# DRAFT ROUND 10 DAM ASSESSMENT REPORT
# NIPSCO BAILLY GENERATING STATION
# COAL ASH IMPOUNDMENTS

**NOVEMBER 11, 2011**

**PREPARED FOR:**

**U.S. Environmental Protection Agency**
**1200 Pennsylvania Avenue, NW**
**Washington, DC 20460**

**PREPARED BY:**

**GZA GeoEnvironmental, Inc.**
**19500 Victor Parkway, Suite 300**
**Livonia, MI 48152**
**GZA File No. 01.0170142.30**

***DRAFT***

GZA
GeoEnvironmental, Inc.

*Engineers and*
*Scientists*

November 11, 2011
File No. 01.0170142.30

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

Re: Round 10 Dam Assessment - Draft Report
EPA Contract No. EP10W001313
NIPSCO – Bailly Generating Station
Coal Ash Impoundments
Chesterton, Indiana

One Edgewater Drive
Norwood, MA 02062
781-278-3700
FAX 781-278-5701
www.gza.com

Dear Mr. Hoffman:

In accordance with our proposal 01.P000177.11, dated March 28, 2011, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-B11S-00049, GZA GeoEnvironmental, Inc. (GZA) has completed our inspection of the Northern Indiana Public Service Company (NIPSCO) Bailly Generating Station (Site) Coal Ash Impoundments located in Chesterton, Indiana. The Site visit was conducted on May 24, 2011. The purpose of our efforts was to provide the EPA with a Site-specific evaluation of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act Section 104(e). We are submitting one hard copy and one CD-ROM copy of this Draft Report directly to the EPA.

Based on our visual inspection, and in accordance with the EPA's criteria, the Site's Coal Ash Impoundments are currently in **SATISFACTORY** condition, in our opinion. Further discussion of our evaluation and recommended actions are presented in the Round 10 Dam Assessment Report. The report includes: (a) completed Field Assessment Checklists; (b) figures of the impoundments; and (c) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A** and the Terms and Conditions of our contract agreement.

We are happy to have been able to assist you with this assessment and appreciate the opportunity to continue to provide you with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Round 10 Dam Assessment Report.

Sincerely,

GZA GEOENVIRONMENTAL, INC.

Walter Kosinski, P.E. (IN)
Principal
walter.kosinski@gza.com

Peter H. Baril, P.E. (MA)
Project Director
peter.baril@gza.com

David M. Leone, P.E. (MA)
Consultant Reviewer

j:\01.xx norwood\01.0170142.30 ccw dams round 10\nipsco_bailly\draft report\bailly cover letter.docx

**DRAFT REPORT**

## EXECUTIVE SUMMARY

This Dam Assessment Report presents the results of a visual evaluation of the Northern Indiana Public Service Company, Bailly Generating Station (BGS, Site) coal ash impoundments located in Chesterton, Indiana. The inspection was performed on May 24, 2011, by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of NIPSCO.

At the Site, there are six separate coal ash impoundments (collectively called the BGS Impoundments) including: the Bottom Ash Storage Area, Primary Settling Pond No. 1, Primary Settling Pond No. 2, Secondary Settling Pond No. 1, Secondary Settling Pond No. 2, and the Forebay. Each of the impoundments is incised and constructed with a liner system. Because the BGS Impoundments are incised, they do not meet U.S. Army Corps of Engineers (COE) or Indiana Department of Natural Resources (IDNR) criteria to be classified as a dam. As such, they were not assigned a size rating. Additionally, since the BGS Impoundments do not meet the minimum requirements to be considered a dam, the IDNR has not assigned them a hazard potential rating.

Under the EPA hazard rating classification system, it is GZA's opinion that if the BGS Impoundments met the requirements of a dam, they would each be considered as having a **Low** hazard potential because although there is no dike where failure may occur, overflow of the water within the impoundments may still occur. However, the overflow would likely result in minimal environmental damage.

Since each of the BGS Impoundments is incised, no further research or remedial recommendations are necessary.

## PREFACE

The assessment of the general condition of the embankment at the Northern Indiana Public Service Company, Bailly Generating Station located in Chesterton, Indiana is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of this report.

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

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

Prepared by:

GZA GeoEnvironmental, Inc.

**Walter Kosinski, P.E.**
Principal
Indiana License No.: PE10201153

J:\01.xx Norwood\01.0170142.30 CCW Dams Round 10\NIPSCO_Bailly\Draft Report\Bailly Preface.docx

COAL ASH IMPOUNDMENTS
NIPSCO – BAILLY GENERATING STATION
CHESTERTON, INDIANA

# TABLE OF CONTENTS


**1.0 DESCRIPTION OF PROJECT ..... 1**

1.1 General ..... 1
1.1.1 Authority ..... 1
1.1.2 Purpose of Work ..... 1
1.1.3 Definitions ..... 1
1.2 Description of Project ..... 2
1.2.1 Location ..... 2
1.2.2 Owner/Caretaker ..... 2
1.2.3 Purpose of the Impoundments ..... 2
1.2.4 Description of the Impoundments and Appurtenances ..... 3
1.2.5 Operations and Maintenance of the Impoundments ..... 3
1.2.6 Size Classification ..... 4
1.2.7 Hazard Potential Classification ..... 4
1.3 Pertinent Engineering Data ..... 4
1.3.1 Drainage Area ..... 5
1.3.2 Discharges at the Site ..... 5
1.3.3 General Elevations ..... 5
1.3.4 Design and Construction Records and History of the Impoundments ..... 6
1.3.5 Operating Records and Previous Inspection Reports ..... 6

**2.0 INSPECTION ..... 6**

2.1 Visual Inspection ..... 6
2.1.1 General Findings ..... 6
2.1.2 Bottom Ash Stormwater Area ..... 6
2.1.3 Primary Settling Pond No. 1 ..... 6
2.1.4 Primary Settling Pond No. 2 ..... 7
2.1.5 Secondary Settling Pond No. 1 ..... 7
2.1.6 Secondary Settling Pond No. 2 ..... 7
2.1.7 Forebay ..... 7
2.1.8 Appurtenant Structures ..... 7
2.2 Caretaker Interview ..... 8
2.3 Emergency Action Plan ..... 8
2.4 Hydrologic/Hydraulic Data ..... 8
2.5 Structural and Seepage Stability ..... 8

## TABLE OF CONTENTS (Cont'd)

**3.0 ASSESSMENTS AND RECOMMENDATIONS ..... 8**

3.1 Assessments ..... 8

**4.0 ENGINEER'S CERTIFICATION ..... 8**

**FIGURES**

Figure 1 Locus Plan (U.S.G.S. Topographic Quad)
Figure 2 Locus Plan (Digital Orthophoto / Aerial Imagery)
Figure 3 Observations and Photolog
Figure 4 Ash Pond Lining Plan, Sections & Details Sheet 1

**APPENDICES**

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

# 1.0 DESCRIPTION OF PROJECT

## 1.1 General

### 1.1.1 Authority

The United States Environmental Protection Agency (EPA) has retained GZA GeoEnvironmental, Inc. (GZA) to perform a visual assessment and develop a report of conditions for the Northern Indiana Public Service Company (NIPSCO, Owner), a division of NiSource, Bailly Generating Station (BGS, Site) coal ash impoundments (Impoundments) located in Chesterton, Indiana. This assessment was authorized by the EPA under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). This assessment and draft report were performed in accordance with Round 10 of the Assessment of Dam Safety of Coal Combustion Surface Impoundments, RFQ-DC-16, dated March 16, 2011, and EPA Contract No. EP10W001313, Order No. EP-B11S-00049. The assessment generally conformed to the requirements of the Federal Guidelines for Dam Safety[1], and this report is subject to the limitations contained in **Appendix A** and the Terms and Conditions of our Contract Agreement.

### 1.1.2 Purpose of Work

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

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

### 1.1.3 Definitions

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

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

## 1.2 Description of Project

### 1.2.1 Location

The BGS is located about four miles northwest of the city of Chesterton, Indiana, at the address 246 Bailly Station Road, Chesterton, Indiana 46304. The coal ash impoundments are located less than a mile southeast of the BGS at latitude 41 38' 18" North and longitude 87 07' 07" West. A Site locus map of the BGS, coal ash impoundments, and surrounding area is shown on **Figure 1**. An aerial photograph of the BGS, coal ash impoundments, and surrounding area is provided as **Figure 2**. The coal ash impoundments can be accessed by vehicle via paved(?) access roads from the BGS.

### 1.2.2 Owner/Caretaker

The Impoundments are owned and operated by NIPSCO, a wholly owned division of NiSource.

| | **Impoundment Owner/Caretaker** |
|---|---|
| Name | NIPSCO, Bailly Generating Station |
| Mailing Address | 246 Bailly Station Road |
| City, State, Zip | Chesterton, Indiana 46304 |
| Contact | Greg Costakis |
| Title | Manager - Environmental Services |
| E-Mail | gcostakis@nisource.com |
| Phone Number | (219) 956-5125 |

### 1.2.3 Purpose of the Impoundments

The BGS is a two-unit coal-fired and one unit natural gas fired power plant with a maximum generating capacity of approximately 642 megawatts. Commercial operation of the BGS facility began in 1962. From 1962 through 1981, the method of ash disposal was landfilling into an unlined disposal pit. The location of the former landfills is shown on **Figure 2**. In 1981, the BGS switched to a dry fly ash handling system and the Impoundments were constructed in the same year for the purpose of temporarily storing and disposing coal combustion byproducts as well as recycling the wastewater back to the BGS. The Impoundments have been utilized from 1981 to date.

Wastewater discharged from the Site is regulated under one National Pollution Discharge Elimination System (NPDES) permit[2]. NIPSCO personnel estimated that approximately 70 to 80 percent of the wastewater within the Impoundments is recycled back to the BGS. The remaining 20 to 30 percent of the wastewater is discharged to Lake Michigan under the NPDES permit through Outfall 001 as shown on **Figure 2**.

[2] National Pollutant Discharge Elimination System (NPDES) Permit No. IN0000132, NIPSCO BGS, Indiana Department of Environmental Management, January 10, 2011.

### 1.2.4 Description of the Impoundments and Appurtenances

The following description of the Impoundments is based on the Owner interviews, design reports, as-built drawings, and field observations by GZA.

As shown on **Figures 2 and 3**, there are six separate impoundments: the Bottom Ash Storage Area (BASA), Primary Settling Pond No. 1 (Primary No. 1), Primary Settling Pond No. 2 (Primary No. 2), Secondary Settling Pond No. 1 (Secondary No. 1), Secondary Settling Pond No. 2 (Secondary No. 2), and the Forebay. Each of the impoundments is incised (i.e., without the means of a significant impounding structure or embankment) and constructed with a liner system. The liner system in each impoundment includes a 30 mil Hypalon membrane liner[3] underlain by a 6–inch layer of compacted sand underlain by a 1-foot layer of compacted clay. The inner slopes of the Impoundment are approximately 3 horizontal to 1 vertical (3H:1V) from the bottom to the top of the slope at the ground surface[4].

In general, wastewater flows through the Impoundments by gravity from west to east to the Forebay where it is pumped to either the BGS or Outfall 001. Each impoundment receives the following types of wastewater:

1. The BASA receives boiler slag, economizer ash, and sanitary treatment plant discharge. A valve on the BASA decant pipe directs the effluent flow to either Primary No. 1 or Primary No. 2;
2. Primary No. 1 receives flow from the BASA, boiler blowdown water, boiler fireside wash water, filter backwash, reverse osmosis reject water, and ion exchange wastewater;
3. Primary No. 2 can receive the same wastewaters as Primary No. 1. Currently, the only flow into Primary No. 2 is from the BASA due to a leaking valve in a transfer valve pit;
4. Secondary No. 1 receives flow from Primary No. 1 and Primary No. 2;
5. Secondary No. 2 receives air heater wash water; and,
6. The Forebay receives flow from Secondary No. 1 and Secondary No. 2.

There is no emergency spillway or overflow structure in the Impoundments. A pump house at the north end of the Forebay contains pumps that are used to remove excess water from the Impoundments. Instrumentation near the Impoundments includes a staff gage in Secondary No. 2 and monitoring wells throughout the Impoundment area to monitor groundwater on a quarterly basis.

### 1.2.5 Operations and Maintenance of the Impoundments

NIPSCO personnel visually inspect the Impoundments on an infrequent basis but generally not for structural purposes. There are limited formal operation and maintenance procedures. According to NIPSCO, the vegetation is sprayed on an annual basis to minimize growth on impoundment slopes. Given that the Impoundments are incised and do not meet the

[3] Project Specification No. T-2622 Ash Pond Earthwork and Lining, Bailly Generating Station Units 7 and 8, Sargent & Lundy, March 13, 1980.
[4] Drawing No. B-565, Ash Pond Lining Plan, Sections & Details Sheet 1, Bailly Generating Station Units No. 7 & 8, Sargent & Lundy, May 8, 1981.

definition of a dam, they are not regulated by the Indiana Department of Natural Resources (IDNR).

### 1.2.6 Size Classification

Since the Impoundments are incised and do not meet the United States Army Corps of Engineer (COE) criteria, no size classification will be assigned.

### 1.2.7 Hazard Potential Classification

Under the EPA classification system presented in the Definition sections of **Appendix B** and on page 2 of the EPA checklist of **Appendix C**, it is GZA's opinion that if the Impoundments met the criteria of a dam, each of them would be considered as having a **Low** hazard potential. This hazard potential rating was assigned to each Impoundment because although there is no dike where failure may occur, overflow of the water within the Impoundments may still occur. However, the overflow would likely result in minimal environmental damage.

## 1.3 Pertinent Engineering Data

The liner system was constructed in the same manner for each of the six Impoundments. According to the design drawings[4], the liner system consisted of a 30 mil Hypalon membrane liner underlain by a 6–inch thick layer of compacted sand underlain by a 12-inch thick layer of compacted clay. The clay liner was required to be compacted to a minimum of 90 percent optimum dry density at optimum moisture content per ASTM D1557, Method A, and was required to have a compacted permeability of less than $10^{-6}$ centimeters per second when compacted to 90 percent optimum density per ASTM D1557. A 6-inch thick layer of sand was placed on top of the Hypalon membrane. The inner slopes of the BGS impoundments are approximately 3 horizontal to 1 vertical (3H:1V) from the bottom to the ground surface as shown on **Figure 4**.

The size, capacity, and current storage volume of each Impoundment based on information provided by NIPSCO[5] are included in the following table. Note that the maximum height is not included because each of the Impoundments is incised.

| Impoundment | Size (Acres) | Total Storage Capacity (Cubic Yards) | Current Material Storage Volume (Cubic Yards) |
|---|---|---|---|
| Bottom Ash Storage Area | 0.71 | 3,889 | 778 |
| Primary No. 1 | 5.85 | 66,111 | 33,055 |
| Primary No. 2 | 5.85 | 75,555 | 7,555 |
| Secondary No. 1 | 1.61 | 28,519 | 2,852 |
| Secondary No. 2 | 2.87 | 48,611 | 4,861 |
| Forebay | 0.14 | 2,567 | 128 |

### 1.3.1 Drainage Area

Each of the Impoundments is incised. As such, the contributory drainage area is the surface area of the Impoundments and their side slopes which equals approximately 20 acres. According to NIPSCO, the Impoundments do not receive surface stormwater runoff.

### 1.3.2 Discharges at the Site

Discharges at the Site are regulated under the previously noted NPDES Permit. NIPSCO personnel estimated during the Site visit that approximately 70 to 80 percent of the wastewater within the Impoundments is recycled back to the BGS. The remaining 20 to 30 percent of the wastewater is discharged to Lake Michigan under the NPDES permit through Outfall 001. Stormwater that is collected at the BGS (not in the Impoundments) during rain events is discharged to Lake Michigan under the NPDES permit through Outfall 004. The locations of Outfall 001 and Outfall 004 are shown on **Figure 2**. There are no overflow structures or emergency spillways that are part of the Impoundments.

### 1.3.3 General Elevations

Impoundment elevations presented in this report are taken from design drawings and reports provided by NIPSCO. Elevations are based upon the NGVD 29 vertical datum unless otherwise noted. The perimeter elevation surrounding the BGS impoundments, which is also the ground surface and the lowest crest elevation, is approximately 621.0 feet, with the exception of the BASA, which is approximately 620.5 feet. The pool elevation in each of the

[5] NIPSCO Response to EPA Information Request for Information for the Bailly Generating Station, October 4, 2010.

BGS impoundments was approximately the same at 616.5 feet, with the exception of the BASA at approximately 618.5 feet, and Primary No. 2, which was virtually empty.

1.3.4 Design and Construction Records and History of the Impoundments

According to the information provided by NIPSCO, the Impoundments were designed by professional engineers at Sargent & Lundy. Construction of the Impoundments was completed in 1981. The Impoundments have not been modified since they were constructed.

1.3.5 Operating Records and Previous Inspection Reports

Minimal operating records are recorded by NIPSCO personnel. According to NIPSCO, no inspection reports for the structural integrity of the Impoundments have been completed previously or considered necessary.

## 2.0 INSPECTION

2.1 Visual Inspection

The Impoundments were evaluated on May 24, 2011 by Walter Kosinski, P.E., and Thomas Boom, P.E. of GZA. The weather was partly sunny with temperatures in the 60°s to 70°s Fahrenheit. Underwater areas were not inspected as this level of investigation was beyond GZA's scope of services. A copy of the EPA Checklists is included in **Appendix C**. Photographs to document the current conditions of the Impoundments were taken during the evaluation and are included in **Appendix D**. With respect to our visual evaluation, there was no evidence of prior releases, failures, or patchwork observed by GZA.

2.1.1 General Findings

In general, the BGS Impoundments were found to be in **SATISFACTORY** condition. Specific items are identified in more detail in the sections below.

An overall BGS plan view showing the pertinent features is detailed on **Figure 2**. **Figure 3** depicts the location and orientation of photographs provided in **Appendix D.**

2.1.2 Bottom Ash Storage Area (Photos 1 - 3)

The BASA generally appeared to be in good condition. Wastewater was discharging into the BASA during the Site evaluation from one of the three discharge pipes. The BASA decant outlet could not be observed due to vegetation.

2.1.3 Primary Settling Pond No. 1 (Photos 4 - 7)

Primary No. 1 generally appeared to be in good condition. Wastewater was discharging into Primary No. 1 from the BASA and from the BGS during the Site evaluation. A decant structure was observed but the exiting water was not able to be observed due to the location of the decant structure. The side slopes of Primary No. 1 appeared generally level, with no sloughing observed, and they appeared to be sloped at the design grade. There was vegetation growing within Primary No. 1 but minimal vegetation surrounding it.

2.1.4 Primary Settling Pond No. 2 (Photos 8 - 14)

Primary No. 2 generally appeared to be in good condition. Although Primary No. 2 is not currently active, some wastewater was being discharged into Primary No. 2 during the Site evaluation from the BASA due to a leaking valve at Valve Pit No. 5. According to NIPSCO, this is a small leak and the majority of the water in Primary No. 2 was due to recent storm events. Water was flowing into a decant structure. The side slopes of Primary No. 2 appeared generally level and sloped to the design grade, with no sloughing observed. Vegetation surrounding and within Primary No. 2 was minimal.

2.1.5 Secondary Settling Pond No. 1 (Photos 18, 24, 25)

Secondary No. 1 generally appeared to be in good condition. Secondary No. 1 was receiving wastewater from Primary No. 1 during the Site inspection. The decant structure was not able to be observed because it was underwater. The side slopes of Secondary No. 1 appeared generally level and sloped to the design grade, with no sloughing observed. Vegetation surrounding and within Secondary No. 1 was minimal.

2.1.6 Secondary Settling Pond No. 2 (Photos 16 – 21, 23, 25)

Secondary No. 2 generally appeared to be in good condition. According to NIPSCO, the only wastewater discharged to Secondary No. 2 is low pH air heater wash water. Historically, water discharged from Secondary No. 2 would be directed to the on-Site Wastewater Treatment Plant and treated to raise the pH prior to returning it to the Forebay. However, in recent years, Secondary No. 2 has been discharged directly to the Forebay at a rate that minimally affects the pH of the water in the Forebay. There is a staff gage in Secondary No. 2 to measure the water elevation. The gravel cover in Secondary No. 2 appeared stained, likely due to the low pH wastewater. The side slopes of Secondary No. 2 appeared generally level and sloped to the design grade, with no sloughing observed. Vegetation surrounding and within Secondary No. 2 was minimal.

2.1.7 Forebay (Photos 25 - 27)

The Forebay generally appeared to be in good condition. Water is pumped directly from the Forebay back to either the BGS or to Outfall 001, so there is no decant pipe. Vegetation surrounding and within the Forebay was minimal.

2.1.8 Appurtenant Structures (Photos 14, 15, 22, 23, 26, 28 - 30)

The pump house and valve pits were not assessed during GZA's site visit as these were outside of the scope of work (Photos 15, 23, 26, and 28). The transfer and discharge pipes between the Impoundments could not be visually evaluated during the assessment due to the level of water within the Impoundments. Several monitoring wells were observed at various locations near the Impoundments (Photos 14 and 29).

2.2 Caretaker Interview

Maintenance of the Impoundments is the responsibility of NIPSCO personnel. As detailed in previous sections, GZA met with NIPSCO personnel and discussed the current operations and maintenance procedures, regulatory requirements, and the history of the BGS Impoundments since they were constructed.

2.3 Emergency Action Plan

There is no Emergency Action Plan (EAP) developed for the Impoundments. An EAP is not required under current IDNR regulations.

2.4 Hydrologic/Hydraulic Data

GZA did not perform an independent assessment of the hydraulics and hydrology for the Impoundments as this was beyond our scope of services.

2.5 Structural and Seepage Stability

The original structural and seepage stability analyses, if any, were not available to GZA at the time of inspection. Slope stability analyses, seepage analyses, foundation liquefaction analyses, and settlement analyses reports were not available.

## 3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of the Impoundments is judged to be **SATISFACTORY**. The Impoundments are incised and do not meet the IDNR, COE, or EPA definition of a dam. Therefore, as discussed with EPA representatives, no further analysis or recommendations are required.

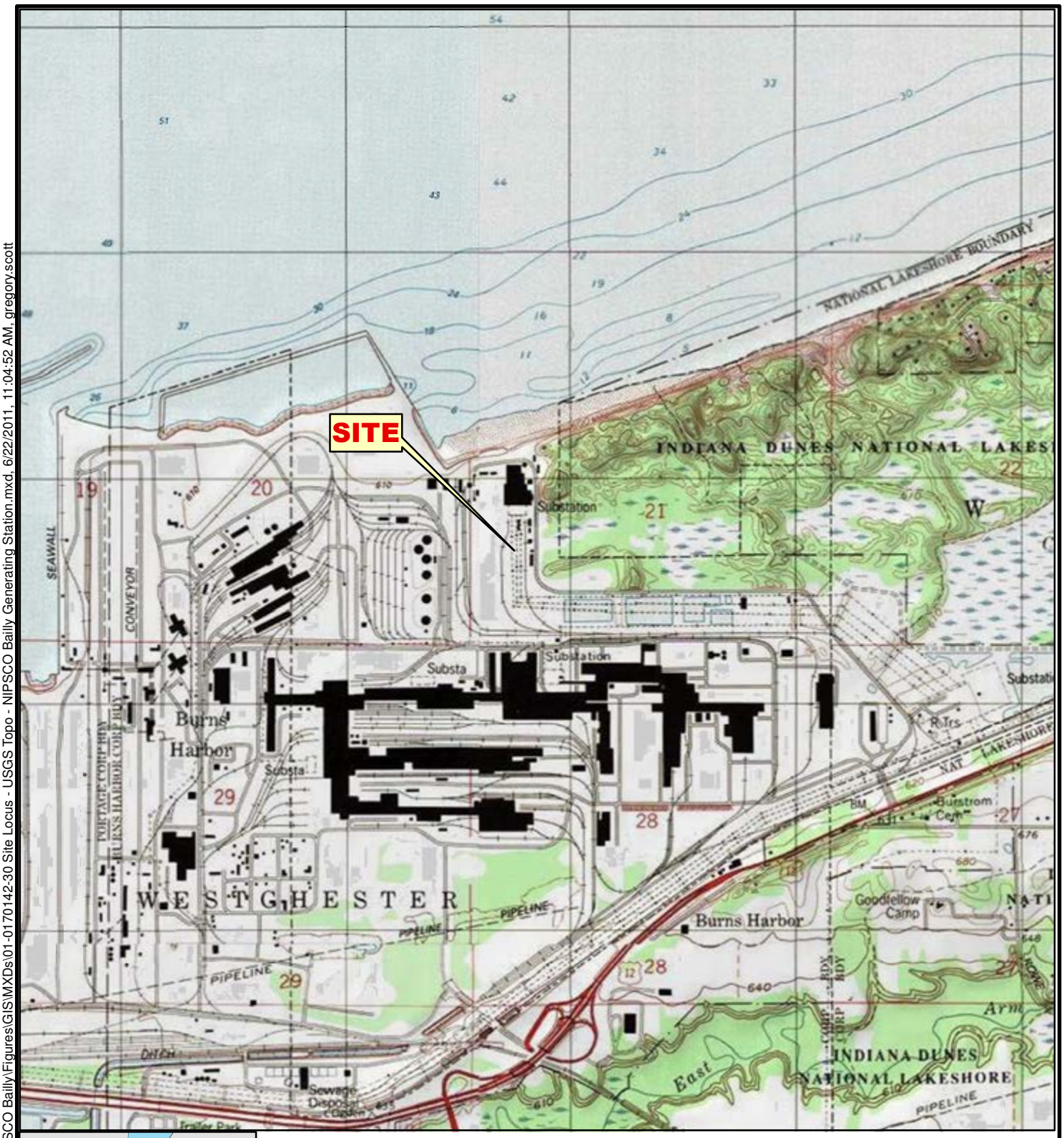
## 4.0 ENGINEER'S CERTIFICATION

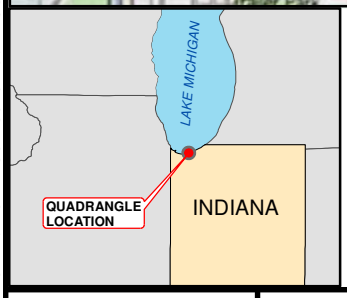
I acknowledge that the management units referenced herein, the Impoundments, have been assessed to be in **SATISFACTORY** condition on May 24, 2011.

Walter Kosinski, P.E.
Principal

Y:\01.xx Norwood\01.0170142.30 CCW Dams Round 10\NIPSCO_Bailly\Draft Report\Bailly - Report Draft.docx

**Figures**




SOURCE : This map contains the ESRI ArcGIS Online World Topographic Map service, Published February 2011 by ESRI ARCIMS Services. The service was compiled to uniform cartography using a variety of best available sources from several data providers,.

Data Supplied by : esri

0 750 1,500 3,000 4,500 6,000 Feet

N W E S

PROJ. MGR.: TRB
DESIGNED BY: TRB
REVIEWED BY: PHB
OPERATOR: GAS

DATE: 06-22-2011

# LOCUS PLAN
# (USGS TOPOGRAPHIC QUAD)

JOB NO.
01.0170142.30

NIPSCO BAILLY GENERATING STATION
246 BAILLY STATION ROAD
CHESTERTON, INDIANA

FIGURE NO.
**1**


J:\170,000-179,999\170142\170142-30 Round 10\NIPSCO Bailly\Figures\GIS\MXDs\01-0170142-30 Site Locus - USGS Topo - NIPSCO Bailly Generating Station.mxd, 6/22/2011, 11:04:52 AM, gregory.scott



SOURCE : This map contains the ESRI ArcGIS Online World Imagery Map service, Published February 2011 by ESRI ARCIMS Services. The service was compiled to uniform cartography using a variety of best available sources from several data providers.

Data Supplied by : esri

0 750 1,500 3,000 4,500 Feet

N W E S

| | | | |
|---|---|---|---|
| GZA | PROJ. MGR.: TRB<br>DESIGNED BY: TRB<br>REVIEWED BY: PHB<br>OPERATOR: GAS<br><br>DATE: 07-19-2011 | LOCUS PLAN<br>(DIGITAL ORTHOPHOTO/AERIAL IMAGERY) | JOB NO.<br>01.0170142.30 |
| | | NIPSCO BAILLY GENERATING STATION<br>246 BAILLY STATION ROAD<br>CHESTERTON, INDIANA | FIGURE NO.<br>2 |


J:\170,000-179,999\170142\170142-30 Round 10\NIPSCO Bailly\Figures\GIS\MXDs\01-0170142-30 Site Locus - Orthophoto Imagery - NIPSCO Bailly Generating Station.mxd, 7/19/2011, 3:24:13 PM, gregory.scott


LEGEND

4 PHOTO LOCATION / DIRECTION

N
W E
S

0 200 400 800 1,200
Feet

SOURCE : This map contains the ESRI ArcGIS Online World Imagery Map service, Published February 2011 by ESRI ARCIMS Services. The service was compiled to uniform cartography using a variety of best available sources from several data providers,.

Data Supplied by : esri

| NO. | ISSUE / DESCRIPTION | BY | DATE |
|---|---|---|---|
| | | | |
| | | | |
| XX | XXXX | XX | XX |



NIPSCO BAILLY GENERATING STATION
246 BAILLY STATION ROAD
CHESTERTON, INDIANA

**OBSERVATIONS AND PHOTOLOG**

| | | | |
|---|---|---|---|
| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | PREPARED FOR: | |
| PROJ MGR: TRB | REVIEWED BY: PHB | CHECKED BY: TRB | FIGURE 3 |
| DESIGNED BY: TRB | DRAWN BY: GAS | SCALE: 1 in = 400 ft | |
| DATE: 07/19/2011 | PROJECT NO. 01.0170142.30 | REVISION NO. | |

**Figure 4**
Ash Pond Lining
Plan, Sections & Details Sheet 1

B-565

PLAN
SCALE: 1"=100'-0"

SECTION A-A
SCALE: 1"=100'-0"

SECTION B-B
SCALE: 1"=40'-0"

SECTION E-E
SCALE: 1"=20'-0"

DETAIL 'C'
SCALE: NONE

DETAIL 'A'
(FOR BERM WITH PONDS ON BOTH SIDE)

DETAIL 'A-1'
(FOR BERM WITH POND ON ONE SIDE ONLY)

DETAIL 'A'+'A-1'
(TYPICAL LINING MATERIALS)
SCALE: 1"=10'-0"

SECTION F-F
SCALE: 1"=20'-0"

SECTION G-G
SCALE: 1"=10'-0"

SECTION H-H
SCALE: 1"=10'-0"

SECTION J-J

SECTION K-K
SCALE: 1/8"=1'-0"

DETAIL 'H'
SKIMMER

## NOTES

1. ALL WORK SHOWN ON THIS DRAWING AND ON DRAWINGS REFERRED TO THESE NOTES SHALL BE DONE BY ASH POND SITE WORK CONTRACTOR ACCORDING TO PROJECT SPECIFICATION No. T-2622 UNLESS NOTED OTHERWISE.
2. LEGEND:
   - EXISTING MANHOLE
   - NEW MANHOLE
   - EXISTING PIPE
   - NEW PIPE
3. ALL PIPES SHALL BE ASBESTOS BONDED CORRUGATED METAL PIPE UNLESS OTHERWISE NOTED.
4. ALL EXISTING AND NEW PIPE PENETRATION THROUGH THIS LINING SHALL BE CONSTRUCTED AS PER DETAIL M, DRAWING B-560.
5. ALL MANHOLES SHALL BE ASPHALT COATED.
6. FOR EXISTING SETTLING POND CONFIGURATIONS AND ELEVATIONS REFER TO NIPSCO DRAWINGS 70-D-55, 70-D-50 & 70-D-51.
7. RAMPS ARE TO BE INSTALLED AFTER INSTALLATION OF LINER MATERIALS AND LOCATED AS DETERMINED BY THE PURCHASER.

## REFERENCE DRAWINGS

| | |
|---|---|
| B-563 | ASH SLUICE PUMP HOUSE PILING & SECTIONS: UNIT NOS. |
| B-564 | ASH SLUICE PUMPHOUSE PLANS & SECTIONS (UNIT NOS. |
| B-565 | ASH POND LINING PLAN, SECTIONS & DETAILS (THIS SHT.) |
| D-523 | ASH SLUICE PUMPHOUSE |
| D-524 | WASTE WATER TREATMENT BUILDING, GRADING, DRAINAGE & SEWERS, PLAN, SECTIONS AND DETAILS |
| D-560 | ASH POND LINING, PLAN SECTIONS & DETAILS SHT. 2 |
| M-1004 | PLAN OF OUTDOOR PIPING - UNIT NO. 1 & 2 |

DRAWING RELEASE RECORD

| REV. | DATE REL'D. | PREPARED | REVIEWED | APPROVED | PURPOSE | FILM |
|---|---|---|---|---|---|---|
| H | | | | | CAMPED VALVE PIT #1 TO FUTURE | |

DRAWING RELEASE RECORD

| REV. | DATE REL'D. | PREPARED | REVIEWED | APPROVED | PURPOSE | FILM |
|---|---|---|---|---|---|---|
| 0 | 11-27-78 | | | | FOR COMMENTS | |
| A | 2-15-79 | | | | FOR PERMIT | |
| B | 3-27-79 | | | | REVISED FOR PERMIT | |
| C | 10-5-79 | T.E. Hill | | | FOR BIDS, SPEC. T-2622 | |
| D | 11-7-79 | Wm. F. Hill | | | BID ADDENDUM No. 1, SPEC. No. T-2622 | |
| E | 3-14-80 | J. Bowers | | | ASH POND EARTH WORK & LINING CONSTRUCTION, SPEC. T-2622 | |
| F | 10-3-80 | Wm. F. Hill | [illegible] | [illegible] | ADD'D SPLASH BLOCK TO INLET AT S.W. VALVE PIT & N. EXIST. PONDS | |
| G | 5-21-81 | Wm. F. Hill | [illegible] | [illegible] | [illegible] | |

SCALE: AS NOTED
PROJECT NUMBER: 5660.10

ASH POND LINING
PLAN, SECTIONS & DETAILS SHEET 1
BAILLY GENERATING STATION UNITS NO. 7 & 8
NO. INDIANA PUBLIC SERVICE CO.
MALEYTOWN, INDIANA

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO. B-565 REV. H
SHEET OF
FORMERLY S-1

\NIPSCO Drawings\B\B-0500\B-0550\B-0565.TIF

**Appendix A**

Limitations

## DAM ENGINEERING & VISUAL INSPECTION LIMITATIONS

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the United States Environmental Protection Agency (EPA).

2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Northern Indiana Public Service Company (NIPSCO) (and their affiliates) as well as Federal, state, and local officials and other parties referenced therein. GZA has also relied on certain information contained on the State of Indiana's website as well as Federal, state, and local officials and other parties which were available to GZA at the time of the inspection. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.

3. In reviewing this Report, it should be noted that the reported condition of the Bailly Generating Station Coal Ash Impoundments (BGS Impoundments) is based on observations of field conditions during the course of this study along with data made available to GZA. The observations of conditions at the BGS Impoundments reflect only the situation present at the specific moment in time the observations were made, under the specific conditions present. It may be necessary to reevaluate the recommendations of this report when subsequent phases of evaluation or repair and improvement provide more data.

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

5. Water level readings have been reviewed and interpretations have been made in the text of this report. Fluctuations in the level of the groundwater and surface water may occur due to variations in rainfall, temperature, and other factors different than at the time measurements were made.

6. GZA's comments on the history, hydrology, hydraulics, and embankment stability for the BGS Impoundments are based on a limited review of available design documentation for the Bailly Generating Station. Calculations and computer modeling used in these analyses were not available and were not independently reviewed by GZA.

7. This report has been prepared for the exclusive use of EPA for specific application to the existing dam facilities, in accordance with generally accepted dam engineering practices. No other warranty, express or implied, is made.

8. This dam inspection verification report has been prepared for this project by GZA. This report is for broad evaluation and management purposes only and is not sufficient, in and of itself, to prepare construction documents or an accurate bid.

**Appendix B**

Definitions

# COMMON DAM SAFETY DEFINITIONS

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

## Orientation

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

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

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

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

## Dam Components

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

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

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

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

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

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

## General

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

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

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

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

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

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

## Condition Rating

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

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

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

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

## Hazard Potential

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

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

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

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

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

**Appendix C**

Inspection Checklists

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Bottom Ash Storage Area | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant (Low) |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 618.5 ft +/- | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | 617.17 ft | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 620.5 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | N/A | | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) Not able to observe the water exiting outlet into Primary Settling Pond No. 1.
21, 23) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station

Impoundment Company NIPSCO

EPA Region 5

State Agency (Field Office) Addresss N/A

Name of Impoundment Bottom Ash Storage Area

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

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Temporary storage of boiler slag sluice water.

Nearest Downstream Town : Name N/A - Lake Michigan

Distance from the impoundment 0.64 miles

Impoundment Location:

Longitude 87 Degrees 07 Minutes 17 Seconds

Latitude 41 Degrees 38 Minutes 18 Seconds

State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

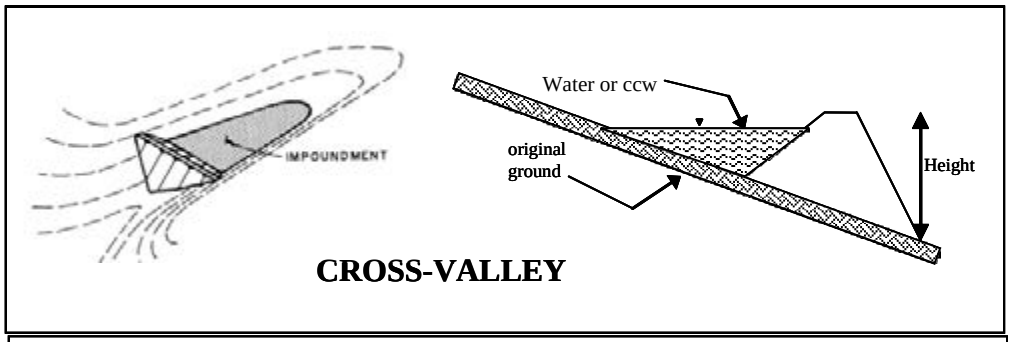
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

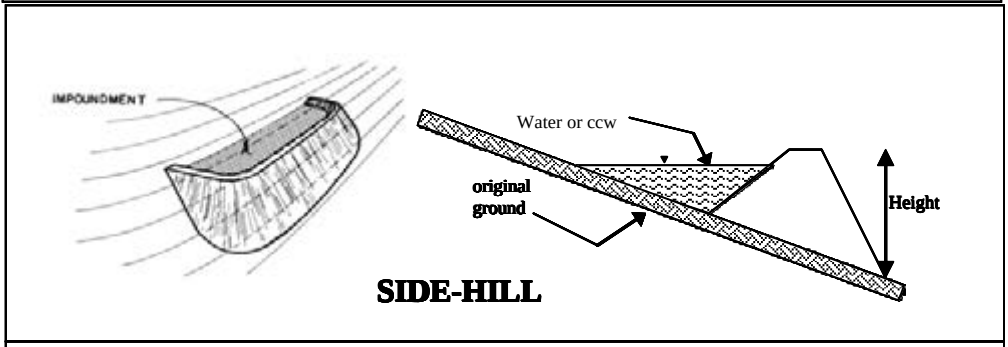
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

The Bottom Ash Storage Area is essentially a lined, incised area for the purpose of temporarily storing boiler slag sluice water. Any ponded water immediately discharges to the Primary Settling Pond No. 1 or Primary Settling Pond No. 2. There is no real impoundment where a failure may occur. However, overflow of sluice water may occur but the overflow would likely be limited to the owner's property.

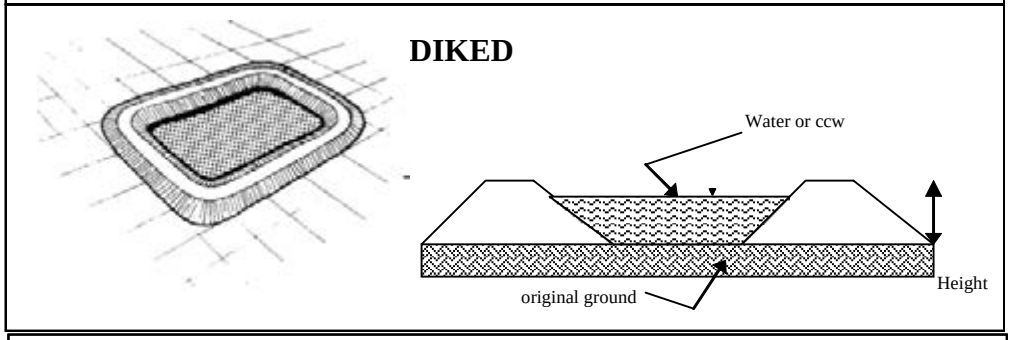
## CONFIGURATION:



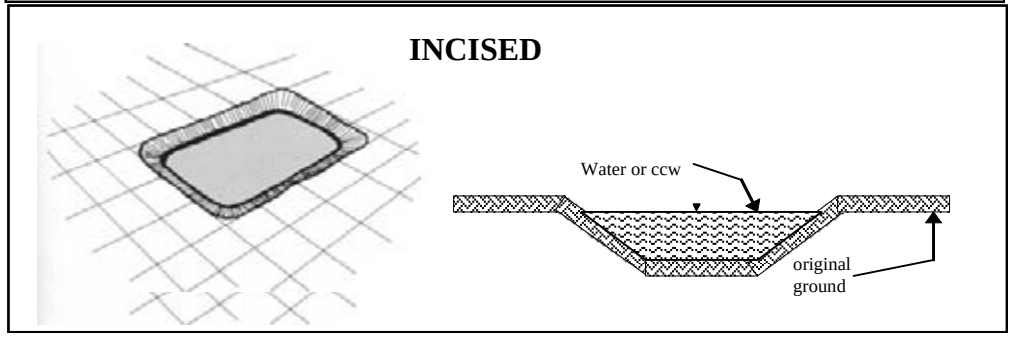

**CROSS-VALLEY**




**SIDE-HILL**




**DIKED**




**INCISED**

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

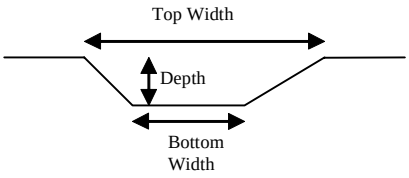
Embankment Height 0 feet
Pool Area 0.71 acres
Current Freeboard 2.0 feet

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

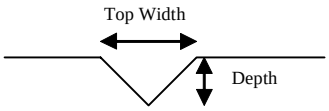
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

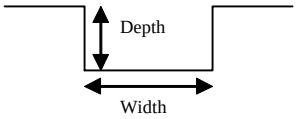



TRIANGULAR

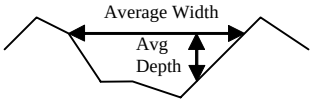



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

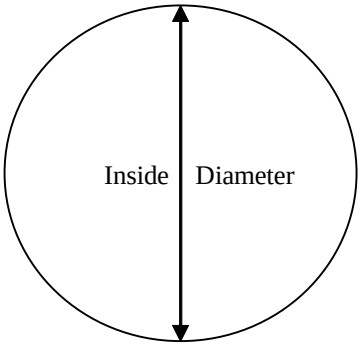



IRREGULAR




__X__ **Outlet**

24 in. inside diameter




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

_____

Is water flowing through the outlet? YES __X*__ NO _____
*could not observe

_____ **No Outlet**

_____

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Sargent & Lundy Engineers
_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Primary Settling Pond No. 1 | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant Low (Low circled) |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 616.5 ft | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | 616.5 ft | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 621.0 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | | ✔ | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) Not able to observe the water exiting outlet into the Secondary Settling Pond No. 1.
21, 23) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station

Impoundment Company NIPSCO

EPA Region 5

State Agency (Field Office) Addresss N/A

Name of Impoundment Primary Settling Pond No. 1

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

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Settling of economizer ash and temporary storage of boiler slag sluice water.

Nearest Downstream Town : Name N/A - Lake Michigan

Distance from the impoundment 0.67 miles

Impoundment Location:

Longitude 87 Degrees 07 Minutes 08 Seconds

Latitude 41 Degrees 38 Minutes 18 Seconds

State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

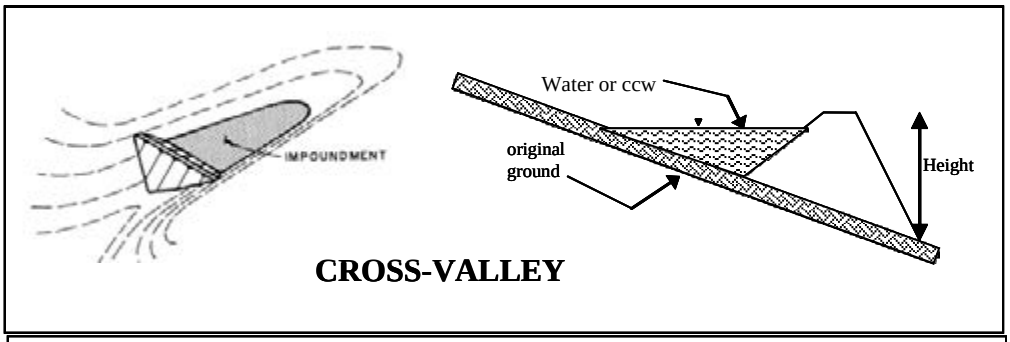
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

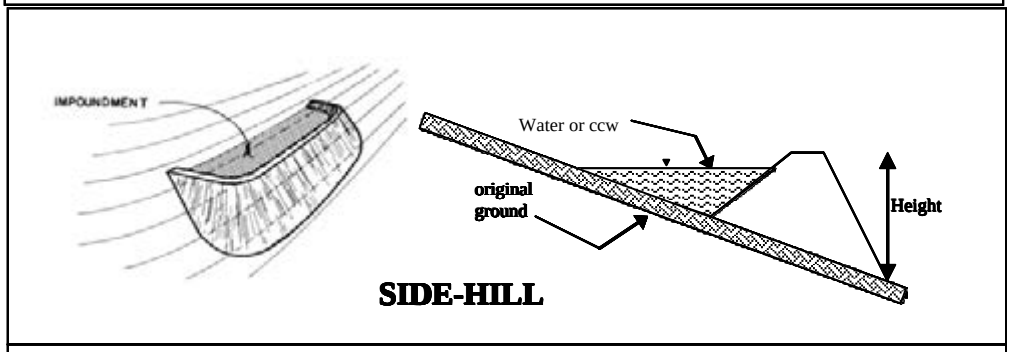
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

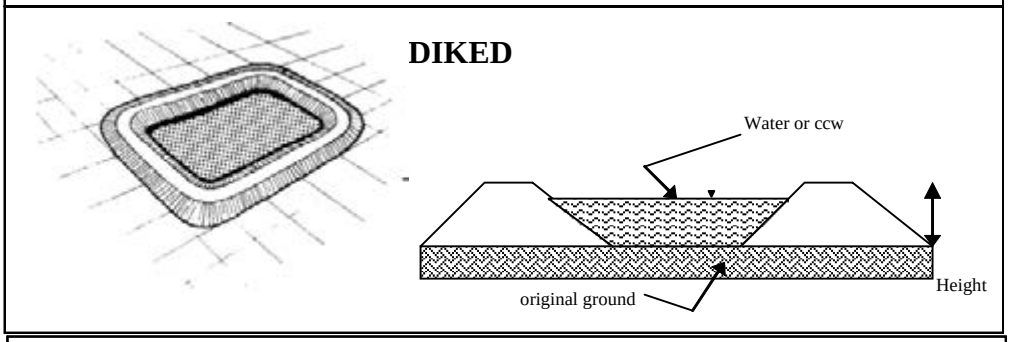
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

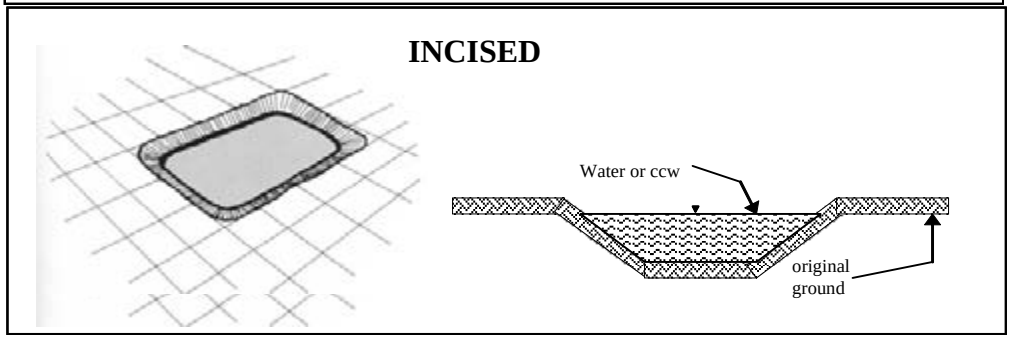
Primary Settling Pond No. 1 is an incised, lined impoundment whose failure would likely result in no probable loss of human life and low economic or environmental losses, with losses principally limited to the owner's property.

## CONFIGURATION:




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

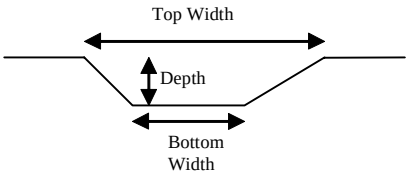
Embankment Height _____0_____ feet
Pool Area _____5.85_____ acres
Current Freeboard _____3.0*_____ feet
*Top of liner

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

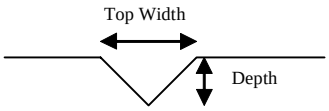
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

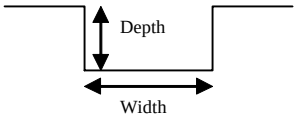



TRIANGULAR

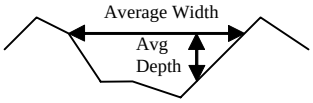



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

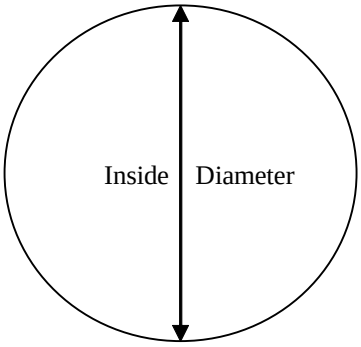



IRREGULAR




__X__ **Outlet**

36 in. inside diameter




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

_____

Is water flowing through the outlet? YES __X*__ NO _____
*could not observe

_____ **No Outlet**

_____

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Sargent & Lundy Engineers
_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Secondary Settling Pond No. 1 | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant **Low** |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 616.5 ft | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | 612.5 ft | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 621.0 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | | ✔ | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
3) There are three decant pipes. Their elevations are 608.5, 612.0 and 612.5 ft. The pipe with elevation 608.5 ft is not currently in use.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) The decant pipe inlet and outlet was submerged. As such, the water flow could not be observed exiting to the Forebay.
21, 23) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station
Impoundment Company NIPSCO
EPA Region 5
State Agency (Field Office) Addresss N/A

Name of Impoundment Secondary Settling Pond No. 1
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Secondary settling from Primary Settling Pond No. 1 and from Primary Settling Pond No. 2.

Nearest Downstream Town : Name N/A - Lake Michigan
Distance from the impoundment 0.67 miles
Impoundment Location:
Longitude 87 Degrees 06 Minutes 43 Seconds
Latitude 41 Degrees 38 Minutes 17 Seconds
State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

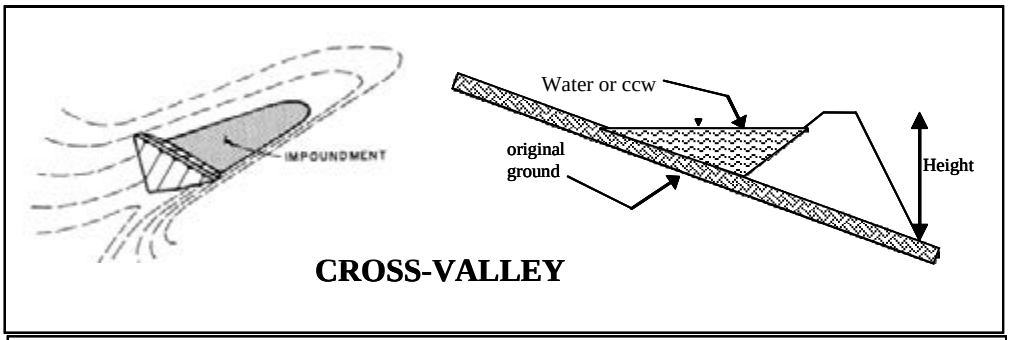
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

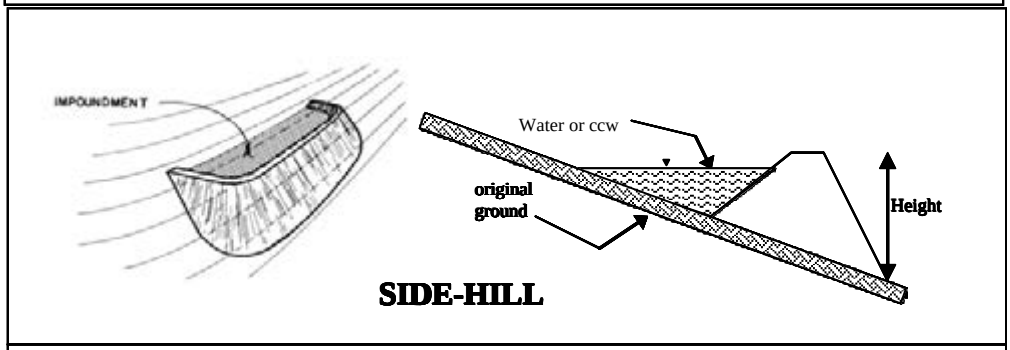
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

Secondary Settling Pond No. 1 is an incised, lined impoundment whose failure would likely result in no probable loss of human life and low economic or environmental losses, with losses principally limited to the owner's property.

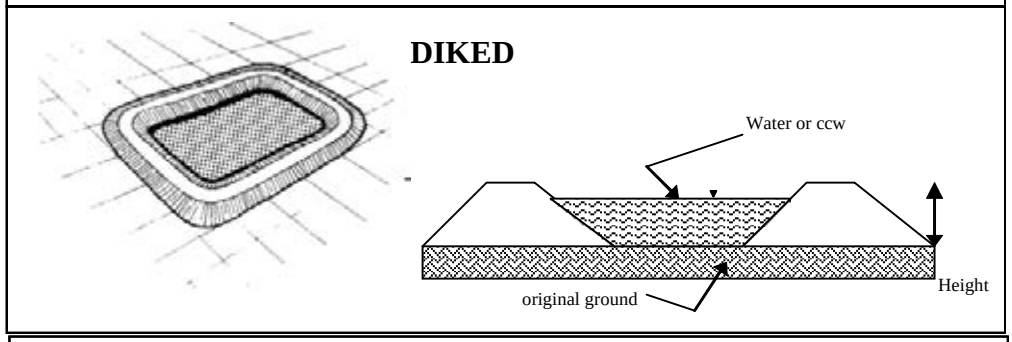
## CONFIGURATION:



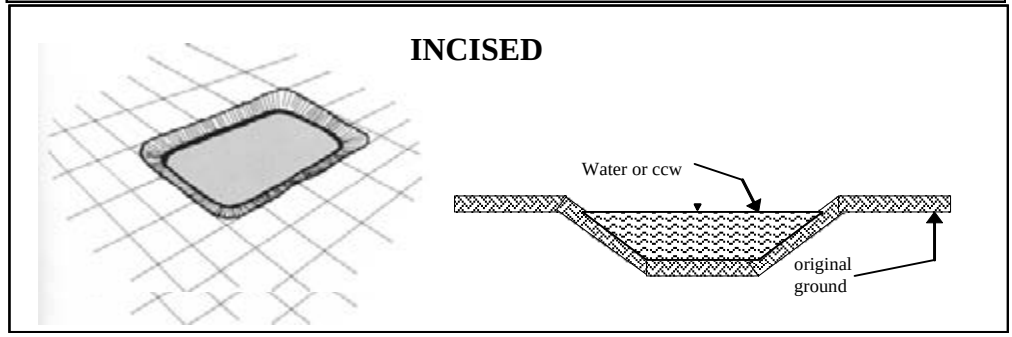

**CROSS-VALLEY**




**SIDE-HILL**




**DIKED**




**INCISED**

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

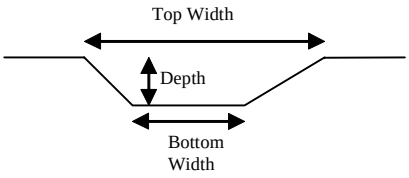
Embankment Height ____0____ feet
Pool Area ____1.61____ acres
Current Freeboard ____3.0*____ feet
*Top of Liner

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon Liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

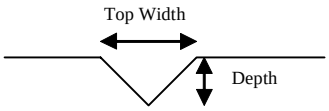
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

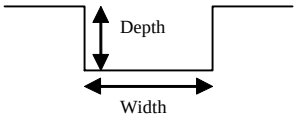



TRIANGULAR

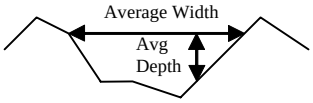



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

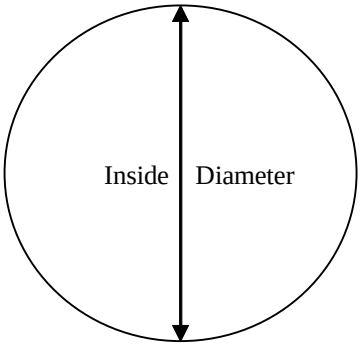



IRREGULAR




__X__ **Outlet**

24 in. inside diameter




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

_____

Is water flowing through the outlet? YES __X*__ NO _____
*Not able to observe - pipe was submerged.

_____ **No Outlet**

_____

__X__ **Other Type of Outlet** (specify) 30 inch and 12 inch corrugated metal

The Impoundment was Designed By Sargent & Lundy Engineers

_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Primary Settling Pond No. 2 | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant Low (Low circled) |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 616.5 ft | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | 616.5 ft | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 621.0 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | | ✔ | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) Not able to observe the water exiting outlet into the Secondary Settling Pond No. 2.
21, 23) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station

Impoundment Company NIPSCO

EPA Region 5

State Agency (Field Office) Addresss N/A

Name of Impoundment Primary Settling Pond No. 2

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

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Settling of economizer ash (not currently in use) and temporary storage of boiler slag sluice water.

Nearest Downstream Town : Name N/A - Lake Michigan

Distance from the impoundment 0.67 miles

Impoundment Location:

Longitude 87 Degrees 06 Minutes 57 Seconds

Latitude 41 Degrees 38 Minutes 18 Seconds

State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

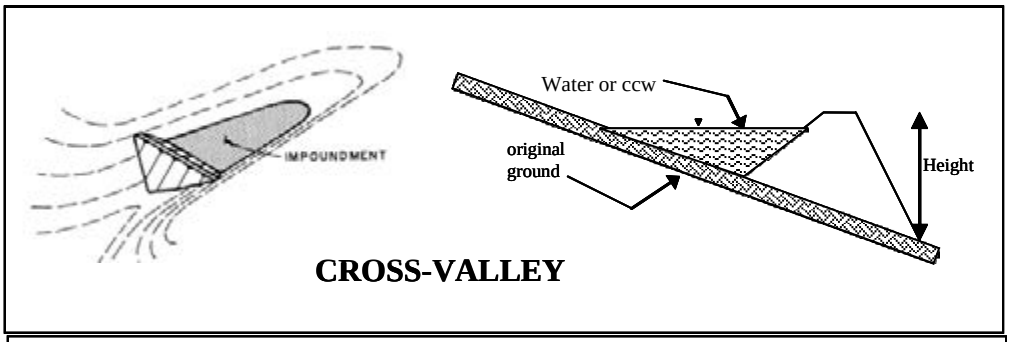
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

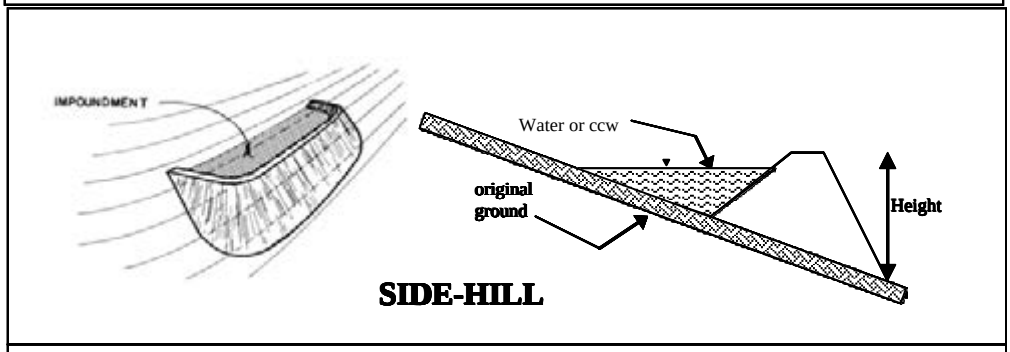
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

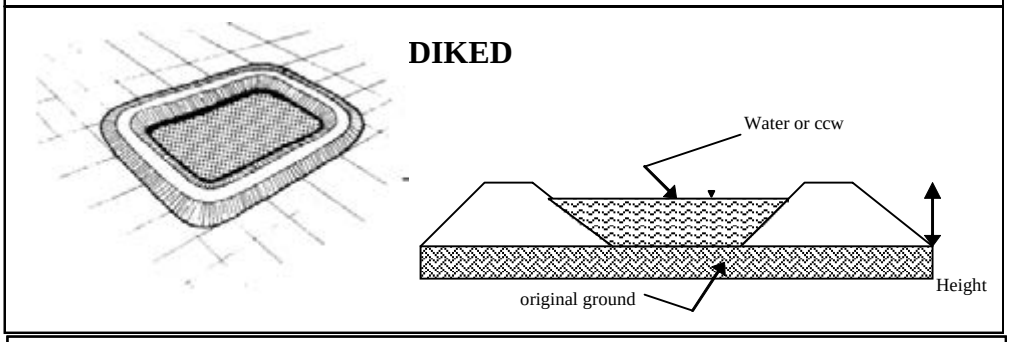
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

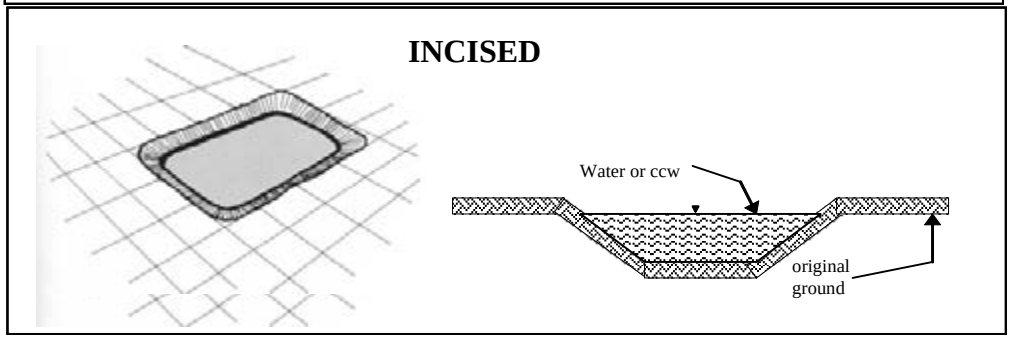
Primary Settling Pond No. 2 is an incised, lined impoundment whose failure would likely result in no probable loss of human life and low economic or environmental losses, with losses principally limited to the owner's property.

## CONFIGURATION:




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

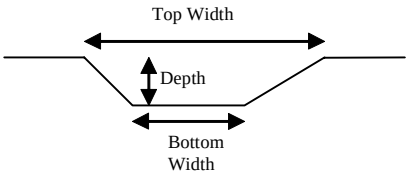
Embankment Height _____0_____ feet
Pool Area _____5.85_____ acres
Current Freeboard _____3.0*_____ feet
*Top of liner

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

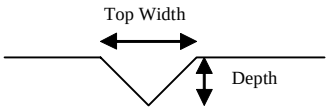
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

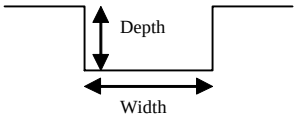



TRIANGULAR

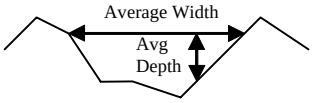



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

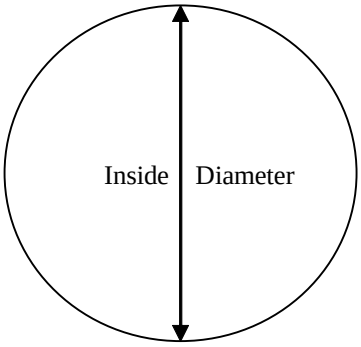



IRREGULAR




__X__ **Outlet**

30 in. inside diameter




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

_____

Is water flowing through the outlet? YES __X*__ NO _____
*could not observe

_____ **No Outlet**

_____

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Sargent & Lundy Engineers
_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Secondary Settling Pond No. 2 | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant **Low** |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 616.5 ft | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | 612.5 ft | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 621.0 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | | ✔ | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
3) There are two decant pipes. One at elevation 608.5 ft is not currently in use.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) The decant pipe inlet and outlet was submerged. As such, the water flow could not be observed exiting to the Forebay.
21) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station

Impoundment Company NIPSCO

EPA Region 5

State Agency (Field Office) Addresss not regulated by Indiana DNR

Name of Impoundment Secondary Settling Pond No. 2

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

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Temporary storage of air heater wash water.

Nearest Downstream Town : Name N/A - Lake Michigan

Distance from the impoundment 0.64 miles

Impoundment Location:

Longitude 87 Degrees 06 Minutes 48 Seconds

Latitude 41 Degrees 38 Minutes 18 Seconds

State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

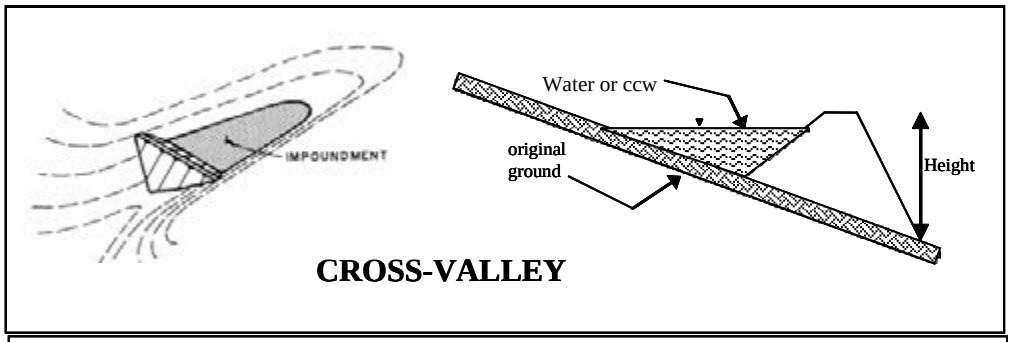
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

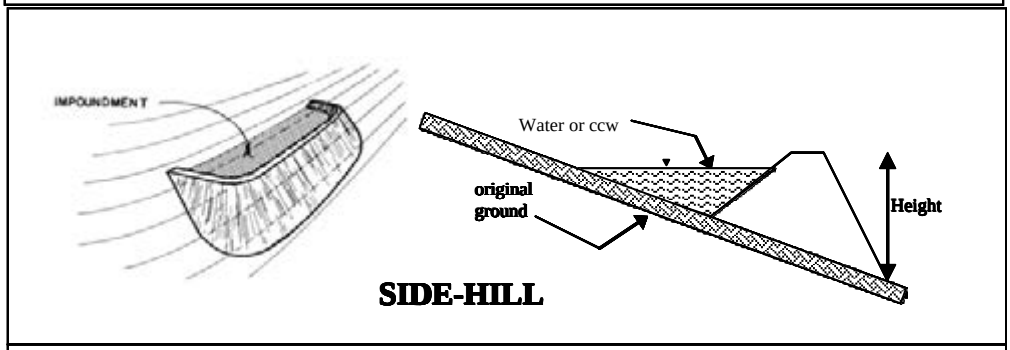
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

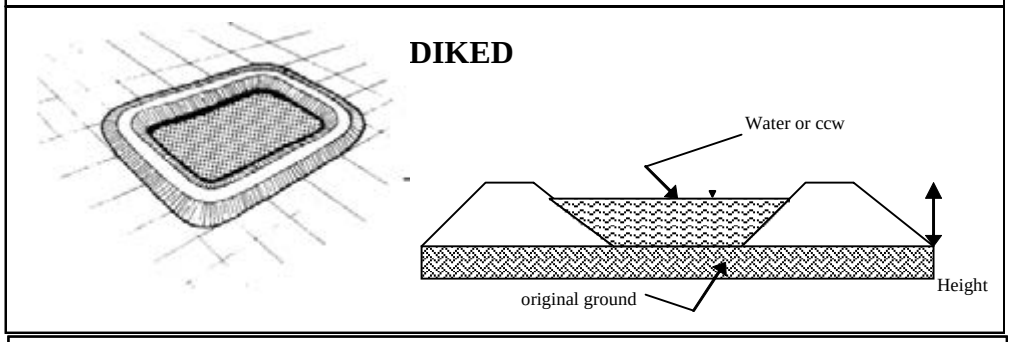
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

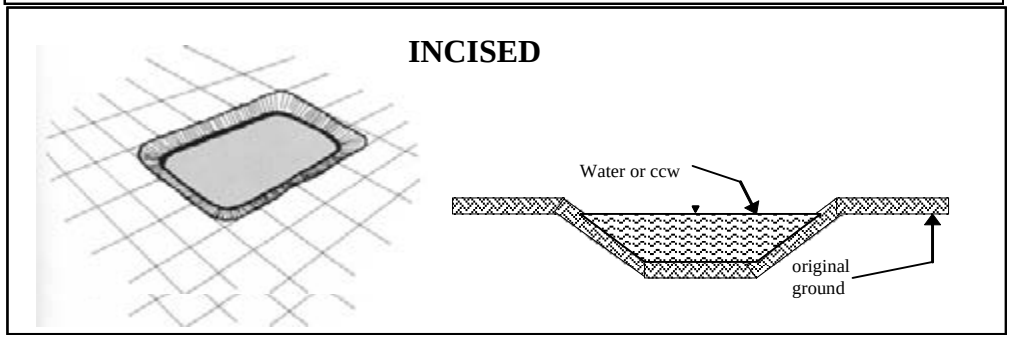
Secondary Settling Pond No. 2 is an incised, lined impoundment whose failure would likely result in no probable loss of human life and low economic or environmental losses, with losses principally limited to the owner's property.

## CONFIGURATION:




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

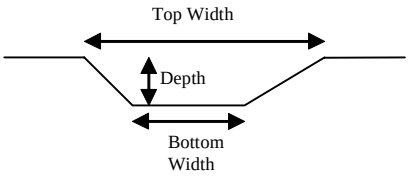
Embankment Height ____0____ feet
Pool Area ____2.87____ acres
Current Freeboard ____3.0*____ feet
*Top of Liner

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon Liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

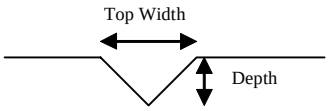
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

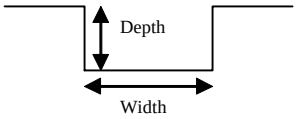



TRIANGULAR

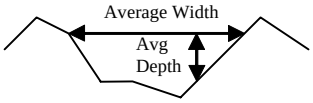



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

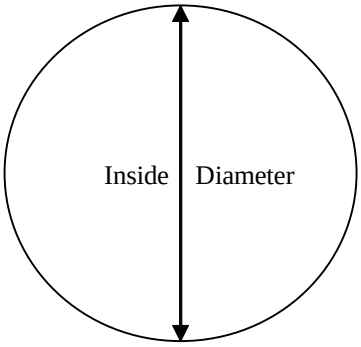



IRREGULAR




__X__ **Outlet**

24 in. inside diameter




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

_____

Is water flowing through the outlet? YES __X*__ NO _____
*Not able to observe

_____ **No Outlet**

_____

__X__ **Other Type of Outlet** (specify) 12 inch corrugated metal

The Impoundment was Designed By Sargent & Lundy Engineers

_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

| | | | |
|---|---|---|---|
| Site Name: | Bailly Generating Station | Date: | May 24, 2011 |
| Unit Name: | Forebay | Operator's Name: | NIPSCO |
| Unit I.D.: | N/A | Hazard Potential Classification: | High Significant Low (Low circled) |
| Inspector's Name: | Walter Kosinski, P.E. & Thomas Boom, 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? | Daily | | 18. Sloughing or bulging on slopes? | | ✔ |
| 2. Pool elevation (operator records)? | 616.5 ft | | 19. Major erosion or slope deterioration? | | ✔ |
| 3. Decant inlet elevation (operator records)? | N/A | | 20. Decant Pipes: | | |
| 4. Open channel spillway elevation (operator records)? | N/A | | Is water entering inlet, but not exiting outlet? | | ✔ |
| 5. Lowest dam crest elevation (operator records)? | 621.0 ft | | Is water exiting outlet, but not entering inlet? | | ✔ |
| 6. If instrumentation is present, are readings recorded (operator records)? | ✔ | | Is water exiting outlet flowing clear? | ✔ | |
| 7. Is the embankment currently under construction? | | ✔ | 21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below): | | |
| 8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)? | ✔ | | From underdrain? | N/A | |
| 9. Trees growing on embankment? (If so, indicate largest diameter below) | | ✔ | At isolated points on embankment slopes? | N/A | |
| 10. Cracks or scarps on crest? | | ✔ | At natural hillside in the embankment area? | N/A | |
| 11. Is there significant settlement along the crest? | | ✔ | Over widespread areas? | N/A | |
| 12. Are decant trashracks clear and in place? | | ✔ | From downstream foundation area? | N/A | |
| 13. Depressions or sinkholes in tailings surface or whirlpool in the pool area? | | ✔ | "Boils" beneath stream or ponded water? | N/A | |
| 14. Clogged spillways, groin or diversion ditches? | N/A | | Around the outside of the decant pipe? | N/A | |
| 15. Are spillway or ditch linings deteriorated? | N/A | | 22. Surface movements in valley bottom or on hillside? | N/A | |
| 16. Are outlets of decant or underdrains blocked? | | ✔ | 23. Water against downstream toe? | N/A | |
| 17. Cracks or scarps on slopes? | | ✔ | 24. Were Photos taken during the dam inspection? | ✔ | |

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

Inspection Issue # Comments

1) Maintenance is performed daily but not for the purpose of inspecting the impoundment.
3) Water is pumped directly from the Forebay. As such, there are no uncontrolled decant pipes.
6) Monitoring wells are sampled quarterly. No other instrumentation is present.
8) According to as-built drawings and construction specifications.
12) No trashracks present.
20) There are no uncontrolled decant pipes. Water is recycled from the Forebay back to the Bailly Generating Station.
21, 23) Impoundment is incised.

**U. S. Environmental Protection Agency**

## Coal Combustion Waste (CCW)
## Impoundment Inspection

Impoundment NPDES Permit # IN0000132 INSPECTOR Walter Kosinski, P.E. & Thomas Boom, P.E.

Date May 24, 2011

Impoundment Name Bailly Generating Station

Impoundment Company NIPSCO

EPA Region 5

State Agency (Field Office) Addresss not regulated by Indiana DNR

Name of Impoundment Forebay

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

New X Update _____

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

**IMPOUNDMENT FUNCTION:** Holding area prior to recycling.

Nearest Downstream Town : Name N/A - Lake Michigan

Distance from the impoundment 0.64 miles

Impoundment Location:
Longitude 87 Degrees 06 Minutes 42 Seconds
Latitude 41 Degrees 38 Minutes 19 Seconds
State IN County Porter County

Does a state agency regulate this impoundment? YES _____ NO X

If So Which State Agency? N/A

**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.

__X__ **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.

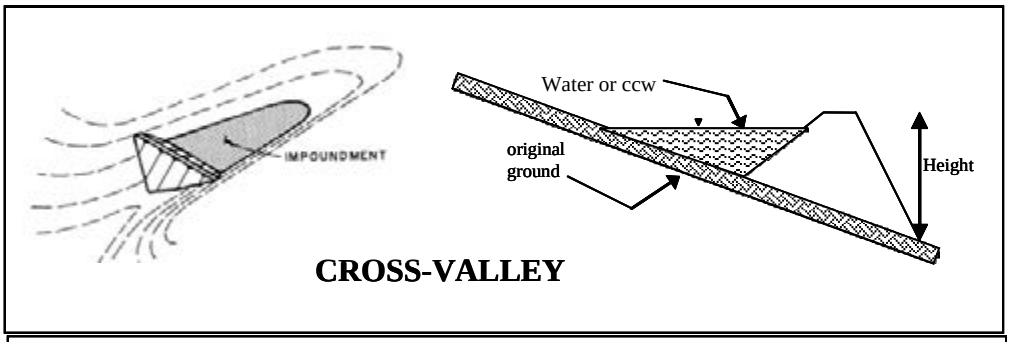
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.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

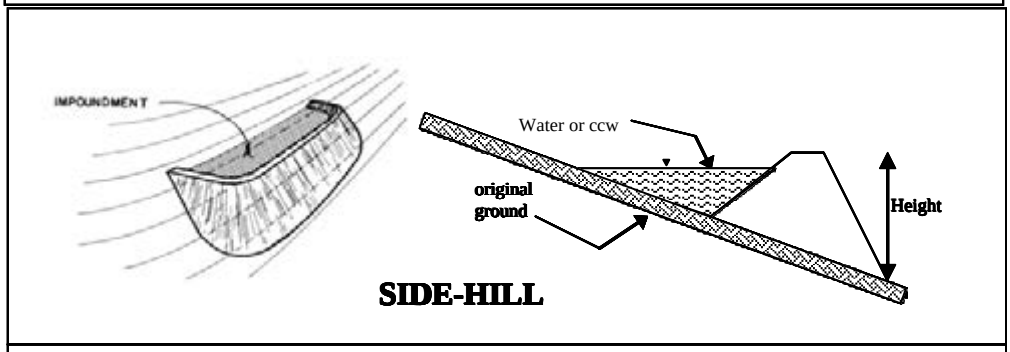
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

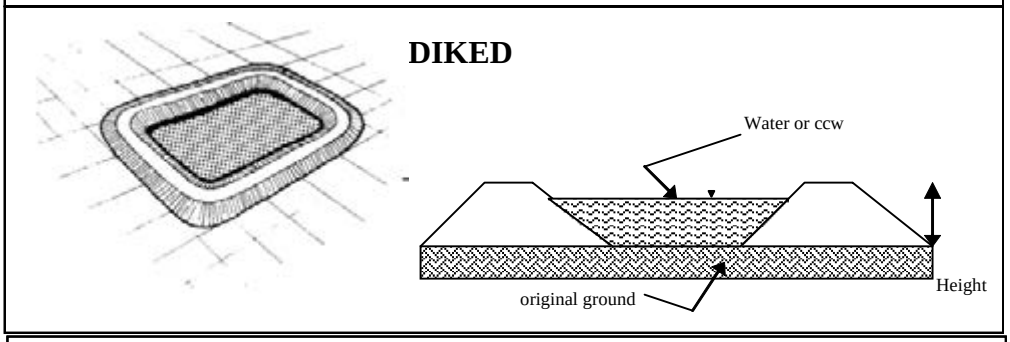
**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

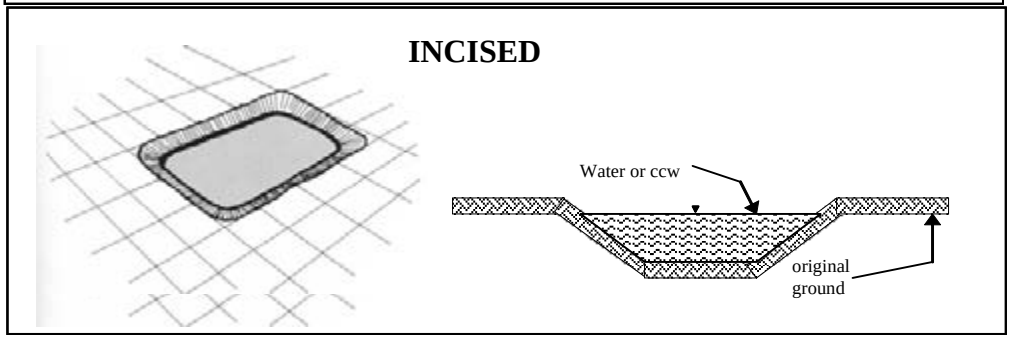
The forebay is a lined, incised impoundment used as a holding area prior to recycling the water back to the generating station via pumping. There is no dike where failure may occur. Overflow of the water may occur, however, the overflow would likely be limited to the owner's property and would likely result in minimal environmental damage.

## CONFIGURATION:




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

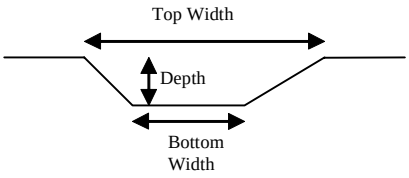
Embankment Height _____0_____ feet
Pool Area _____0.14_____ acres
Current Freeboard _____3.0*_____ feet
*Top of liner

Embankment Material Natural sand
Liner Clay and 30 mil Hypalon liner
Liner Permeability Clay - less than 1x10-6 cm/sec
Hypalon - unknown

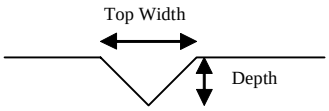
**TYPE OF OUTLET** (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

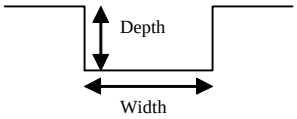



TRIANGULAR

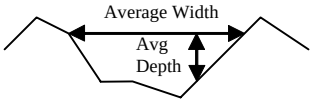



_____ depth
_____ bottom (or average) width
_____ top width
_____

RECTANGULAR

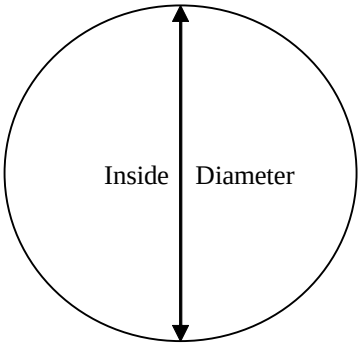



IRREGULAR




_____ **Outlet**

_____ inside diameter




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

_____

Is water flowing through the outlet? YES __X____ NO _____

_____ **No Outlet**

_____

__X__ **Other Type of Outlet** (specify) Pumps

The Impoundment was Designed By Sargent & Lundy Engineers

_____

Has there ever been a failure at this site? YES _____ NO ___X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___X____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

**Appendix D**

Photographs

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 1 | 05/24/11 |

**Direction Photo Taken:**
East

**Description:**
Bottom Ash Storage Area.


| Photo No. | Date: |
|---|---|
| 2 | 05/24/11 |

**Direction Photo Taken:**
Southeast

**Description:**
Bottom Ash Storage Area.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 3 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
Bottom Ash Storage Area and outlet pipes.


| Photo No. | Date: |
|---|---|
| 4 | 05/24/11 |

**Direction Photo Taken:**
Southeast

**Description:**
Pipes discharging into Primary Settling Basin No. 1.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 5 | 05/24/11 |

**Direction Photo Taken:**
East

**Description:**
Interior slope of Primary Settling Pond No. 1 embankment.


| Photo No. | Date: |
|---|---|
| 6 | 05/24/11 |

**Direction Photo Taken:**
Northwest

**Description:**
Primary Settling Pond No. 1, including the decant structure.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 7 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
Interior of Primary Settling Pond No. 1.


| Photo No. | Date: |
|---|---|
| 8 | 05/24/11 |

**Direction Photo Taken:**
Southeast

**Description:**
Primary Settling Pond No. 2. Note the inlet discharge pipes from the BGS in the foreground.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

**Photo No.** 9 | **Date:** 05/24/11

**Direction Photo Taken:**
South

**Description:**
Eastern interior embankment of Primary Settling Pond No. 2.


**Photo No.** 10 | **Date:** 05/24/11

**Direction Photo Taken:**
Northwest

**Description:**
Decant structure in Primary Settling Pond No. 2.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| | | |
|---|---|---|
| **Client Name: U.S. Environmental Protection Agency** | **Site Location:** NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | **Project No.**<br>01.0170142.30 |

| Photo No. | Date: |
|---|---|
| 11 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
Interior southern embankment of Primary Settling Pond No. 2.


| Photo No. | Date: |
|---|---|
| 12 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
Interior southern embankment of Primary Settling Pond No. 2.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 13 | 05/24/11 |

**Direction Photo Taken:**
Northeast

**Description:**
Inlet pipe into Primary Settling Pond No. 2 from the Bottom Ash Stormwater Area.


| Photo No. | Date: |
|---|---|
| 14 | 05/24/11 |

**Direction Photo Taken:**
South

**Description:**
Monitoring well located on the north embankment of Primary Settling Pond No. 2.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

**Photo No.** 15 | **Date:** 05/24/11

**Direction Photo Taken:**
North

**Description:**
Valve pit to control and direct the influent wastewater flow from the BGS.


**Photo No.** 16 | **Date:** 05/24/11

**Direction Photo Taken:**
South

**Description:**
Western embankment of the Secondary Settling Pond No. 2.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 17 | 05/24/11 |

**Direction Photo Taken:**
East

**Description:**
Southern embankment of Secondary Settling Basin No. 2.


| Photo No. | Date: |
|---|---|
| 18 | 05/24/11 |

**Direction Photo Taken:**
North

**Description:**
Embankment between Secondary Settling Pond No. 2 (left side of photograph) and Secondary Settling Pond No. 1 (right side of photograph).

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 19 | 05/24/11 |

**Direction Photo Taken:**
Southwest

**Description:**
Staff gage in the Secondary Settling Pond No. 2 with a site specific elevation.


| Photo No. | Date: |
|---|---|
| 20 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
North embankment of the Secondary Settling Pond No. 2.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

**Photo No.** 21 | **Date:** 05/24/11

**Direction Photo Taken:**
Southeast

**Description:**
Inlet pipe into the Secondary Settling Pond No. 2.


**Photo No.** 22 | **Date:** 05/24/11

**Direction Photo Taken:**
Northwest

**Description:**
The Indiana National Dunes Lakeshore that abuts the north side of the impoundments.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 23 | 05/24/11 |

**Direction Photo Taken:**
North

**Description:**
The east embankment of Secondary Settling Pond No. 1. The vacant wastewater treatment plant is on the right of the photograph and the Recycle Water Pumphouse is in the background.


| Photo No. | Date: |
|---|---|
| 24 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
The south embankment of Secondary Settling Pond No. 1.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 25 | 05/24/11 |

**Direction Photo Taken:**
West

**Description:**
The embankment between the Secondary Settling Pond No. 1 (left side of photograph), Secondary Settling Pond No. 2 (background), and the Forebay (right side of photograph). The valves shown control the flow between the impoundments.


| Photo No. | Date: |
|---|---|
| 26 | 05/24/11 |

**Direction Photo Taken:**
Northwest

**Description:**
Forebay and Recycle Water Pumphouse.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO<br>Bailly Generating Station<br>Chesterton, Indiana | Project No.<br>01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 27 | 05/24/11 |

**Direction Photo Taken:**
Southeast

**Description:**
East embankment of the Forebay. The vacant wastewater treatment building is on the left side of the photograph.


| Photo No. | Date: |
|---|---|
| 28 | 05/24/11 |

**Direction Photo Taken:**
Northeast

**Description:**
Recycle Water Pumphouse.

# GZA GeoEnvironmental, Inc.

## PHOTOGRAPHIC LOG

| Client Name: U.S. Environmental Protection Agency | Site Location: NIPSCO Bailly Generating Station Chesterton, Indiana | Project No. 01.0170142.30 |
|---|---|---|

| Photo No. | Date: |
|---|---|
| 29 | 05/24/11 |

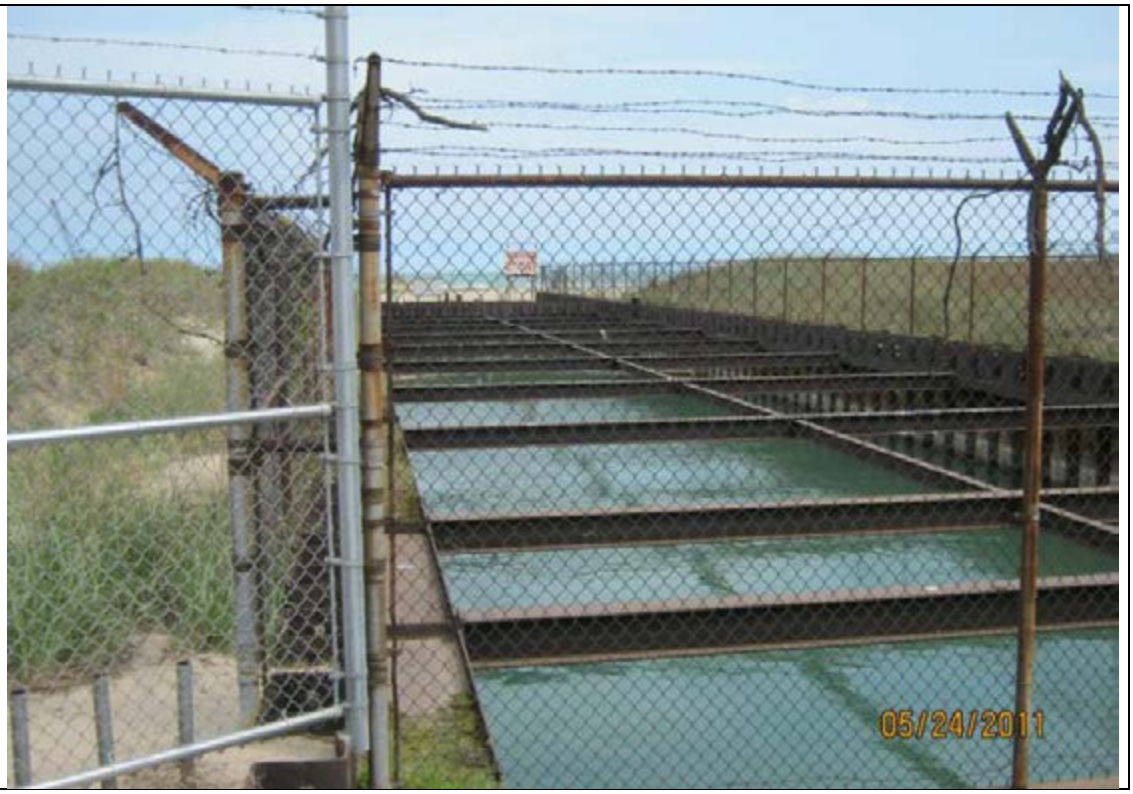
**Direction Photo Taken:**
Southwest

**Description:**
Groundwater monitoring well near the Forebay.


| Photo No. | Date: |
|---|---|
| 30 | 05/24/11 |

**Direction Photo Taken:**
North

**Description:**
NPDES outfall to Lake Michigan.



**Appendix E**

References

# NIPSCO – BAILLY GENERATING STATION

## REFERENCES


1. NPDES Permit No. IN 0000132 Permit Modification – Sreamline Mercury Variance issued to NIPSCO Bailly Generating Station, dated January 10, 2011.

2. October 4, 2010 response by NIPSCO to EPA (5306p) Request for Information regarding the Bailly Generating Station.

3. NIPSCO Bailly Generating Station RCRA Corrective Action Program, Quarterly Progress Report 06-01, authored by AMEC dated April 14, 2006

4. March 31, 2005 EPA Administrative Order on Consent covering corrective action work at NIPSCO Bailly Generating Station.

5. Contract T-2622 between Superior Construction Co., Inc. and NIPSCO regarding work at Bailly Generating Station in connection with Ash Pond Earthwork and Lining for Units 7 & 8 dated March 13, 1980.

6. NIPSCO company correspondence letter from L.C. McGrath to D.L. Kuhn regarding Specification Covering Ash Pond Earthwork and Lining, Units 7 & 8, Bailly Generating Station dated October 2, 1979.