

US EPA ARCHIVE DOCUMENT

FINAL REPORT

# Dam Safety Assessment of CCW Impoundments

NRG Power Midwest LP  
New Castle Generating Station  
West Pittsburg, Lawrence County, Pennsylvania

United States Environmental Protection Agency  
Washington, DC

January 17, 2014



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

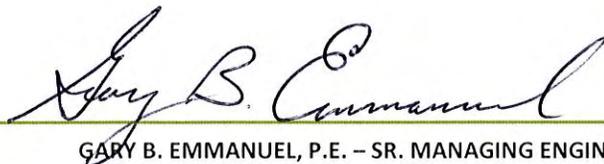
NRG Power Midwest LP  
New Castle Generating Station

Prepared for:  
US Environmental Protection Agency  
Washington, DC



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ROBERT R. BOWERS, P.E. – VICE PRESIDENT  
O'BRIEN & GERE ENGINEERS, INC.



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GARY B. EMMANUEL, P.E. – SR. MANAGING ENGINEER  
O'BRIEN & GERE ENGINEERS, INC.

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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 has initiated a nationwide program of structural integrity and safety assessments of coal combustion waste 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 USEPA 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 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 inspection 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 the North Ash Pond and the South Ash Pond at the New Castle Generating Station in West Pittsburg, Pennsylvania. Effective December 14, 2012, NRG Energy, Inc. (NRG) and GenOn Energy, Inc. have combined and will retain the name NRG Energy, Inc. As a result of the merger, all GenOn entities are now wholly owned subsidiaries of NRG. As such, the owner and operator of the above impoundments is NRG Power Midwest LP (NRG). In the course of this assessment, we obtained information from representatives of NRG and the Pennsylvania Department of Environmental Protection (PADEP).

## 2. PROJECT/FACILITY DESCRIPTION

The New Castle Generating Station is located at 2189 Route 168 South in West Pittsburg, Pennsylvania. A Site Location Map is included as Figure 1. The coal-fired power station includes the three generating units with a combined generation capacity of approximately 340 MW. Operation is intermittent on an as-needed basis to meet demand. Coal combustion waste that is produced during power generation is managed on-site with one CCW impoundment and a “dry” landfill.

The facility utilizes one impoundment known as the North Ash Pond for bottom ash management. A second impoundment known as the South Ash Pond was formerly also used for bottom ash management, but has not been used for this purpose since 2006. Fly ash has been moistened for dust control and transported dry for disposal in the on-site plant landfill since the 1980s. This safety assessment report summarizes the September 2012 assessment of both the North Ash Pond and the South Ash Pond at the New Castle Generating Station.

### 2.1. MANAGEMENT UNIT IDENTIFICATION

The locations of the two CCW impoundments inspected during this safety assessment are identified on Figure 2 – Site Aerial Photograph and Photograph Location Map.

#### 2.1.1. North Ash Pond

The North Ash Pond is located to the north of the power plant and south of the plant landfill. The North Ash Pond is currently not regulated by the Pennsylvania Department of Environmental Protection (PADEP) Division of Dam Safety.

The North Ash Pond was originally built in 1955. Coal combustion waste stored in the pond consists of bottom ash. Fly ash is no longer sluiced to the North Ash Pond, as it is currently managed dry, collected and placed in the on-site landfill. Bottom ash is sluiced to the pond using water from the Beaver River. Water that is routed through the pond is discharged into an outlet structure and ultimately back to the Beaver River.

#### 2.1.2. South Ash Pond

The South Ash Pond is located to the north of the power plant and directly south of the North Ash Pond. The South Ash Pond is currently not regulated by the Pennsylvania Department of Environmental Protection (PADEP) Division of Dam Safety.

The South Ash Pond was originally built in 1955. The sluicing of ash to the South Ash Pond ceased in 2006. At that time, the majority of the impounded ash was removed and placed in the on-site landfill. Currently the South Ash Pond is used for the storage of excess inflow of stormwater runoff to the nearby Coal Pile Sedimentation Basin. During large precipitation events, the inflow of stormwater runoff may exceed the permitted discharge capacity of the Coal Pile Sedimentation Basin. In this case, some excess water is pumped from the Coal Pile Sedimentation Basin to the South Ash Pond, temporarily stored, and then pumped back to the Coal Pile Sedimentation Basin for treatment and ultimate discharge to the Beaver River. The infrastructure for sluicing ash to the South Ash Pond remains in place, allowing for the possibility of future impoundment of coal combustion waste in the South Ash Pond.

## 2.2. HAZARD POTENTIAL CLASSIFICATION

The Commonwealth of Pennsylvania classifies dams or embankments in accordance with the Pennsylvania Dam Safety and Encroachments Act and Title 25 of the Pennsylvania Code, Chapter 105. The regulations are administered by the Pennsylvania Department for Environmental Protection (PADEP), Bureau of Waterways Engineering, Division of Dam Safety. Structures and activities regulated by the PADEP are as follows (25 PA Code § 105.3.a):

- 1) *Dams on a natural or artificial watercourse, other than those licensed under the Federal Power Act (16 U.S.C.A. §§ 791a—825s), where one or more of the following occur:*
  - (i) *The contributory drainage area exceeds 100 acres.*
  - (ii) *The greatest depth of water measured by upstream toe of the dam at maximum storage elevation exceeds 15 feet.*
  - (iii) *The impounding capacity at maximum storage elevation exceeds 50 acre-feet.*
- 2) *Dams used for the storage of water not located on a watercourse and which have no contributory drainage where the greatest depth of water measured at upstream toe of the dam at maximum storage elevation exceeds 15 feet and the impounding capacity at maximum storage elevation exceeds 50 acre-feet.*
- 3) *Dams used for the storage of fluids or semifluids other than water, the escape of which may result in air, water or land pollution or in danger to persons or property.*
- 4) *Water obstructions and encroachments other than dams located in, along or across, or projecting into a watercourse, floodway or body of water, whether temporary or permanent.*
- 5) *Flood control projects constructed, owned or maintained by a governmental unit.*

Dam and embankment hazard classifications are established by Title 25 PA Code Chapter 105.91 and provide standards regarding impoundment facility structure classification:

*A dam or reservoir shall be classified in accordance with Size Category and the Hazard Potential Category which might occur in the event of an operational or structural failure. In approving a classification, the Department will consider, without limitation:*

- (1) *The height of the dam and storage capacity of the reservoir.*
- (2) *The physical characteristics and extent of actual and projected development of the dam site and downstream areas.*
- (3) *The relationship of the site to existing or projected industrial, commercial and residential areas and other land uses downstream which may be affected by a dam failure.*

### 2.2.1. North Ash Pond

The PADEP Division of Dam Safety currently does not regulate the North Ash Pond; therefore no hazard classification has been assigned.

The definitions for the four hazard potentials (Less than Low, Low, Significant and High) to be used in this assessment are included in the EPA CCW checklist found in Appendix A. Based on the checklist definitions and as a result of this assessment, the hazard potential rating recommended for the North Ash Pond is **LOW**. A failure of the embankments impounding the North Ash Pond would result in no probable loss of life and only minimal economic and environmental impact, primarily to the owner's property. The risk of environmental impact to the adjacent McKee Run and Beaver River is minimal. The power station is located in a predominantly rural area and the size of the impoundment is extremely small; therefore, damage to critical infrastructure or lifeline facilities in the event of a dam failure would likely be limited to the power plant facilities only.

### 2.2.2. South Ash Pond

The PADEP Division of Dam Safety currently does not regulate the South Ash Pond; therefore no hazard classification has been assigned.

The definitions for the four hazard potentials (Less than Low, Low, Significant and High) to be used in this assessment are included in the EPA CCW checklist found in Appendix A. Based on the checklist definitions and as a result of this assessment, the hazard potential rating recommended for the South Ash Pond is **LOW**. A failure of the embankments impounding the South Ash Pond would result in no probable loss of life and only minimal economic and environmental impact, primarily to the owner's property. The risk of environmental impact to the adjacent McKee Run and Beaver River is minimal, since only a small amount of residual material remains in the impoundment. The power station is located in a predominantly rural area and the size of the impoundment is extremely small; therefore, damage to critical infrastructure or lifeline facilities in the event of a dam failure would likely be limited to the power plant facilities only.

### 2.3. IMPOUNDING STRUCTURE DETAILS

The following sections summarize the structural components and basic operations of the North Ash Pond and the South Ash Pond. The location of these impoundments on the plant grounds and their relevant features are provided on Figure 2. Typical cross-sections of the impoundments are provided as Figure 3. It should be noted that the site plans shown in Figure 2 and the topographic detail shown in Figure 3 are adapted from publicly available data and may not depict all current features. Design plans and documents are not available for these impoundments, and feature locations and dimensions are primarily from plant records and site measurements. Additionally, photos taken during the visual assessment are incorporated in a Photographic Log provided as Appendix B.

#### 2.3.1. Embankment Configuration

##### North Ash Pond

The North Ash Pond is a combined incised/diked earthen embankment structure that impounds an area of approximately 4 acres. The North Ash Pond is primarily incised into a natural slope, with diked portions of embankments varying in height from 1 to 3 feet around the perimeter to provide vehicle access drives above the surrounding grade. The maximum embankment height is approximately 8 feet from the crest of the vehicle access drives to the toe of the outer embankment. The typical water surface elevation maintained in the North Ash Pond is approximately EL 768 which is within the incised portion of the impoundment. The lowest portion of the crest is at approximately elevation (EL) 778 feet above mean sea level and is located along the southern side of the pond in the area between the North Ash Pond and the South Ash Pond. The pond bottom (as indicated by plant records) is at approximately EL 760. The inboard embankment slopes have an inclination of approximately 2H:1V.

##### South Ash Pond

The South Ash Pond is also a combined incised/diked earthen embankment structure. The South Ash Pond impounds an area of approximately 3 acres. The South Ash Pond is primarily incised into a natural slope, with diked portions of embankments varying in height from 1 to 3 feet around the perimeter to provide vehicle access drives above the surrounding grade. The highest embankment is along the southern side of the pond, where the pond was incised into the natural stream embankment of the McKee Run. This embankment is approximately 18 feet from the McKee Run to the crest, with an estimated 2 feet of diked embankment at the

top. The lowest portion of the crest is at approximately elevation (EL) 778 feet above mean sea level and is located along the northern side of the pond in the area between the North Ash Pond and the South Ash Pond. The pond bottom (as indicated by plant records) is at approximately EL 760. The inboard embankment slopes are very steep, ranging from approximately 1.5H:1V to steeper than 1H:1V along the southeastern portion of the pond based on visual observations.

In addition to the impoundments described above, there is a lined pond located to the east of the South Ash Pond. This pond functions as a storm water runoff sedimentation basin for the coal storage pile. This pond was not assessed as part of this CCW impoundment assessment since its purpose is not to store CCW. During large precipitation events, the inflow of stormwater runoff from the coal pile may exceed the permitted discharge capacity of the sedimentation basin. In this case, some excess water is pumped from the Coal Pile Sedimentation Basin to the South Ash Pond, temporarily stored, and then pumped back to the Coal Pile Sedimentation Basin for treatment and ultimate discharge to the Beaver River. This basin utilizes the same outfall as the North and South Ash Ponds.

### 2.3.2. Type of Materials Impounded

#### North Ash Pond

Currently, influent into the North Ash Pond includes water with solids consisting of bottom ash and lesser quantities of miscellaneous fines composed of coal fines and surface runoff silt.

#### South Ash Pond

Influent into the South Ash Pond includes water with solids consisting of miscellaneous fines composed of coal fines and surface runoff silt.

### 2.3.3. Outlet Works

#### North Ash Pond

The North Ash Pond has two outlet structures located along the eastern bank. The northern primary outlet structure consists of a concrete box with a rectangular weir equipped with stop logs to govern the water level in the pond. A steel slide gate serves as a baffle to exclude floating debris from the discharge. The top consists of an open steel grate. The effluent discharges into an 18" concrete pipe which extends below the bottom of the pond to the southern secondary outlet structure. The secondary outlet structure consists of a concrete box with two separate rectangular weirs equipped with stop logs and slide gate baffles. The secondary outlet stop logs are set at a higher elevation than the primary outlet structure's stop logs and are used for overflow control. The effluent discharges into an 18" high-density polyethylene (HDPE) pipe which extends along the access road to Manhole #1 located between the Coal Pile Sedimentation Basin and the South Ash Pond. From Manhole #1, the effluent is conveyed by a 24" HDPE pipe to an outfall at the Beaver River. This outfall is permitted as Outfall 004 under NPDES Permit #PA0005061.

#### South Ash Pond

The South Ash Pond outlet structure is located in the southeastern corner of the impoundment. The outlet structure consists of a concrete box with a rectangular weir equipped with stop logs to govern the water level in the pond. A steel slide gate serves as a baffle to exclude floating debris from the discharge. The top consists of an open steel grate. Currently the water level is maintained below the elevation of the stop logs since no bottom

ash is sluiced into the impoundment. The effluent, if any, discharges into an 18” high-density polyethylene (HDPE) pipe which extends below the bottom of the pond to Manhole #1 located between the Coal Pile Sedimentation Basin and the South Ash Pond. From Manhole #1, the effluent is conveyed by a 24” HDPE pipe to an outfall at the Beaver River. This outfall is permitted as Outfall 004 under NPDES Permit #PA0005061.

The former corrugated metal pipe (CMP) which served as the outlet pipe for this basin experienced a release of material due to corrosion in 2006. At that time, all corrugated metal piping within the effluent conveyance system of the South Ash Pond and North Ash Pond was replaced with the current HDPE piping in response to the release. There was no remaining visible evidence of the 2006 release during the visual assessment performed in September of 2012.

### 3. RECORDS REVIEW

A review of the available records related to design, construction, operation and inspection of the North Ash Pond and the South Ash Pond was performed as part of this assessment. The documents provided by NRG are listed below:

**Table 3.1 Summary of Documents Reviewed**

Document	Dates	By	Description
Response to RFI from the USEPA Office of Water	2010	RRI Energy	Utility's response to EPA questionnaire regarding CCW impoundments
Water Flow Diagram	2010	RRI Energy	Flow chart of plant process and waste water
NPDES Permit PA0005061 – Amendment No. 1	2006	Orion Power Midwest, LP	Authorization for Discharge of Industrial Wastewater from the Ash Ponds

#### 3.1. ENGINEERING DOCUMENTS

No design drawings exist for the North Ash Pond or South Ash Pond. The original Engineer of Record for the impoundments is also unknown. Information on the original design, construction and subsequent modifications provided by NRG personnel are summarized below.

##### North Ash Pond

- The North Ash Pond was originally constructed and brought online in 1955.
- Originally, the ash pond received fly ash and bottom ash. Fly ash was redirected to the on-site landfill in the 1980's.
- No information on an engineered pond liner system was noted in the records reviewed.
- No design or as-built geotechnical information was provided in the records reviewed.
- The North Ash Pond and its embankments are located outside of the FEMA 100-year floodplain for the Beaver River and McKee Run (Map #42073C0253D).
- No slope stability analyses, hydrologic, or hydraulic analyses were provided in the records reviewed.
- A water flow diagram for the power plant was provided, which indicates normal and maximum design flows for the various water management systems in use at the facility.
- The North Ash Pond has a total storage volume of approximately 16 acre-ft.
- No information concerning the embankment foundations or method of construction was available. No indication or mention of ash, coal slimes, or other CCW by-products within the dike foundations was noted in our review of the engineering records listed above. The impoundment is primarily incised with only limited height of diked embankment above the normal operating water surface elevation.
- No indication of former spills or releases of impounded materials from the North Ash Pond was noted in the records reviewed.
- The North Ash Pond is dredged on an annual basis to restore its impoundment capacity. The bottom ash

removed from the impoundment is disposed of in the on-site landfill.

### South Ash Pond

- The South Ash Pond was constructed at the same time as the North Ash Pond and brought online in 1955.
- Originally, the ash pond received fly ash and bottom ash. Fly ash was redirected to the on-site landfill in the 1980's.
- No information on an engineered pond liner system was noted in the records reviewed.
- No design or as-built geotechnical information was provided in the records reviewed.
- The South Ash Pond and its embankments are located within the limits of the FEMA 100-year floodplain for the Beaver River and McKee Run (Map #42073C0253D). However, the floodplain delineation is by approximate methods in this location and, therefore the Flood Insurance Study does not indicate the 100-year flood elevation at this location.
- No slope stability analyses, hydrologic, or hydraulic analyses were provided in the records reviewed.
- A water flow diagram for the power plant was provided, which indicates normal and maximum design flows for the various water management systems in use at the facility.
- The South Ash Pond has a total storage volume of approximately 6 acre-ft.
- No information concerning the embankment foundations or method of construction was available. No indication or mention of ash, coal slimes, or other CCW by-products within the dike foundations was noted in our review of the engineering records listed above. The impoundment is primarily incised with only limited height of diked embankment above the normal operating water surface elevation.
- There was a minor release of water and impounded material from the South Ash Pond to the McKee Run in 2006 resulting from failure of an outlet pipe through the southern embankment due to deterioration of the corrugated metal. The failure was repaired by constructing a new HDPE outlet pipe discharging to a new outfall along the Beaver River and repairing the failed portion of the embankment. No design or as-built plans for this repair were provided for review.
- Subsequent to the release in 2006, the impoundment of CCW in the South Ash Pond ceased. The remaining impounded materials were removed and placed in the on-site landfill.

NRG is currently planning to convert the New Castle Generating Station from coal to natural gas. This will include installing the infrastructure to transport natural gas to the station, converting the existing boiler to install natural gas burners and, at that point, operate on natural gas only. This work is anticipated to be completed by May 2016.

#### **3.1.1. Stormwater Inflows**

Stormwater inflows to both the North Ash Pond and the South Ash Pond are minimal. The impounding structures are surrounded by diked embankments forming vehicle access drives on all sides which direct storm water away from the impoundment and limit runoff to that from precipitation which falls directly on the water surface and crest of the dikes.

#### **3.1.2. Stability Analyses**

As mentioned above, no geotechnical reports or records of design or as-built slope stability analyses were provided in the records made available by NRG. Based on our discussion with plant personnel, geotechnical/slope stability records are either non-existent or could not be located in preparation for our visit. We did not observe any indications of slope distress during our visual assessment of both ponds.

**3.1.3. Modifications from Original Construction**

North Ash Pond

Plant records indicate that the only significant modifications to the North Ash Pond, other than minor raising of the surrounding embankments to provide the current vehicle access drives, was the replacement of corrugated metal piping with HDPE piping in 2006. Operationally, the North Ash Pond became the only CCW impoundment for the facility after this function was ceased in the South Ash Pond in 2006.

South Ash Pond

Based on the records review and discussions with plant personnel, the only significant modification to the South Ash Pond was the repair and relocation of the discharge pipe in 2006 related to the failure of the former CMP at the outlet structure and adjacent embankment failure. Operationally, the impoundment of CCW within the South Ash Pond ceased in 2006.

**3.1.4. Instrumentation**

No instrumentation is present at either of the two ponds.

**3.2. PREVIOUS INSPECTIONS**

No formal inspections are performed on the two ponds, and no records of inspection are available.

**3.3. OPERATOR INTERVIEWS**

Numerous plant and corporate personnel took part in the assessment proceedings. The following is a list of participants for the assessment of the North Ash Pond and the South Ash Pond:

**Table 4 List of Participants**

<b>Name</b>	<b>Affiliation</b>	<b>Title</b>
<b>Stephen Dixon</b>	NRG	Director, Coal Ash Management
<b>Stephen Frank</b>	NRG	Senior Environmental Specialist
<b>Kelly Hamilton</b>	NRG	Environmental Supervisor
<b>Keith Schmidt</b>	NRG	Director, Environmental Policy
<b>Thomas Senedak</b>	NRG	Environmental Specialist
<b>Ryan Hall, EIT</b>	Pennsylvania DEP	Engineer, Division of Dam Safety
<b>Gary Emmanuel, PE</b>	O'Brien & Gere	Senior Managing Engineer
<b>Stephen Szewczak, PE</b>	O'Brien & Gere	Project Engineer

Facility personnel provided a good working knowledge of both the North Ash Pond and the South Ash Pond, provided general plant operation background and provided requested historical documentation as available. These personnel also accompanied O'Brien & Gere and the PADEP Representative throughout the visual assessments to answer questions and to provide additional information as needed in the field.

## 4. VISUAL ASSESSMENT

The following sections summarize the assessment of the North Ash Pond and the South Ash Pond, which occurred on September 5, 2012. At the time of the assessment, O'Brien & Gere completed an EPA assessment checklist for each ash pond, which was submitted electronically to EPA on September 10, 2012. A copy of the completed assessment checklist is included as Appendix A.

### 4.1. GENERAL

The weather on the date of the assessment was cloudy and approximately 75 degrees. The visual assessment consisted of a thorough site walk along the perimeter of both ash ponds. O'Brien & Gere team members made observations along the toe, outboard slope, and crest of the embankments, 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. Site Plans of the ponds are presented as Figure 3, which also provides photograph locations and directions.

### 4.2. SUMMARY OF FINDINGS

#### North Ash Pond

The following observations were made during the assessment:

- Sluiced bottom ash discharge enters the pond near the northwest corner and discharges onto a concrete pad. (Appendix B –Photos 3 & 4).
- The bottom ash has accumulated above the normal pool level adjacent to the discharge point in an ash delta.
- The inboard slopes are very sparsely vegetated and show some evidence of rill erosion from stormwater runoff from the crest.
- The annual maintenance and removal of accumulated ash does not clear the material to an engineered smooth surface. This has resulted in the widening of the crest and steepening of the interior side slopes, as well as leaving a layer of bottom ash in place preventing vegetative growth and enhancing rill erosion.
- The crest is covered by vehicle access drives around the entire perimeter. These drives are constructed of compacted ash material. There is some minor surface rutting in the drive, mainly due to the softer nature of the compacted ash than a traditional gravel drive.
- The primary and secondary outlet structures appear to be in good condition and functioning normally. The water level was below the level of the stop logs in the secondary outlet structure at the time of assessment.
- There is no visual evidence of repairs to the embankment performed due to any releases, failures or patchwork.

#### South Ash Pond

The following observations were made during the visual assessment:

- The inboard slopes are extremely steep, especially along the southern bank, around the outlet structure, and beneath the former bottom ash discharge piping.
- Erosion of the inboard slope has exposed the supporting structure for the former bottom ash discharge

pipings. (Appendix B – Photo 15)

- The inboard slopes are completely unvegetated and exhibit rill erosion from stormwater runoff from the crest.
- The prior annual maintenance activities and final removal of bottom ash from the South Ash Pond did not clear all of the impounded material to an engineered smooth surface. This has resulted in the widening of the crest and steepening of the interior side slopes, as well as leaving a layer of bottom ash in place preventing vegetative growth and enhancing rill erosion.
- The crest is covered by vehicle access drives around the entire perimeter. These drives are constructed of compacted ash material. There is some minor surface rutting in the drive, mainly due to the softer nature of the compacted ash than a traditional gravel drive.
- The outboard slope along the southern side of the impoundment, above the McKee Run channel, is heavily vegetated, primarily by woody shrubs with larger trees closer to the McKee Run at the toe of slope.
- There is no visual evidence of the repairs to the embankment performed due to the prior release in 2006 or any other releases, failures or patchwork.
- The outlet structure appears to be in good condition and functioning normally. The water level was being maintained below the elevation of the stop logs at the time of assessment. There was no discharge from the outlet structure.

## 5. CONCLUSIONS

### North Ash Pond

Based on the ratings defined in the USEPA Task Order Performance Work Statement (Satisfactory, Fair, Poor and Unsatisfactory), the information reviewed and the visual assessment, the overall condition of the North Ash Pond is considered to be **FAIR**. Acceptable performance is expected under all loading conditions; however, some minor deficiencies exist that require repair and/or additional studies or investigations. The deficiencies include the following:

- There is poor vegetative cover or other form of stabilization over the inboard slopes, which are experiencing some minor rill erosion.
- The use of concrete Jersey barriers along the access drives may contribute to erosion along the inboard slopes. Stormwater runoff is collected by the barriers and then flows through gaps between the concrete units to the slope below as concentrated flow.

Other than the conditions cited above, the owner has implemented regular visual inspections and performs routine maintenance which appears to be sufficient to keep the impoundment in good working order.

In addition to the physical deficiencies, we also noted that no geotechnical data or associated slope stability analyses are on record for the impoundment. Given the nature of this impoundment as primarily incised, with the operating water level maintained below the level of the surrounding natural grade, there do not appear to be any critical slopes requiring a stability analysis in the immediate future. Completion of a slope stability analysis should be considered if modifications to the impoundment structure or significant alterations in the normal water level are proposed in the future.

The operating pond water level provides approximately 4 feet of freeboard that would accommodate the direct runoff from a significant precipitation event including the Probable Maximum Flood. No hydrologic or hydraulic analyses are on record for the impoundment to determine the likelihood of overtopping during various design storm events.

### South Ash Pond

Based on the ratings defined in the USEPA Task Order Performance Work Statement (Satisfactory, Fair, Poor and Unsatisfactory), the information reviewed and the visual assessment, the overall condition of the South Ash Pond is considered to be **FAIR**. Acceptable performance is expected under all loading conditions; however, some minor deficiencies exist that require repair and/or additional studies or investigations. The deficiencies include the following:

- There is poor vegetative cover over the inboard slopes, which are experiencing significant erosion.
- The slope beneath the former bottom ash discharge piping is experiencing significant erosion. The structural support for the piping has been exposed.
- The outboard slope of the southern embankment is heavily vegetated, which limits visual inspection.
- The use of concrete Jersey barriers along the access drives may contribute to erosion along the inboard slopes. Stormwater runoff is collected by the barriers and then flows through gaps between the concrete units to the slope below as concentrated flow.

Other than the conditions cited above, the owner has implemented regular visual inspections and performs routine maintenance which appears to be sufficient to keep the impoundment in good working order.

In addition to the physical deficiencies, we also noted that no geotechnical data or associated slope stability analyses are on record for the impoundment. Given the close proximity of the South Ash Pond to the McKee Run, the lack of any traditional slope armoring, setbacks or benches and the lack of an engineered liner system within the impoundment, a slope stability analysis would typically be recommended for the impoundment as part of this assessment. However, O'Brien & Gere does not recommend a slope stability analysis at this time based on consideration of the following factors:

- The bottom elevation of the pond is approximately the same elevation as the McKee Run, with a normal water surface elevation at approximately 8 feet above the normal water surface of the McKee Run. The outboard slope (the natural bank of the McKee Run) is typically about 2:1. It is probable that the base of the natural slope is partially saturated during normal conditions, but no seepage was observed at the toe of slope, which is a condition that would typically be necessary to create potential slope stability problems for a natural slope at this inclination and height. Further, the width to height ratio of the slope considering the width at the water line is large, which further reduces the likelihood of deep seated slope failures capable of releasing the impounded contents of the unit.
- The South Ash Pond has existed in this location in generally the same configuration since 1955. The only documented failure during that time was due to a failure along the original CMP outlet in 2006. This failure was addressed by relocating the outlet piping to a new alignment outside of the southwest perimeter of the unit.
- If the outboard slope was prone to instability, there would be some history of slope sloughing, or other outward signs of slope distress. No signs of such distress or of past repairs or stabilization efforts were observed in the site visit.
- The South Ash Pond is not actively used for the storage of CCW. The water stored within the pond consists of storm precipitation directly into the pond and occasional overflow runoff from the nearby sediment settling basin for the plant coal pile. A slope failure would therefore only release a minimal amount of residual CCW, if any, from the bottom of the pond. Under normal operations, the pond is rarely, if ever, full of water and never contains an appreciable amount of CCW.
- The plant is planned for conversion to natural gas in about 2 years. Were the impoundment to be used in the long term for continued storage of stormwater or returned to service as a storage facility for CCW, stability analyses would be appropriate.

If this impoundment were to remain in operation for an extended period of time or if CCW were to be again impounded within the pond, we would likely recommend a geotechnical study and slope stability evaluation. However, given its long history with no incident and upcoming closure in the near future, we believe that some minor repairs and erosion stabilization of the inboard slopes and a regular visual monitoring plan looking for signs of slope distress is the most practical recommendation until final decommissioning and closure.

The Flood Insurance Study for Lawrence County, Pennsylvania shows that the South Ash Pond is located within the 100-year floodplain of the Beaver River and McKee Run. The Flood Insurance Study did not include a detailed study to predict a 100-year flood elevation of the Beaver River or McKee Run at this location. The limits of the floodplain indicated on Map Panel 42073C0253D are based on approximate methods and are therefore interpreted from topographic mapping. While it does not appear that floodwaters in the Beaver River pose a significant risk of scour or erosion of the embankment along the McKee Run, the potential for floodwaters to overtop the embankment and fill the South Ash Pond is unknown. Similarly, the effects of high floodwaters on the function of the outlet works for both the North Ash Pond and South Ash Pond are uncertain. It is possible that interaction between floodwaters in the Beaver River and the water impounded in the Ash Ponds may occur

by overtopping of an embankment or outlet system manhole, resulting in the possible release of bottom ash.

The normal operating pond water level provides approximately 10 feet of freeboard that would accommodate the direct runoff from a significant precipitation event including the Probable Maximum Flood. Some or all of this available storage volume is likely to be used during a large storm event for the temporary storage of inflow from the coal pile sediment basin. No hydrologic or hydraulic analyses are on record for the impoundment to determine the likelihood of overtopping during various design storm events.

## 6. RECOMMENDATIONS

Based on the findings of our visual assessment and review of the available records for the North Ash Pond and the South Ash Pond, O'Brien & Gere recommends that additional maintenance of the embankments be performed to correct the erosion, drainage, and other miscellaneous deficiencies cited above.

### 6.1. URGENT ACTION ITEMS

None of the recommendations are considered to be urgent, since the issues noted above do not appear to threaten the structural integrity of the ash pond embankments in the near term.

### 6.2. LONG TERM IMPROVEMENT

The deficient conditions observed during the assessment do not require immediate attention, but should be implemented in the near future as part of a regular maintenance plan. The recommended maintenance/improvement actions are provided below:

#### North Ash Pond

- Crest:
  - Fill ruts on crest as needed. Consider the use of crushed stone in lieu of compacted ash to provide a more stable driving surface.
  - Consider re-establishing vegetative cover on the crest where feasible (i.e., where regular vehicle access is not required).
  - Consider use of an alternate vehicle barrier to the existing Jersey barrier system to reduce concentration of stormwater runoff from access drives or install erosion protection measures on the inboard slopes in accordance with an engineered design.
- Inboard slopes:
  - Monitor all inboard slopes for signs of erosion. Repair in accordance with an engineered design.
  - Consider regrading and revegetating the inboard slopes above the waterline to reduce erosion due to stormwater runoff. Any regrading should be done in accordance with an engineered design.
- Additional studies:
  - Perform a hydrologic and hydraulic analysis of the impoundment for the 1-year through 100-year, 24-hour duration design storm events to confirm that adequate freeboard is available during normal operating conditions. A revised configuration of the secondary outlet stop log elevations could be considered in this analysis and implemented in the field to provide additional freeboard if necessary.

#### South Ash Pond

- Overall:
  - Maintain the current operation of the South Ash Pond as storage for stormwater runoff only. If resumed, the impoundment of bottom ash within the South Ash Pond may require additional studies and engineering analysis.
- Crest:
  - Fill ruts on crest as needed. Consider the use of crushed stone in lieu of compacted ash to provide a more stable driving surface.
  - Consider re-establishing vegetative cover on the crest where feasible (i.e., where regular vehicle

- access is not required).
- Consider use of an alternate vehicle barrier to the existing Jersey barrier system to reduce concentration of stormwater runoff from access drives or install erosion protection measures on the inboard slopes in accordance with an engineered design.
- Inboard slopes:
  - Repair erosion of the slope beneath the former bottom ash discharge piping. Repairs or regrading should be performed in accordance with an engineering design.
  - Monitor all inboard slopes for signs of continuing erosion. Repair in accordance with an engineered design.
  - Consider regrading and revegetating the inboard slopes above the waterline to reduce erosion due to stormwater runoff. Any regrading should be done in accordance with an engineered design.
- Outboard slopes:
  - Increase maintenance activities to control vegetation on the outboard slope of the southern embankment above the McKee Run to facilitate visual inspection of the slope for signs of erosion, movement, or seepage.
- Additional studies:
  - Perform a hydrologic and hydraulic analysis of the impoundment for the 1-year through 100-year, 24-hour duration design storm events to confirm that adequate freeboard is available during normal operating conditions. The analysis should include consideration of the volume of excess inflow from the coal pile sedimentation basin stored in the impoundment during a storm event.
  - Perform a hydrologic and hydraulic analysis of the Beaver River and McKee Run at the location of the South Ash Pond and Outfall 004 in order to determine the 100-year flood elevation and its impacts on the South Ash Pond.

### 6.3. MONITORING AND FUTURE INSPECTION

O'Brien & Gere recommends consideration of independent inspections by licensed dam safety engineers on at least a biennial basis. Future inspections may be required by the Pennsylvania Department of Environmental Protection should they determine that these impoundments will be regulated in the future.

### 6.4. TIME FRAME FOR COMPLETION OF REPAIRS/IMPROVEMENTS

We recommend that the maintenance activities to control vegetation be implemented in the Spring of 2014. The remaining improvements, surveys, engineering and repairs may be required or may be rendered moot by an overall closure plan for the impoundments if the anticipated plant conversion to natural gas occurs as scheduled in 2016. Completion of these items may be deferred until that time, unless long-term continued operation of the plant as a coal-fired generating station is anticipated.

6.5. CERTIFICATION STATEMENT

I acknowledge that the North Ash Pond and the South Ash Pond CCW management units referenced herein were personally inspected by me on September 5, 2012 and were found to be in the following condition:

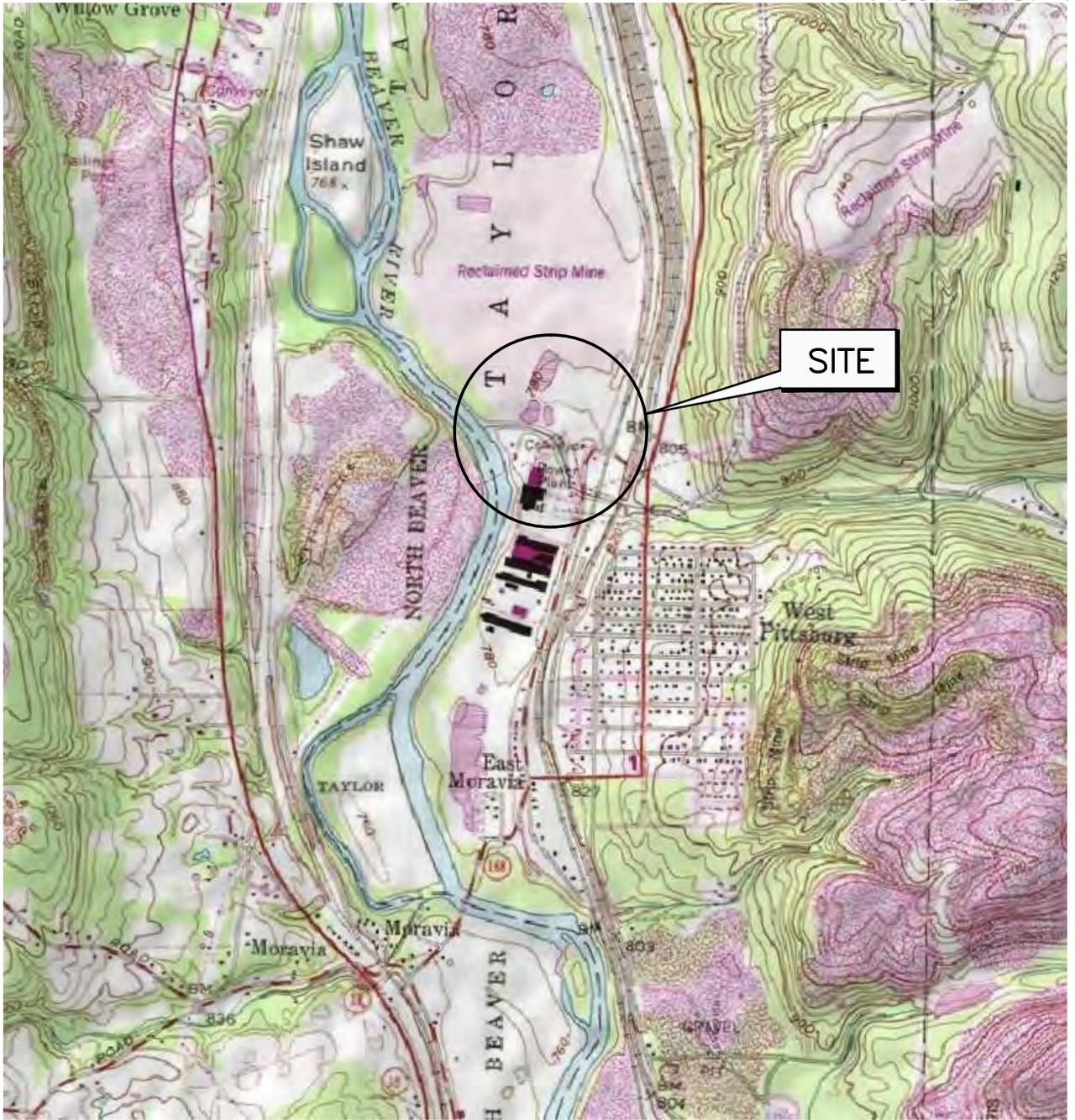
~~SATISFACTORY~~  
**FAIR**  
~~POOR~~  
~~UNSATISFACTORY~~

Signature: *Gary B. Emmanuel*  
Gary B. Emmanuel, PE  
PA PE-030497-E

Date: 1/17/14

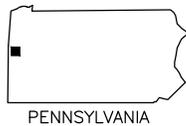


*Figures*



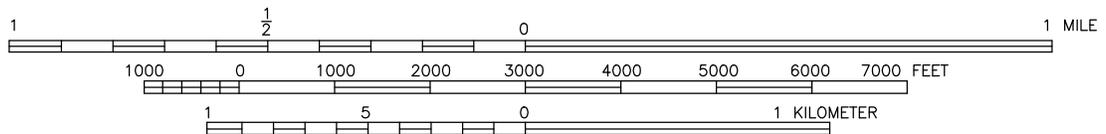
ADAPTED FROM: NEW CASTLE SOUTH, PA & BESSEMER, PA U.S.G.S. 7.5 MIN. QUADS

US EPA – DAM SAFETY ASSESSMENT OF  
 CCW IMPOUNDMENTS  
 NRG POWER MIDWEST LP – NEW CASTLE



SITE LOCATION MAP

QUADRANGLE LOCATION

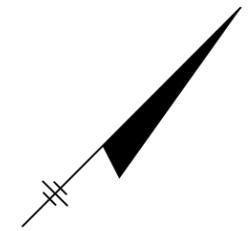


FILE NO. 13498.46122-250  
 JANUARY 2014

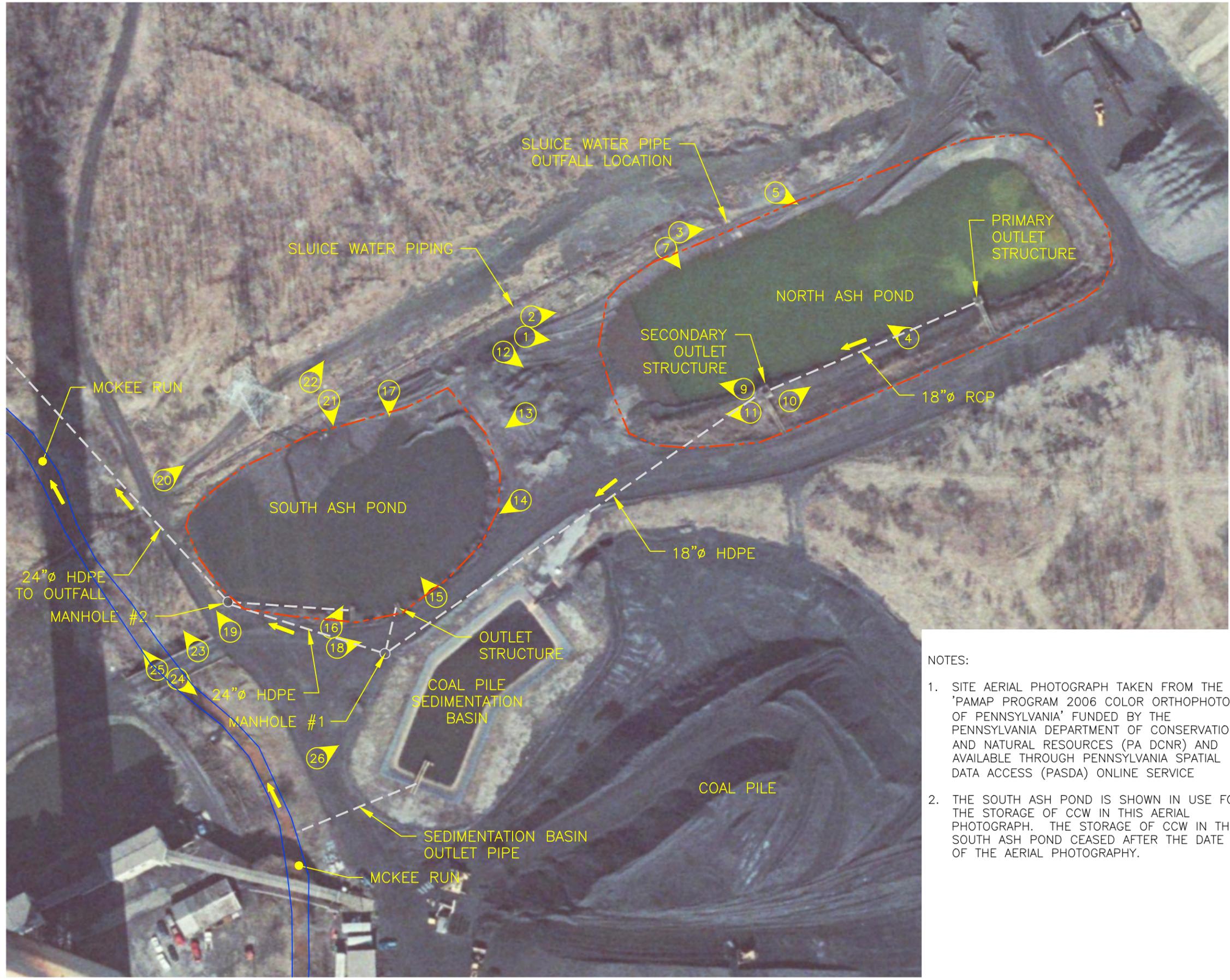
SCALE: 1:24000



FIGURE 2



-  PHOTOGRAPH NUMBER AND ORIENTATION
-  APPROXIMATE CREST OF IMPOUNDMENT
-  APPROXIMATE LOCATION OF UNDERGROUND PIPING



NOTES:

1. SITE AERIAL PHOTOGRAPH TAKEN FROM THE 'PAMAP PROGRAM 2006 COLOR ORTHOPHOTOS OF PENNSYLVANIA' FUNDED BY THE PENNSYLVANIA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES (PA DCNR) AND AVAILABLE THROUGH PENNSYLVANIA SPATIAL DATA ACCESS (PASDA) ONLINE SERVICE
2. THE SOUTH ASH POND IS SHOWN IN USE FOR THE STORAGE OF CCW IN THIS AERIAL PHOTOGRAPH. THE STORAGE OF CCW IN THE SOUTH ASH POND CEASED AFTER THE DATE OF THE AERIAL PHOTOGRAPHY.

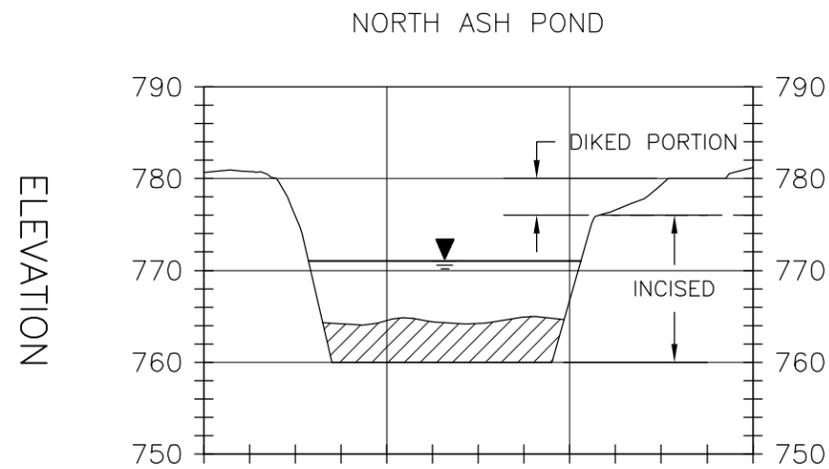
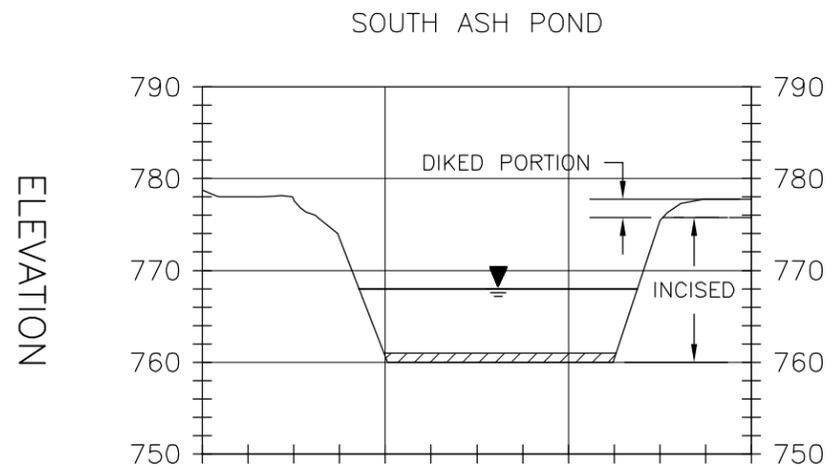
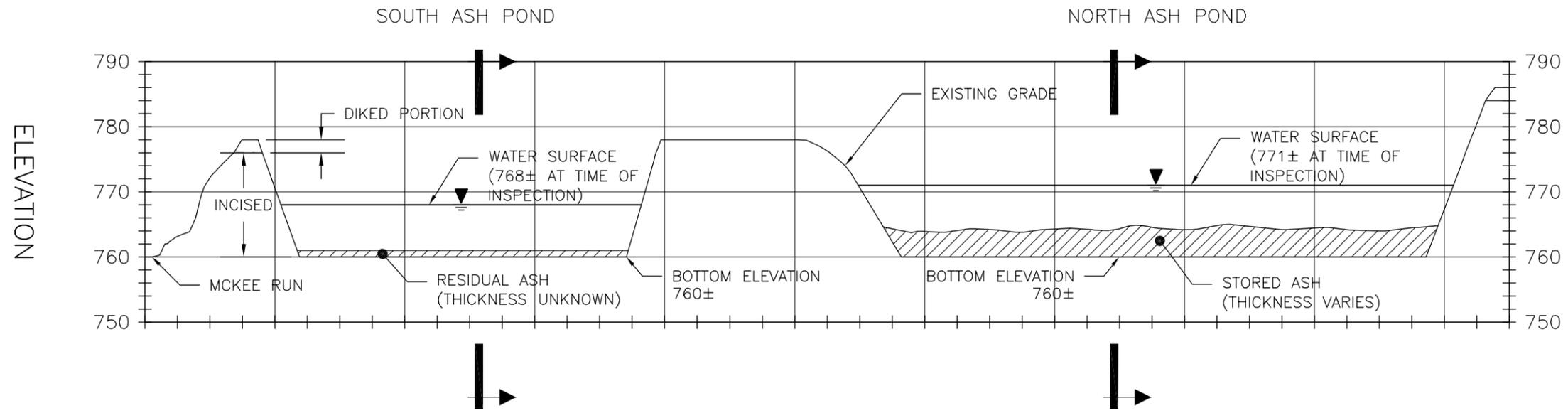
US EPA  
 DAM SAFETY ASSESSMENT  
 OF CCW IMPOUNDMENTS  
 NRG POWER MIDWEST LP  
 NEW CASTLE  
 GENERATING STATION

SITE AERIAL PHOTOGRAPH  
 AND PHOTOGRAPH  
 LOCATION MAP



FILE NO. 13498.46122.-250  
 JANUARY 2014

FIGURE 3



HORIZONTAL SCALE: 1"=100'

VERTICAL SCALE: 1"=20'

US EPA  
 DAM SAFETY ASSESSMENT  
 OF CCW IMPOUNDMENTS  
 NRG POWER MIDWEST LP  
 NEW CASTLE  
 GENERATING STATION

TYPICAL CROSS-SECTIONS

FILE NO. 13498.46122.250  
 JANUARY 2014



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*Appendix A*  
*Visual Inspection Checklists*



<b>Site Name:</b>	GenOn Energy - New Castle Plant	<b>Date:</b>	09/05/12
<b>Unit Name:</b>	North Ash Pond	<b>Operator's Name:</b>	GenOn Power Midwest
<b>Unit I.D.:</b>	SPD-1	<b>Hazard Potential Classification:</b> High Significant Low	
<b>Inspector's Name:</b> Gary B. Emmanuel / Stephen M. Szewczak			

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)?		768.0	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)?		778.0	Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?		✓	Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?		✓	From underdrain? N/A		
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? N/A			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? N/A			Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated? N/A			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
See attached for Comments	

US EPA ARCHIVE DOCUMENT

**Site Name:** GenOn Energy – New Castle Plant

**Date:** September 5, 2012

**Unit Name:** North Ash Pond

**Unit I.D.:** SPD-1

<b>Inspection Issue #</b>	<b>Comments</b>
GENERAL	Impoundment primarily incised, with built up embankment on 3 of 4 sides (North, East, South). Built up portion constructed primarily of compacted earth material, supplemented with compacted ash material for the top roadway surface.
1	Company personnel perform visual inspection of the impoundment on a daily basis; there is no formal dam inspection program.
3	Decant inlet elevation not available; no construction or design drawings available for this impoundment. The bottom of pond elevation is 760.0 according to company records.
20	Decant pipe from the primary outlet of the North Ash Pond (SPD-1) runs south into the secondary outlet structure, then beneath the South Ash Pond (SPD-2) and discharges into the outlet structure for the South Ash Pond. From the South Ash Pond outlet structure, the combined decant pipe system runs to permitted Outfall 004 at the Beaver River.
21	Normal water elevation is maintained in the incised portion of the pond, lower than surrounding areas, such that seepage is unlikely to be observed.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # PA0005061 INSPECTOR G. Emmanuel/S.Szewczak
Date September 5, 2012

Impoundment Name GenOn Energy - New Castle Plant - North Ash Pond
Impoundment Company GenOn Power Midwest
EPA Region 3
State Agency (Field Office) Address PA DEP Northwest Regional Office
230 Chestnut Street, Meadville, PA 16335

Name of Impoundment North Ash Pond (SPD-1)
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update X

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

IMPOUNDMENT FUNCTION: Settling and storage of bottom ash

Nearest Downstream Town : Name Wampum, PA
Distance from the impoundment 4.8 miles
Impoundment Location: Longitude -80 Degrees 22 Minutes 5.83 Seconds
Latitude 40 Degrees 56 Minutes 25.52 Seconds
State PA County Lawrence

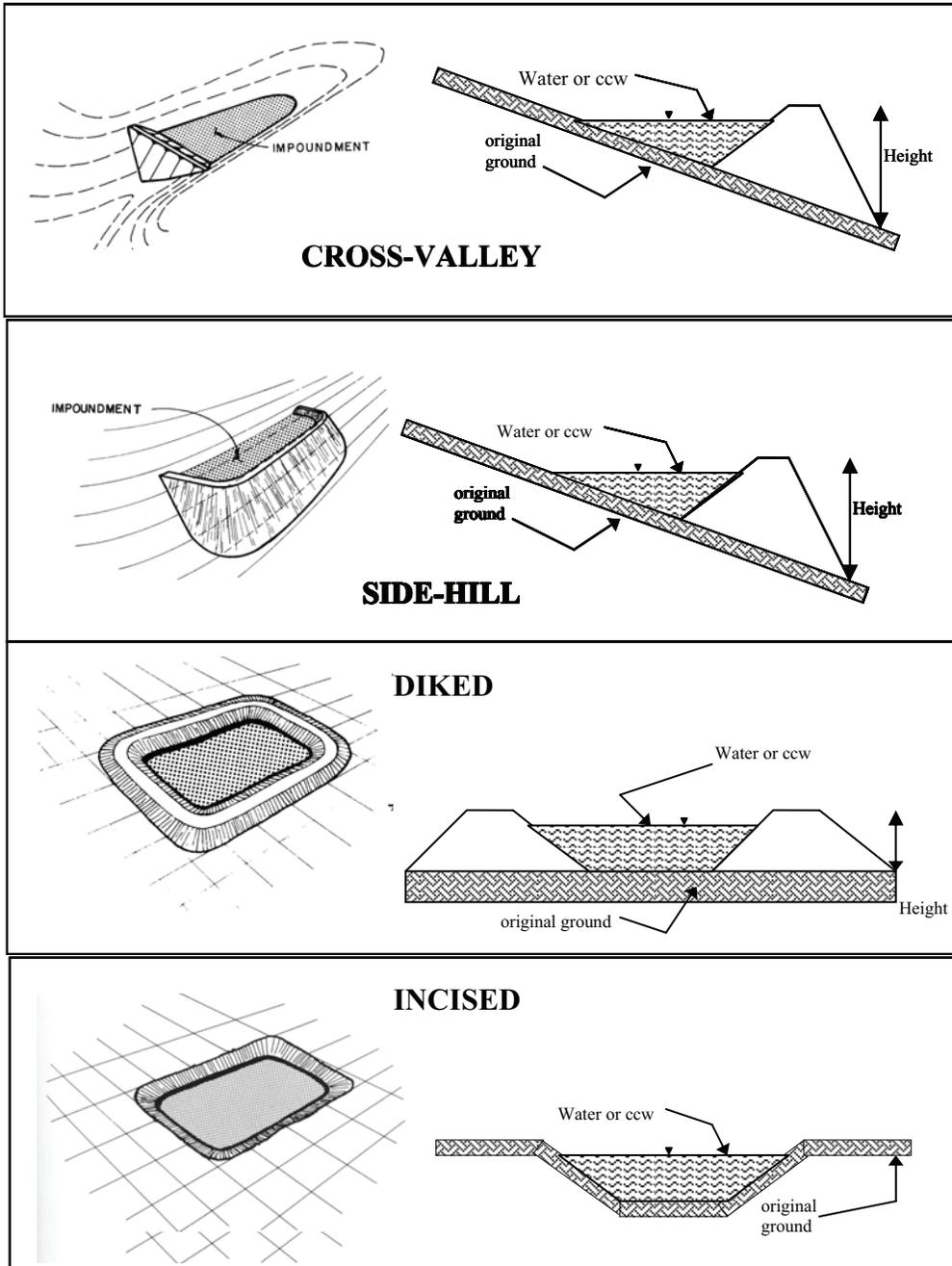
Does a state agency regulate this impoundment? YES X NO

If So Which State Agency? PA DEP - Division of Waste Management

US EPA ARCHIVE DOCUMENT



**CONFIGURATION:**



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

Embankment Height 8 feet      Embankment Material Combination of compacted earth and compacted ash

Pool Area 2.01 acres      Liner None Present

Current Freeboard 10 feet      Liner Permeability N/A

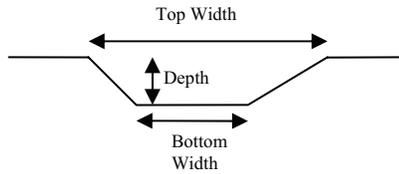
**TYPE OF OUTLET** (Mark all that apply)

N/A **Open Channel Spillway**

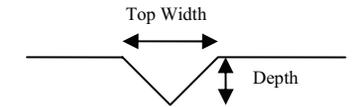
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

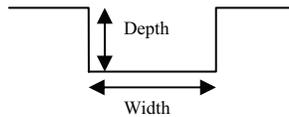
TRAPEZOIDAL



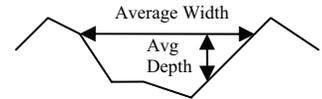
TRIANGULAR



RECTANGULAR



IRREGULAR

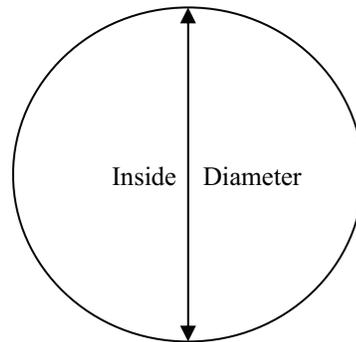


X **Outlet**

18" inside diameter

Material

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



Is water flowing through the outlet? YES X NO \_\_\_\_\_

N/A **No Outlet**

N/A **Other Type of Outlet (specify)** \_\_\_\_\_

The Impoundment was Designed By Unknown









**Site Name:** GenOn Energy – New Castle Plant

**Date:** September 5, 2012

**Unit Name:** South Ash Pond

**Unit I.D.:** SPD-2

<b>Inspection Issue #</b>	<b>Comments</b>
GENERAL	South Ash Pond not currently used for storage of combustion waste according to company records. Impoundment is used on an as needed basis to store overflow runoff pumped from the coal pile sedimentation basin. This water is retained in the South Ash Pond, then pumped back to the wastewater treatment system for the coal pile sedimentation basin for treatment and discharge.
GENERAL	Impoundment primarily incised, with built up embankment of on 3 of 4 sides (North, East and South). Primary embankment along the south side, above the McKee Run. Built up portion constructed primarily of compacted earth material, supplemented with compacted ash material for the top roadway surface.
1	Company personnel perform visual inspection of the impoundment on a daily basis; there is no formal dam inspection program.
3	Decant inlet elevation not available; no construction or design drawings available for this impoundment. The bottom of pond elevation is 760.0 according to company records.
18	Heavy vegetation on the southern side, adjacent to the McKee Run, precludes close inspection of the outer embankment slope.
20	Decant pipe from the primary outlet of the North Ash Pond (SPD-1) runs south into the secondary outlet structure, then beneath the South Ash Pond (SPD-2) and discharges into the outlet structure for the South Ash Pond. From the South Ash Pond outlet structure, the combined decant pipe system runs to permitted Outfall 004 at the Beaver River.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # PA0005061 INSPECTOR G. Emmanuel/S.Szewczak
Date September 5, 2012

Impoundment Name GenOn Energy - New Castle Plant - South Ash Pond
Impoundment Company GenOn Power Midwest
EPA Region 3
State Agency (Field Office) Address PA DEP Northwest Regional Office
230 Chestnut Street, Meadville, PA 16335

Name of Impoundment South Ash Pond (SPD-2)
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update X

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

IMPOUNDMENT FUNCTION: Temporary storage of overflow runoff from Coal Pile Sedimentation Basin - Pond not used for ash storage since 2006.

Nearest Downstream Town : Name Wampum, PA

Distance from the impoundment 4.8 miles

Impoundment

Location: Longitude -80 Degrees 22 Minutes 7.56 Seconds
Latitude 40 Degrees 56 Minutes 24.71 Seconds
State PA County Lawrence

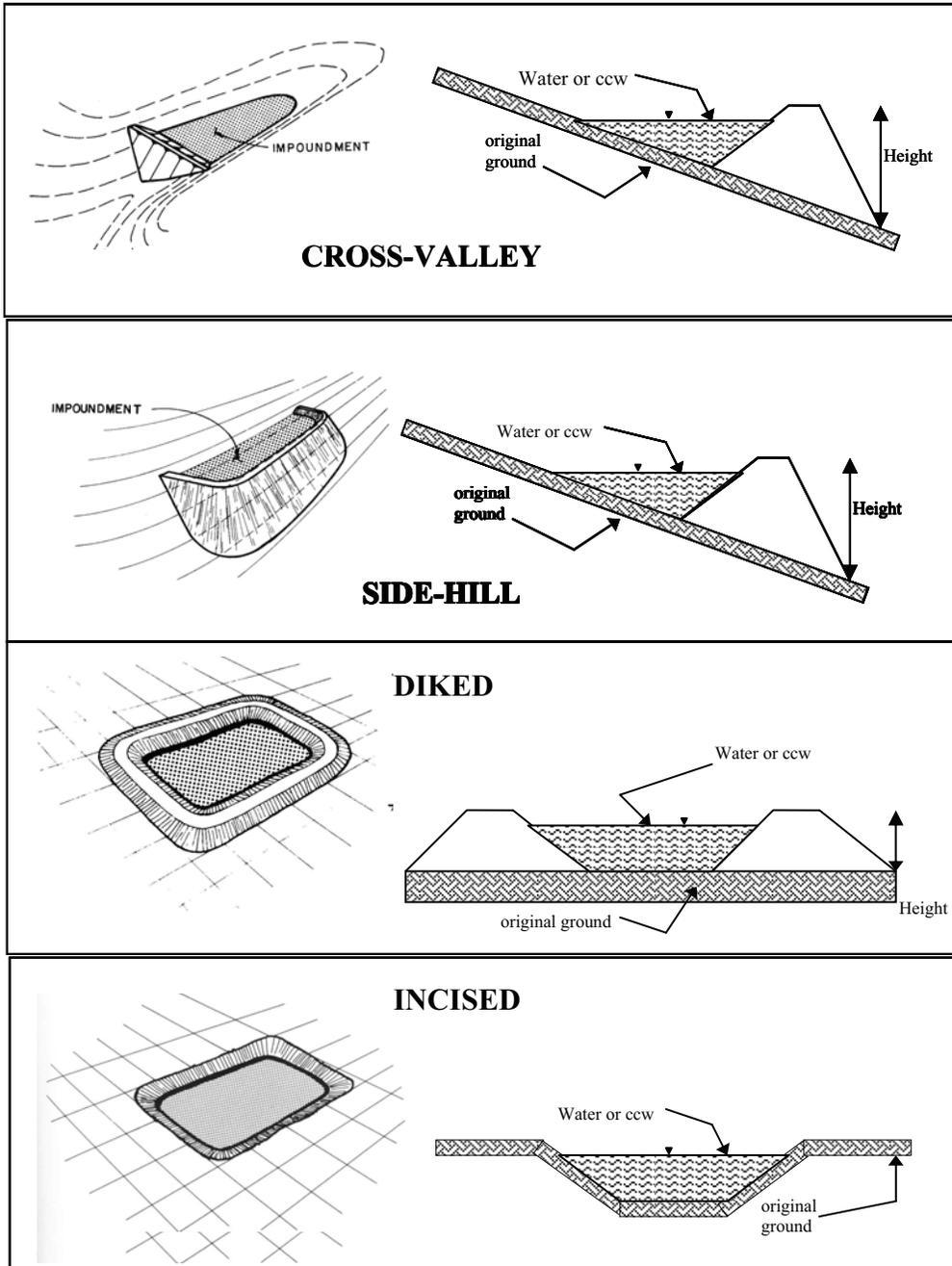
Does a state agency regulate this impoundment? YES X NO

If So Which State Agency? PA DEP - Division of Waste Management

US EPA ARCHIVE DOCUMENT



**CONFIGURATION:**



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

Embankment Height 18 feet      Embankment Material Combination of compacted earth and compacted coal ash  
 Pool Area 0.72 acres      Liner None Present  
 Current Freeboard 10 feet      Liner Permeability N/A

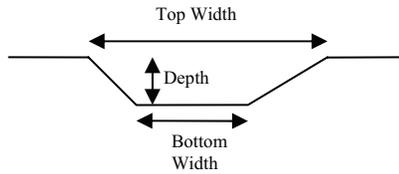
**TYPE OF OUTLET** (Mark all that apply)

  N/A   **Open Channel Spillway**

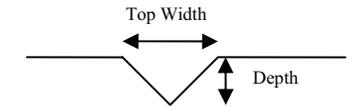
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

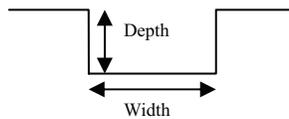
TRAPEZOIDAL



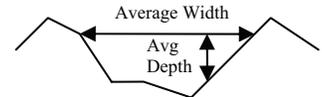
TRIANGULAR



RECTANGULAR



IRREGULAR

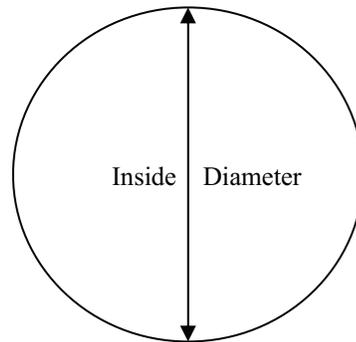


  X   **Outlet**

  18"   inside diameter (increases to 24" at outfall to Beaver River)

**Material**

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



Is water flowing through the outlet? YES   X   NO \_\_\_\_\_

  N/A   **No Outlet**

  N/A   **Other Type of Outlet (specify)** \_\_\_\_\_

The Impoundment was Designed By   Unknown

Has there ever been a failure at this site? YES   X   NO \_\_\_\_\_

If So When?   August 2006  

If So Please Describe :   Piping failure of the embankment of the South Ash Pond  
  due to deterioration of the corrugated metal outlet pipe discharging to the McKee Run.  
  (Note: Same outlet pipe is used for discharge of the North Ash Pond). Some stored  
  ash material was released to the McKee Run. Repair consisted of replacing the  
  outlet pipe below the South Ash Pond with a new HDPE pipe discharging directly to  
  the Beaver River instead of the McKee Run. Current outfall location reflected in  
  NPDES Permit PA0005061 - Amendment 1 as Outfall 004.

US EPA ARCHIVE DOCUMENT





*Appendix B*  
*Photographic Log*

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
NE

Description:  
North Ash Pond; northern and eastern interior slopes. Primary outlet structure to the left, secondary outlet structure to the right.



Date:  
9/5/12

Photo Number:  
1

Photographer:  
G. Emmanuel

Orientation:  
N

Description:  
North Ash Pond; northern and western interior slopes. Primary sluice discharge shown.



Date:  
9/5/12

Photo Number:  
2

Photographer:  
S. Szewczak

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
N

Description:  
North Ash Pond; primary sluice discharge pipes. Note ash delta formed at discharge.



Date:  
9/5/12

Photo Number:  
3

Photographer:  
S. Szewczak

Orientation:  
W

Description:  
North Ash Pond; sluice discharge onto poured concrete apron. Some undercutting of concrete apron visible.



Date:  
9/5/12

Photo Number:  
4

Photographer:  
G. Emmanuel

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
E

Description:  
North Ash Pond; View of primary outlet structure. Pond level control consists of slide gate and stop logs.



Date:  
9/5/12

Photo Number:  
5

Photographer:  
S. Szewczak

Orientation:  
Down

Description:  
North Ash Pond; View inside primary outlet structure. Water flowing clear.



Date:  
9/5/12

Photo Number:  
6

Photographer:  
G. Emmanuel

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
E

Description:  
North Ash Pond; View of secondary outlet structure used for overflow control. Pond level control consists of 2 slide gates and stop logs.



Date:  
9/5/12

Photo Number:  
7

Photographer:  
S. Szewczak

Orientation:  
Down

Description:  
North Ash Pond; View inside secondary outlet structure. Flow visible at bottom of structure from the primary outlet structure which drains to this structure.



Date:  
9/5/12

Photo Number:  
8

Photographer:  
S. Szewczak

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
S

Description:  
North Ash Pond; View of south crest. South crest is the lowest crest elevation and shows only minimal built-up embankment to form the roadway.



Date:  
9/5/12

Photo Number:  
9

Photographer:  
S. Szewczak

Orientation:  
N

Description:  
North Ash Pond; View of northern and eastern interior side slopes and crest.



Date:  
9/5/12

Photo Number:  
10

Photographer:  
S. Szewczak

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:

S

Description:

North Ash Pond; View of eastern interior side slope and crest.



Date:

9/5/12

Photo Number:

11

Photographer:

S. Szewczak

Orientation:

E

Description:

North Ash Pond; View of crest south of the impoundment.



Date:

9/5/12

Photo Number:

12

Photographer:

S. Szewczak

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:

S

Description:

South Ash Pond



Date:

9/5/12

Photo Number:

13

Photographer:

S. Szewczak

Orientation:

S

Description:

South Ash Pond  
eastern interior  
slope and outlet  
structures



Date:

9/5/12

Photo Number:

14

Photographer:

S. Szewczak

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
W

Description:  
South Ash  
Pond; Former  
sluice discharge  
piping



Date:  
9/5/12

Photo Number:  
15

Photographer:  
S. Szewczak

Orientation:  
NW

Description:  
South Ash  
Pond; Access  
ramp to South  
Ash Pond at NW  
corner of the  
impoundment



Date:  
9/5/12

Photo Number:  
16

Photographer:  
S. Szewczak

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
SE

Description:  
South Ash Pond; View of outlet structure; Note apparent repair of minor erosion to the interior slope to the right of the outlet structure



Date:  
9/5/12

Photo Number:  
17

Photographer:  
S. Szewczak

Orientation:  
NE

Description:  
South Ash Pond; Access driveway on eastern crest of the impoundment



Date:  
9/5/12

Photo Number:  
18

Photographer:  
S. Szewczak

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
W

Description:  
South Ash Pond; Access drive along southern crest of the impoundment



Date:  
9/5/12

Photo Number:  
19

Photographer:  
S. Szewczak

Orientation:  
N

Description:  
South Ash Pond; Western crest of the impoundment, minimal built-up embankment to form access driveway.



Date:  
9/5/12

Photo Number:  
20

Photographer:  
S. Szewczak

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
SE

Description:  
South Ash Pond; Overall view looking southeast towards the coal pile storage area.



Date:  
9/5/12

Photo Number:  
21

Photographer:  
S. Szewczak

Orientation:  
NW

Description:  
Natural wooded area to the west of the impoundments, minimal built-up embankment to form the access drive



Date:  
9/5/12

Photo Number:  
22

Photographer:  
S. Szewczak

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
W

Description:  
Heavily vegetated outer side slope south of South Ash Pond leading down to the McKee Run.



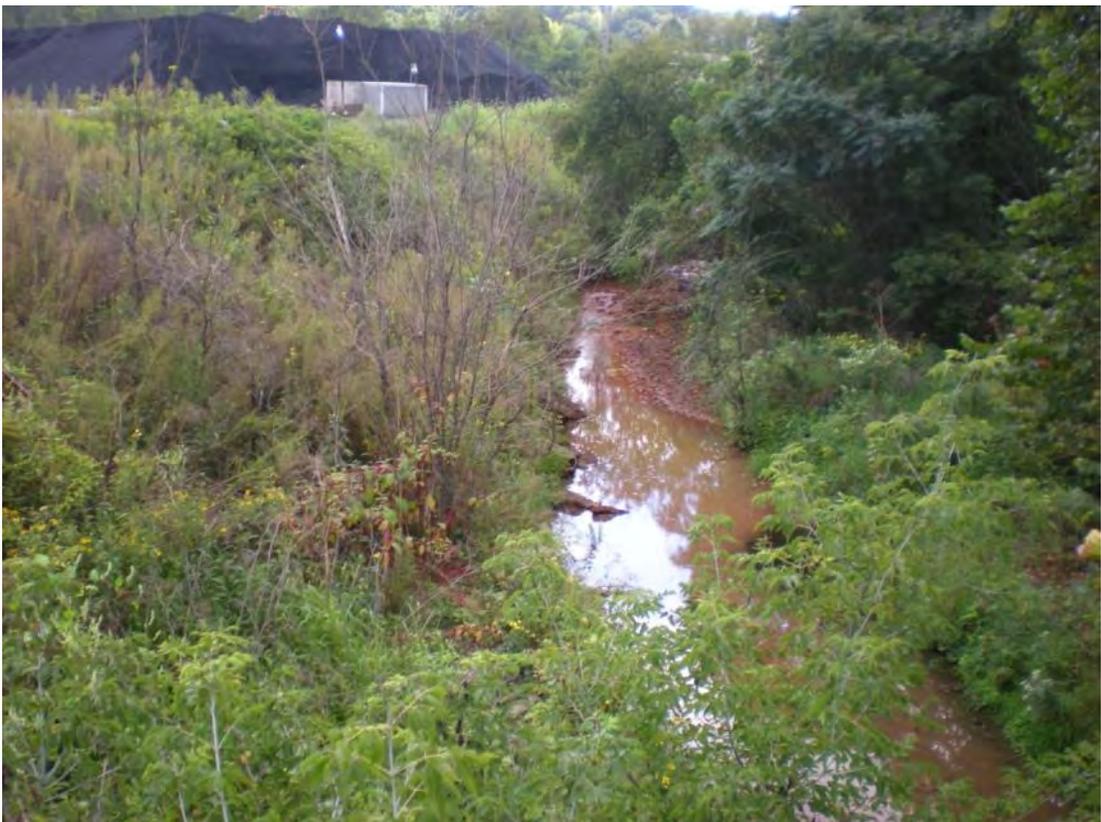
Date:  
9/5/12

Photo Number:  
23

Photographer:  
S. Szewczak

Orientation:  
E

Description:  
View of the McKee Run upstream from the impoundments



Date:  
9/5/12

Photo Number:  
24

Photographer:  
G. Emmanuel

## PHOTOGRAPHIC LOG

Client: US EPA

Project Number: 46122.250.100

Site Name: GenOn Energy – New Castle Plant

Location: New Castle, PA

Orientation:  
W

Description:  
View of the  
McKee Run  
south of the  
South Ash  
Pond.



Date:  
9/5/12

Photo Number:  
25

Photographer:  
S. Szewczak

Orientation:  
N

Description:  
Coal Pile  
Sedimentation  
Basin, not a part  
of this  
assessment.  
Photo included  
for reference as  
the source of  
occasional  
pumped water  
to the South  
Ash Pond.



Date:  
9/5/12

Photo Number:  
26

Photographer:  
S. Szewczak