001	PH (MINIMUM - MAXIMUM)	1 EVERY MONTH	GRAB	INTAKE FROM THE MISSISSIPPI RIVER PRIOR TO ANY CHEMICAL ADDITION
001	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	CALCULATED	FINAL EFFLUENT (NET ADDITION)
001	FLOW	1 TIME PER WEEK	24 HOUR TOTAL	FINAL EFFLUENT FROM THE FLOW METER LOCATED BETWEEN THE UPPER AND LOWER ASH POND
001	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	GRAB	FINAL EFFLUENT
001	PH (MINIMUM - MAXIMUM)	1 EVERY MONTH	GRAB	FINAL EFFLUENT
001	OIL AND GREASE	1 EVERY MONTH	GRAB	FINAL EFFLUENT
001	ACUTE TOXICITY, CERIODAPHNIA	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	FINAL EFFLUENT
001	ACUTE TOXICITY, PIMEPHALES	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	FINAL EFFLUENT
002	FLOW	1 TIME PER WEEK	24 HOUR TOTAL	FINAL EFFLUENT
002	CBOD5	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	FINAL EFFLUENT
002	TOTAL SUSPENDED SOLIDS	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	FINAL EFFLUENT
002	PH (MINIMUM - MAXIMUM)	1 EVERY 3 MONTHS	GRAB	FINAL EFFLUENT
002	COLIFORM,FECAL	1 EVERY 3 MONTHS	GRAB	FINAL EFFLUENT
002	SETTLEABLE SOLIDS	1 TIME PER WEEK	GRAB	FINAL EFFLUENT

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized.

(c) Chapter 63 of the Iowa Administrative Code provides you with further explanation of your monitoring requirements.

(d) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. Also, flow data shall be reported in million gallons per day (MGD).

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the department by the fifteenth day following the close of the reporting period. Your reporting period is on a monthly basis, ending on the last day of each reporting period.

Outfall Number	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
002	TEMPERATURE	1 EVERY 3 MONTHS	GRAB	FINAL EFFLUENT
004	STREAM FLOW	7/WEEK OR DAILY	MEASUREMENT	RIVER FLOW AT LOCK & DAM 18 DURING THE MONTHS OF MAY THROUGH OCTOBER (VARIABLE TEMPERATURE LIMITS TIMEFRAME)
004	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	INTAKE FROM RIVER DURING THE MONTHS OF MAY THROUGH OCTOBER (VARIABLE TEMPERATURE LIMITS TIMEFRAME)
004	TEMPERATURE	7/WEEK OR DAILY	MEASUREMENT	RIVER TEMPERATURE AT LOCK & DAM 18 DURING THE MONTHS OF MAY THROUGH OCTOBER (VARIABLE TEMPERATURE LIMITS TIMEFRAME)
004	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	FINAL EFFLUENT
004	PH (MINIMUM - MAXIMUM)	1 TIME PER WEEK	GRAB	FINAL EFFLUENT
004	CHLORINE,TOTAL RESIDUAL	1 EVERY 2 WEEKS	GRAB	SAMPLING TO OCCUR DURING PERIODS OF CHLORINE ADDITION
004	TEMPERATURE	7/WEEK OR DAILY	GRAB	FINAL EFFLUENT
004	DURATION OF CHLORINE DISCHARGE	7/WEEK OR DAILY	MEASUREMENT	MONTHLY REPORT
005	IRON,TOTAL (AS FE)	7/WEEK OR DAILY	GRAB	INTAKE FROM RIVER ONLY DURING A DISCHARGE EVENT
005	IRON,TOTAL (AS FE)	7/WEEK OR DAILY	CALCULATED	FINAL EFFLUENT (NET ADDITION) ONLY DURING A DISCHARGE EVENT
005	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	CHEMICAL METAL CLEANING WASTES PRIOR TO MIXING WITH OTHER WASTESTREAMS ONLY DURING A DISCHARGE EVENT
005	PH (MINIMUM - MAXIMUM)	7/WEEK OR DAILY	GRAB	CHEMICAL METAL CLEANING WASTES PRIOR TO MIXING WITH OTHER WASTESTREAMS ONLY DURING A DISCHARGE EVENT
005	COPPER,TOTAL (AS CU)	7/WEEK OR DAILY	GRAB	CHEMICAL METAL CLEANING WASTES PRIOR TO MIXING WITH OTHER WASTESTREAMS ONLY DURING A DISCHARGE EVENT

Facility Name: IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized.

(c) Chapter 63 of the Iowa Administrative Code provides you with further explanation of your monitoring requirements.

(d) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. Also, flow data shall be reported in million gallons per day (MGD).

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the department by the fifteenth day following the close of the reporting period. Your reporting period is on a monthly basis, ending on the last day of each reporting period.

Outfall Number	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
005	IRON,TOTAL (AS FE)	7/WEEK OR DAILY	GRAB	CHEMICAL METAL CLEANING WASTES PRIOR TO MIXING WITH OTHER WASTESTREAMS ONLY DURING A DISCHARGE EVENT
006	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	GRAB	INTAKE FROM STREAM
006	PH (MINIMUM - MAXIMUM)	1 EVERY MONTH	GRAB	INTAKE FROM THE MISSISSIPPI RIVER PRIOR TO ANY CHEMICAL ADDITION
006	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	CALCULATED	FINAL EFFLUENT (NET ADDITION)
006	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	GRAB	FINAL EFFLUENT
006	PH (MINIMUM - MAXIMUM)	1 EVERY MONTH	GRAB	FINAL EFFLUENT
006	IRON,TOTAL (AS FE)	1 EVERY MONTH	GRAB	FINAL EFFLUENT
006	OIL AND GREASE	1 EVERY MONTH	GRAB	FINAL EFFLUENT
007	TOTAL SUSPENDED SOLIDS	1 EVERY MONTH	GRAB	FINAL EFFLUENT FROM THE COAL PILE RUNOFF RETENTION POND PRIOR TO MIXING WITH OTHER WASTESTREAMS IF A DISCHARGE OCCURS
007	PH (MINIMUM - MAXIMUM)	1 EVERY MONTH	GRAB	FINAL EFFLUENT FROM THE COAL PILE RUNOFF RETENTION POND PRIOR TO MIXING WITH OTHER WASTESTREAMS IF A DISCHARGE OCCURS

Facility Name IP&L-BURLINGTON GENERATING STATION

Permit Number: 2900101

Special Monitoring Requirements

Outfall Number	Description
001	TOTAL SUSPENDED SOLIDS

Druing flooding events, when the Mississippi River level is at an elevation where the effluent pipe from the lower ash pond becomes submerged, all compliance monitoring shall be conducted at the discharge from the upper ash pond prior to entering the lower ash pond.

During normal operations, when the effluent pipe from the lower ash pond is not submerged, all compliance monitoirng shall be conducted at the effluent pipe from the lower ash pond. Following a flooding event, monitoring shall continue from the upper ash pond for one week after the river level has dropped below the effluent pipe.

002 COLIFORM,FECAL

The average limit for fecal coliform of 200 org/100 ml specified in page 6 of this permit is a geometric mean, not a 30-day average and the maximum limit of 373 org/100 ml is a sample maximum, not a daily maximum limit. These limits are equivalent to the E. coli Water Quality Standard of 126 org/100 ml geometric mean and 235 org/100 ml sample maximum.

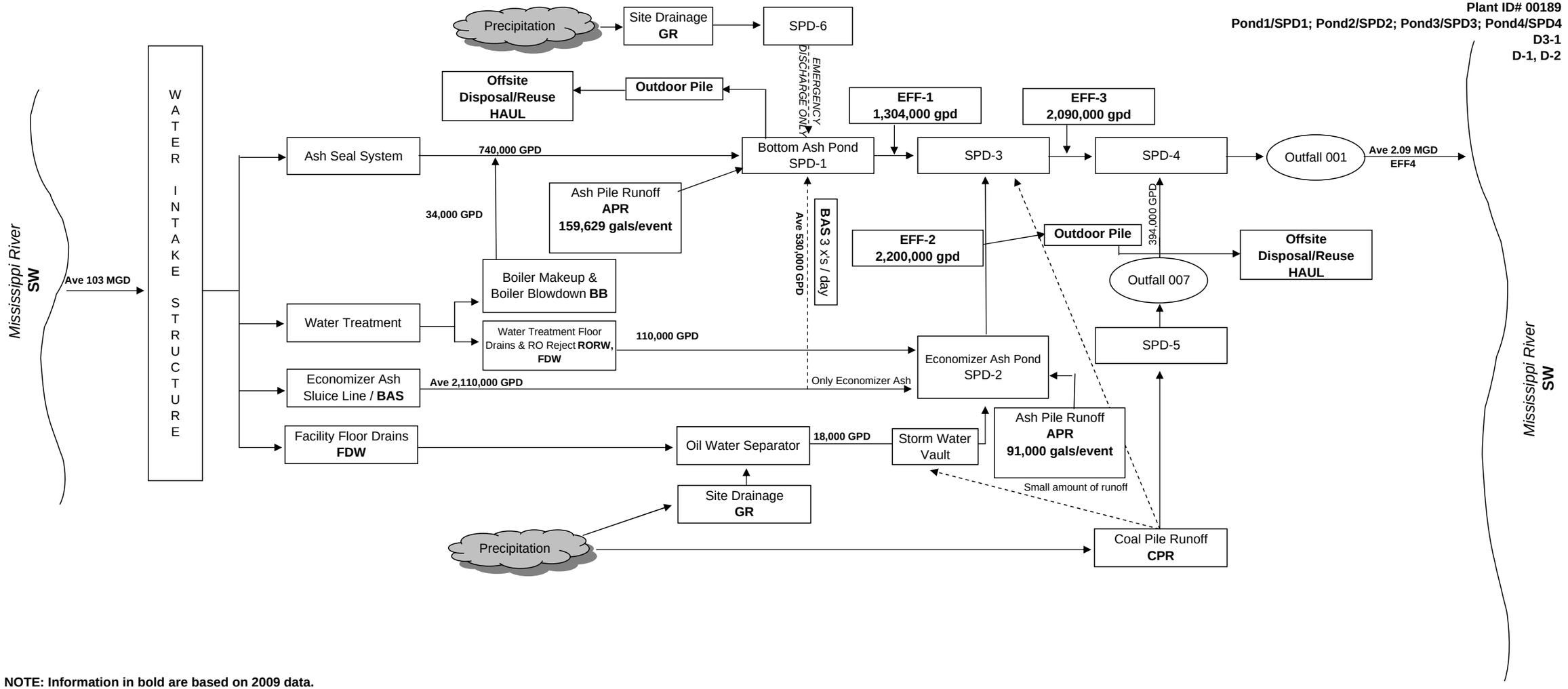
The facility must collect and analyze a minimum of five samples in one calendar month during each 3-month period (quarter) from March 15 to November 15. This will result in a minimum of 15 samples being collected during a calendar year. For example, for the first 3-month period, the operator may choose April as the calendar month to collect the 5 individual fecal coliform samples to determine compliance with the limits. The operator may also choose the months of March or May as well, as long as each of the 5 samples are collected during a single calendar month. The same principle applies to the other two 3-month periods during the disinfection season. The following requirements apply to the individual samples collected in one calendar month:
Samples must be spaced over one calendar month.
No more than one sample can be collected on any one day.
There must be a minimum of two days between each sample.
No more than two samples may be collected in a period of seven consecutive days.

Each individual sample result will be compared to the sample maximum limit to determine compliance. The geometric mean must be calculated using all valid sample results collected during a month. The geometric mean formula is as follows: Geometric Mean = (Sample one * Sample two * Sample three * Sample four *Sample five…Sample N)(1/N), which is the Nth root of the result of the multiplication of all of the sample results where N = the number of samples. If a sample result is a less than value, the value reported by the lab without the less than sign should be used in the geometric mean calculation.

The geometric mean can be calculated in one of the following ways:
Use a scientific calculator that can calculate the powers of numbers.
Enter the samples in Microsoft Excel and use the function "GEOMEAN" to perform the calculation.
Use the geometric mean calculator on the Iowa DNR webpage at: http://www.iowadnr.com/water/npdes/calculator.html.

CONFIDENTIAL BUSINESS INFORMATION

IPL - Burlington Generating Station
Plant ID# 00189
Pond1/SPD1; Pond2/SPD2; Pond3/SPD3; Pond4/SPD4
D3-1
D-1, D-2

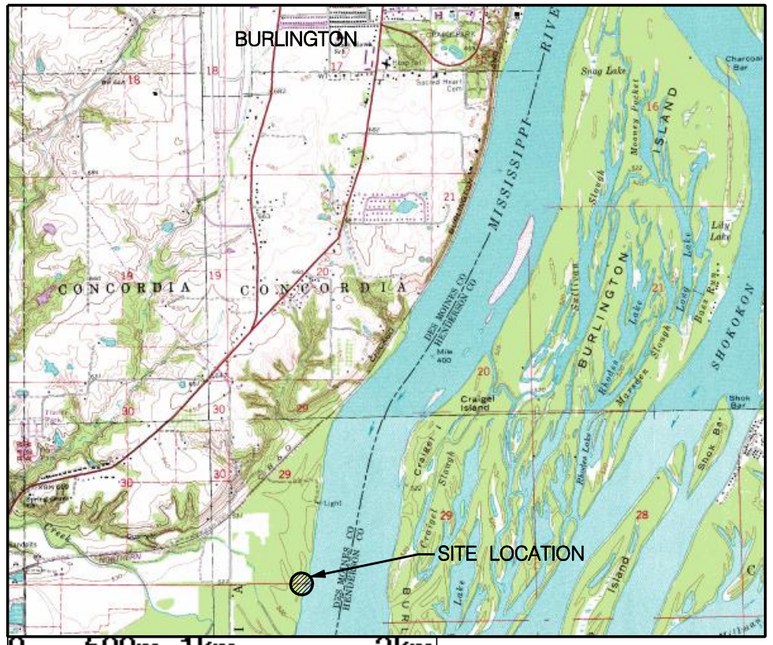


NOTE: Information in bold are based on 2009 data.

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY
BURLINGTON GENERATING STATION
SLURRY WALL CONSTRUCTION AND SEEP REPAIR

4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601
OCTOBER 2007



AREA QUAD

DRAWING INDEX

SITE AERIAL

REV	DATE	BY	DESCRIPTION

SCALE: NONE

DESIGNED: M. Loerop
DRAWN: HHSI
CHECKED: HHSI

CLIENT: ALLIANT ENERGY
BURLINGTON GENERATING STATION

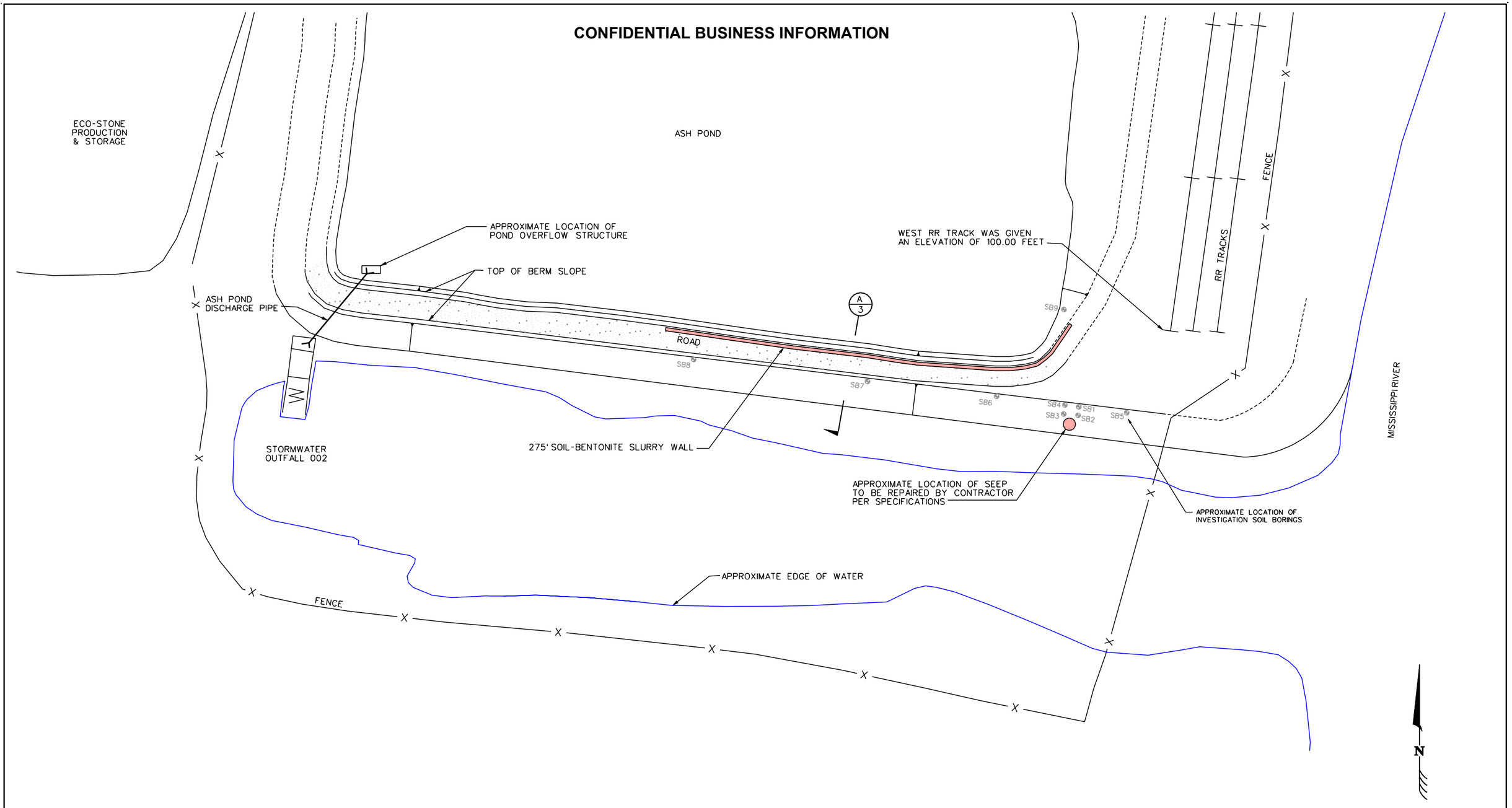
TITLE: COVER SHEET

HARD HAT SERVICES TM
Engineering, Construction and Management Solutions
940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 637-9470

SHEET: 1 OF 3 SHEETS

10/12/2007 ...\cover.dgn

CONFIDENTIAL BUSINESS INFORMATION



REV	DATE	BY	DESCRIPTION

SCALE: 0 — 30 — 60
SCALE IN FEET

DESIGNED: M. Loerop
DRAWN: HHSI
CHECKED: HHSI

CLIENT: ALLIANT ENERGY
BURLINGTON GENERATING STATION

TITLE: GENERAL SITE LAYOUT

HARD HAT SERVICES TM
Engineering, Construction and Management Solutions

940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 637-9470

SHEET: 2 OF 3 SHEETS

10/12/2007 ...\SITE LAYOUT.dgn

DESIGN SPECIFICATIONS

CONFIDENTIAL BUSINESS INFORMATION

Contractor Experience

An experienced slurry wall Contractor shall construct a soil-bentonite slurry wall. Experience shall include at least 100,000 square feet of soil-bentonite slurry wall construction with the contractors proposed site superintendent having at least 50,000 square feet of soil bentonite wall experience. Contractor shall submit their experience to the Project Manager for approval prior to installation of the slurry wall or purchase of materials.

Sodium Bentonite

Contractor shall supply the Construction Manager with the bentonite manufacturer's certificate of compliance. The bentonite shall be pulverized premium grade sodium cation montmorillonite.

Test results for each lot of bentonite must be provided:

• YP/PV ratio	API Std. 13A	Less than 3
• Viscometer		Greater than 30
• Filtrate Loss		15 - 25 cm3 loss at 100psi, and 12-15cm3 loss at 42 psi with no more than 2 mm of filter cake on the paper
• Moisture Content	ASTM D 2216	less than 10 percent

Sodium Bentonite must be stored in an above ground dry enclosure. High humidity storage locations shall not be used. Prematurely hydrated sodium bentonite shall not be used for construction of the slurry wall and shall be properly disposed.

Make-up Water

Clean and fresh water, free from excessive quantities of deleterious substances that could adversely affect the properties of the slurry, shall be used to manufacture the bentonite slurry. It is the responsibility of the contractor that the slurry resulting from the water used shall always meet the following standards:

• pH	6 - 9
• Hardness	less than 200 ppm
• Total Dissolved Solids	less than 500 ppm
• Oil, organics, acids, alkali	less than 50 ppm each
• Chloride	report

Sodium Bentonite Slurry

The initial bentonite slurry must be tested prior to placement in the trench. The slurry may either be mixed in high shear mixers or mixed and hydrated in slurry hydration ponds. If slurry ponds are used for hydration, dry bentonite shall be added in a venturi mixer, not in bulk. Sodium Bentonite shall be added to the make-up water at a minimum of 5% by weight.

• Viscosity - Marsh Funnel (API RP 13B-1)	less than 40 seconds
• Density	less than 64 pcf
• pH	6.5 to 10

A minimum hydration time of 8 hours shall be used.

After placement in the trench, the slurry shall be tested two times at two locations for each 8-hour shift. At each location the slurry shall be tested two feet from the surface and two feet from the bottom of the trench

- The viscosity shall be measured using the Marsh Funnel test (API RP 13B-1) and shall be between 30 to 40 seconds.
- Slurry shall have a unit weight between 64 pcf and 85 pcf unless approved by the Project Manager. If the slurry exceeds 85 pcf the excess solids must be removed by desanding or the slurry replaced with fresh slurry.

In place slurry shall be no more than 2 feet below the top of the working platform and at least 2 feet above the ash pond water elevation.

Soil-Bentonite Backfill

Soil used to produce the soil-bentonite backfill shall pass the following gradation specification.

- 65 to 100 percent passing 3/8" sieve
- 40 to 85 percent passing the #20 sieve
- 25 to 40 percent passing the #200 sieve
- Roll soil that passes the #200 sieve to 1/8 inch thread

Bentonite backfill shall be mixed with the soil removed from the excavation and mixed until the material is homogeneous with a slump of 2 to 6 inches, as measured per ASTM D 143. The Contractor shall mix the materials at the location determined by the Project Manager. Contractor shall provide documentation to the Project Manager that the soil-bentonite backfill contains at least 2% bentonite by weight. A passing slump test is required for each 750 CY of backfill material. All particles should be coated with bentonite slurry and large particles (> 4 inches) should be removed or segregated. The tracks of a bulldozer and excavator or other method may be used in reducing the clod size and in producing a homogeneous material prior to material placement within the slurry wall. The slurry wall shall be constructed at least 12 inches above the high water elevation within the settling pond, which will be provided by the Project Manager. The Contractor shall place the soil-bentonite backfill to a depth of 18 inches below the surrounding ground elevation.

The Contractor shall demonstrate, to the satisfaction of the Project Manager, that each section of the slurry-filled trench is continuous prior to backfilling. Trench continuity shall be assured by demonstrating the free action and movement of the excavation equipment within the trench prior to backfilling. Digging tools must pass vertically from top to bottom of the trench, and horizontally along the alignment of the trench, without encountering unexcavated material. The trench shall be verified and documented by the Contractor for proper depth every 10 feet.

The contractor shall demonstrate, to the satisfaction of the Project Manager, that the trench is keyed the minimum specified depth into the underlying hard silty clay. Penetration of the bottom of the trench into the underlying hard silty clay shall be assured by observation of the cuttings removed from the trench and by comparing direct trench depth measurements to anticipated depths based on the design details.

Temporary and Permanent Clay Cap

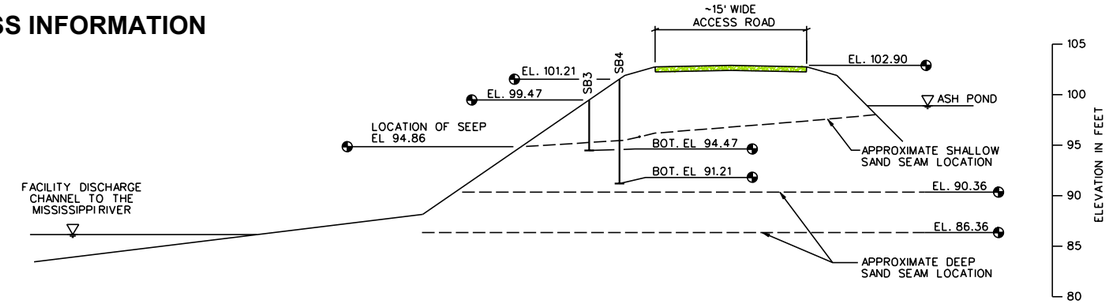
A two-foot deep temporary protective slurry wall cap shall be constructed in the form of non-compacted soil cover and placed within 24-hours of each 100-foot length of slurry wall. The temporary cap shall be completely removed after greater than two weeks of consolidation time. In place of the temporary cap, Contractor may chose to place soil-bentonite to finish grade and then remove soil bentonite to construct the permanent cap. The permanent clay cap shall be constructed by replacing the void space with at least, three, 6-inch compacted clay lifts, placed at +/- 2% of optimum moisture content or as approved by project manager and compacted to 95% of a Standard Proctor, per ASTM D698. The compacted clay lifts shall be installed to match the surrounding ground surface, as necessary. The clay fill material shall pass the backfill gradation requirement as specified above.

Restoration Activities

A six-ounce geotextile shall be placed atop the completed soil bentonite slurry wall in accordance with the manufacture's installation instructions. The geotextile shall extend 5 feet beyond all disturbed areas along the berm. Finally, 6 inches of well-graded Iowa DOT 4120.03 Class C gravel shall be placed and compacted atop the geotextile at a minimum of 5 passes with a smooth drum roller. The gravel gradation shall be provided to and approved by the Project Manager prior to placement by the Contractor.

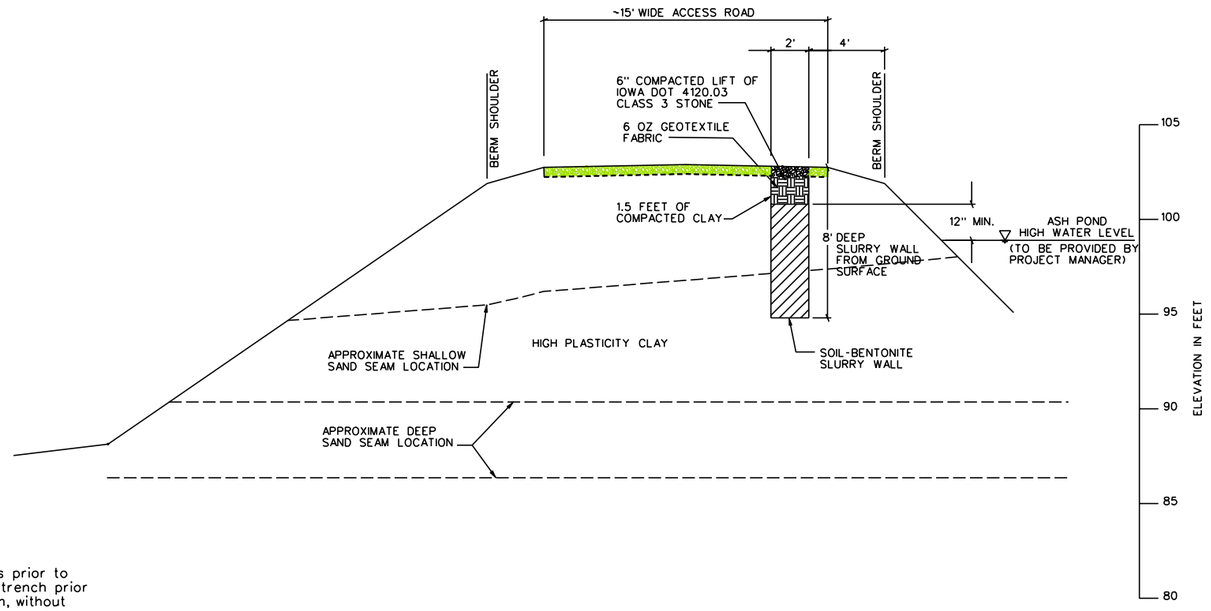
The Contractor shall repair the seep on the south east corner of the berm as shown on Sheet 2. The erosion area shall be regraded, seeded with Iowa DOT approved seed mix, and straw shall be placed on disturbed areas to prevent erosion along the berm face.

After Completion of backfilling and capping, remove and level all remaining excavated material and slurry as directed by the Project Manager. Dispose of excess slurry by spreading in thin layers at the location designated by the Project Manager. No slurry shall be left in ponds, and all ponds shall be pumped dry and backfilled with suitable material approved by the Project Manager.



EXISTING BERM DETAIL

0 4 10 15
SCALE IN FEET



SLURRY WALL SECTION 1/2

0 4 8
SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE: AS SHOWN

DESIGNED: M. Loerop
DRAWN: HHSI
CHECKED: HHSI

CLIENT: ALLIANT ENERGY
BURLINGTON GENERATING STATION

TITLE: SPECIFICATIONS AND DETAILS

HARD HAT SERVICES TM
Engineering, Construction and Management Solutions
940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 637-9470

SHEET: 3 OF 3 SHEETS

10/12/2007 ...\DETAILS.dgn

GEOTECHNICS
Soil & Material Testing
A DIVISION OF KLINGNER
610 N. 4th St., Suite 100 • Burlington, IA 52601 • voice 319.753.0816 • fax 319.752.3605

CONFIDENTIAL BUSINESS INFORMATION

January 8, 2008

Mr. Ron Veach, Project Manager
Alliant Energy
4282 Sullivan Slough Road
Burlington, IA 52601

RE: Ash Pond Repairs
Burlington Generating Station
Engineer Certification

Dear Ron:

Pursuant to the Iowa DNR correspondence dated October 30, 2007, we are providing a certification and supporting documentation that the repair work to the ash pond as proposed by Hard Hat Services has been completed in accordance with the 10/29/07 engineering drawings.

We observed key portions of the repair work including trench excavation, bentonite slurry mixing, soil bentonite mixing, slurry and soil placement, and final cap placement. Additionally, we performed various tests to determine if the slurry and soil mixture properties were in conformance with those specified. The documentation is included as attachments.

It was subsequently learned through the use of a backhoe that the "seep to be repaired by contractor" is actually an old drain tile outfall that likely originates somewhere near the railroad tracks, possibly installed at the time of construction to dewater that area. The slurry wall construction has not had a noticeable impact on the flow from this drain tile.

I certify that, to the best of my knowledge, the repair work for the Alliant Energy Ash Pond was completed according to the design specifications of the Hard Hat engineering drawings dated 10/29/07. As always, if you have any questions please do not hesitate to contact us.

Very truly yours,

GEOTECHNICS

Bryan C. Bross, PE, RG
Licensed Professional Engineer
Iowa License Certificate No. 17084
Valid Through 12/31/2009

BCB/sjb/P:\05749 INTERSTATE POWER & LIGHT CO\002-072298_SLURRYWALLTESTING\RV20071213.DOC

C: Ms. Robin Nelson, Alliant Energy

Enclosure: On-Site Representative's Daily Construction Report (2 pages)
Sieve Analyses of Native Soils (3 pages)
Hard Hat Services – Slurry Wall Design (3 pages)
Site Photographs (4 pages)

GEOTECHNICS
Soil & Material Testing

SOIL AND FOUNDATION CONSULTANTS
610 N. 4 TH Street, Burlington, Iowa 52601, 319-753-0816

SIEVE ANALYSIS DATA

TO: Interstate Power & Light
P.O. Box 5007
Dubuque, Iowa 52004-5007

P.O. NO. _____

DATE 11/15/07

JOB NO. 5749-2/07-2298

PROJECT: SLURRY WALL

DESCRIPTION OF SAMPLE NO. Soil/Clay Mixture

LOCATION Alliant Generating Plant

SAMPLED BY: GSG DATE: 11/12/07 DRY WT.:746.9 gm TESTED BY: GSG DATE: 11/13/07

SIEVE NO.	WT. RETAINED	% RETAINED	% PASSING	SPEC. LIMITS
1"	0	0	100	
3/8"	77.59	10.4	90	65-100
8	51.86	6.9	83	
20	35.54	4.8	78	40-85
30	36.84	4.9	73	
50	98.65	13.2	60	
100	100.60	13.5	46	
200	63.98	8.6	38	25-40
PAN	15.89	2.1		
WASH	266.1	35.6		

REMARKS: -200 ROLLED OUT TO 1/8" RIBBONS WHEN MIXED WITH WATER

Respectfully submitted,

Bryan Bross, P.E., R.G.
Branch Manager

MEETS REQUIREMENTS

GEOTECHNICS
Soil & Material Testing

SOIL AND FOUNDATION CONSULTANTS
610 N. 4 TH Street, Burlington, Iowa 52601, 319-753-0816

SIEVE ANALYSIS DATA

TO: Interstate Power & Light
P.O. Box 5007
Dubuque, Iowa 52004-5007

P.O. NO. _____

DATE 11/15/07

JOB NO. 5749-2/07-2298

PROJECT: SLURRY WALL

DESCRIPTION OF SAMPLE NO. Soil/Clay Mixture

LOCATION Alliant Generating Plant

SAMPLED BY: GSG DATE: 11/8/07 DRY WT.: 1205.0 gm TESTED BY: GSG DATE: 11/9/07

SIEVE NO.	WT. RETAINED	% RETAINED	% PASSING	SPEC. LIMITS
1"	0	0	100	
1/2"	147.88	12.3	88	
3/8"	65.35	5.4	82	65-100
4	35.37	3.0	79	
8	20.71	1.7	78	
20	38.23	3.2	74	40-85
30	27.03	2.2	72	
50	70.10	5.8	66	
100	68.38	5.7	61	
200	52.81	4.4	56	25-40
PAN	29.88	2.5		
WASH	645.2	53.8	56	

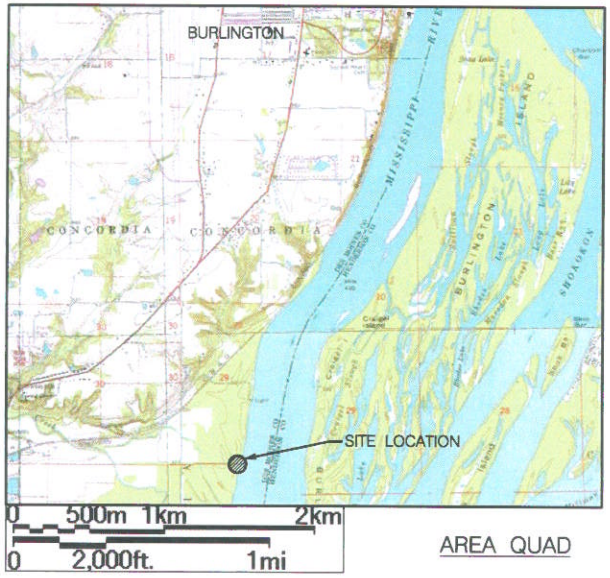
REMARKS: Not Suitable

Respectfully submitted,

Bryan Bross, P.E., R.G.
Branch Manager

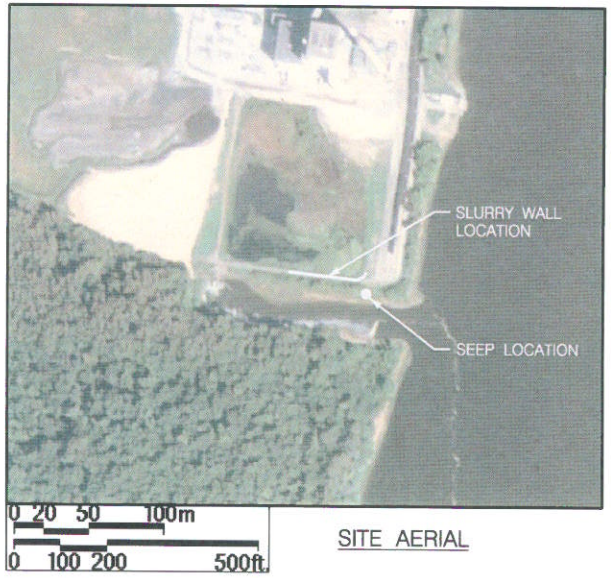
ALLIANT ENERGY
BURLINGTON GENERATING STATION
SLURRY WALL CONSTRUCTION AND SEEP REPAIR

4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601
OCTOBER 2007



AREA QUAD

DRAWING INDEX



SITE AERIAL

CONFIDENTIAL BUSINESS INFORMATION

REV	DATE	BY	DESCRIPTION

SCALE: NONE
DESIGNED: M. Loerop
DRAWN: HHSI
CHECKED: HHSI

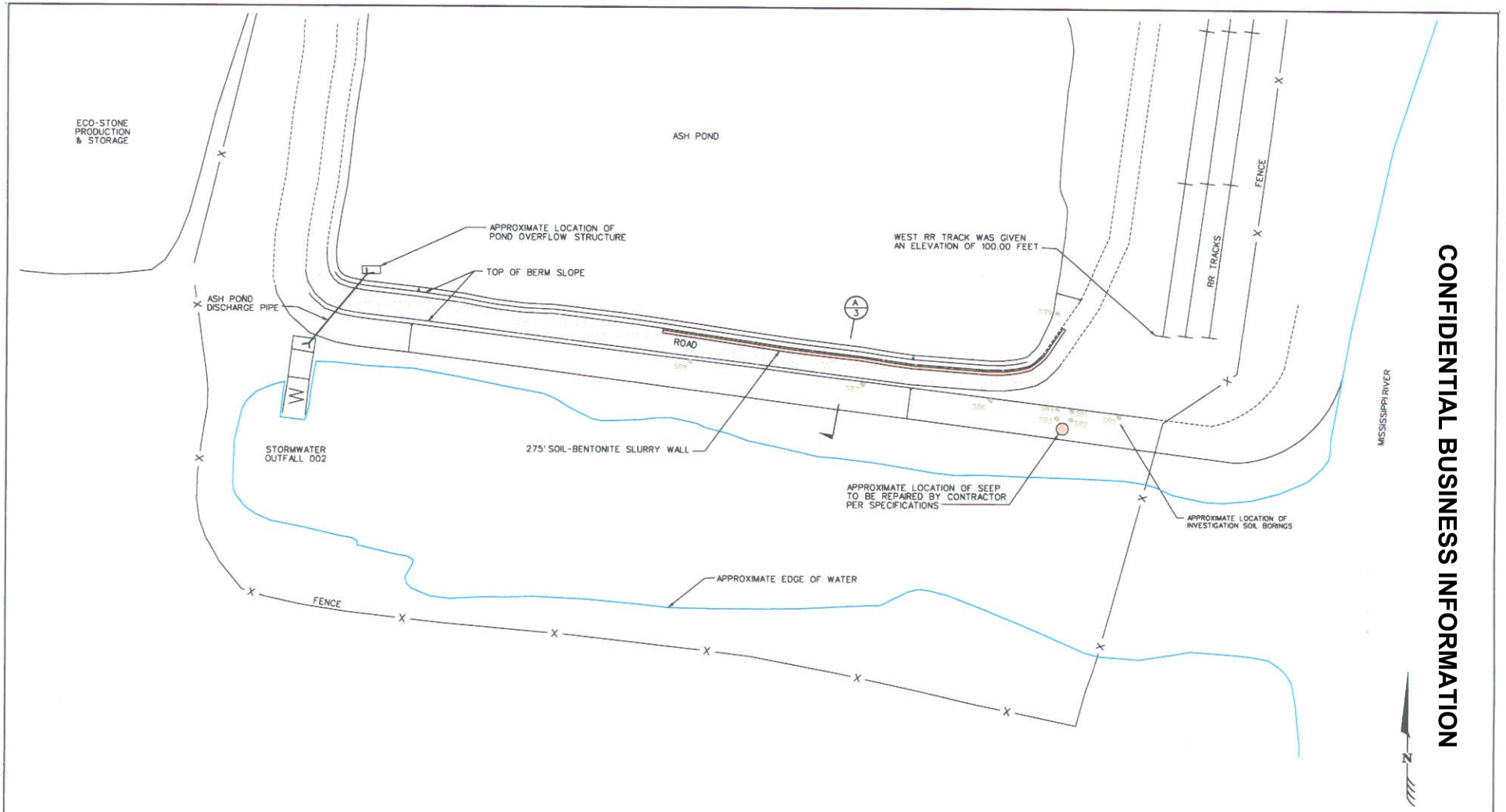
CLIENT: ALLIANT ENERGY
BURLINGTON GENERATING STATION

TITLE: COVER SHEET

HARD HAT SERVICES TM
Engineering, Construction and Management Solutions
940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 637-9470

SHEET: 1 OF 3 SHEETS

10/12/2007 ...\cover.dgn



CONFIDENTIAL BUSINESS INFORMATION

REV	DATE	BY	DESCRIPTION

SCALE: 0 30 60 SCALE IN FEET

DESIGNED: M. Lonroo
DRAWN: HHSI
CHECKED: HHSI

CLIENT: ALLIANT ENERGY BURLINGTON GENERATING STATION

TITLE: GENERAL SITE LAYOUT

HARD HAT SERVICES ™
Engineering, Construction and Management Solutions
940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 637-9470

SHEET: 2 OF 3 SHEETS

10/12/2007 ...\SITE LAYOUT.dgn

DESIGN SPECIFICATIONS

Contractor Experience

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Soil used to produce the soil-bentonite backfill shall pass the following gradation specification.

- 65 to 100 percent passing ⅜" sieve
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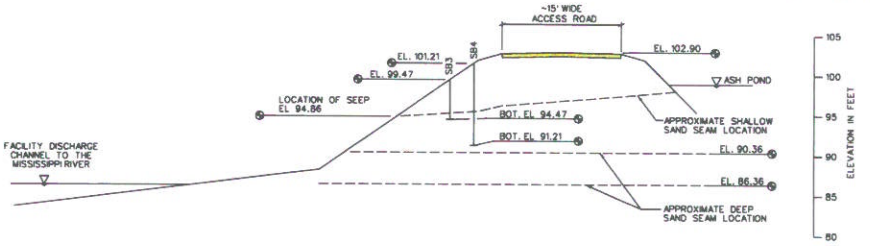
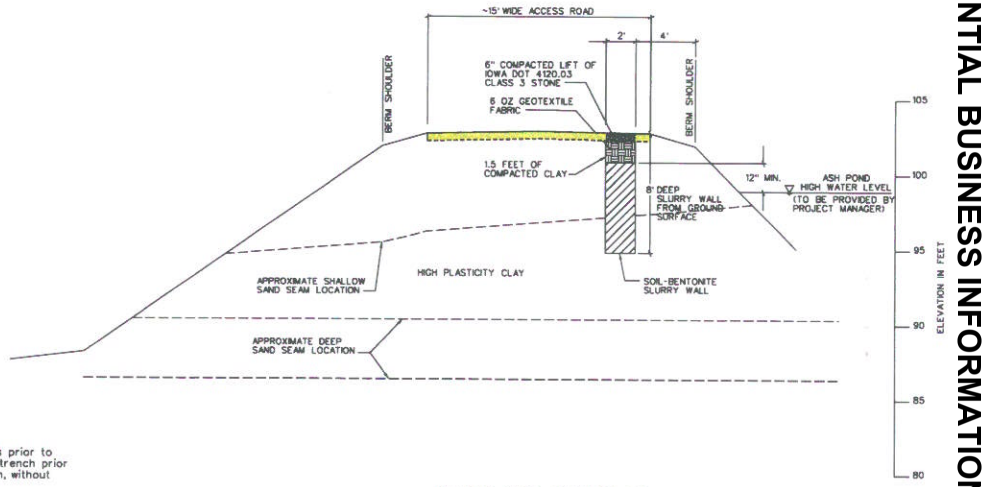


EXISTING BERM DETAIL

0 4 10 15
SCALE IN FEET



SLURRY WALL SECTION (1/2)

0 4 8
SCALE IN FEET

CONFIDENTIAL BUSINESS INFORMATION

REV	DATE	BY	DESCRIPTION

SCALE: AS SHOWN

DESIGNED: M. Loerop
DRAWN: HHSI
CHECKED: HHSI

CLIENT: ALLIANT ENERGY BURLINGTON GENERATING STATION

TITLE: SPECIFICATIONS AND DETAILS

HARD HAT SERVICES ™
Engineering, Construction and Management Solutions
940 E. Diehl Rd, Suite 150
Naperville, IL 60563
(630) 837-9470

SHEET: 3 OF 3 SHEETS

10/12/2007 ...\DETAILS.dgn

CONFIDENTIAL BUSINESS INFORMATION

Soil/bentonite mixing pit. Slurry trench excavation is visible in background.

Another view of soil/bentonite mixing pit with generating station in background.

Looking across ash pond at excavator digging slurry trench in ash pond berm.

Photograph of bentonite slurry mixing pit. The Mississippi River is at background left and the ash pond is at far right.

Another photo looking across the ash pond at the excavator digging the slurry trench.

Photograph of slurry trench in berm along ash pond. Standing water is simply the bentonite slurry at the top of the trench.

Photograph of bentonite slurry mixing in process.

Photograph close-up of bentonite slurry running and filling the trench prior to placement of the soil/bentonite mixture.

Photograph of final cap placement.

Photograph of filled-in mixing area.

Photograph of drain tile outfall pipe. Old drain tile was determined to be the source of the seep. It was properly plumbed out to daylight so it can be observed in the future.

KLINGNER
& ASSOCIATES, P. C.
Engineers & Land Surveyors

CONFIDENTIAL BUSINESS INFORMATION

610 North 4th St., Suite 100 • Burlington, IA 52601 • voice 319.752.3603 • fax 319.752.3605

January 4, 2010

Mr. Vernon Hasten
Interstate Power & Light-Burlington Generating Station
A subsidiary of Alliant Energy
4282 Sullivan Slough Road
Burlington, Iowa 52601

RE: Upper Ash Pond
2009 Work Summary

Dear Mr. Hasten

Klingner & Associates developed specifications for the rehabilitation of the Upper Ash Pond levee. Fye Excavating completed the reconstruction and our firm performed construction observation in conjunction with Bielka Liriano of Alliant Energy.

The project had several objectives. The first objective was to create a uniform twelve foot wide top. This was accomplished by importing clay to build the levee top and inside slope. The normal pond elevation was lowered approximately two feet so the inside slope of the levee could be reconstructed to create uniform slope (~6:1). After the placement and compaction of clay, a geotextile fabric was laid down as a boundary between the aggregate and rip-rap finished surfaces. Additionally the geotextile fabric should reduce erosion in the event the Mississippi River would raise enough to "back" over the levee.

Initially when the fabric was being placed the contractor did not have the recommended lap between the rolls of fabric. It was recommended to the contractor to create a notch and place an additional strip of fabric in the notch, fill with rip-rap and lap this fabric over the already placed geotextile fabric. (See attached photo). This procedure was completed. After the fabric placement was completed a 6" aggregate base was laid so vehicles could travel on the levee without damaging it or becoming stuck. Rip-rap was placed to a depth of approximately 12" on the inside of the reconstructed levee from the top down (road) to two feet below normal pool elevation. When the pond elevation returns to normal, the rip-rap will be below normal water elevation and thus minimize erosion due to wave lap and overtopping.

Completing the project, Fye Excavation removed an abandoned pipe that went through the levee and removed many small and large trees from the outside slope of the levee. Klingner & Associates performed a post construction topographic survey of the levee.

CONFIDENTIAL BUSINESS INFORMATION

This information was forwarded to Patrick Kelleher with Burlington Generating Station to update the facility master drawing.

It is recommended that the Burlington Generating Station investigate a larger size of discharge monitoring pipe for the Upper Ash Pond levee. In October 2009, Outfall 006 was closed because the boiler seal lift station was brought online. This lift station discharge now flows to the Upper Ash Pond. This additional discharge has maximized the capacity of the existing monitoring pipe.

Enclosed are several pictures of the Upper Ash Pond during and after construction.

As always, if you have any questions please do not hesitate to contact us.

Very truly yours,

KLINGNER & ASSOCIATES, P.C.

Matt Morgan, P.E.

DMM/P:\05749 INTERSTATE POWER & LIGHT CO\007-2009_PROJECTS\092131.001_UPPERASHPONDLEVEE\001_SUMMARY 12-31-09.DOC

C: Bielka Liriano

Enclosure: Photos

CONFIDENTIAL BUSINESS INFORMATION

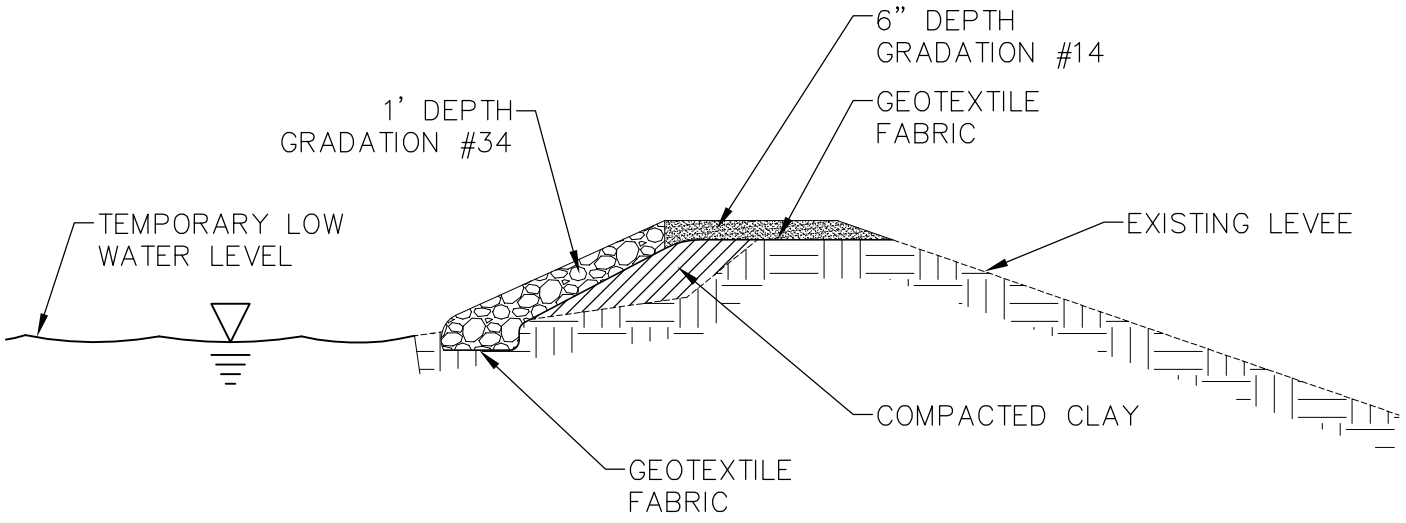
Upper Ash Pond levee prior to rehabilitation

Upper Ash Pond levee after rehabilitation

CONFIDENTIAL BUSINESS INFORMATION

Notching geotextile fabric into top and inside slope

CONFIDENTIAL BUSINESS INFORMATION



SCALE: NTS

TYPICAL SECTION

KLINGNER & ASSOCIATES, P.C.
Engineers • Architects • Surveyors
☐ 616 North 24th Street, Quincy, IL — Ph (217)223-3670 - Fax (217)223-3603
☐ 3318 Market Street, Hannibal, MO — Ph (573)221-0020 - Fax (573)221-0012
■ 610 N. 4th Street, Suite 100, Burlington, IA — Ph (319)752-3603 - Fax (319)752-3605
☐ 49 North Prairie Street, Galesburg, IL — Ph (309)342-4042 - Fax (309)341-3781
Internet Address: www.klingner.com

NO.	APPR.	REVISION DESCRIPTION	DATE
5	.	.	.
4	.	.	.
3	.	.	.
2	.	.	.
1	.	.	.

FULL SCALE DRAWING: 8 1/2" x 11" — SCALE: AS SHOWN

DESIGNED DMM	DRAWN DMM
FIELD .	FIELD BOOK .
CHECKED	DATE 5/2/09
PROJECT NO. 09-2131.001	FILE NAME .

INTERSTATE POWER & LIGHT
LOWER ASH POND LEVEE
BURLINGTON, IOWA

SHEET 1/1

CONFIDENTIAL BUSINESS INFORMATION

GENCO STANDARD GUIDE FOR POND INSPECTIONS

Procedure No. GENCO-0-OP-402-01

Approved By: Paul Treangen
Regional Director Generation West
Date: 4/29/2009

Terry Kouba
Regional Director Generation Central
Date: 4/30/2009

Linda Poe
Regional Director Generation East
Date: 4/30/2009

TABLE OF CONTENTS

ENCLOSURES

1. GENCO Pond Inspection Guide

GENCO STANDARD GUIDE FOR POND INSPECTIONS

1. INTRODUCTION

Alliant Energy owns numerous generating stations and other facilities that utilize engineered process water systems (ash ponds) to handle coal combustion byproducts (e.g., bottom ash, economizer ash, and fly ash) coal pile and landfill storm water runoff, and cooling ponds. In nearly every case, state mandated monitoring and water quality testing requirements are associated with the discharges of these ponds and a compromise of the structural integrity of these ponds could lead to an uncontrolled or unmonitored discharge to the environment.

2. OBJECTIVE

The purpose of this Guide is to formalize guidance regarding routine Pond inspections including frequency of inspections, management review requirements, and guidance on issue resolution. This procedure will be utilized by all GENCO power plants to establish a comprehensive and corporate-wide compliance and inspection program for ash ponds, storm water runoff ponds including coal piles and landfill ponds, and cooling ponds (if applicable). Failure to routinely inspect and document the integrity of ponds can result in unidentified structural or operational problems that if unresolved can lead to noncompliance with environmental requirements. Encl (1) provides a general overview of the inspection process as well as detailed instructions and a checklist for performing and documenting the inspections.

3. DISCUSSION

Each generating station or facility with a pond system, that may pose a risk to the environment and the company, generally has a system that is unique to their site. This guide along with Encl (1) is meant to provide general guidance to each plant manager or site director to perform routine inspections of their pond systems to allow prompt identification of problems or potential problems. Although no formal state guidelines exist in Iowa, Minnesota, or Wisconsin regarding pond inspections, each plant manager or site director is responsible to ensure that these pond systems operate properly with discharges that are within permit limits and with no breeches in structural integrity.

The GENCO inspection guidelines are a tool for plant or site management to help standardize routine pond inspections. Deficiencies that are identified during the process should be properly vetted through the environmental and engineering groups to determine what corrective actions are required and what state permitting or approvals are necessary to conduct corrective actions.

4. GENCO POND INSPECTION GUIDELINES

4.1 Pond Inspection Periodicities

1. Due to the uniqueness of each plant or site's pond systems, plant managers, site directors, environmental specialists, and engineering representatives must jointly determine inspection periodicities. Routine inspection periodicities should be determined based upon physical construction and arrangement and should also take historical environmental factors into account (e.g. spring melt and flooding). However, ponds should be inspected at a minimum of once per year in accordance with Enclosure (1). Additionally, corporate environmental will participate in site pond inspections a minimum of once a year.

2. To facilitate planning and execution of these inspections each plant should set up a task in Enviance or Maximo to ensure that the inspections are performed and documented at the desired periodicity.

4.2 Pond Inspection Procedure

1. **Inspections**- knowledgeable plant personnel (corporate environmental if applicable) will use Enclosure (1) as a standard checklist to perform the required pond inspections. Inspectors should review previous inspection reports to review past issues and corrective actions prior to each pond inspection. Inspectors will complete Encl (1) for each pond inspected and note any concerns on page two Encl (1). Inspectors shall take pictures of any discrepant conditions and attach them to the report to allow corporate environmental and engineering resources to better understand the exact nature of the concern.

2. **Review Requirements-** the Plant Manager and Environmental and Safety Specialist will review the report with the inspector(s) and sign off on the inspection form.

3. **Issue Resolution**- plant management will determine how to correct any deficiencies noted during the inspection process. Outside assistance may be required in some cases.

    a. Prior to commencing the work, Corporate Environmental shall be contacted to review solutions; and to determine if any type of permitting or approval is required from the State, Federal, or County Agencies.

    b. Engineering shall be contacted to resolve any structural concerns of a dike or levee (e.g. tree removal or erosion).

4.3 Record Retention- plants shall maintain a copy of each pond's Encl (1) inspection results for a period of five years. This requirement may be met by attaching an electronic copy of the Encl (1) pond Inspection results for each pond to the Enviance task or Maximo PM that tracks the inspections.

5.0 Revision / Review Record

Any amendments or revisions to this procedure **must** be approved by GENCO Regional Directors

Revision / Review Record				
Revision	**Reason for Revision**	**Date**	**Author**	**Approved By**
Original	Initial Issue of new GENCO Procedure	4/30/09	Buddy Hasten	Paul Treangen Terry Kouba Linda Poe

**** End of Procedure ****

APPENDIX B: SITE PHOTOGRAPHS

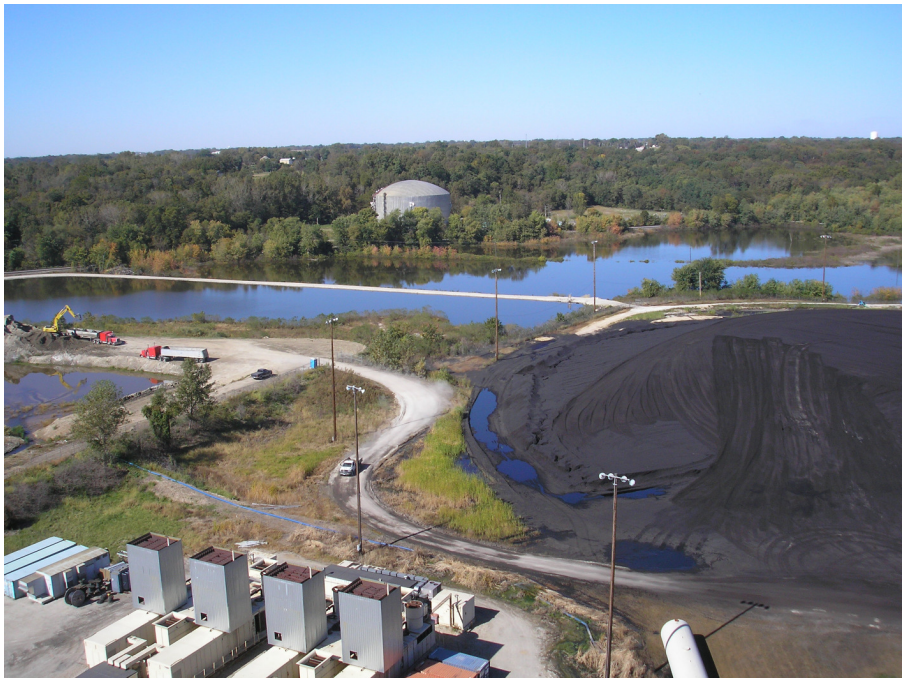
Photograph 1: Rooftop View of East Side of Ash Seal Pond

Photograph 2: Rooftop View of West Side of Ash Seal Pond

Photograph 3: Rooftop View of South Side of Bottom Ash Pond with Eco-Stone Storage Pile

Photograph 4: Rooftop View of North Side of Bottom Ash Pond

Photograph 5: Rooftop View of Economizer Ash Pond. Economizer Ash Pond in Foreground. Ash Pond 1 in Background



Photograph 6: Rooftop View of Ash Pond 1 Ash Pond 1 Upstream Dike Abutment Located at Construction Equipment. Ash Pond 1 Downstream Dike Located Above Downstream Dike.

Photograph 7: Rooftop View of Ash Pond 2. Downstream Dike Located beneath Pipe Crossing in Upper Right. Dike Inundated by Flood Water from Mississippi River

APPENDIX C

DAM INSPECTION CHECKLIST FORM

Site Name:	**Burlington Generating Station**	**Date:**	**7 October 2010**
Unit Name:	**Ash Seal & Storm Water Pond**	**Operator's Name:**	**Interstate Power and Light**
Unit I.D.:		**Hazard Potential Classification:**	**High** ☐ **Significant** ☐ **Low** ☒
	Inspector's Name:	Mark Hoskins, P.E. and Joseph P. Klein, III, 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?	Annual		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	531.1		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	N/A		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?		X	Is water entering inlet, but not exiting outlet?	See Note	
5. Lowest dam crest elevation (operator records)?	533.7		Is water exiting outlet, but not entering inlet?	See Note	
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?	See Note	
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	X		From underdrain?	N/A	
9. Trees growing on embankment? (If so, indicate largest diameter below)	X		At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?	N/A	
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trashracks clear and in place?		X	From downstream foundation area?	See Note	
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?	See Note		Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	See Note		22. Surface movements in valley bottom or on hillside?	See Note	
16. Are outlets of decant or underdrains blocked?	See Note		23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

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

Issue #	Comments
14, 15 and 16	Primary spillway riser pipe is located inside a low gravel berm. Current impoundment pool elevation is below the crest of the berm such that water is not entering the spillway riser.
20	In addition to water not entering the primary spillway riser, the riser discharge pipe was below the flood water elevation of the canal adjacent to the toe of the west dike.
21 and 22	A combination of flooding and thick vegetation along the west dike made observation of the slopes and toe ineffective.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 6-26-00-1-00 **INSPECTOR** Mark Hoskins, P.E. & J.P. Klein, III, P.E.

Date 7 October 2010
Impoundment Name Ash Seal & Storm Water Pond

Impoundment Company Interstate Power and Light Co.
EPA Region 7

State Agency (Field Office) Address Iowa Department of Natural Resources, Environmental Services Division
502 E. 9th St., Des Moines, IA 50319
Name of Impoundment

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

New ☐ **Update** ☒

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

IMPOUNDMENT FUNCTION:

Nearest Downstream Town Name: Chillicothe, IA

Distance from the impoundment: 1.6 miles

Location:

Latitude	41	Degrees	5	Minutes	47	Seconds	**N**
Longitude	92	Degrees	33	Minutes	14	Seconds	**W**

State **County**

	Yes	No
Does a state agency regulate this impoundment?	☒	☐

If So Which State Agency? Iowa Department of Natural Resources

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.

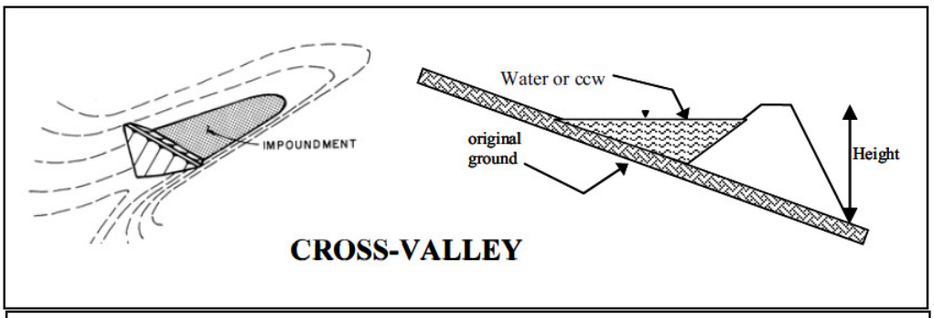
☐ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. 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.

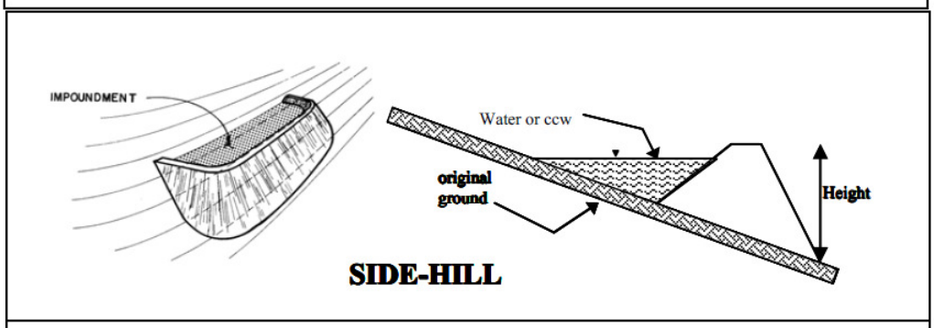
☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

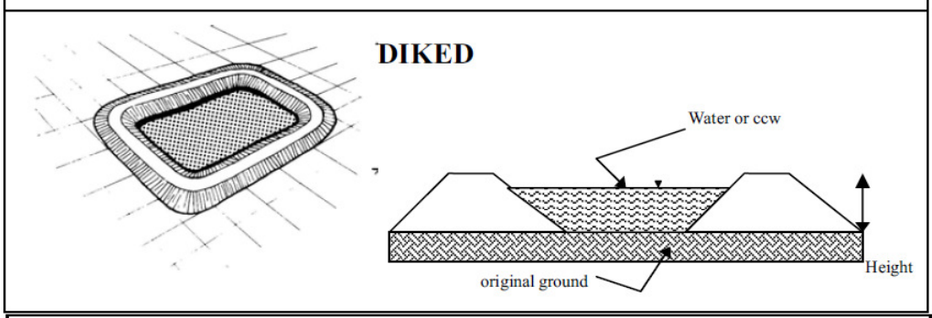
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

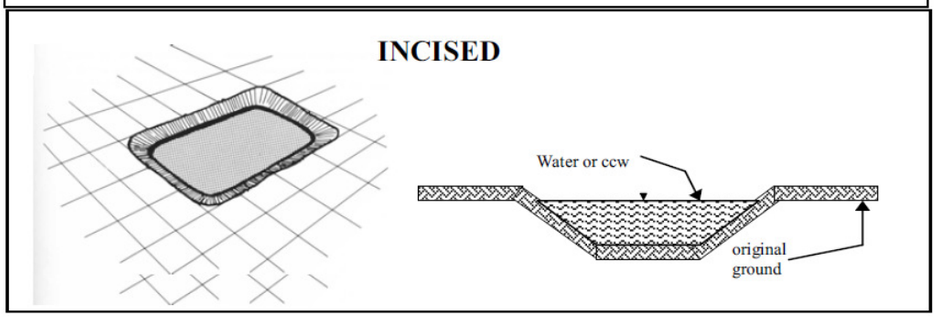
Based on the 15 ft. height of the dam and the adjacent discharge canal to the Mississippi River, failure or misoperation of the dike is not expected to result in loss of human life. The economic impact is expected to include wooded and/or Company owned property and possible ash recovery from the Mississippi River.

CONFIGURATION:









☐ Cross-Valley ☐ Side-Hill ☒ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft)	15	**Embankment Material**	Documentation not provided
Pool Area (ac)	4.54	**Liner**	Documentation not provided
Current Freeboard (ft)	2.6	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

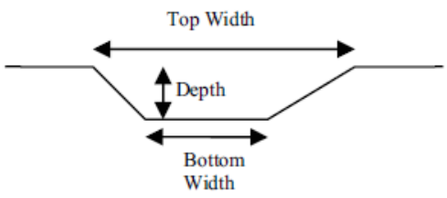
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

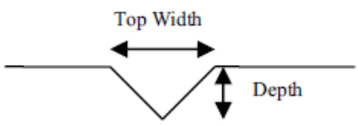
average bottom width (ft)

top width (ft)

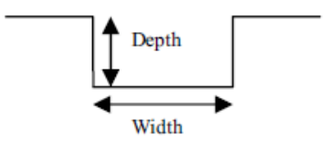
TRAPEZOIDAL



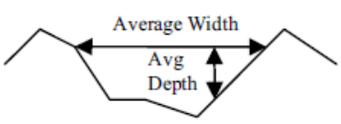
TRIANGULAR



RECTANGULAR

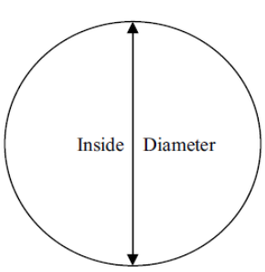


IRREGULAR



☒ **Outlet**

N/A inside diameter
(SDR 17 – smooth lined – 19.5" OD)



Material

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

	Yes	No
Is water flowing through the outlet?	☐	☐

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

The Impoundment was Designed By **Black & Veatch**

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☒	☐
If So When?	2007	

If So Please Describe : Seepage was reportedly observed at two depths near in the embankment at the southeast corner of the impoundment. A geotechnical investigation was conducted by Hard Hat Services that recommended construction of a slurry cut-off wall. An approximately 280 ft. long slurry wall was installed along the south dike beginning at the near the southeastern corner of the impoundment.

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that.

Construction drawings indicate embankment constructed over natural ground. Original configuration has not been altered. Construction specifications indicate foundation preparation was required.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

Documentation not provided during site visit. Owner is conducting additional search for design documentation.

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes?

Neither observations during the site visit nor photographic documentation indicated prior releases, failures or patchwork on the dikes.

Site Name:	**Burlington Generating Station**	**Date:**	**7 October 2010**
Unit Name:	**Main Ash Pond (aka Bottom Ash Pond)**	**Operator's Name:**	**Interstate Power and Light**
Unit I.D.:		**Hazard Potential Classification:**	**High** ☐ **Significant** ☐ **Low** ☒
	Inspector's Name:	Mark Hoskins, P.E. and Joseph P. Klein, III, 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?	Annual		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	530.3		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	530		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	533.8		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?		See Note
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)	X		At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?	See Note		At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?	See Note		Over widespread areas?		X
12. Are decant trashracks clear and in place?		X	From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?		X	22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?	See Note		24. Were Photos taken during the dam inspection?	X	

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

Issue #	Comments
8	Documentation of foundation preparation available at the time of site inspection.
10, 11 & 17	Heavy vegetation growth along crest and embankments of south dike prevented observations of potential cracks, scarps or settlements.
20	Bottom Ash Pond Spillway two 18-inch diameter corrugated metal pipes through the north dike into Ash Pond 1
23	High water in Mississippi River has flooded Ash Seal Pond discharge canal resulting in water backing up along the toe of the adjacent Main Ash south dike.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 6-29-00-1-00 **INSPECTOR** Mark Hoskins, P.E. & J. P. Klein, III P.E.

Date 7 October 2010
Impoundment Name Main or Bottom Ash Pond

Impoundment Company Interstate Power and Light Co.
EPA Region 7

State Agency State of Iowa Department of Natural Resources, Environmental Services Div.
(Field Office) Address 502 E. 9th St., Des Moines, IA 50319
Name of Impoundment Main or Bottom Ash Pond

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

New ☐ **Update** ☒

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

IMPOUNDMENT FUNCTION: Storage of fly ash, bottom ash, ash transport water, storm water runoff from plant site, storm water runoff from hydrated fly ash storage piles and plant floor drains.

Nearest Downstream Town Name: Chillicothe, IA

Distance from the impoundment: 1.6 miles

Location:

Latitude	41	Degrees	5	Minutes	50	Seconds	**N**
Longitude	92	Degrees	33	Minutes	14	Seconds	**W**

State Iowa **County** Des Moines

	Yes	No
Does a state agency regulate this impoundment?	☒	☐

If So Which State Agency? Iowa Department of Natural Resources

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.

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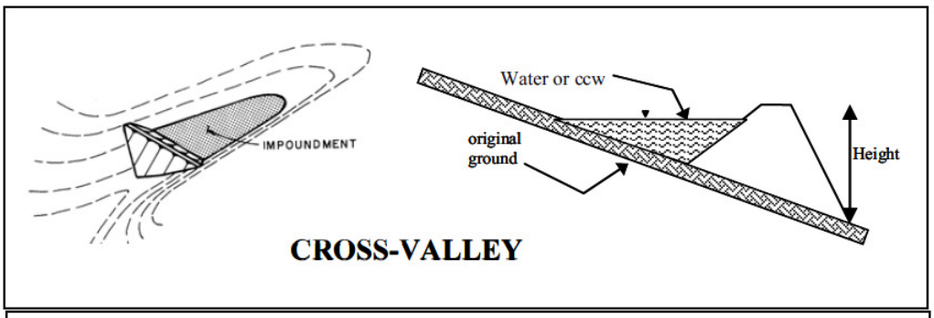
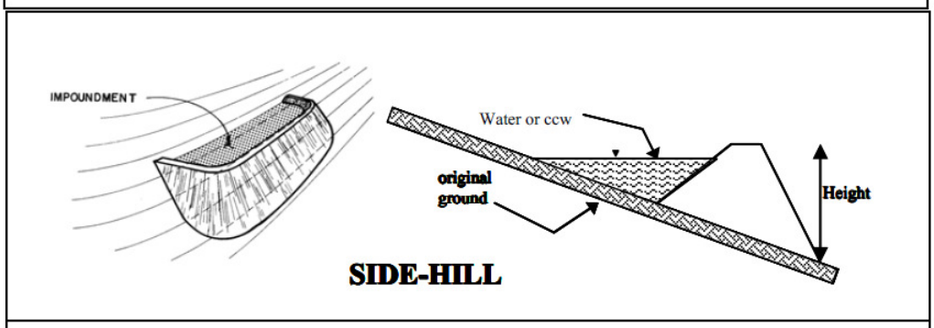
☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

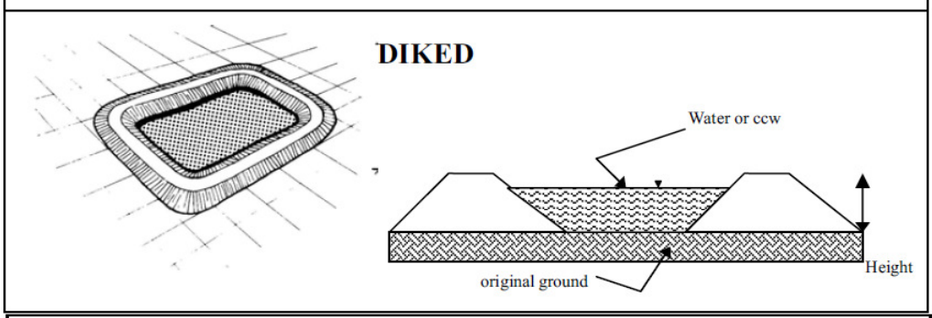
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

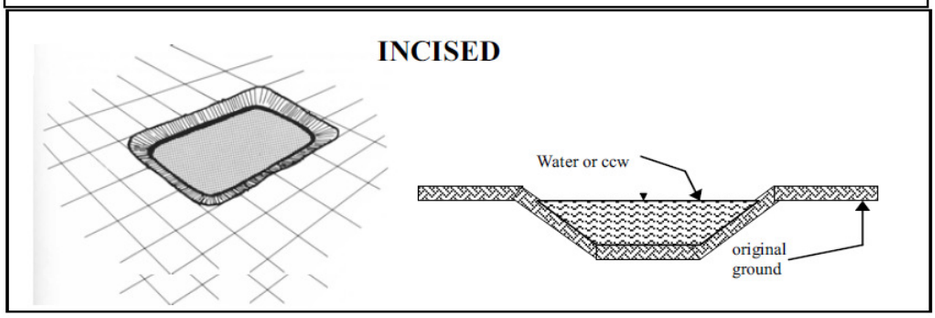
Based on the 5 ft. height of the dam and the heavily wooded area between the impoundment and the Mississippi River, failure or misoperation of the dike is not expected to result in loss of human life. The economic impact is expected to include wooded and/or Company owned property and possible ash recovery from the Mississippi River.

CONFIGURATION:









☐ Cross-Valley ☒ Side-Hill ☐ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft)	5	**Embankment Material**	Documentation not provided
Pool Area (ac)	17	**Liner**	Documentation not provided
Current Freeboard (ft)	3.5	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

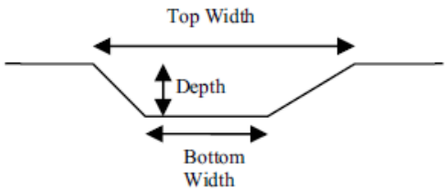
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

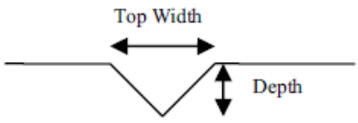
average bottom width (ft)

top width (ft)

TRAPEZOIDAL



TRIANGULAR



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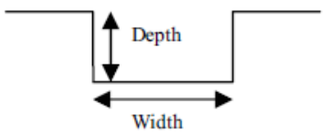
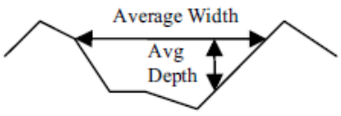
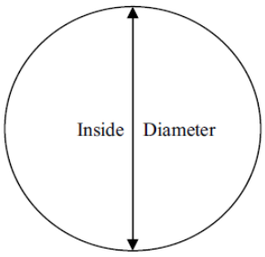


IRREGULAR



☒ **Outlet**

18” inside diameter (two pipes)
(SDR 17 – smooth lined – 19.5” OD)



Material

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

	Yes	No
Is water flowing through the outlet?	☐	☒

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
If So When?		

If So Please Describe :

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that.

Correspondence from Alliant Energy to the EPA (letter dated May 22, 1009) indicates that based on a review of available records Alliant believes the impoundment was designed by a Professional Engineer. Documentation was not available at the time of the site visit.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

The dam assessor did not meet with nor have documentation from the design Engineer-of-Record concerning foundation preparation.

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes?

Neither observations during the site visit nor photographic documentation indicated prior releases, failures or patchwork on the dikes.

Site Name:	**Burlington Generating Station**	**Date:**	**7 October 2010**
Unit Name:	**Economizer Ash Pond**	**Operator's Name:**	**Interstate Power and Light**
Unit I.D.:		**Hazard Potential Classification:**	**High** ☐ **Significant** ☐ **Low** ☒
	Inspector's Name:	Mark Hoskins, P.E. and Joseph P. Klein, III, 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?	Annual		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	See Note		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?			20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	540		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?	X	
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	**N/A**		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trashracks clear and in place?		X	From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?		X	22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

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

Issue #	Comments
3	Economizer Ash Pond used primarily to store/stockpile dry ash. Water limited to small amount of occasional ash transport water and direct storm rainfall stored in small excavations within the ash pile. Recorded pool elevations of the small water storage areas range from 548.9 to 550.3. Water is routed surface ditches to southwest corner of pond to flow into Upper Ash Pond (aka Ash Pond 1)
8	Documentation of foundation preparation available at the time of site inspection.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 6-29-00-1-00 **INSPECTOR** Mark Hoskins, P.E. & J. P. Klein, III P.E.

Date 7 October 2010
Impoundment Name Economizer Ash Pond

Impoundment Company Interstate Power and Light Co.
EPA Region 7

State Agency State of Iowa Department of Natural Resources, Environmental Services Div.
(Field Office) Address 502 E. 9th St., Des Moines, IA 50319
Name of Impoundment Main or Bottom Ash Pond

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

New ☐ **Update** ☒

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

IMPOUNDMENT FUNCTION: Storage of fly ash, bottom ash, economizer ash, ash transport water, boiler wash water, air heater water, steam grade water productions wastewater, storm water runoff from plant site, solids contact units sludge for treatment of Mississippi River water, coal pile runoff and boiler blowdown.

Nearest Downstream Town Name: Chillicothe, IA

Distance from the impoundment: 1.6 miles

Location:

Latitude	41	Degrees	5	Minutes	50	Seconds	**N**
Longitude	92	Degrees	33	Minutes	14	Seconds	**W**

State Iowa **County** Des Moines

	Yes	No
Does a state agency regulate this impoundment?	☒	☐

If So Which State Agency? Iowa Department of Natural Resources

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.

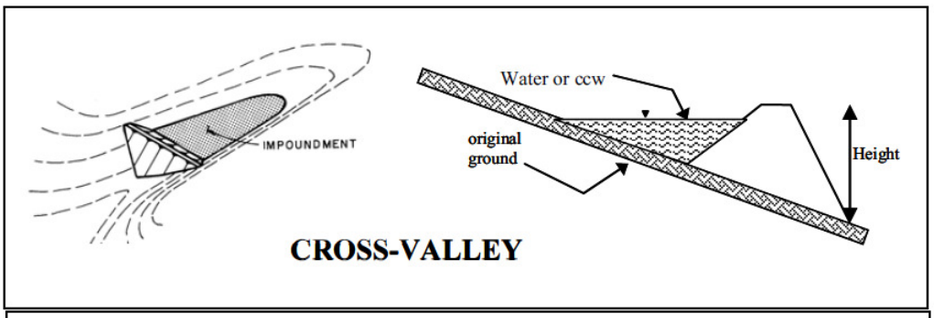
☐ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. 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.

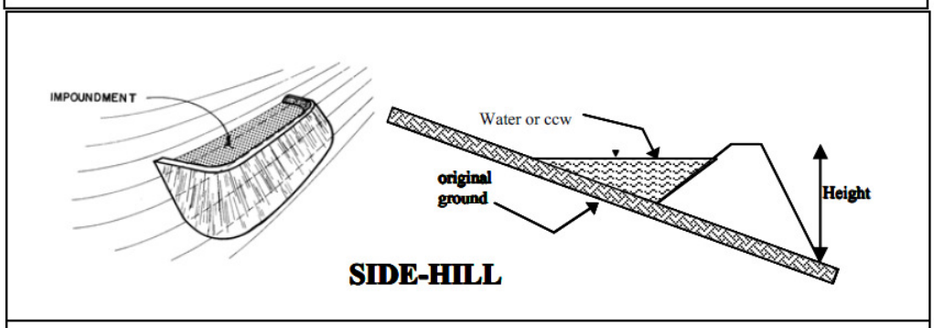
☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

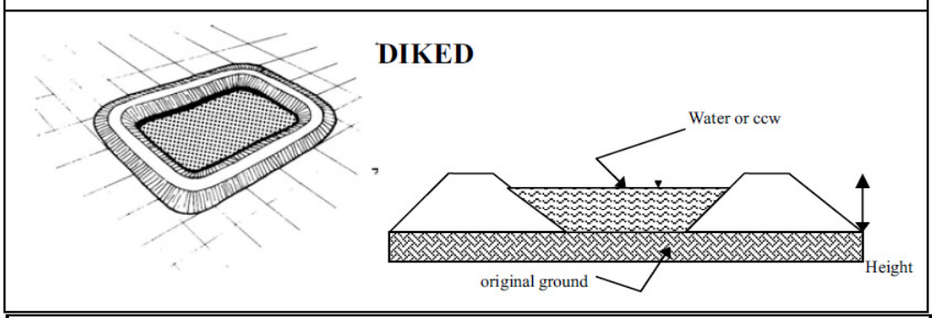
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

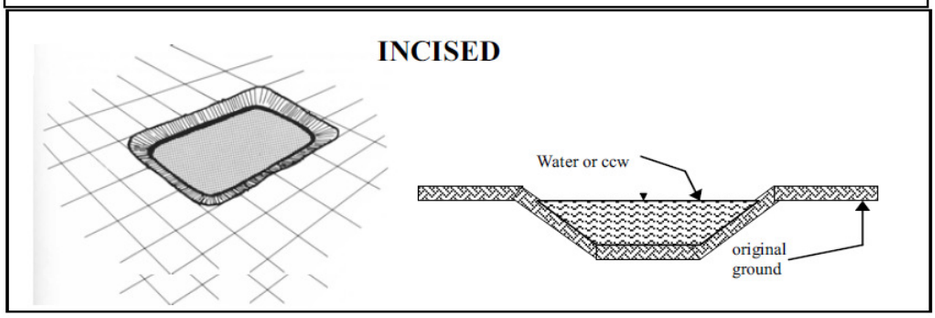
Based on the 10 ft. height of the dam and the area between the impoundment and the Mississippi River being limited to the plant site, failure or misoperation of the dike is not expected to result in loss of human life. The economic impact is expected to include wooded and/or Company owned property and possible ash recovery from the Mississippi River.

CONFIGURATION:









☐ Cross-Valley ☒ Side-Hill ☐ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft)	10	**Embankment Material**	Documentation not provided
Pool Area (ac)	11	**Liner**	Documentation not provided
Current Freeboard (ft)	1.8	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

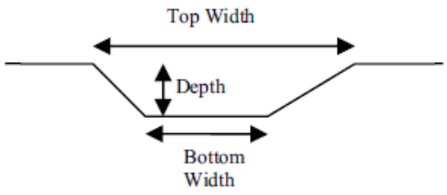
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☒ Irregular

3 depth (ft)

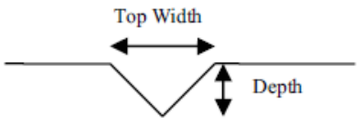
N/A average bottom width (ft)

5 top width (ft)

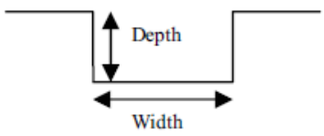
TRAPEZOIDAL



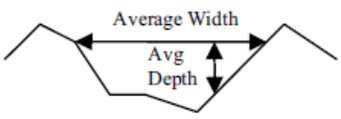
TRIANGULAR



RECTANGULAR

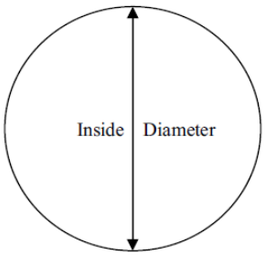


IRREGULAR



☐ **Outlet**

inside diameter
(SDR 17 – smooth lined – 19.5" OD)



Material

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

	Yes	No
Is water flowing through the outlet?	☐	☐

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

The Impoundment was Designed By: N/A

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
If So When?		

If So Please Describe :

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that.

Correspondence from Alliant Energy to the EPA (letter dated May 22, 1009) indicates that based on a review of available records Alliant believes the impoundment was designed by a Professional Engineer. Documentation was not available at the time of the site visit.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

The dam assessor did not meet with nor have documentation from the design Engineer-of-Record concerning foundation preparation.

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes?

Neither observations during the site visit nor photographic documentation indicated prior releases, failures or patchwork on the dikes.

Site Name:	**Burlington Generating Station**	**Date:**	**7 October 2010**
Unit Name:	**Upper Ash Pond (aka Ash Pond 1)**	**Operator's Name:**	**Interstate Power and Light**
Unit I.D.:		**Hazard Potential Classification:**	**High** ☐ **Significant** ☐ **Low** ☒
	Inspector's Name:	Mark Hoskins, P.E. and Joseph P. Klein, III, 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?	Annual		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	529.1		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	529		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?	See Note	
5. Lowest dam crest elevation (operator records)?	530		Is water exiting outlet, but not entering inlet?	See Note	
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?	See Note	
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	**N/A**		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trashracks clear and in place?	X		From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?		X	22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

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

Issue #	Comments
8	Documentation of foundation preparation available at the time of site inspection.
20	Spillway pipe through north dike is gravity flow into Lower Ash Pond (aka Ash Pond 2). Lower Ash Pond was flooded by Mississippi River at the time of the site inspection to an elevation above the spillway outlet invert. Discharge could not be observed.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 6-29-00-1-00 **INSPECTOR** Mark Hoskins, P.E. & J. P. Klein, III P.E.

Date 7 October 2010
Impoundment Name Upper Ash Pond (aka Ash Pond 1)

Impoundment Company Interstate Power and Light Co.
EPA Region 7

State Agency State of Iowa Department of Natural Resources, Environmental Services Div.
(Field Office) Address 502 E. 9th St., Des Moines, IA 50319
Name of Impoundment Upper Ash Pond (aka Ash Pond 1)

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

New ☐ **Update** ☒

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

IMPOUNDMENT FUNCTION: Storage of fly ash, bottom ash, economizer ash, ash transport water, boiler wash water, air heater water, storm water runoff from plant site, solids contact units sludge for treatment of Mississippi River water, coal pile runoff and boiler blowdown.

Nearest Downstream Town Name: Chillicothe, IA

Distance from the impoundment: 1.6 miles

Location:

Latitude	41	Degrees	5	Minutes	50	Seconds	**N**
Longitude	92	Degrees	33	Minutes	5	Seconds	**W**

State Iowa **County** Des Moines

	Yes	No
Does a state agency regulate this impoundment?	☒	☐

If So Which State Agency? Iowa Department of Natural Resources

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.

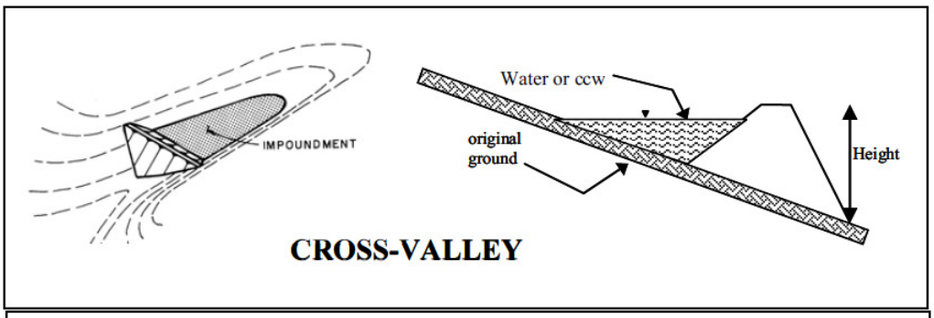
☐ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. 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.

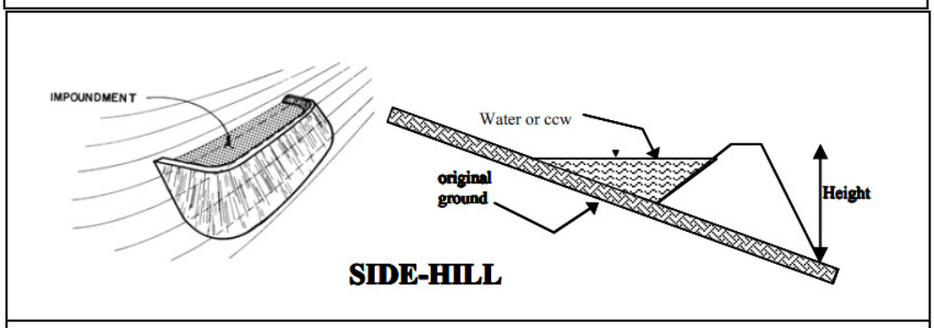
☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

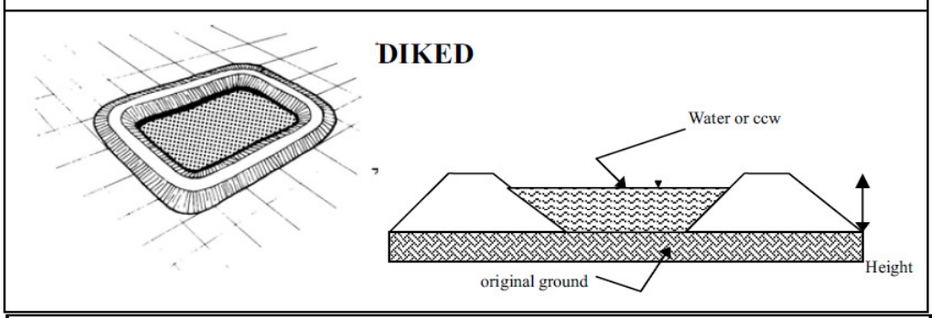
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

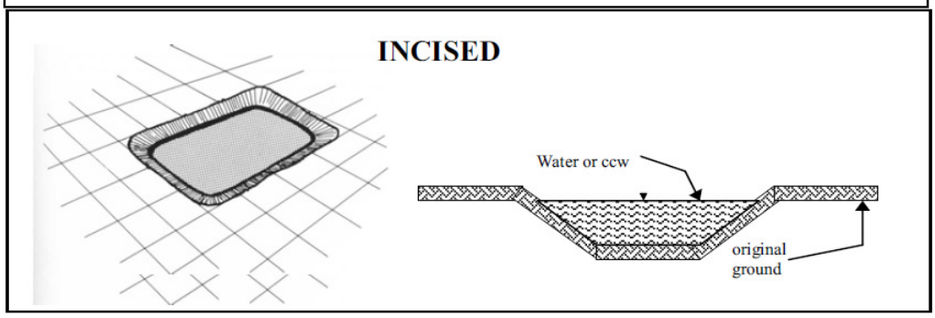
Based on the 5 ft. height of the dam and the heavily wooded area between the impoundment and the Mississippi River, failure or misoperation of the dike is not expected to result in loss of human life. The economic impact is expected to include wooded and/or Company owned property and possible ash recovery from the Mississippi River.

CONFIGURATION:









☐ Cross-Valley ☒ Side-Hill ☐ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft)	5	**Embankment Material**	Documentation not provided
Pool Area (ac)	13.3	**Liner**	Documentation not provided
Current Freeboard (ft)	0.9	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

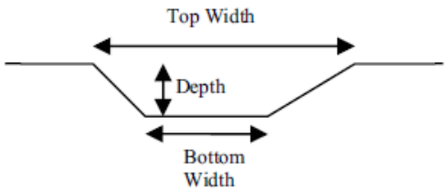
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

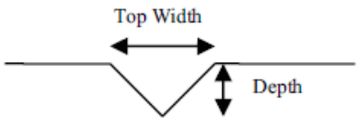
average bottom width (ft)

top width (ft)

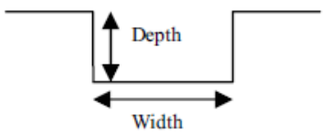
TRAPEZOIDAL



TRIANGULAR



RECTANGULAR



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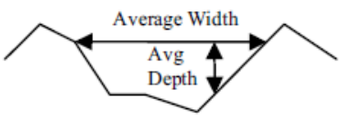
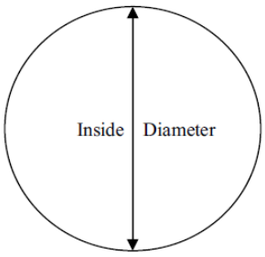


☒ **Outlet**

18” inside diameter (two pipes)
(SDR 17 – smooth lined – 19.5” OD)



Material

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

	Yes	No
Is water flowing through the outlet?	☐	☐

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

The Impoundment was Designed By: N/A

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
If So When?		

If So Please Describe :

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that.

Correspondence from Alliant Energy to the EPA (letter dated May 22, 1009) indicates that based on a review of available records Alliant believes the impoundment was designed by a Professional Engineer. Documentation was not available at the time of the site visit.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

The dam assessor did not meet with nor have documentation from the design Engineer-of-Record concerning foundation preparation.

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes?

Neither observations during the site visit nor photographic documentation indicated prior releases, failures or patchwork on the dikes.

Site Name:	**Burlington Generating Station**	**Date:**	**7 October 2010**
Unit Name:	**Lower Ash Pond (aka Ash Pond 2)**	**Operator's Name:**	**Interstate Power and Light**
Unit I.D.:		**Hazard Potential Classification:**	**High** ☐ **Significant** ☐ **Low** ☒
	Inspector's Name:	Mark Hoskins, P.E. and Joseph P. Klein, III, 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?	Annual		18. Sloughing or bulging on slopes?	See Note	
2. Pool elevation (operator records)?	521.5		19. Major erosion or slope deterioration?	See Note	
3. Decant inlet elevation (operator records)?	522		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?	See Note	
5. Lowest dam crest elevation (operator records)?	522.7		Is water exiting outlet, but not entering inlet?	See Note	
6. If instrumentation is present, are readings recorded (operator records)?	N/A		Is water exiting outlet flowing clear?	See Note	
7. Is the embankment currently under construction?		**X**	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	**N/A**		From underdrain?	See Note	
9. Trees growing on embankment? (If so, indicate largest diameter below)		**X**	At isolated points on embankment slopes?	See Note	
10. Cracks or scarps on crest?	See Note		At natural hillside in the embankment area?	See Note	
11. Is there significant settlement along the crest?	See Note		Over widespread areas?	See Note	
12. Are decant trashracks clear and in place?	See Note		From downstream foundation area?	See Note	
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?	See Note		"Boils" beneath stream or ponded water?	See Note	
14. Clogged spillways, groin or diversion ditches?	See Note		Around the outside of the decant pipe?	See Note	
15. Are spillway or ditch linings deteriorated?	See Note		22. Surface movements in valley bottom or on hillside?	See Note	
16. Are outlets of decant or underdrains blocked?	See Note		23. Water against downstream toe?	**X**	
17. Cracks or scarps on slopes?	See Note		24. Were Photos taken during the dam inspection?	**X**	

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

Issue #	Comments
8	Documentation of foundation preparation available at the time of site inspection.
10 - 22	Lower Ash Pond upstream dike is common as Upper Ash Pond Dike. Downstream dike of Lower Ash Pond was inundated by Mississippi River flooding at the time of the site inspection. Neither the dike nor spillway structures were visible. Observation of drainage swale downstream of the dike location indicated floodwaters were still flowing into the pond during the site visit. The plant has installed a secondary NPDES monitoring station near the Upper Ash Pond spillway to meet compliance monitoring requirements due to the frequency of floods overtopping the Lower Ash Pond dike

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 6-29-00-1-00 **INSPECTOR** Mark Hoskins, P.E. & J. P. Klein, III P.E.

Date 7 October 2010
Impoundment Name Lower Ash Pond (aka Ash Pond 2)

Impoundment Company Interstate Power and Light Co.
EPA Region 7

State Agency State of Iowa Department of Natural Resources, Environmental Services Div.
(Field Office) Address 502 E. 9th St., Des Moines, IA 50319
Name of Impoundment Lower Ash Pond (aka Ash Pond 2)

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

New ☐ **Update** ☒

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

IMPOUNDMENT FUNCTION: Storage of fly ash, bottom ash, economizer ash, ash transport water, boiler wash water, air heater water, storm water runoff from plant site, solids contact units sludge for treatment of Mississippi River water, coal pile runoff and boiler blowdown.

Nearest Downstream Town Name: Chillicothe, IA

Distance from the impoundment: 1.6 miles

Location:

Latitude	41	Degrees	5	Minutes	55	Seconds	**N**
Longitude	92	Degrees	33	Minutes	5	Seconds	**W**

State Iowa **County** Des Moines

	Yes	No
Does a state agency regulate this impoundment?	☒	☐

If So Which State Agency? Iowa Department of Natural Resources

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.

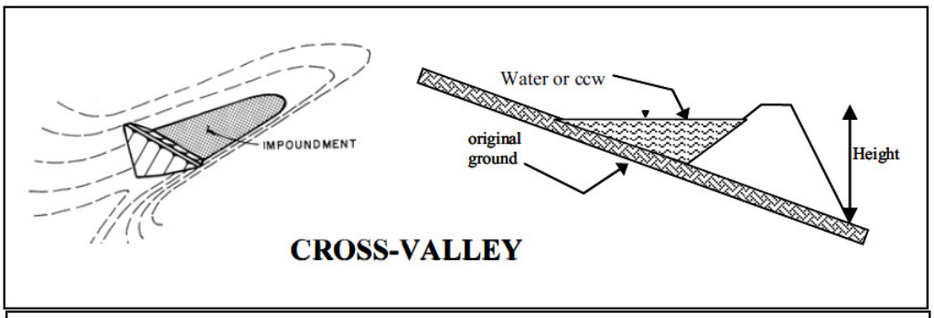
☐ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. 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.

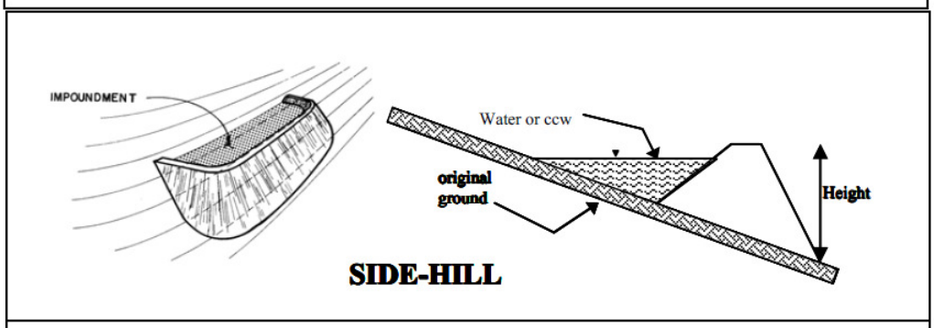
☐ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

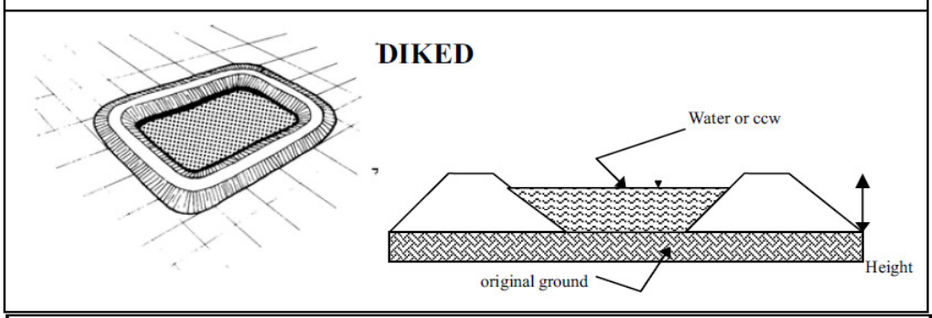
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

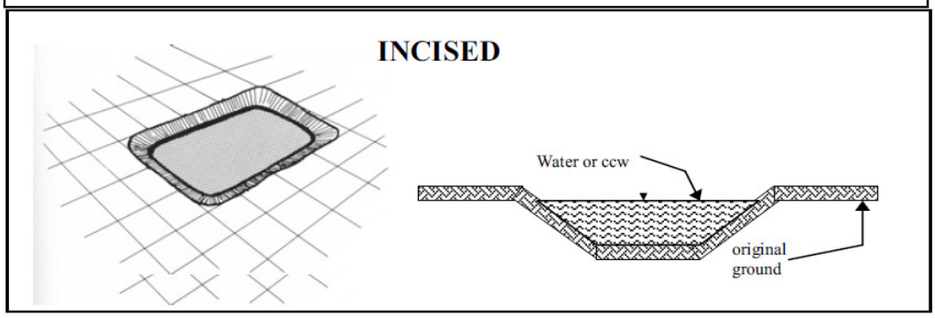
Based on the 3 ft. height of the dam and the heavily wooded area between the impoundment and the Mississippi River, failure or misoperation of the dike is not expected to result in loss of human life. The economic impact is expected to include wooded and/or Company owned property and possible ash recovery from the Mississippi River.

CONFIGURATION:









☐ Cross-Valley ☒ Side-Hill ☐ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft)	3	**Embankment Material**	Documentation not provided
Pool Area (ac)	22.9	**Liner**	Documentation not provided
Current Freeboard (ft)	Pond flooded	**Liner Permeability**	N/A

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway**

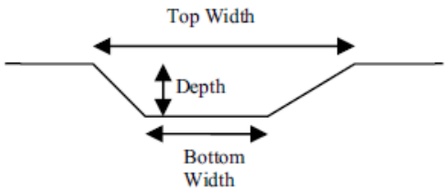
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

average bottom width (ft)

top width (ft)

TRAPEZOIDAL



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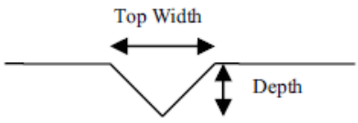

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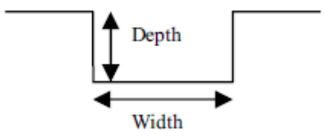

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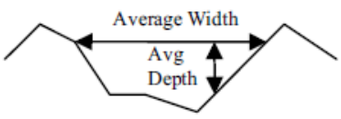

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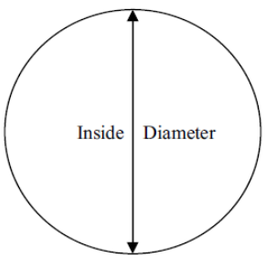

Material

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

	Yes	No
Is water flowing through the outlet?	☐	☐

☐ **No Outlet**

☐ **Other Type of Outlet**
(specify):

The Impoundment was Designed By: N/A

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When?

If So Please Describe :

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
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