

Coal Combustion Residuals Surface Impoundments

Hazard Potential Classification

Periodic Assessment Report

Keystone Generating Station
Ash Filter Ponds
Shelocta, Pennsylvania

GAI Project Number: C151611.05, Task 002

October 2016

Rev. 01, October 2021



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Professional Engineer Certification

The Periodic Hazard Potential Classification Assessment for the Keystone Generating Station Ash Filter Ponds was prepared by GAI Consultants, Inc. (GAI). The Assessment Report was based on certain information that, other than for information GAI originally prepared, GAI has relied on, but not independently verified. Therefore this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Assessment Report was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the State of Pennsylvania (PA) that the Assessment has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, and at the time and in the same locale. It is my professional opinion that the Periodic Hazard Potential Classification Assessment was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not to be interpreted or construed as a guarantee, warranty or legal opinion.

Adam B. Scheller, P.E.
Engineering Manager



Assessment Revisions

Revision	Date	Reason	Description	Reviewer
0	Oct. 2016		Original Document, Initial Assessment	NRG, CB&I Inc.
1	Oct. 2021	Comprehensive review and as-needed revisions to conduct Periodic Assessment per CCR Rule, Section 257.73(f)(3) requirements (Periodic Assessment required every five years)	Remove NRG, additional miscellaneous administrative changes, incorporation of new information to reflect pond reconstruction, which occurred from 2017-2019, and Reevaluation of Hazard Potential Rating.	Keystone Station, GAI Consultants, Inc

1.0 Introduction

On December 19, 2014, the Administrator of the United States Environmental Protection Agency signed the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities final rule (the Rule). The Rule was published in the Federal Register on April 17, 2015, became effective on October 19, 2015, and is contained within amended portions of Title 40, Part 257 of the Code of Federal Regulations (CFR). The Rule establishes a comprehensive set of requirements for the disposal/management of CCR in landfills and surface impoundments at coal-fired power plants under Subtitle D of the Resource Conservation and Recovery Act. These requirements include compliance with location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action criteria, and closure and post-closure care aspects.

Included with the design criteria under 40 CFR §257.73(a)(2)(i-ii) are requirements to conduct initial and periodic hazard potential classification assessments for all existing non-incised CCR surface impoundments. Pursuant to §257.53 (Definitions) of the Rule, this hazard potential classification is an assessment of “the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances.” These assessments are to be certified by a professional engineer, must assign a low, significant, or high hazard potential rating to each CCR unit based on criteria provided in §257.53, and must provide the basis for the selected rating. The initial assessment must be completed no later than October 17, 2016, with subsequent periodic assessments required every 5 years.

The Keystone Generating Station (Station) is a coal-fired steam electric power generating station located in Shelocta, Pennsylvania. The Station has three surface impoundments that are subject to this Rule, specifically identified as Ash Filter Ponds A, B and C. The ponds are utilized as part of the bottom ash management system at this facility, and are used for the settling of fine ash particles from sluice water. A further description of the key components and flow path associated with the sluice water is provided in the paragraphs below. Under normal operating conditions, all three ponds are in service; however, adequate capacity is provided by two ponds such that it is possible to periodically remove one pond from service for cleaning and maintenance. Accumulated bottom ash that is removed from the ponds during cleanout activities is transported to the Station’s CCR landfill facility (comprised of the East Valley and West Valley Disposal Sites). The Station and the relative locations of the three ash ponds are shown on Figure 1.

The Ash Filter Ponds are utilized to separate solids from the sluice water and to enable the discharge of clarified water to on-site surface water features. First, water is pumped through the ash hoppers associated with Units # 1 and # 2 for the sluicing of bottom ash. The sluice water flows from the ash hoppers to four bottom ash dewatering bins known as hydrobins. Overflow and decant water from the hydrobins gravity flows via piping to a distribution box, where it is directed to the ash ponds. Some water is introduced into the system via precipitation falling directly into and around the ponds, and from additional sources (such as flow from miscellaneous sumps and drains) that are routed to the distribution box, but the majority is represented by sluice water. Suspended ash particles are settled out from the water as it moves through the ponds toward the outlet structures. Water exits each pond via an outlet consisting of two saw tooth weir troughs, a concrete riser box, and an 18-inch gravity flow pipe.

The outlet pipes from all three ponds discharge into a shared pump station located northwest of the ponds. From the ash pond pump station, primary discharge is via pumping to the Thermal Pond, which is located approximately 2000 feet northwest of the Ash Filter Ponds. The Thermal Pond discharges via National Pollutant Discharge Elimination System (NPDES) permitted Internal Monitoring Point 503 (IMP-503) to the Final Settling Pond. Overflow from the ash pond pump station can also exit through an emergency overflow pipe, which routes the water to the Final Settling Pond via IMP-203. Ultimately, the Final Settling Pond discharges to Crooked Creek. Key features of the ash water management system are depicted on Figures 2 and 3.

In 2016, the Station engaged the services of CB&I Environmental & Infrastructure, Inc. (CB&I) to conduct an initial review of the Ash Filter Ponds with respect to their size, configuration, and downstream features to develop respective hazard potential classifications for each of these CCR impoundments. This initial effort included the review of available background and design information and a field visit conducted on June 7, 2016 and culminated in the preparation of the Hazard Potential Classification Initial Assessment Report in October 2016.

In 2021, the Station engaged the services of GAI Consultants Inc. (GAI) to conduct a periodic review of the Ash Filter Ponds with respect to their size, configuration, and downstream features to either confirm or revise the respective hazard potential classifications for each of the Ash Filter Ponds. This effort included the review of available background and design information, including the Initial Assessment Report, and a field visit conducted on October 6, 2021.

This Report has been prepared to identify the periodic hazard potential classification for the subject CCR impoundments, and to provide documentation required by the Rule, including the basis for the classification and certification of the findings by a professional engineer. Beyond this introductory section, Section 2.0 outlines the regulatory criteria for selection of a hazard potential classification; Section 3.0 describes the activities performed to support the hazard potential classification; and Section 4.0 provides the formal hazard rating assigned to each of the impoundments. Section 5.0 lists the references that were consulted during this assessment.

As required, this Periodic Assessment Report will be appropriately placed in the facility's operating record pursuant to §257.105(f)(5), noticed to the State Director per §257.106(f)(4), and posted to the publicly accessible internet site pursuant to §257.107(f)(4).

2.0 Hazard Potential Classification Criteria

The Rule presents hazard classification criteria as a means to categorize “the possible adverse incremental consequences that result from the release of water or stored contents due to failure or mis-operation of the diked CCR surface impoundment or its appurtenances.” From §257.53, there are three potential Hazard Classifications for CCR impoundments: Low, Significant, and High. The criteria for each category are as follows:

- ▶ Low Hazard Potential – Failure or mis-operation of the diked surface impoundment results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.
- ▶ Significant Hazard Potential – A failure or mis-operation of the diked surface impoundment results in no probable loss of human life, but can cause disruption of lifeline facilities, or impact other concerns.
- ▶ High Hazard Potential - Failure or mis-operation of the diked surface impoundment will probably cause loss of human life.

3.0 Hazard Potential Classification Activities

The hazard potential classification process included three main steps: review of background and design information for the impoundments; conduct a field visit to view the impoundments and surrounding area; and selection of a hazard potential rating for each impoundment using regulatory criteria presented in the Rule.

3.1 Review of Background and Design Information

Prior to the field visit, GAI collected and reviewed available background and design information regarding the impoundments and surrounding area, including mapping, aerial images, drawings, reports, and other documents provided by the Station. Mapping, reference drawings, and aerial images were utilized to prepare Figures 1 through 3 included with this report. Pertinent information identified during development of the figures included ground surface elevations and topography, property

boundary lines, structures, surface water features, and infrastructure in the vicinity of the impoundments.

The impoundments are situated on the southern reaches of the Station property, just northwest of the primary operations area. The nearest Station property boundary is to the south and southeast, and abuts Crooked Creek, which is approximately 0.4 miles away from the subject ponds. The ponds are located together in a common impoundment area and share an overall perimeter dike. Two interior divider dikes separate the ponds so that the ponds are not hydraulically connected. The impoundment area is bordered by station haul roads to the northeast, northwest, and southwest, and power plant operational areas to the southeast.

Topographic information in the vicinity of the Ash Filter Ponds was obtained from a survey performed by the Station in August 2016 and from construction drawings prepared by GAI to support reconstruction of the Ponds, which occurred from 2017 to 2019. The natural ground surface in the vicinity of the impoundment area slopes to the southwest. The embankment top elevation around the perimeter of the ponds varies from approximately 1024.5 feet mean sea level (ft msl) along the western side of Pond A to about 1027.0 ft msl along the eastern side of Pond C. The greatest exterior embankment height occurs on the northwestern side of the ponds, and is approximately 15.0 feet. The embankment height decreases to approximately 5.0 feet along the eastern side of Pond C. Channels or swales are located along the toe of all four sides of the embankment area. To the northeast, this channel prevents run-on toward the embankment as well as collects runoff from the embankment itself. Along the remaining sides, the channels collect runoff from the embankment area and convey it toward on-site treatment facilities. The swale along the southeast toe conveys runoff to the two Coal Pile Runoff (CPRO) ponds located southwest of the Ash Filter Ponds. Under normal operations, flow from the CPRO ponds discharges to the on-site Industrial Waste Treatment Facility (IWT). The CPRO ponds are also designed with emergency spillways which can direct the flow via channels and culverts to the Final Settling Pond. The swales to the northwest and southwest of the Ash Filter Ponds convey runoff to the IWT.

As presented on Figure 2, infrastructure in the vicinity of the ponds includes access roads, treatment ponds and drainage features. The Station operational areas are to the southeast. The area in the vicinity of the Station is very rural, and consists largely of undeveloped and agricultural lands. The closest nearby properties are approximately 0.4 miles to the east and to the south of the ash ponds, and are separated from the Station property by Crooked Creek.

As part of this hazard assessment, design and operational background information for the ponds was reviewed. It is important to note that the classification required by §257.73 is based on the consequences of the impoundment failing, and not on the likelihood of a failure. Subsequently, a limited amount of design and operational information was pertinent to this evaluation. Specifically, the contents and capacities of the ponds were considered as information relevant to estimating an inundation area and further determining the associated impacts that would occur under a breach scenario.

The combined total capacity of all three Ash Filter Ponds is 17.4 acre-feet (ac-ft) (estimated from drawing E-781-2011), which equates to a capacity of about 5.8 ac-ft per pond. Under normal operating conditions, all three ponds are in service, although adequate capacity is provided by two ponds when one pond is out of service for cleaning and maintenance. For the purpose of this hazard assessment, each pond is considered as a separate unit, as the failure or breach of one unit would not directly translate into the failure or breach of additional units. The capacity of each pond was considered relative to the downstream areas to help identify the approximate potential inundation area. In addition, the single pond capacity was compared to a threshold value of 20 ac-ft, at which impoundments of five feet in height or more require the compilation and submittal of additional construction and stability-related information. Due to the capacity of each pond being less than 20 ac-ft, no evaluations beyond hazard potential classifications are required by §257.73.

3.2 Field Visit

On October 6, 2021, Adam Scheller (GAI engineer) met with Nate Rozic (Station Environmental Specialist) to perform a site walk and visual reconnaissance of the ponds and surrounding area. The visit included a walk-down of the Ash Filter Pond complex, starting with the traverse of the perimeter dike crest and the crest of each of the interior dikes. GAI confirmed that the components and configuration of the ash water management system (pump station, inlet and outlet structures, distribution box, etc.) appeared to be in general agreement with the previously-reviewed design documents. GAI visually assessed upstream conditions for run-on potential and likely breach flow path downstream conditions, respectively. Due to the diked construction of the impoundment area, potential run-on is minimal, limited to precipitation falling directly on and in the immediate vicinity of the ponds. With respect to the likely flow path during breach conditions, breaches toward the northwest, southwest, and southeast were considered, with western embankment of Pond A representing the most likely breach directions due to the larger embankment height. The lack of significant embankments in the northern and eastern directions precluded the consideration of a breach in those directions.

GAI visually assessed the downstream conditions with special attention paid to structures, infrastructure, and above-ground utilities in relation to the likely path of pond contents in the event of a breach. The nearest downstream feature in the line of the most probable breach flow path (to west of Pond A) is a site access road, which is present along all of the subject embankment. Further along the most likely breach flow path in the southwest direction are additional site access roads, the CPRO ponds, stormwater conveyance features, parking areas, and largely undeveloped Station property. Even further downstream in this same direction (approximately 0.2 to 0.3 miles away) are a rail corridor and the Final Settling Pond. To a lesser extent, during a breach scenario the pond contents could also flow to the northwest or to the southeast. Downstream areas in these directions include site access roads, conveyance features, undeveloped site property, and Station operational areas. In general, it appeared that impacts to downstream features would likely be limited to the site roadways and storm water conveyance features.

3.3 Hazard Potential Classification Determination

The information gathered from review of background and design documents/drawings and during the site visit was utilized to complete a Hazard Potential Classification Form (Form) for each impoundment, contained in Attachment A of this report. The Form was devised to provide a comprehensive, methodical, and quantitative means to select a hazard rating. The following types of impacts were considered: loss of human life, economic losses, environmental losses, damage to lifeline facilities, and other concerns (such as impacts to critical facilities, typically represented by medical facilities, transportation facilities, etc.). A worst-case failure scenario was considered to be a catastrophic dike failure and sudden release of the impoundment contents (i.e., a breach scenario). The failure of one pond would not tend to cause the failure of the others; as such, each pond was considered independently. Due to similarities between the ponds, the findings and conclusions are consistent between the ponds.

During a pond breach scenario, it would be expected that solid material from the structure's berm and also settled solids contained in the pond would generally deposit in the near vicinity of the pond and be collected in low lying areas adjacent to the ponds, particularly on the southwest side. Flow would likely follow the surface water channels and swales toward the southern corner of the embankment area, with excess flow moving in an overland pattern toward the CPRO ponds. Aside from overland flow, portions of the breach water would most likely enter piping that would either route the water directly to the CPRO Ponds or to the IWT Facility, both of which have attenuation capacity. It is anticipated that all solids would remain on Station property, and no appreciable increase in discharge to the Final Settling Pond or Crooked Creek would occur. Aside from possible temporary impacts to internal site roadways and stormwater conveyance features, no adverse impacts to the Station infrastructure are anticipated. There are no foreseeable impacts to structures, environmentally sensitive areas, utilities, lifeline or critical facilities, or neighboring properties.

4.0 Conclusions

Based on the review of background and design information, observations made during the site visit, and hazard potential evaluation activities performed as part of this assessment, the following hazard ratings were selected for the Keystone Station CCR impoundments:

Impoundment Name	Hazard Potential Rating
Ash Filter Pond A	Low
Ash Filter Pond B	Low
Ash Filter Pond C	Low

These ratings are based on the determination that a failure or mis-operation of these impoundments would be unlikely to cause a loss of human life and would cause minor economic or environmental losses principally limited to the surface impoundment owner's property. In addition, a failure or mis-operation would be unlikely to impact lifeline or critical facilities or cause other significant negative effects.

5.0 References

CB&I. "Plant Proper Storm Water Drainage Areas, Drawing No. 1009174004-E2." Dated February 23, 2016.

"Critical Facilities." The National Weather Service. Web. 6 May 2016.

Federal Emergency Management Agency (FEMA). "National Flood Hazard Layer." Armstrong County, Pennsylvania. February 16, 2016.

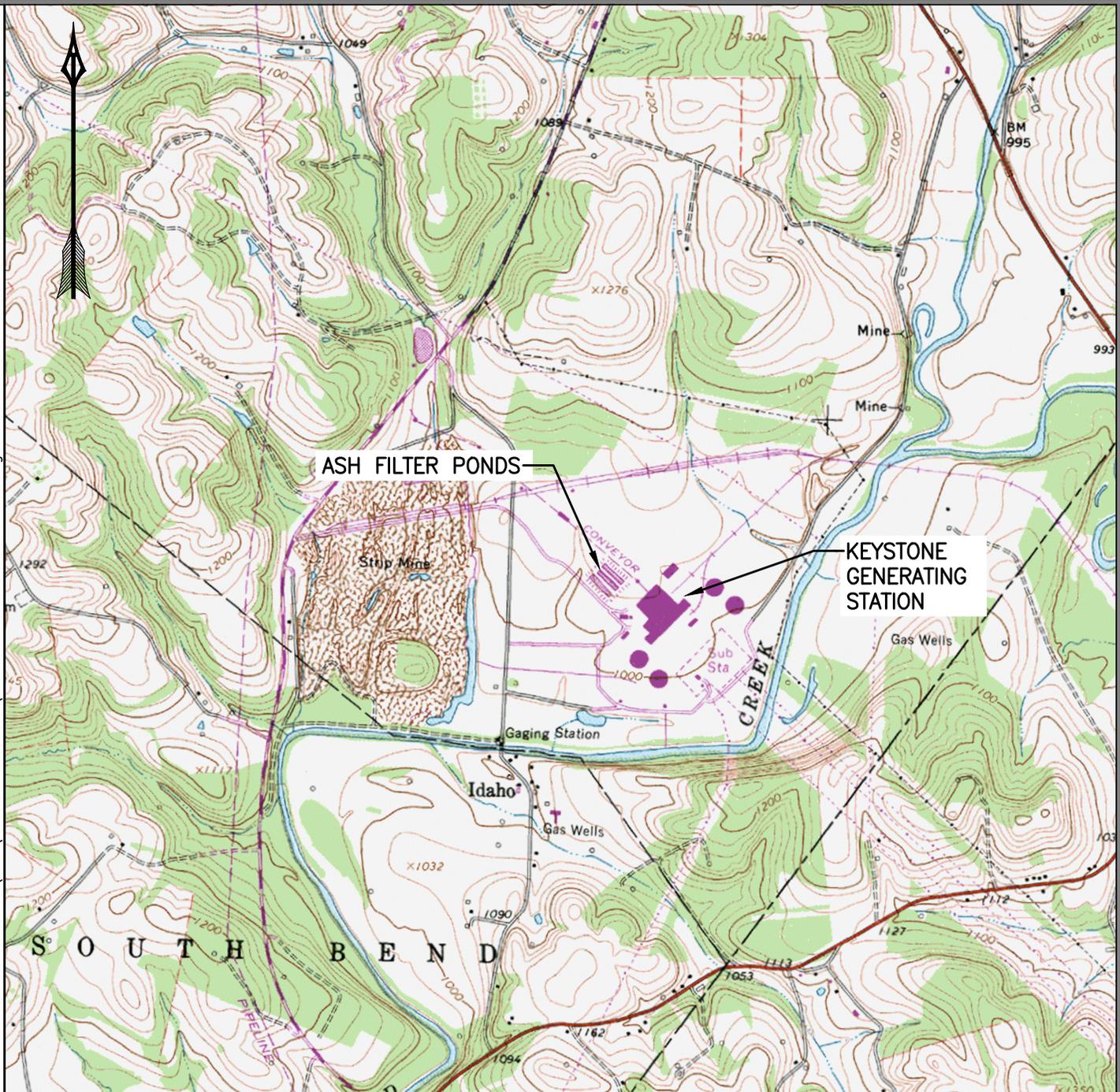
Federal Register, Vol. 80, No. 74. Sections 257.53 (Definitions) and 257.73 (Structural Integrity Criteria for Existing CCR Surface Impoundments). April 17, 2015.

GAI. "Ash Filter Pond Replacement – Plan View, Drawing No. 781-2011." Last Revised May 2, 2019.

NRG. "SPCC Plan Sketch, General Plot Plan, Drawing No. E-727-1002." Last Revised January 27, 2016.

FIGURES

GAI CAD FILE PATH: Z:\Energy\2015\C151611.05 - KEYCON KEY CCR DFR LIN\CAD\Production DWGs\C151611-05-C-A1-FIG 1.dwg



REFERENCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, ELBERTON, PENNSYLVANIA, 1964, PHOTOINSPECTED 1977.

SCALE: 1" = 2000'

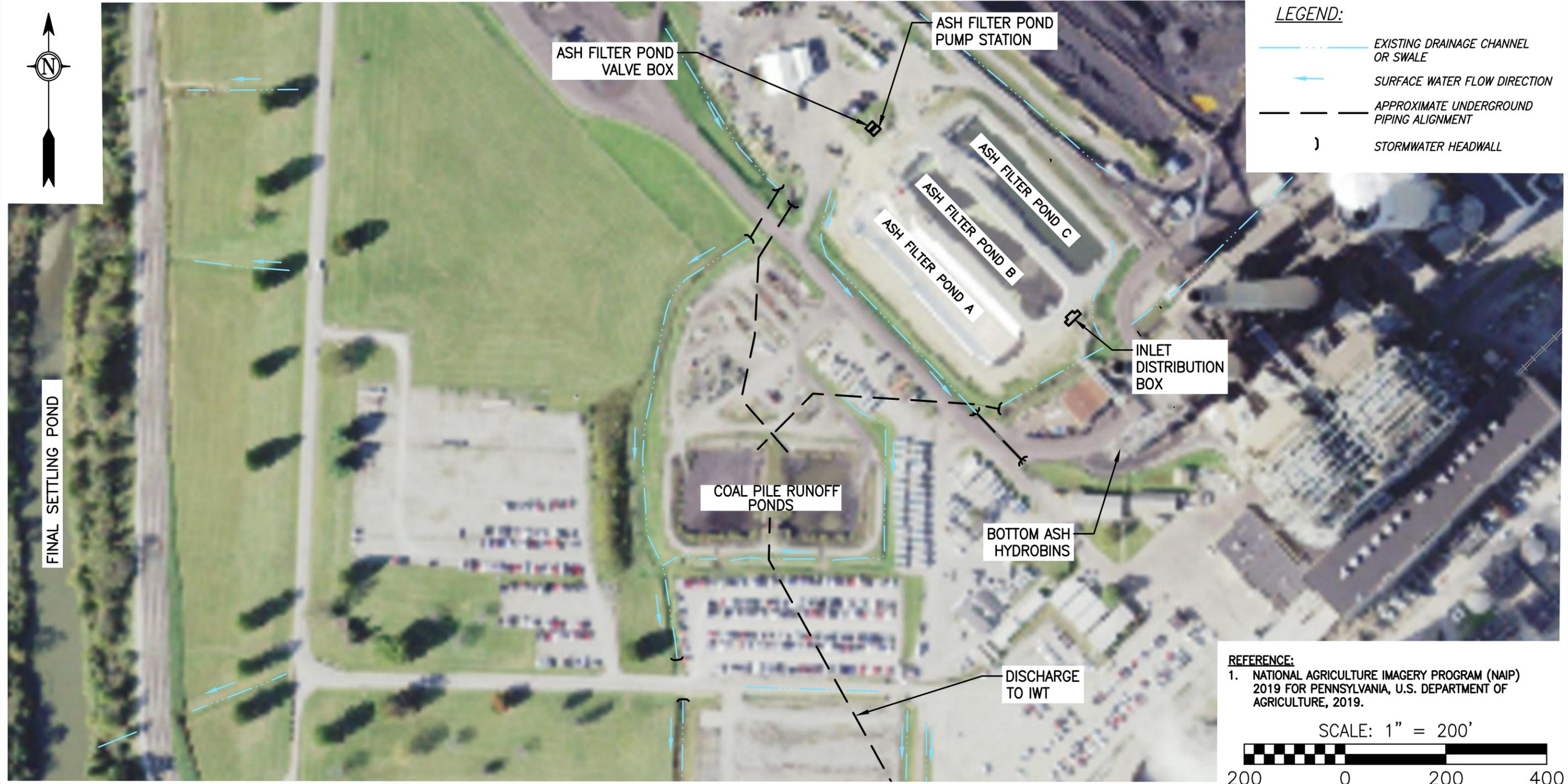


DRAWING TITLE		GAI DRAWING NUMBER:		
FIGURE 1 - SITE LOCATION MAP		FIGURE 1		
PROJECT		GAI FILE NUMBER:		
ASH FILTER PONDS KEYSTONE GENERATING STATION SHELOCTA, PA		C151611-05-C-A1-FIG 1		
CLIENT		DRAWN BY:	CHECKED BY:	APPROVED BY:
KEYSTONE-CONEMAUGH PROJECTS, LLC BLAIRSVILLE, PA		M.DOYLE	M. CORTESE	A.SCHELLER
 gai consultants		SHEET NO.:	SCALE:	ISSUE DATE:
		1 OF 1	AS SHOWN	10/06/2021
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 PLOTTED ON: 10/6/2021 10:15:00 AM PLOTTED BY: Michael Doyle PLOT FILE: GAI.stb

LEGEND:

-  EXISTING DRAINAGE CHANNEL OR SWALE
-  SURFACE WATER FLOW DIRECTION
-  APPROXIMATE UNDERGROUND PIPING ALIGNMENT
-  STORMWATER HEADWALL



REFERENCE:

1. NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2019 FOR PENNSYLVANIA, U.S. DEPARTMENT OF AGRICULTURE, 2019.

SCALE: 1" = 200'



PLOTTED ON: 10/12/2021 4:09:16 PM PLOTTED BY: Adam Scheller PLOT FILE: GAI.stb

NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:
REVISION RECORD					

DRAWING TITLE		
FIGURE 2: PHOTOGRAPHIC MAP		
PROJECT		CLIENT
ASH FILTER PONDS	gai consultants	KEYSTONE-CONEMAUGH PROJECTS, LLC
KEYSTONE GENERATING STATION		BLAIRSVILLE, PA
SHELOCTA, PA		

DRAWN BY: M.DOYLE	CHECKED BY: M.CORTESE	APPROVED BY: A.SCHELLER
REVISION	SCALE: AS SHOWN	ISSUE DATE: 10/12/2021
 A/0	SHEET NO.: 1 OF 1	
GAI FILE NUMBER: C151611-05-C-B2-FIG 2		
GAI DRAWING NUMBER: FIGURE 2		

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GAI CAD FILE PATH: Z:\Energy\2015\C151611.05 - KEYCON KEY CCR DFR LI\CAD\Production DWGs\C151611-05-C-B2-FIG 2.dwg

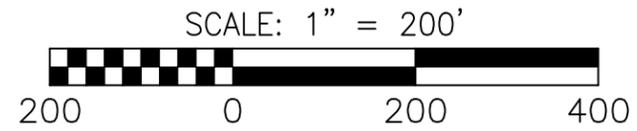
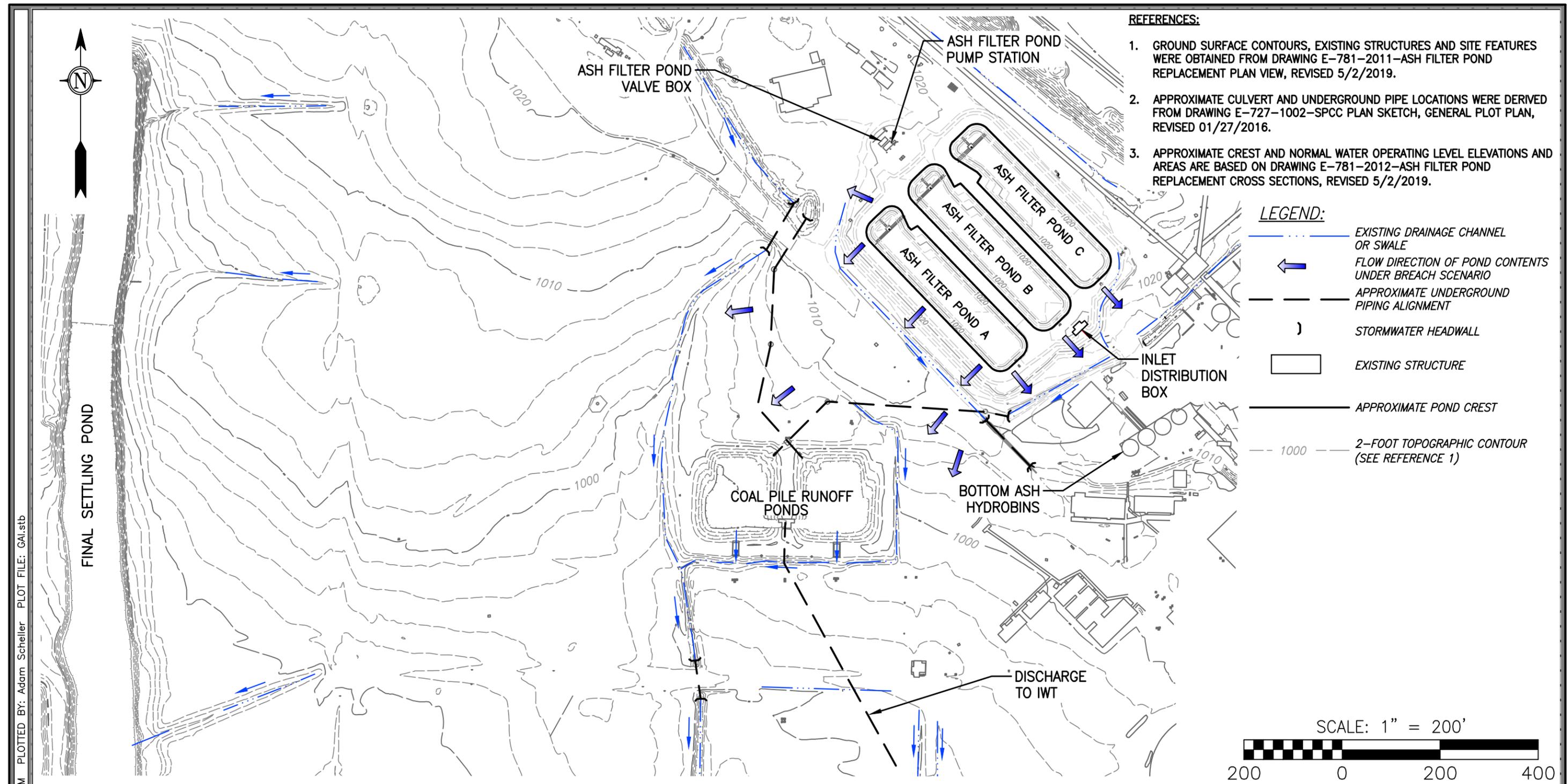
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REFERENCES:

1. GROUND SURFACE CONTOURS, EXISTING STRUCTURES AND SITE FEATURES WERE OBTAINED FROM DRAWING E-781-2011-ASH FILTER POND REPLACEMENT PLAN VIEW, REVISED 5/2/2019.
2. APPROXIMATE CULVERT AND UNDERGROUND PIPE LOCATIONS WERE DERIVED FROM DRAWING E-727-1002-SPCC PLAN SKETCH, GENERAL PLOT PLAN, REVISED 01/27/2016.
3. APPROXIMATE CREST AND NORMAL WATER OPERATING LEVEL ELEVATIONS AND AREAS ARE BASED ON DRAWING E-781-2012-ASH FILTER POND REPLACEMENT CROSS SECTIONS, REVISED 5/2/2019.

LEGEND:

-  EXISTING DRAINAGE CHANNEL OR SWALE
-  FLOW DIRECTION OF POND CONTENTS UNDER BREACH SCENARIO
-  APPROXIMATE UNDERGROUND PIPING ALIGNMENT
-  STORMWATER HEADWALL
-  EXISTING STRUCTURE
-  APPROXIMATE POND CREST
-  2-FOOT TOPOGRAPHIC CONTOUR (SEE REFERENCE 1)



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NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:
REVISION RECORD					

DRAWING TITLE		
FIGURE 3: TOPOGRAPHIC AND FLOW DIRECTION MAP		
PROJECT		CLIENT
ASH FILTER PONDS	gai consultants	KEYSTONE-CONEMAUGH PROJECTS, LLC
KEYSTONE GENERATING STATION		BLAIRSVILLE, PA
SHELOCTA, PA		

DRAWN BY: M.DOYLE	CHECKED BY: M.CORTESE	APPROVED BY: A.SCHELLER
REVISION	SCALE: AS SHOWN	ISSUE DATE: 10/06/2021
 A/0	SHEET NO.: 1 OF 1	
GAI FILE NUMBER: C151611-05-C-B2-FIG 3		
GAI DRAWING NUMBER: FIGURE 3		

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ATTACHMENT A

Hazard Potential Classification Forms

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond A

Type of Inspection (Circle One): Initial **Periodic**

Date of Visit: 10/6/21

Impoundment Configuration (Circle or Specify): Cross-Valley Side-Hill **Diked** Incised Other: _____

Notes:

1. If the impoundment is entirely incised, hazard potential classification is not necessary.
2. For the purposes of selecting a hazard potential category, this form assigns numeric values to the categories listed in 40 CFR §257.53, as follows:
1 = Low 2 = Significant 3 = High

I. Risk to Human Life						
<i>Pursuant to 40 CFR 257.53, the probable loss of human life results in a High hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Loss of Human Life <i>Would a failure or mis-operation of the unit probably cause loss of human life?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 3	1	
II. Economic Losses						
<i>40 CFR 257.53 associates economic loss with a Significant hazard potential rating, except that low economic losses principally limited to the owner's property may be associated with a Low hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Parties <i>Would economic losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Magnitude <i>Are the anticipated economic losses due to a failure or mis-operation of the impoundment relatively low compared to the resources available to the owner/operator to correct foreseeable impacts?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
III. Environmental Losses						
<i>40 CFR 257.53 associates environmental damage with a Significant hazard potential rating, except that low environmental losses principally limited to the owner's property may be associated with Low hazard potential rating.</i>						
Feature	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Areas <i>Would environmental losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Containment <i>In the event of a failure or mis-operation, is it likely that the CCR materials would be contained on Station property, either by natural features or through reasonably applied remedial measures, so as to prevent offsite migration of these materials?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Existing topography and site configuration encourage solids drop out and the spreading out and dissipation of flow before exit of Station property.
Restoration <i>Is it expected that the area(s) impacted by a failure or mis-operation of the impoundment could be readily restored to pre-incident conditions?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
Sensitive Species <i>Are there any protected or endangered species in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Wetlands <i>Are there any jurisdictional or other identified wetlands in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Waterways <i>Are there any navigable streams or rivers that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	Appreciable impacts to Crooked Creek are not anticipated for reasons previously noted above.

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond A

Type of Inspection (Circle One): Initial Periodic

Date of Visit: 10/6/21

IV. Lifeline Facilities

40 CFR 257.53 associates disruption of lifeline facilities with a Significant hazard potential rating. The National Weather Service defines lifeline facilities as distributive systems and related facilities necessary to provide electric power, oil and natural gas, water and wastewater, and communications.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Lifeline Facilities Would a failure or mis-operation likely cause disruption to any distributive systems or facilities that provide electric power, oil and natural gas, water and wastewater, or communication services?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	

V. Other Concerns

40 CFR 257.53 notes the potential for other concerns not specifically identified in the regulation to justify a Significant hazard rating. GAI recognizes probable impacts to "Critical Facilities" as another concern that may trigger a Significant hazard rating. Critical Facilities as identified by the National Weather Service are listed below. Lifeline Facilities are also considered to be Critical Facilities, but are not listed below due to being addressed in Item IV. The inspector shall also consider any other site-specific concerns not previously addressed that may impact the hazard rating, and shall write in any such concerns below.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Critical Facilities Would failure or mis-operation of the impoundment likely cause damage or sustained closure of any of the following critical facilities? If yes, please specify. Emergency Response Facilities Medical Facilities Designated Emergency Shelters Transportation Telecommunications Data centers Financial Major industrial/commercial	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No (to all) = 1 Yes (to any) = 2	1	No critical facilities are within anticipated flow path.
Other Concerns Are there any other significant concerns relative to the potential impacts due to the failure or mis-operation of this impoundment? If yes, please specify.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2 (Depending on Severity)	1	

IV. Conclusions/Final Rating

The Final Rating is equal to the Maximum of all "Selected Scores" above.

Final Score = 1 (=Maximum "Selected Score" from above)
Hazard Potential Classification = LOW (1 = Low 2 = Significant 3 = High)

Adam B. Scheller
Printed Name

Engineering Manager, GAI Consultants
Title / Company

Signature*

* Signature certifies that the inspection was performed as indicated, and that the information contained herein is true and accurate to the best of the inspector's knowledge.

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond B

Type of Inspection (Circle One): Initial **Periodic**

Date of Visit: 10/6/21

Impoundment Configuration (Circle or Specify): Cross-Valley Side-Hill **Diked** Incised Other: _____

Notes:

1. If the impoundment is entirely incised, hazard potential classification is not necessary.
2. For the purposes of selecting a hazard potential category, this form assigns numeric values to the categories listed in 40 CFR §257.53, as follows:
1 = Low 2 = Significant 3 = High

I. Risk to Human Life						
<i>Pursuant to 40 CFR 257.53, the probable loss of human life results in a High hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Loss of Human Life <i>Would a failure or mis-operation of the unit probably cause loss of human life?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 3	1	
II. Economic Losses						
<i>40 CFR 257.53 associates economic loss with a Significant hazard potential rating, except that low economic losses principally limited to the owner's property may be associated with a Low hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Parties <i>Would economic losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Magnitude <i>Are the anticipated economic losses due to a failure or mis-operation of the impoundment relatively low compared to the resources available to the owner/operator to correct foreseeable impacts?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
III. Environmental Losses						
<i>40 CFR 257.53 associates environmental damage with a Significant hazard potential rating, except that low environmental losses principally limited to the owner's property may be associated with Low hazard potential rating.</i>						
Feature	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Areas <i>Would environmental losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Containment <i>In the event of a failure or mis-operation, is it likely that the CCR materials would be contained on Station property, either by natural features or through reasonably applied remedial measures, so as to prevent offsite migration of these materials?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Existing topography and site configuration encourage solids drop out and the spreading out and dissipation of flow before exit of Station property.
Restoration <i>Is it expected that the area(s) impacted by a failure or mis-operation of the impoundment could be readily restored to pre-incident conditions?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
Sensitive Species <i>Are there any protected or endangered species in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Wetlands <i>Are there any jurisdictional or other identified wetlands in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Waterways <i>Are there any navigable streams or rivers that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	Appreciable impacts to Crooked Creek are not anticipated for reasons previously noted above.

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond B

Type of Inspection (Circle One): Initial Periodic

Date of Visit: 10/6/21

IV. Lifeline Facilities

40 CFR 257.53 associates disruption of lifeline facilities with a Significant hazard potential rating. The National Weather Service defines lifeline facilities as distributive systems and related facilities necessary to provide electric power, oil and natural gas, water and wastewater, and communications.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Lifeline Facilities Would a failure or mis-operation likely cause disruption to any distributive systems or facilities that provide electric power, oil and natural gas, water and wastewater, or communication services?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	

V. Other Concerns

40 CFR 257.53 notes the potential for other concerns not specifically identified in the regulation to justify a Significant hazard rating. GAI recognizes probable impacts to "Critical Facilities" as another concern that may trigger a Significant hazard rating. Critical Facilities as identified by the National Weather Service are listed below. Lifeline Facilities are also considered to be Critical Facilities, but are not listed below due to being addressed in Item IV. The inspector shall also consider any other site-specific concerns not previously addressed that may impact the hazard rating, and shall write in any such concerns below.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Critical Facilities Would failure or mis-operation of the impoundment likely cause damage or sustained closure of any of the following critical facilities? If yes, please specify. Emergency Response Facilities Medical Facilities Designated Emergency Shelters Transportation Telecommunications Data centers Financial Major industrial/commercial	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No (to all) = 1 Yes (to any) = 2	1	No critical facilities are within anticipated flow path.
Other Concerns Are there any other significant concerns relative to the potential impacts due to the failure or mis-operation of this impoundment? If yes, please specify.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2 (Depending on Severity)	1	

IV. Conclusions/Final Rating

The Final Rating is equal to the Maximum of all "Selected Scores" above.

Final Score = 1 (=Maximum "Selected Score" from above)
Hazard Potential Classification = LOW (1 = Low 2 = Significant 3 = High)

Adam B. Scheller
Printed Name

Engineering Manager, GAI Consultants
Title / Company

Signature*

* Signature certifies that the inspection was performed as indicated, and that the information contained herein is true and accurate to the best of the inspector's knowledge.

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond C

Type of Inspection (Circle One): Initial Periodic

Date of Visit: 10/6/2021

Impoundment Configuration (Circle or Specify): Cross-Valley Side-Hill Diked Incised Other: _____

Notes:

1. If the impoundment is entirely incised, hazard potential classification is not necessary.
2. For the purposes of selecting a hazard potential category, this form assigns numeric values to the categories listed in 40 CFR §257.53, as follows:
1 = Low 2 = Significant 3 = High

I. Risk to Human Life						
<i>Pursuant to 40 CFR 257.53, the probable loss of human life results in a High hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Loss of Human Life <i>Would a failure or mis-operation of the unit probably cause loss of human life?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 3	1	
II. Economic Losses						
<i>40 CFR 257.53 associates economic loss with a Significant hazard potential rating, except that low economic losses principally limited to the owner's property may be associated with a Low hazard potential rating.</i>						
Consideration	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Parties <i>Would economic losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Magnitude <i>Are the anticipated economic losses due to a failure or mis-operation of the impoundment relatively low compared to the resources available to the owner/operator to correct foreseeable impacts?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
III. Environmental Losses						
<i>40 CFR 257.53 associates environmental damage with a Significant hazard potential rating, except that low environmental losses principally limited to the owner's property may be associated with Low hazard potential rating.</i>						
Feature	Yes	No	N/A	Scoring	Selected Score	Comments
Affected Areas <i>Would environmental losses be principally limited to the surface impoundment owner's property?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Anticipated flow path contained by Station property.
Containment <i>In the event of a failure or mis-operation, is it likely that the CCR materials would be contained on Station property, either by natural features or through reasonably applied remedial measures, so as to prevent offsite migration of these materials?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	Existing topography and site configuration encourage solids drop out and the spreading out and dissipation of flow before exit of Station property.
Restoration <i>Is it expected that the area(s) impacted by a failure or mis-operation of the impoundment could be readily restored to pre-incident conditions?</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes = 1 No = 2	1	
Sensitive Species <i>Are there any protected or endangered species in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Wetlands <i>Are there any jurisdictional or other identified wetlands in the area that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	
Waterways <i>Are there any navigable streams or rivers that would likely be impacted by a failure or mis-operation of the impoundment?</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	Appreciable impacts to Crooked Creek are not anticipated for reasons previously noted above.

**CCR SURFACE IMPOUNDMENT
HAZARD POTENTIAL CLASSIFICATION FORM**

Facility Name: Keystone Generating Station

Unit Name: Ash Filter Pond C

Type of Inspection (Circle One): Initial **Periodic**

Date of Visit: 10/6/2021

IV. Lifeline Facilities

40 CFR 257.53 associates disruption of lifeline facilities with a Significant hazard potential rating. The National Weather Service defines lifeline facilities as distributive systems and related facilities necessary to provide electric power, oil and natural gas, water and wastewater, and communications.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Lifeline Facilities Would a failure or mis-operation likely cause disruption to any distributive systems or facilities that provide electric power, oil and natural gas, water and wastewater, or communication services?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2	1	

V. Other Concerns

40 CFR 257.53 notes the potential for other concerns not specifically identified in the regulation to justify a Significant hazard rating. GAI recognizes probable impacts to "Critical Facilities" as another concern that may trigger a Significant hazard rating. Critical Facilities as identified by the National Weather Service are listed below. Lifeline Facilities are also considered to be Critical Facilities, but are not listed below due to being addressed in Item IV. The inspector shall also consider any other site-specific concerns not previously addressed that may impact the hazard rating, and shall write in any such concerns below.

Condition	Yes	No	N/A	Scoring	Selected Score	Comments
Critical Facilities Would failure or mis-operation of the impoundment likely cause damage or sustained closure of any of the following critical facilities? If yes, please specify. Emergency Response Facilities Medical Facilities Designated Emergency Shelters Transportation Telecommunications Data centers Financial Major industrial/commercial	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No (to all) = 1 Yes (to any) = 2	1	No critical facilities are within anticipated flow path.
Other Concerns Are there any other significant concerns relative to the potential impacts due to the failure or mis-operation of this impoundment? If yes, please specify.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No = 1 Yes = 2 (Depending on Severity)	1	

IV. Conclusions/Final Rating

The Final Rating is equal to the Maximum of all "Selected Scores" above.

Final Score = (=Maximum "Selected Score" from above)
Hazard Potential Classification = (1 = Low 2 = Significant 3 = High)

Adam B. Scheller
Printed Name

Engineering Manager, GAI Consultants
Title / Company

Signature*

* Signature certifies that the inspection was performed as indicated, and that the information contained herein is true and accurate to the best of the inspector's knowledge.