

US EPA ARCHIVE DOCUMENT

FINAL REPORT

# Dam Safety Assessment of CCW Impoundments

**ALLEGHENY ENERGY COMPANY, LLC  
HATFIELD'S FERRY POWER STATION**

US EPA ARCHIVE DOCUMENT

United States Environmental Protection Agency  
Washington, DC

February 27, 2014



**O'BRIEN & GERE**  
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# Dam Safety Assessment of CCW Impoundments

Allegheny Energy Company, LLC  
Hatfield's Ferry Power Station

Prepared for:  
US Environmental Protection Agency  
Washington, DC



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## 1. INTRODUCTION

### 1.1. GENERAL

In response to the coal combustion waste (CCW) impoundment failure at the TVA/Kingston coal-fired electric generating station in December of 2008, the U. S. Environmental Protection Agency (USEPA) has initiated a nationwide program of structural integrity and safety assessments of coal combustion residuals impoundments or "management units". A CCW management unit is defined as a surface impoundment or similar diked or bermed management unit or management units designated as landfills that receive liquid-borne material and are used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. Management units also include inactive impoundments that have not been formally closed in compliance with applicable federal or state closure/reclamation regulations.

The U.S. EPA has authorized O'Brien & Gere to provide site specific impoundment assessments at selected facilities. This project is being conducted in accordance with the terms of BPA# EP10W000673, Order EP-B12S-00065, dated July 18, 2012.

### 1.2. PROJECT PURPOSE AND SCOPE

The purpose of this work is to provide Dam Safety Assessment of CCW management units, including the following:

- Identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures
- Note the extent of deterioration, status of maintenance, and/or need for immediate repair
- Evaluate conformity with current design and construction practices
- Determine the hazard potential classification for units not currently classified by the management unit owner or by state or federal agencies

O'Brien & Gere's scope of services for this project includes performing a site specific dam safety assessment of all CCW management units at the subject facility. Specifically, the scope includes the following tasks:

- Perform a review of pertinent records (prior inspections, engineering reports, drawings, etc.) made available at the time of the site visit (or shortly thereafter) to review previously documented conditions and safety issues and gain an understanding of the original design and modifications of the facility.
- Perform a site visit and visual assessment of each CCW management unit and complete the visual assessment checklist to document conditions observed.
- Perform an evaluation of the adequacy of the outlet works, structural stability, quality and adequacy of the management unit's inspection, maintenance, and operations procedures.
- Identify critical infrastructure within 5 miles down gradient of management units.
- Evaluate the risks and effects of potential overtopping and evaluate effects of flood loading on the management units.
- Immediate notification of conditions requiring emergency or urgent corrective action.
- Identify all environmental permits issued for the management units
- Identify all leaks, spills, or releases of any kind from the management units within the last 5 years.
- Prepare a report summarizing the findings of the assessment, conclusions regarding the safety and structural integrity, recommendations for maintenance and corrective action, and other action items as appropriate.

This report addresses the above issues for Waste Water Treatment (WWT) Lagoons at the Hatfield's Ferry Power Station in Masontown, Greene County, Pennsylvania. The above impoundments are owned and operated by Allegheny Energy Company, LLC, a subsidiary of FirstEnergy Corp. In the course of this assessment, information was obtained from representatives of Allegheny Energy Company and the Pennsylvania Department of Environmental Protection (PADEP).

## 2. PROJECT/FACILITY DESCRIPTION

The Hatfield's Ferry Power Station is located along the west side of the Monongahela River along East Roy Furman Highway in Masontown, Pennsylvania. The center of the Hatfield's Ferry Power Station is situated at approximate latitude 39.8556 degrees, and longitude -79.9288 degrees. A Site Location Map is included as Figure 1. The coal-fired power plant began commercial operation in 1969 and has three 576-megawatt units producing a total of 1,728 megawatts of electricity. In late 2013, the facility ceased the commercial generation of electricity and is currently being decommissioned. Coal combustion residual waste that is produced during power generation consists of fly ash, bottom ash, and flue-gas desulphurization residue (i.e. synthetic gypsum). Synthetic gypsum is dry handled and trucked to either the on-site landfill or a mine reclamation facility about 25 miles away in West Virginia. Fly ash is dry handled in silos and trucked for beneficial reuse or to the on-site landfill south of East Roy Furman Highway. Coal combustion residual bottom ash that is produced during power generation is managed in hydrobins which decant to ash settling basins. The decanted bottom ash is removed from the hydrobins and either trucked for beneficial use or to the on-site landfill.

Waste Water Treatment (WWT) Lagoons receive a variety of wastewater from the station including the effluent from the ash settling basins. The WWT Lagoons are composed of two cells: the Hillside Lagoon and the Riverside Lagoon.

This dam safety assessment report summarizes the September 25, 2012 assessment of the above management units at the Hatfield's Ferry Power Station.

### 2.1. MANAGEMENT UNIT IDENTIFICATION

The locations of impoundments visited during this safety assessment are identified on Figure 2 – Facility Layout Plan. Three separate pond facilities are located at the on-site landfill and are identified on Figure 2. Closed Landfill Pond 007 handles surface runoff from landfill phases 1 and 2 which have been covered with soil and vegetated. It is regulated by the Pennsylvania Department of Environmental Protection (PADEP) Division of Dam Safety. Wetland Treatment Ponds handle water from landfill phases 1 and 2 underdrains. A Leachate Storage Impoundment (LSI) constructed in 2009 handles surface runoff and underdrain leachate from phase 3 of the landfill still in operation. It is regulated by the PADEP Bureau of Waste Management. These impoundments are closely regulated by the PADEP and were not assessed for this safety assessment report.

Bottom Ash is handled in hydrobins which decant to ash settling basins. The ash settling basins also receive all of the plant's "low volume wastewater" (except for Flue Gas Desulfurization (FGD) wastewater). The ash settling basins are located within the main plant area and are below ground reinforced concrete tank structures, which were not assessed. Decant water from the ash settling basins is pumped to one of two Waste Water Treatment (WWT) Lagoons, which are separated by a divider dike. The majority of bottom ash is distributed for beneficial use, or used as a component of the onsite landfill leachate collection/drainage systems as authorized by PADEP. A very small quantity is used as a protective cover layer over the clay lining in each WWT lagoon following the cleaning of each lagoon.

Both lagoon impoundments were assessed. However, following comments from the utility, these units were found to be outside of the scope of this assessment effort, and therefore, a condition rating and hazard classification will not be made. Given that the WWT Lagoons are for tertiary removal of low volume suspended particulates, the WWT Lagoons do not fall within the scope of this assessment program; therefore, they were not assigned a hazard potential classification or an overall condition rating.

#### 2.1.1. Waste Water Treatment (WWT) Lagoons

The WWT Lagoons are located within the north corner of the Hatfield's Ferry Power Station, as shown on Figure 2. Each lagoon consists of an approximately 1.6 acre impoundment. The Hillside Lagoon (southwest or plant south lagoon) is bordered on the north, west, and south by constructed embankments; and, on the east by a divider dike separating the two lagoons. Little Whitely Creek runs about 100 feet from the south corner of the

Hillside Lagoon, approximately 40 feet below the embankment crest. The Riverside Lagoon (northeast or plant north lagoon) is bordered on the west by the divider dike; and, on the north, east and south by constructed embankments. The eastern embankment was constructed near the top of the Monongahela River's natural slope. The access road to the lagoons runs alongside and over Little Whitely Creek.

One lagoon typically remains out of service and in standby condition while the other lagoon is actively receiving wastewater. In September 2012, the Hillside Lagoon was in service and the Riverside Lagoon was in standby status. Interior features of the two lagoons are identical. Both lagoons are about 13 feet deep. Inflow is through three (3) 12-inch pipes at the south end (Photo 11). Decant water flows over a long metal weir trough (Photos 5 and 10). In the middle of the weir trough, each lagoon is drained through a concrete outlet tower with an adjustable stop plate. Each lagoon is drained prior to sediment removal activities. From the weir trough and concrete outlet tower, decant water flows into a buried 24-inch outlet pipe, then into a concrete weir box open channel which transitions into a riprap-lined channel before entering the Monongahela River (Photo 20). Prior to discharge, decant water is automatically sampled with sampling equipment in the Monitoring Building on the north side of the Hillside Lagoon (Photo 16). The discharge is authorized by Pennsylvania National Pollutant Discharge Elimination System (PA NPDES) Permit No. PA0002941.

## 2.2. IMPOUNDING STRUCTURE DETAILS

The following sections summarize the structural components and basic operations of the subject impoundments. The location of the impoundments on the plant grounds is shown on Figure 2. A typical cross section of the WWT Lagoons is shown on Figure 4.

### 2.2.1. Embankment Configuration

Each lagoon impounds a surface area of approximately 1.6 acre. The Riverside Lagoon is diked on all sides; however, the Hillside Lagoon is partially incised on the west side. Based on the drawings provided by Allegheny Energy Company, maximum constructed embankment heights and slopes are shown in the table below.

Lagoon	Embankment	Maximum constructed height	Inboard Slope	Outboard Slope
Hillside Lagoon	Southern	Up to 20 ft	3H:1V	2H:1V
	Northern	Up to 15 ft	2.5H:1V	2.5H:1V
	Eastern (divider dike)	Up to 25 ft	3H:1V	2.5H:1V
	Western (hillside)	Up to 25 ft (and partially incised)	3H:1V	2.5H:1V
Riverside Lagoon	Southern	Up to 20 ft	3H:1V	2H:1V
	Northern	Up to 15 ft	2.5H:1V	2.5H:1V
	Eastern (riverside)	Up to 25 ft	3H:1V	2.5H:1V
	Western (divider dike)	Up to 25 ft	3H:1V	2.5H:1V

The western embankment of the Hillside Lagoon ties into relatively flat ground for 50-100 feet which is then bordered by a natural hillside. The south corner of the Hillside Lagoon ties into ground sloping down for about 100 feet at about 4H:1V toward Little Whitely Creek. The eastern embankment of the Riverside Lagoon ties into a relatively flat segment for about 10-25 feet before sloping down at about 3H:1V to the Monongahela River.

The crest is at approximately elevation (EL) 806 feet above mean sea level. The lagoon bottom (as indicated by plant record drawings) is at approximately EL 793. The typical water surface elevation maintained in the operating lagoon is approximately EL 803. As described in the table above, the northern inboard embankment slope has an inclination of approximately 2.5H:1V. Remaining inboard embankment slopes, including the divider dike slopes, have an inclination of approximately 3H:1V. The southern outboard embankment slope has an inclination of approximately 2H:1V. Remaining outboard embankment slopes have an inclination of approximately 2.5H:1V.

Hand placed riprap embankment protection was constructed on the southern embankment inboard slope and bottom of the Hillside Lagoon's western embankment outboard slope where not incised.

### **2.2.2. Type of Materials Impounded**

The WWT Lagoons are designed to settle out fine particulates in the wastewater prior to discharge. The particulates include but are not limited to suspended bottom ash that is not removed in the hydrobins or ash settling basins.

### **2.2.3. Outlet Works**

The WWT Lagoons have identical outlet works. A temporary boom is placed near the center of the operating WWT Lagoon to trap floating debris and encourage particulate settling in the upstream half of the lagoon. Water is decanted through a 72-ft long, 2.5-ft wide metal weir trough which drains toward the center. A concrete outlet tower contains an adjustable stop plate which is used to drain the lagoon through orifices located on the side of the outlet tower. At the bottom of the outlet tower, a 24-inch diameter pipe directs outflow to the Monitoring Building. Outflow exits the Monitoring Building over a flume in a concrete weir box, then discharges into a rip rap-lined channel and outfalls at the Monongahela River. The discharge is authorized by Pennsylvania National Pollutant Discharge Elimination System (PA NPDES) Permit No. PA0002941.

### **2.3. HAZARD POTENTIAL CLASSIFICATION**

The WWT Lagoons are for tertiary removal of low volume suspended particulates and do not fall within the scope of this assessment program. Therefore, they were not assigned a hazard potential classification.

### 3. RECORDS REVIEW

A review of the available records related to design, construction, operation and inspection of the WWT Lagoons was performed as part of this assessment. The documents provided by Allegheny Energy Company are listed below:

**Table 3.1 Summary of Documents Reviewed**

Document	Dates	By	Description
West Penn Power Company Hatfield Power Station Wastewater Treatment Facilities Construction Drawings	1976-1977	First Energy	Sheet C-2411: Lagoons Plan C-2412: Lagoons Section and Details Sheet 1 C-2418: Lagoons Section and Details Sheet 3 C-2419: Lagoons Section and Details Sheet 4 C-2424: Lagoons Section and Details Sheet 5 C-4426: Lagoon & Settling Camber Piping

#### 3.1. ENGINEERING DOCUMENTS

Review of the above documents revealed information on the design details and construction of the Hatfield's Ferry CCW impoundments, which are summarized below.

- Waste Water Treatment (WWT) Lagoons were constructed and put into operation in 1977.
- All embankment sides were constructed between 15 to 25 feet high except for a section of the Hillside Lagoon that was incised.
- A one-foot (1-ft) thick layer of bottom ash lines the lagoon bottoms as a sub-drainage medium. Below the pond bottom, native clay is reportedly present.
- Foundation subsurface drains surround the embankment perimeter and a subsurface drainage system was constructed within the lagoon bottoms. Outflow from the subsurface system is directed to a manhole on the riverside slope which outlets to a 12-inch diameter RCP (reinforced concrete pipe) that connects to the lagoon outfall to the Monongahela River.
- No geotechnical information or slope stability analyses were available for review.
- No embankment failures or releases of impounded materials have occurred.

##### 3.1.1. Stormwater Inflows

No hydrologic & hydraulic analyses have been conducted to evaluate stormwater inflow into the WWT Lagoons. The impounding structures are surrounded by 15 to 25-ft high diked embankments on nearly all sides except for a portion of the western embankment. This portion of the western embankment was constructed with an approximately 5-ft high outboard slope draining to a 3H:1V V-shaped perimeter surface drain. Therefore, stormwater inflows to the WWT Lagoons are limited to direct precipitation with negligible runoff based on observations of the topography around the lagoons. Available volume provided by the lagoon freeboard of three (3) feet is sufficient to contain the precipitation of a 24-hour 100-year storm (5 inches) or a PMP (Probable Maximum Precipitation) event (approximately 34 inches) without overtopping the lagoon.

##### 3.1.2. Stability Analyses

As mentioned above, no geotechnical records of design or as-built slope stability analyses were provided in the records made available by Allegheny Energy Company. Based on our discussions with plant personnel,

geotechnical design and slope stability records are either non-existent or could not be located in preparation for our visit. No indications of slope distress were observed during the visual assessment of both lagoons.

### 3.1.3. Modifications from Original Construction

Based on records review and discussions with plant personnel, no modifications from original lagoon construction have occurred.

### 3.1.4. Instrumentation

No geotechnical or dam safety related instrumentation has been installed. The Monitoring Building and groundwater monitoring pits were part of original lagoon construction.

## 3.2. PREVIOUS INSPECTIONS

Informal operational inspections are conducted. No inspections are performed to check for seepage, cracks, holes, and freeboard.

## 3.3. OPERATOR INTERVIEWS

Plant personnel took part in the assessment proceedings. The following table lists participants for the September 2012 assessment of the WWT Lagoons:

Name	Affiliation	Title
Joe Lapcevic	Allegheny Energy Company	Senior Environmental Scientist
Randy Jones	Allegheny Energy Company	Senior Environmental Scientist
Dreher Whetstone, PE	O'Brien & Gere	Technical Associate - Geotechnical Engineer
Carrie Lohrmann, PE	O'Brien & Gere	Design Engineer

Dave Hoone of Allegheny Energy Company was unable to attend the September 2012 assessment; however, he provided construction drawings and additional information following the assessment. PADEP desired to attend the assessment, but also was not present. Facility personnel provided a good working knowledge of the impoundments, provided general plant operation background and provided requested historical documentation. The personnel listed in the table above accompanied O'Brien & Gere throughout the visual assessment to answer questions and to provide additional information as needed in the field.

## 4. VISUAL ASSESSMENT

The following sections summarize the assessment of the Waste Water Treatment (WWT) Lagoons which occurred on September 25, 2012. At the time of the assessment, O'Brien & Gere filled out EPA assessment checklists for the facilities. Additional information on the checklists was identified from drawings provided by Allegheny Energy Company following the assessment. Checklists were submitted electronically to EPA on November 12, 2012. Copies of the completed assessment checklists are included as Appendix A.

### 4.1. GENERAL

The weather on the date of the assessment was approximately 55 degrees and mostly clear. The visual assessment consisted of a thorough site walk along the perimeter of the impoundment dikes and other portions of the impoundments to observe outlet structures and general facility operations. O'Brien & Gere team members made observations along the toe, outboard slope, and crest of the dikes, and along exposed portions of the inboard slopes. We also observed the inlet/outlet structures and current operation.

Photos of relevant features and conditions observed during the assessment were taken by O'Brien & Gere and are provided in Appendix B. An aerial photograph depicting the layout and locations and orientation of the photographs is included as Figure 3.

### 4.2. SUMMARY OF FINDINGS

The following observations were made during the assessment:

- The Hillside Lagoon was operating at the time of assessment. The Riverside Lagoon was drained at the time of assessment. Otherwise, lagoon features and condition are nearly identical so they are documented as one complete unit.
- Lagoon access was restricted with a security fence topped with barbed wire.
- Influent wastewater enters the south end of the lagoons through three (3) 12-inch inflow pipes. Inflow control valves for both lagoons are located near the top of the southern outboard slope.
- No depressions or ponding along the crest were noted.
- The access road to the lagoons and lagoon crest roadway surfaces were mainly bare earth with some gravel. The access road down to the river was mainly gravel and grass. Access roads were maintained adequately for vehicular traffic.
- The freeboard portion of the Hillside Lagoon and Riverside Lagoon inboard slopes and inboard slopes were mainly vegetated with tall grasses and wildflowers.
- The bottom of the Riverside Lagoon had been relined with bottom ash except for at the north end where water ponded in the bottom. Lower inboard slopes were a combination of bottom ash and earth. No significantly eroded areas were observed.
- The divider dike crest and slopes were identical in material and condition to other portions of the crest roads and inboard slopes.
- The boom in the Hillside Lagoon as well as inflow and outflow structures appeared to be in good condition and functioning normally.
- Plant personnel stated that the adjustable stop plates for draining the lagoons are operational.
- Metal outflow weir troughs and other metal components were rusted, but the outlet works showed no other significant signs of wear.

- The southern embankment outboard slope was heavily vegetated with tall grasses, wildflowers, brush, saplings, and small trees. Remaining outboard slopes were vegetated with tall grasses, wildflowers, and a few small trees.
- The eastern embankment, natural slope down to the Monongahela River, and streamside of the access road to the lagoons are a protected mitigation area that was intentionally planted as mitigation for another on-site project.
- No seepage was evident.
- A Monitoring Building is positioned northwest of the Riverside Lagoon, below the toe of the outboard slope.
- The WWT Lagoons' outfall to the Monongahela River was observed and operating.

## 5. CONCLUSIONS

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As stated previously, the WWT Lagoons do not fall within the scope of this assessment program given that their purpose is for fine particulate settling of low volume wastewater and CCW storage in the WWT Lagoons is minimal. Since the WWT Lagoons do not fall within the scope of this assessment program, no overall condition rating is given in this report.

Some minor deficiencies that the owner may want to address include the following:

- Heavy vegetation on southern outboard slope, tall grass and some trees on remaining outboard slopes.
- Tall grass vegetation on inboard slopes.

Allegheny Energy Company should implement regular visual inspections for perimeter embankment seeps, cracks, holes, and freeboard with the goal of identifying, documenting, and repairing any deficiencies early so that they do not develop into more serious problems. Plant staff should maintain design and construction documents and inspection reports in a well organized manner for future reference.

**6. RECOMMENDATIONS**

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As previously stated, the WWT Lagoons do not fall within the scope of this assessment program. No formal recommendations will be provided.

**7. CERTIFICATION STATEMENT**

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I acknowledge that the Waste Water Treatment (WWT) Lagoons, Hillside Lagoon and Riverside Lagoon management units, referenced herein were personally inspected by me on September 25, 2012 and were found to be outside of the scope of this assessment program given the operational details discussed herein.

Signature:  \_\_\_\_\_  
D. Dreher Whetstone, PE  
PA PE License PE060840

Date: February 27, 2014



I:\US-EPA-13498\STDS\GIS\Impoundments\Figures\HatfieldsFerry\HatfieldsFerry\_Figure1\_SiteLocation.mxd

PLOTDATE: 2/27/2014 DRK

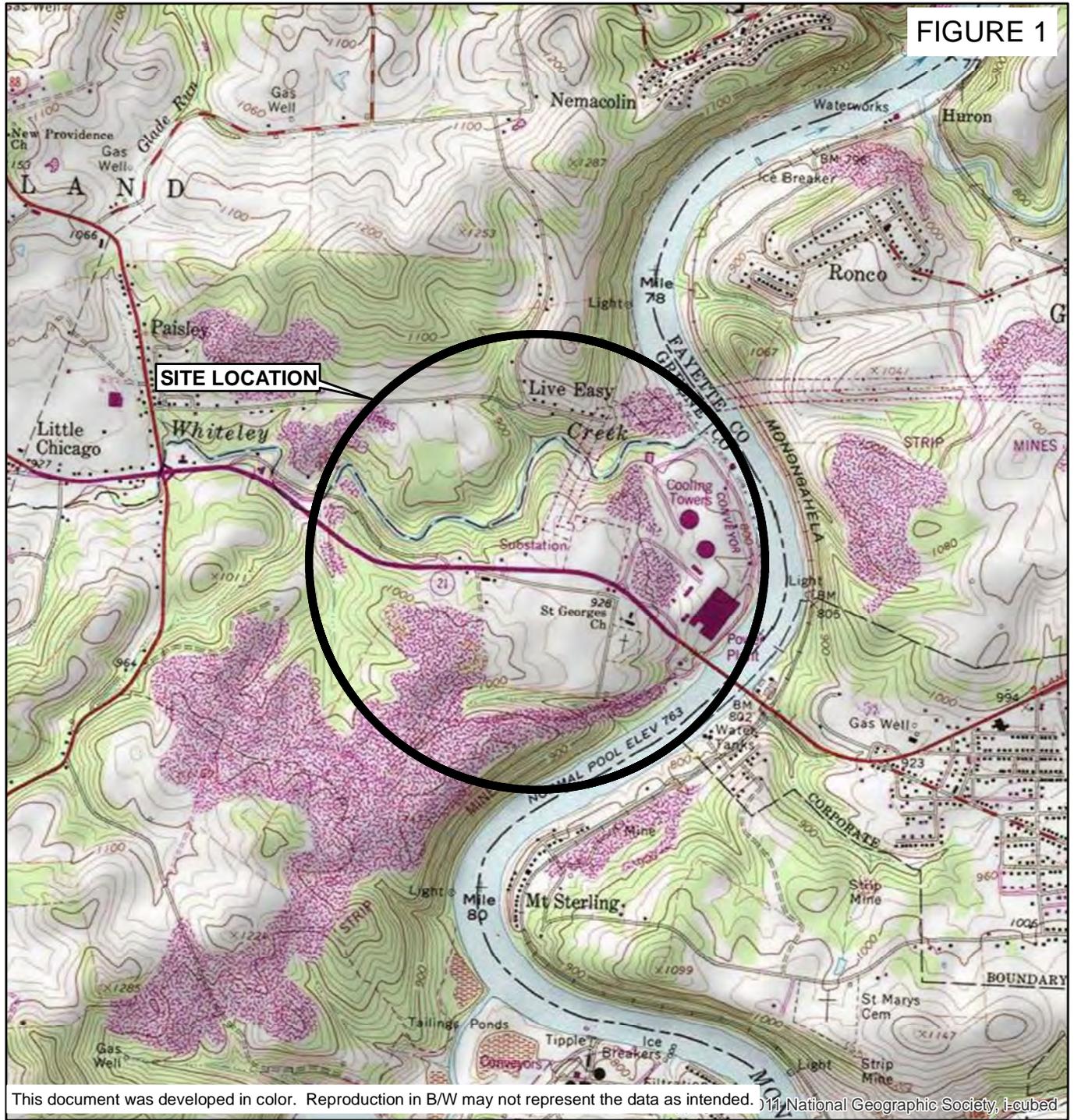
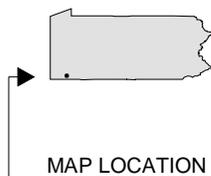


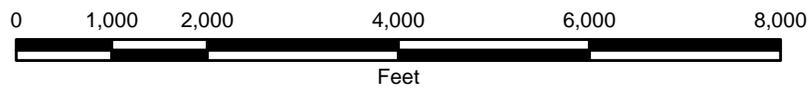
FIGURE 1

ADAPTED FROM: CARMICHEALS AND MASONTOWN, PENNSYLVANIA USGS QUADRANGLES

US EPA - DAM SAFETY ASSESSMENT OF  
 CCW IMPOUNDMENTS  
 HATFIELD'S FERRY POWER STATION  
 MASONTOWN, PENNSYLVANIA



SITE LOCATION





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

FIGURE 2

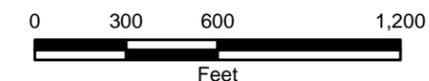


LEGEND

- OUTFALL
- LAGOON
- OTHER IMPOUNDMENT
- LITTLE WHITELEY CREEK

DAM SAFETY ASSESSMENT OF  
CCW IMPOUNDMENTS  
HATFIELD'S FERRY  
POWER STATION  
MASONTOWN, PENNSYLVANIA

FACILITY LAYOUT PLAN



FEBRUARY 2014  
13498/46122





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

FIGURE 3

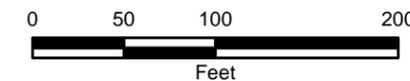


LEGEND

- OUTFALL
- LAGOON
- 1 PHOTO LOCATION/  
DIRECTION

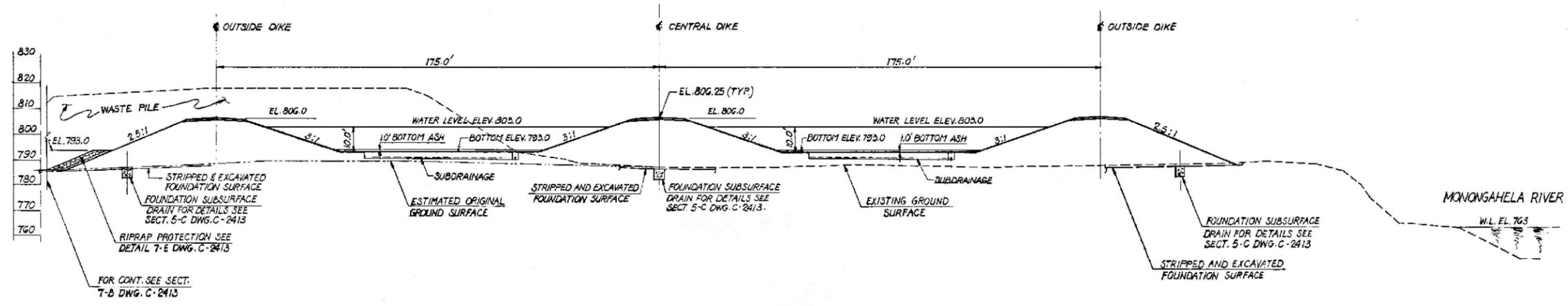
DAM SAFETY ASSESSMENT OF  
CCW IMPOUNDMENTS  
HATFIELD'S FERRY  
POWER STATION  
MASONTOWN, PENNSYLVANIA

**WWT LAGOONS  
PHOTO LOCATION MAP**



FEBRUARY 2014  
13498/46122





**WASTEWATER TREATMENT (WWT) LAGOONS**  
 (SECTION 5-C)  
 SCALE: 1" = 50'-0"

REFERENCE:  
 DRAWING TAKEN FROM DRAWING NO. 4918-C-2412, REVISION A,  
 TITLED "LAGOONS SECTIONS AND DETAILS, SH.1", DATED  
 8/10/76 BY SANDERSON & PORTER, INC., NEW YORK

US EPA  
 DAM SAFETY ASSESSMENT  
 OF CCW IMPOUNDMENTS

FIRST ENERGY  
 HATFIELD'S FERRY  
 MASONTOWN, PENNSYLVANIA

**WASTEWATER  
 TREATMENT LAGOONS**



46122-HATFIELDS-F04  
 FEBRUARY 2013



**APPENDIX A**

**Visual Inspection Checklist**



Site Name:	Hatfields Ferry Power Station	Date:	September 25, 2012
Unit Name:	Ash Settling Basins - 2	Operator's Name:	First Energy
Unit I.D.:	Waste Water Treatment (WWT) Lagoons	Hazard Potential Classification:	High <del>Significant</del> Low
Inspector's Name:	D. Whetstone, PE & C. Lohrmann, PE		Not Assigned

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?		never			18. Sloughing or bulging on slopes?				✓
2. Pool elevation (operator records)?		803.0			19. Major erosion or slope deterioration?				✓
3. Decant inlet elevation (operator records)?					20. Decant Pipes:				
4. Open channel spillway elevation (operator records)?		803.0			Is water entering inlet, but not exiting outlet?				✓
5. Lowest dam crest elevation (operator records)?		806.0			Is water exiting outlet, but not entering inlet?				✓
6. If instrumentation is present, are readings recorded (operator records)?		N/A			Is water exiting outlet flowing clear?		✓		
7. Is the embankment currently under construction?				✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):				
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?					From underdrain?				✓
9. Trees growing on embankment? (If so, indicate largest diameter below)		✓			At isolated points on embankment slopes?				✓
10. Cracks or scarps on crest?				✓	At natural hillside in the embankment area?				✓
11. Is there significant settlement along the crest?				✓	Over widespread areas?				✓
12. Are decant trashracks clear and in place?					From downstream foundation area?				✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?				✓	"Boils" beneath stream or ponded water?				✓
14. Clogged spillways, groin or diversion ditches?				✓	Around the outside of the decant pipe?				✓
15. Are spillway or ditch linings deteriorated?				✓	22. Surface movements in valley bottom or on hillside?				✓
16. Are outlets of decant or underdrains blocked?				✓	23. Water against downstream toe?				✓
17. Cracks or scarps on slopes?				✓	24. Were Photos taken during the dam inspection?		✓		

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

Inspection Issue #	Comments
3. Adjustable stop plate	
6. No instrumentation present.	
8. Unknown	
9. 6" - small brush, young trees	

US EPA ARCHIVE DOCUMENT

U. S. Environmental  
Protection Agency



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

Impoundment NPDES Permit # PA 0002941 INSPECTOR D. Whetstone/C. Lohrmann

Date September 25, 2012

Impoundment Name ~~Ash Settling Basins~~ Waste Water Treatment (WWT) Lagoons

Impoundment Company First Energy

EPA Region 3

State Agency (Field Office) Address PA Dept. of Environmental Protection  
Pittsburgh, PA

Name of Impoundment ~~Ash Settling Basins~~ Waste Water Treatment (WWT) Lagoons

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

New  Update

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

**IMPOUNDMENT FUNCTION:** **Settling suspended fly ash solids not removed with dry handling.**

Nearest Downstream Town Name: Masontown

Distance from the impoundment: 0.75 mile / 4000 feet

Impoundment Location:

Latitude 39 Degrees 51 Minutes 46 Seconds North

Longitude 79 Degrees 55 Minutes 50 Seconds West

State PA County Fayette

Does a state agency regulate this impoundment? YES  NO

If So Which State Agency? PA Department of Environmental Protection  
For effluent water quality only.

US EPA ARCHIVE DOCUMENT

Not Assigned--Impoundment determined to be out of scope of assessment

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

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

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

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

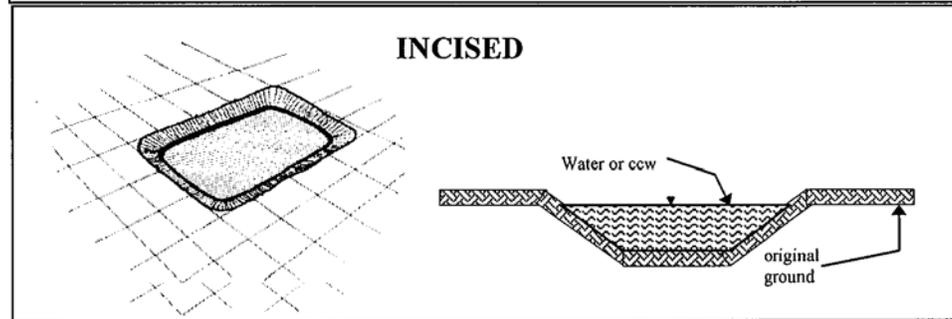
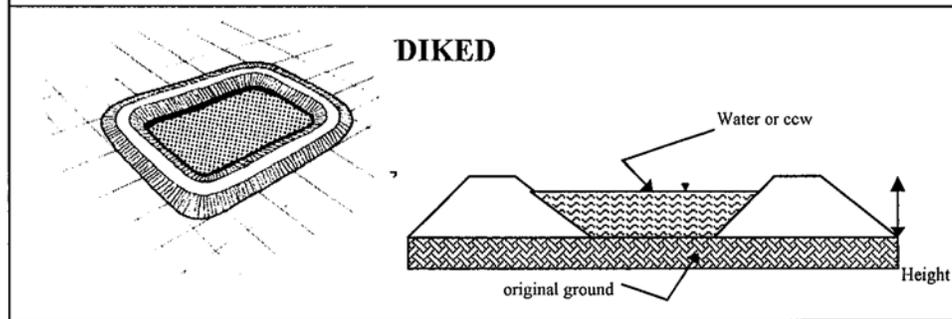
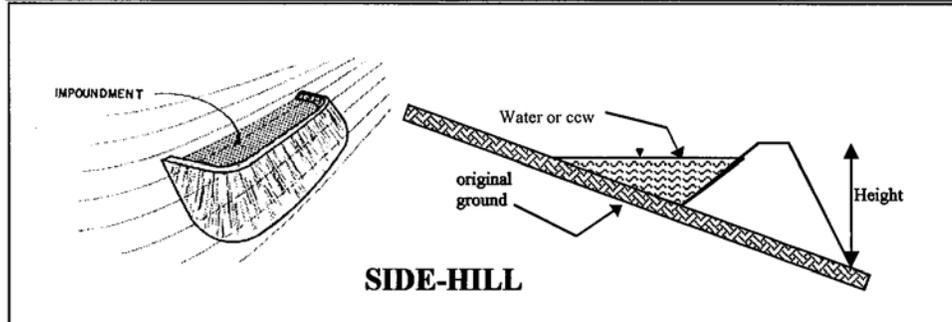
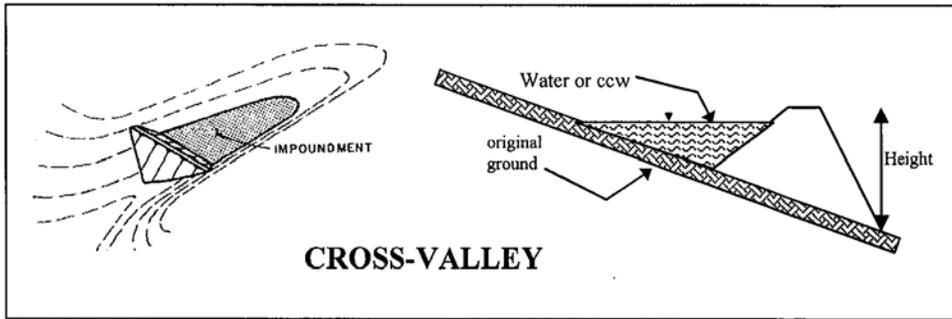
\_\_\_\_\_ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

**DESCRIBE REASONING FOR HAZARD RATING CHOSEN:**

A breach in the embankment would flow into the Monongahela River which is adjacent to the ponds lagoons, potentially causing environmental damage.

\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CONFIGURATION:**



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

Embankment Height	<u>36</u>	Feet	Embankment Material	<u>Earth</u>
Pool Area	<u>(1 lagoon) 1.6</u>	Acres	Liner	<u>Clay</u>
Current Freeboard	<u>3</u>	feet	Linear Permeability	<u>unknown</u>

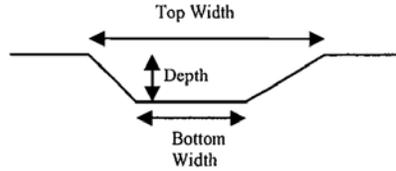
US EPA ARCHIVE DOCUMENT

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

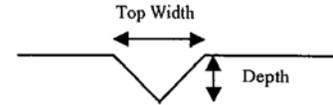
**Open Channel Spillway**

- Trapezoidal
- Triangular
- Rectangular
- Irregular

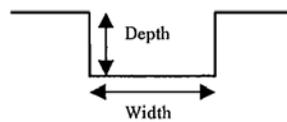
TRAPEZOIDAL



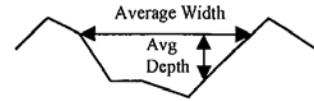
TRIANGULAR



RECTANGULAR



IRREGULAR



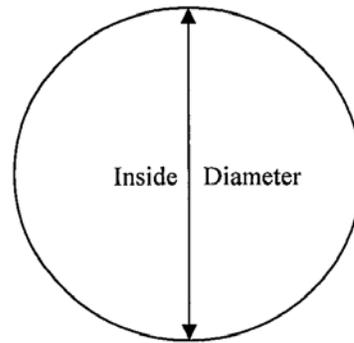
- 2.5 depth (ft)
- 72 bottom (or average) width (ft)
- 72 top width (ft)

**Outlet**

Inside diameter

**Material**

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



Outflow flows over the top of a 72-ft long, 2.5-ft wide metal weir trough, alternately through a concrete outlet tower with an adjustable stop plate / to outlet pipe to concrete weir box open channel to rip rap open channel to river

Is water flowing through the outlet? YES  NO

**No Outlet**

**Other Type of Outlet** (specify) \_\_\_\_\_

The Impoundment was Designed By Sanderson & Porter, Inc. of New York for West Penn Power Company: Hatfield Power Station Wastewater Treatment Facilities









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Additional Inspection Questions

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

No information.

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

No.

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

No.

**APPENDIX B**

**Photographs**

Client: US EPA

Project Number: 46122.210.100

Site Name: First Energy – Hatfield's Ferry

Location: Masontown, PA

Orientation:  
SEDescription:  
Ash Settling  
Basin 1 in  
operation, view  
from outlet  
tower.Date:  
9/25/12Photo Number:  
1Photographer:  
DDWOrientation:  
SEDescription:  
Divider dike  
between 2 Ash  
Settling Basins.  
Basin 1 in  
operation on  
right. Drained  
Basin 2 on left.Date:  
9/25/12Photo Number:  
2Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
NW

Description:  
Ash Settling Basin 1, view from basin south corner. Note boom across center of basin in background.



Date:  
9/25/12

Photo Number:  
3

Photographer:  
DDW

Orientation:  
NW

Description:  
Ash Settling Basin 2, view from basin south corner.



Date:  
9/25/12

Photo Number:  
4

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100  
Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation: NE  
Description: Weir trough in operation in Ash Settling Basin 1.  
Date: 9/25/12  
Photo Number: 5  
Photographer: DDW



Orientation: SE  
Description: Concrete outlet tower with adjustable stop plate in Ash Settling Basin 1.  
Date: 9/25/12  
Photo Number: 6  
Photographer: DDW



Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
W

Description:  
Ash Settling  
Basin 2 bottom,  
inboard slopes,  
concrete outlet  
tower, and weir  
trough.



Date:  
9/25/12

Photo Number:  
7

Photographer:  
DDW

Orientation:  
W

Description:  
Exposed  
concrete outlet  
tower with  
adjustable stop  
plate in Ash  
Settling Basin 2.



Date:  
9/25/12

Photo Number:  
8

Photographer:  
DDW

Client: US EPA

Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry

Location: Masontown, PA

Orientation:  
SW

Description:  
Ash Settling  
Basin 2 inboard  
slopes near  
concrete outlet  
tower and weir  
trough.



Date:  
9/25/12

Photo Number:  
9

Photographer:  
DDW

Orientation:  
SW

Description:  
Weir trough out  
of operation in  
Ash Settling  
Basin 2.



Date:  
9/25/12

Photo Number:  
10

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
NE

Description:  
Inflow pipes on  
inboard slope of  
drained Ash  
Settling Basin 2.



Date:  
9/25/12

Photo Number:  
11

Photographer:  
DDW

Orientation:  
SW

Description:  
Ash Setting  
Basin inflow  
pipes and valves  
near top of  
southern  
embankment  
outboard slope.



Date:  
9/25/12

Photo Number:  
12

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
SW

Description:  
Access road and southern embankment of Ash Settling Basins.



Date:  
9/25/12

Photo Number:  
13

Photographer:  
DDW

Orientation:  
NW

Description:  
Inflow pipes along southern embankment of Ash Setting Basins.



Date:  
9/25/12

Photo Number:  
14

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
W

Description:  
Flat area west of Ash Settling Basins, limestone conveyor and hillside in background.



Date:  
9/25/12

Photo Number:  
15

Photographer:  
DDW

Orientation:  
N

Description:  
Sampling building for Ash Settling Basin outflow prior to outfall at the Monongahela River.



Date:  
9/25/12

Photo Number:  
16

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
NW

Description:  
Access road to Monongahela River on Ash Settling Basin 2 eastern embankment.



Date:  
9/25/12

Photo Number:  
17

Photographer:  
DDW

Orientation:  
SE

Description:  
Natural riverside slope along Monongahela River and toe of constructed eastern embankment of Ash Settling Basin 2. Planted as mitigation area.



Date:  
9/25/12

Photo Number:  
18

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
SE

Description:  
Mooring cells along  
Monongahela  
River adjacent  
to Ash Settling  
Basins.



Date:  
9/25/12

Photo Number:  
19

Photographer:  
DDW

Orientation:  
NW

Description:  
Ash Setting  
Basins outfall to  
Monongehela  
River.



Date:  
9/25/12

Photo Number:  
20

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
NE

Description:  
Access road to  
Ash Settling  
Basins.  
Mitigation area  
along access  
road and  
riverside  
embankment.



Date:  
9/25/12

Photo Number:  
21

Photographer:  
DDW

Orientation:  
N/A

Description:  
Ash storage  
silos and  
hydrobins.



Date:  
9/25/12

Photo Number:  
22

Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100

Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
S

Description:  
Closed Landfill  
Pond 007, view  
from right of  
outlet structure.  
Closed landfill  
in background.



Date:  
9/25/12

Photo Number:  
23

Photographer:  
DDW

Orientation:  
S

Description:  
Closed Landfill  
Pond 007  
outfall.



Date:  
9/25/12

Photo Number:  
24

Photographer:  
DDW

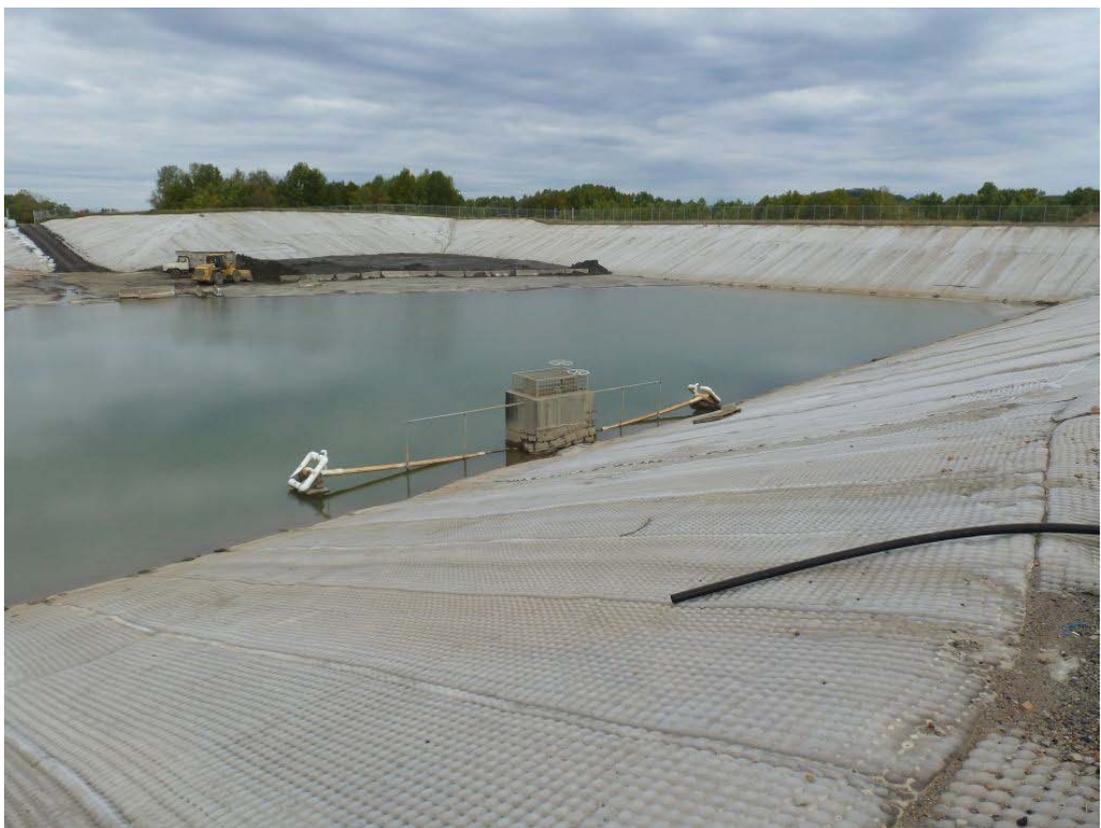
Client: US EPA Project Number: 46122.210.100  
Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
W  
Description:  
Leachate  
Storage  
Impoundment  
(LSI).



Date:  
9/25/12  
Photo Number:  
25  
Photographer:  
DDW

Orientation:  
NW  
Description:  
Leachate  
Storage  
Impoundment  
(LSI).



Date:  
9/25/12  
Photo Number:  
26  
Photographer:  
DDW

Client: US EPA Project Number: 46122.210.100  
 Site Name: First Energy – Hatfield’s Ferry Location: Masontown, PA

Orientation:  
SE

Description:  
Leachate  
Storage  
Impoundment  
(LSI) outflow  
channel.



Date:  
9/25/12

Photo Number:  
27

Photographer:  
DDW

Orientation:  
N/A

Description:  
On-site landfill  
in operation.



Date:  
9/25/12

Photo Number:  
28

Photographer:  
DDW