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Coal Combustion Residuals Surface Impoundments

Inflow Design Flood Control System Periodic Plan

Conemaugh Generating Station
Ash Filter Ponds
New Florence, Pennsylvania

GAI Project Number: C151611.14, Task 001

October 2016
Rev. 01, October 2021
Rev. 02, October 2026

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Table of Contents

Professional Engineer's Certification ii

Plan Revisions iii

1.0 Introduction 1

2.0 Hydrologic and Hydraulic Capacity Requirements of 40 CFR §257.82 2
- 2.1 Demonstration of the Adequacy of the Inflow Design Flood Control System 2
- 2.2 Inflow Design Flood Control System Plan 3

3.0 Hydrologic and Hydraulic Evaluation 3
- 3.1 Review of Background and Design Information 3
- 3.2 Field Visit 4
- 3.3 Hazard Potential Classification 5
- 3.4 Hydrologic Calculations 5
- 3.5 Pond Outflow Considerations 5

4.0 Conclusions and Recommendations 6

5.0 References 7

Figure 1 Site Location Map
Figure 2 Photographic Map
Figure 3 Hydrologic Map

Attachment A Hydrologic Calculations
Attachment A-1 NOAA Point Precipitation Frequency Estimates

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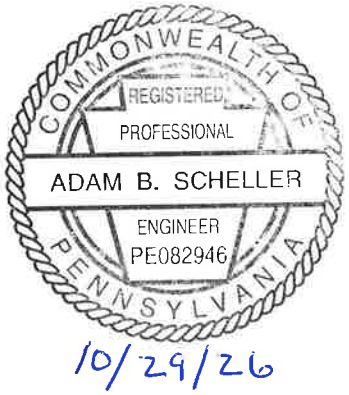
Professional Engineer's Certification

The Inflow Design Flood Control System Periodic Plan (Plan) for the Conemaugh Generating Station Ash Filter Ponds was prepared by GAI Consultants, Inc. (GAI). The Plan 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 Plan was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Pennsylvania (PA), that the Plan 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 Plan 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 be interpreted or construed as a guarantee, warranty, or legal opinion.

Adam B. Scheller, P.E.

Assistant Engineering Director



10/29/26

Plan Revisions

Revision	Date	Reason	Description	Reviewer
0	Oct. 2016		Original Document, Initial Plan	NRG, CB&I Inc.
1	Oct. 2021	Comprehensive review and as-needed revisions to develop Periodic Plan per CCR Rule, Section 257.82(c)(4) requirements (review of plan required every five years)	Remove NRG, additional miscellaneous administrative changes, revised hydrologic and hydraulic calculations to reflect recent survey information.	Conemaugh Station, GAI Consultants, Inc
2	Oct. 2026	Comprehensive review and as-needed revisions to develop Periodic Plan per CCR Rule, Section 257.82(c)(4) requirements (review of plan required every five years)	Incorporation of new information and calculation revision to reflect Ash Filter Pond reconstruction and other site updates.	Conemaugh 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 operating criteria under 40 CFR §257.82 are requirements to prepare an initial inflow design flood control system plan (Plan) and subsequent periodic Plans for all existing, new, or expanded CCR surface impoundments. Pursuant to the Rule, this Plan is to serve as documentation by a professional engineer that the CCR unit is designed, constructed, operated, and maintained with an inflow design flood control system that will adequately manage flow into and from the CCR unit under the peak discharge conditions of the design flood. The specific design flood under which each CCR unit must be evaluated is based on the hazard potential classification of the impoundment as determined pursuant to §257.73(a)(2). Further details regarding the required content and criteria for the Plan (pursuant to §257.82[c]) are provided in Section 2.0 of this document. The initial Plan must be prepared no later than October 17, 2016, and periodic Plans must be reviewed and updated as necessary every five years thereafter.

The Conemaugh Generating Station (Station) is a coal-fired steam electric power generating station located in New Florence, Pennsylvania. The Station has four surface impoundments that are subject to this Rule, specifically identified as Ash Filter Ponds A, B, C, and D. The ponds are part of an ash water recycling system and serve the multi-purpose function of receiving, storing, settling, and supplying water for bottom ash sluicing activities. Other components of the ash water recycling system include a distribution box (also known as the receiver box), ash dewatering bins (which receive sluice water from the bottom ash hoppers), an ash water recycle sump (AWRS), and recycling and level control pumps.

Ponds A, B, and C were retrofitted in 2023 (B and C) and 2024 (A) to replace the existing clay liner with a double-lined geosynthetic system. Upon completion of retrofitting efforts, Pond D was removed from service, drained, and settled CCR and other materials were excavated and landfilled per the usual pond cleaning protocol. In 2024, Pond D was isolated from the bottom ash handling system and stabilized. Pond D is now idled and awaiting closure and retirement no later than Station retirement. Pond D receives only the stormwater that falls directly onto its footprint. Stormwater within Pond D may drain from the unit via the existing drainpipe.

Water from the ponds drains via gravity to the AWRS, where it is subsequently pumped to the bottom ash hoppers during sluicing. Sluice water from the hoppers is sent to dewatering bins and is decanted or drained from the bins and sent back to the ponds via the distribution box. Some water is introduced into the system via precipitation falling directly into and around the ponds, and the Station maintains the ability to add circulating water and some process waters to the system. These sources help to replenish losses, providing an adequate, ongoing supply of sluice water.

In 2026, the existing AWRS was partitioned to create two distinct sumps to comply with the federal effluent limitations guidelines for bottom ash transport water at 40 CFR Part 423 (ELG Rule). One of the new sumps continues to function as the AWRS for recirculating bottom ash transport water. The second sump is designated as the Level Control Sump (LCS) and serves to manage non-bottom ash transport water that was previously comingled with bottom ash transport water prior to the partition.

There are overflow provisions for the ponds, the AWRS, and the LCS. Accumulated bottom ash is removed from the ponds during periodic cleanout activities and transported to the Station's CCR landfill (the Ash/Refuse Disposal Site). The locations of the Station and the ponds are shown on Figure 1.

In 2016, the Station engaged the services of CB&I Environmental & Infrastructure, Inc. (CB&I) to develop an Initial Plan for all four Ash Filter Ponds. This Initial Plan development followed the review of available background and design information and a field visit conducted on June 28, 2016. Additionally, development of this Initial Plan occurred following completion of an Initial Hazard Potential Classification performed by CB&I and documented under separate cover in October 2016.

In 2021, the Station engaged the services of GAI Consultants Inc. (GAI) to review and update as necessary the Initial Plan developed for all four Ash Filter Ponds. This Periodic Plan development followed the review of available background and design information (including the Initial Plan) and a field visit conducted on October 6, 2021. Additionally, development of this Periodic Plan occurred following a Periodic Hazard Potential Classification completed by GAI and documented under a separate cover in October 2021.

In 2026, the Station engaged the services of GAI to review and update as necessary the 2021 Periodic Plan developed for all four Ash Filter Ponds. This Periodic Plan development followed the review of available background and design information, including the Initial Plan (2016), Revision 1 to the Plan (2021), and a field visit conducted on October 13, 2026. Additionally, development of this Periodic Plan occurred following a Periodic Hazard Potential Classification completed by GAI and documented under a separate cover in October 2026.

Beyond this introductory section of the Plan, Section 2.0 outlines the regulatory requirements of §257.82; Section 3.0 describes the hydrologic and hydraulic evaluation performed for the subject impoundments, and Section 4.0 provides conclusions and recommendations regarding the adequacy of the impoundments to manage the specified flood conditions. Section 5.0 lists the references that were consulted during development of this Plan.

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

2.0 Hydrologic and Hydraulic Capacity Requirements of 40 CFR §257.82

The Rule requires owners or operators of any existing CCR surface impoundment to design, construct, operate, and maintain an inflow design flood control system. The ability of the system to meet these requirements must be demonstrated in the form of an inflow design flood control system Plan.

2.1 Demonstration of the Adequacy of the Inflow Design Flood Control System

Pursuant to §257.82(a)(1)-(2), the design flood control system must:

- *Adequately Manage Flow Into the CCR Unit* – The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood.
- *Adequately Manage Flow From the CCR Unit* – The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood.

Pursuant to §257.82(a)(3), the inflow design flood that must be managed is based on the type of impoundment (incised or non-incised) and hazard potential classification as determined in accordance

with §257.73(a)(2). The impoundment types and classifications and the associated inflow design floods are as follows:

- *Incised CCR Surface Impoundment* – A 25-year design flood applies to an incised CCR surface impoundment.
- *Low Hazard Potential CCR Surface Impoundment* – A 100-year design flood applies to a (non-incised) Low Hazard CCR surface impoundment.
- *Significant Hazard Potential CCR Surface Impoundment* – A 1000-year design flood applies to a (non-incised) Significant Hazard CCR surface impoundment.
- *High Hazard Potential CCR Surface Impoundment* – The probable maximum flood applies to a (non-incised) Significant Hazard CCR surface impoundment.

Since the subject ponds are diked, Low Hazard (refer to Section 3.3) impoundments, the 100-year design flood applies. Pursuant to §257.82(c), discharge from the CCR unit must be handled in accordance with the surface water requirements of §257.3-3 (i.e., the discharge must be authorized under the National Pollutant Discharge Elimination System [NPDES] program). Flow from these ponds is discharged in accordance with the Station's NPDES Permit No. PA0005011 issued by the Pennsylvania Department of Environmental Protection (PADEP).

2.2 Inflow Design Flood Control System Plan

The Rule requires preparation of an initial Plan and periodic Plans to document the adequacy of the inflow design flood control system. The Plan must be supported by appropriate engineering calculations per §257.82(c)(1) and be certified by a qualified professional engineer in accordance with §257.82(c)(5).

3.0 Hydrologic and Hydraulic Evaluation

Confirmation of the adequacy of the inflow design flood control system was performed via a hydrologic and hydraulic evaluation conducted by GAI. The overall effort consisted of four main activities, including: (1) review of background and design information, (2) a site visit, (3) development of a hazard potential classification (provided under separate cover in a report by GAI dated October 2026, but referenced herein), and (4) preparation of stormwater calculations. These activities are described in the sections below.

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, and reports and other documents provided by the Station. Mapping and aerial images were utilized to prepare Figures 1 through 3 included with this Plan. Pertinent information identified during development of the figures included ground surface elevations and topography, surface water features, and pond design information (such as geometry, crest elevations, operating water levels, and inflow and outflow features).

The impoundments are situated toward the southern reaches of the Station property, just southwest of the primary operations area. The nearest Station property boundary is to the south and abuts the Conemaugh River. The ponds are located together in a common impoundment area and share an overall perimeter dike. This diked area is bordered by a Station haul road to the north and south, a haul road and limestone storage area to the west, and the flue gas desulfurization (FGD) system to the east. A rail corridor runs through the Station property between the impoundment area and the Conemaugh River. At its closest, the rail corridor is over 300 feet away from the toe of the basin impoundment area.

Topographic information for the subject area was obtained from a site survey by L. R. Kimball performed in 2010 (Kimball, 2010), from a site survey performed by GAI in January 2020 (GAI, 2021), and from record drawings produced following reconstruction of Ponds A, B, and C (GAI, 2024). The

overall topography in the vicinity of the ponds slopes southward toward the Conemaugh River. The common diked area has a crest elevation of approximately 1092 to 1095 feet mean sea level (ft msl). The greatest exterior embankment heights occur on the western and southern sides, while relief on the northern and eastern sides is minimal. The western and southern embankments slope to the west and south, respectively, to perimeter channels at the toe, at an approximate elevation of 1080 ft msl. Toward the north and east, the ground surface generally slopes away from the ponds, toward a grassy area and perimeter road to the north, and toward the FGD system to the east.

Pond design information was obtained from drawings and previous reports provided by the Station. The reconstructed ponds (A, B, and C) each have a storage capacity of approximately 5.1 acre-feet (ac-ft). Pond D has a storage capacity of approximately 5.5 ac-ft. A minimum of two of the three reconstructed ponds are in use at any one time. All three reconstructed ponds may also be in service at any given time. As mentioned previously, Pond D has been isolated from the bottom ash transport water system and is no longer used for the storage or management of CCR. Pond D maintains its ability to collect stormwater that falls within its footprint, and this stormwater is able to drain from Pond D using the existing drainage piping, which conveys stormwater to the AWRS.

One or two of the in-service ponds receives water overflowing from the dewatering bins (Ponds B and/or C), while the third (Pond A or B) is valved to provide the storage volume required to fill and drain a dewatering bin. The ponds are operated so as to keep relatively constant water levels while in use, though the storage pond level fluctuates to support the bin filling and draining operations. For the reconstructed ponds, the normal water operating level while in service is 1,090 ft msl (Gilbert Associates, 1995 and GAI, 2020). Pond D is no longer in service and, as such, does not maintain a normal water operating level.

The primary inflow to the ponds is recycled bottom ash transport water that is routed through a distribution box located just northeast of the pond area. Controls at the inlet of each pond allow Station personnel to select the desired mode of operation. Ponds that are in active settling mode (Ponds B and/or C) receive water through inflow piping on the eastern pond perimeters. Ponds that are operating in storage mode (Ponds A or B) receive pumped influent on the western end of the ponds from the AWRS. Some additional water is introduced to the ponds via precipitation, but this is generally limited to rainfall falling directly within and in limited areas around the pond footprints due to the elevated construction of the ponds.

Outflow from each pond drains by gravity through an outlet structure located on the western side of the pond. Each outlet structure consists of twin saw tooth weirs that drain to a concrete riser structure. The concrete structure outlets to gravity drainage piping that merge together with drainage from the other ponds into a single pipe to Manhole No. 4 (MH-4). From MH-4, the water generally flows via gravity to the AWRS. An emergency overflow is present in MH-4 to route overflow water to a surface swale, if necessary. Water routed to the AWRS is pumped to the ash hoppers for further re-use as sluice water. Should water levels become sufficiently high in the AWRS, overflow will occur over a rectangular weir and into the LCS, from where the water is pumped to the on-site Desilting Basin (surface impoundment not subject to the CCR Rule).

3.2 Field Visit

On October 13, 2026, Adam Scheller (GAI Engineer) performed a site walk and visual reconnaissance of the ponds and surrounding area. The visit was conducted to support GAI's hazard assessment of the impoundments (provided under separate cover) and to assess the hydrologic and hydraulic evaluation performed herein. GAI walked the perimeter of the ponds and confirmed that the ash water recycling features appeared to be in overall agreement with the previously reviewed reports and documents.

As part of the hydrologic and hydraulic evaluation, GAI visually assessed upstream conditions for run-on potential. 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.

3.3 Hazard Potential Classification

Based on the review of background information and field observations, GAI assigned a Low Hazard rating to each of the four subject ponds. A full discussion of the process and rationale for this assignment is provided in a report entitled, “Ash Filter Ponds Hazard Potential Classification Periodic Assessment Report” (GAI, 2026). The Low Hazard rating for each pond is 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.

This hazard potential classification is consistent with the classification assigned to the Ash Filter Ponds as part of the Initial Design Flood Control Plan, submitted in October 2016 and the Periodic Plan, submitted in October 2021.

3.4 Hydrologic Calculations

As noted previously, Ponds A, B, and C are operated so as to maintain constant operating water levels in the ponds that are in service. Under normal operating conditions, this is accomplished by application of pond inflow rates that are below the capacity of the pond outfall structures with very minimal increases in water levels, such that pond outflow equals pond inflow. Accordingly, the water level rises to just slightly (less than a few inches) above the crest of the effluent saw tooth weirs, and discharge occurs until the water level drops and becomes approximately equal to the crest of the effluent weirs. For practical purposes, the normal operating water level for each pond is approximately equal to the crest of the effluent weir structure.

These calculations consider the capacity of each pond to contain stormwater from the inflow design flood. For the modeling of each pond, it is assumed that the pond is filled to its normal water operating level when the design flood occurs. The design flood is assumed to be equivalent to the design storm, because hydrologic analyses are based upon storm events rather than floods. If the available capacity of the pond between the operating water level and the crest is determined to be greater than the design storm inflow volume, the flood control system is deemed adequate to manage the flow into the pond during and following the inflow design storm. Under these conditions, the storm water inflow would temporarily raise the water level of the subject pond above the normal operating level, but would not overtop the basin crest. Conservatively, these calculations consider each pond’s capacity to temporarily hold the entire storm event inflow volume. In actuality, pond discharge would occur during the storm event and the entire storm inflow volume would not need to be held at once.

Attachment A provides calculations showing the capability of each pond to hold the contents of a 24-hour, 100-year design storm within the volume between its operating water level and crest. The point precipitation associated with the specified storm event is 5.80 inches (NOAA, 2006). Because stormwater inflow into each pond is limited to the precipitation that falls directly on the pond footprint and upon a small area immediately surrounding the pond, a direct computation of inflow volume was performed as the precipitation depth for the inflow design storm times the approximate pond surface water drainage area. The drainage areas were obtained via CAD and are depicted on Figure 3. The available volume between the operating water level and crest elevation for each pond was computed using the areas at each elevation (determined via CAD and shown on Figure 3), freeboard height, and the average end area method. The calculations presented in the 2021 Periodic Plan have been revised to reflect the updated elevations as a result of the reconstruction of Ponds A, B, and C. The inflow volume and available volume were computed and compared for each pond. These calculations show the available capacity for stormwater inflow to be adequate for all of the ponds.

3.5 Pond Outflow Considerations

Following the design storm event, the pond water level would gradually return to its normal operating water level via the regular discharge processes (gravity drainage to the AWRS and subsequent

pumping to the ash hoppers or discharge via the LCS to the Desilting Basin). As extra precautionary measures, two overflow features are present in structures that receive outflow from the ponds. First, there is an emergency overflow pipe at MH-4, such that if the ponds discharge more than can be routed to the AWRS, the excess flow will discharge to a permitted emergency overflow outfall. In addition, the partition that separates the AWRS from the LCS contains an overflow weir that allows water from the AWRS to spill over into the LCS. Once in the LCS, water is discharged via pumping to the Desilting Basin. Even during an event that discharge occurs through emergency overflow structures at either MH-4 or from the AWRS, such discharges would be routed to NPDES-approved outfalls within Station property. Any such discharges would be temporary and limited and would not result in adverse downstream impacts. Accordingly, the inflow design flood control system adequately manages flow from each CCR unit that results from the inflow design storm.

4.0 Conclusions and Recommendations

Based upon observations, review of information, and the hydrologic and hydraulic analyses described herein (and associated calculations contained in Attachment A), the subject ponds have flood control systems that are adequate to manage flow into and from the units under the applicable inflow design flood. Outflow from the ponds will be via an approved NPDES outfall.

These conclusions are based upon the background information provided to GAI by the Station and field observations made around the time of the Plan preparation. The applicability of these results is dependent upon the ongoing operation and maintenance of the ponds in accordance with design documents and appropriate operating procedures. Any deviations from the crest elevations or operating conditions presented in this Plan would warrant a re-evaluation of the ponds to ensure adequate available capacity for stormwater inflow. Such a re-evaluation would fall under the provisions of §257.82(c)(2), which stipulate that the Plan must be amended whenever significant changes in CCR unit configuration/operation affect the validity of the Plan that is currently in effect. Once completed, the amended Plan must be appropriately placed into the facility's operating record. As a matter of routine maintenance/inspection, any areas of settlement, depressions, ruts, or similar features along the crest shall be regraded and filled as needed. In addition, the integrity of the grading and diversion channels around the ponds should be periodically inspected to ensure their continued functionality.

5.0 References

CB&I. “Ash Filter Ponds Hazard Potential Classification Initial Assessment Report.” October 2016.

Federal Emergency Management Agency (FEMA). “National Flood Hazard Layer.” Indiana County, Pennsylvania. January 27, 2015.

Federal Register, Vol. 80, No. 74. Section 257.82 (Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments). April 17, 2015.

GAI “Ash Filter Ponds Hazard Potential Classification Periodic Assessment Report.” October 2026.

GAI Topographic Survey of Ash Filter Ponds, conducted January 19 through January 31, 2020.

GAI “Ash Filter Ponds Reconstruction Project” Hydrologic and Hydraulic Calculations. June 2020.

GAI “Ash Filter Ponds Reconstruction Project” Record Drawings. November 2024.

Geosyntec. “Geotechnical and Hydraulic Assessment Report, Conemaugh Generating Station – Filter Ash Ponds and Desilting Basin.” November 22, 2013.

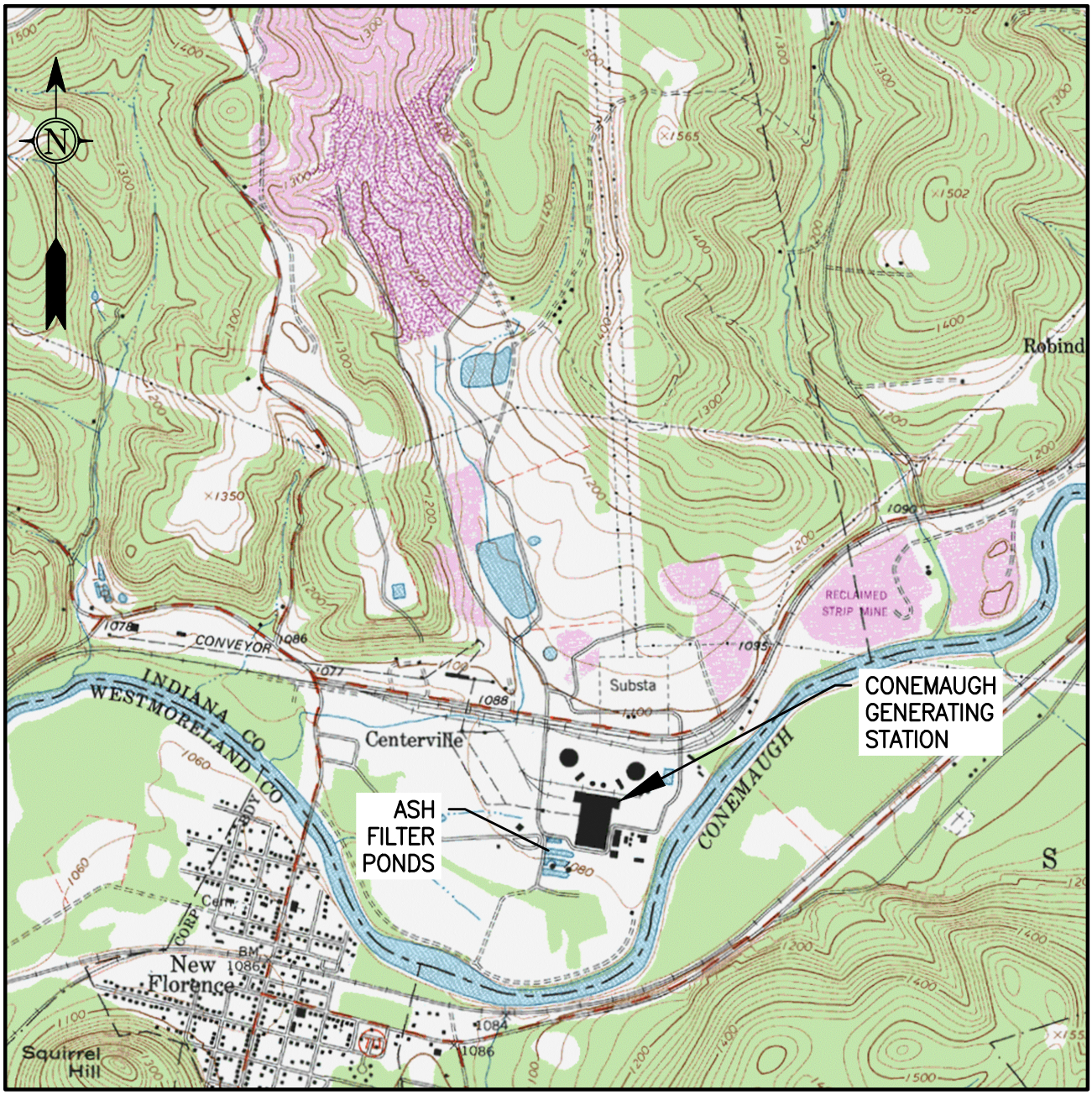
Gilbert Associates, Inc. “Conemaugh Power Station Addition of 4th Ash Filter Pond, As-Built Drawing No. D-782-008.” Revised October 10, 1995.

Kimball, L. R., “Conemaugh Station Base Mapping.” Drawing No. E-744-3093-0. August 4, 2010.

NOAA. “Point Precipitation Frequency (PF) Estimates, New Florence, PA.” NOAA Atlas 14, Vol.2, Version 3. 2006.

Reliant Energy. “Water Balance Diagram, for Conemaugh Station Units 1 & 2.” Drawing No. 1942-SK-M-113 SH 2 Rev. 9. February 3, 2006.

FIGURES



REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE

NEW FLORENCE, PENNSYLVANIA 1964
REVISED 1993

SCALE 1"=2000'

2000 0 2000

DRAWING TITLE

FIGURE 1 - SITE LOCATION MAP

PROJECT		DRAWN BY:	ISSUE DATE:
ASH FILTER PONDS CONEMAUGH GENERATING STATION INDIANA COUNTY, PENNSYLVANIA	gai consultants	**T.BORING**	**08/06/2026**
		CHECKED BY:	SCALE:
		L. ROUNCE	**AS SHOWN**
CLIENT		APPROVED BY:	SHEET NO.:
KEYSTONE-CONEMAUGH PROJECTS, LLC BLAIRSVILLE, PA		**A.SCHELLER**	**1** OF **1**

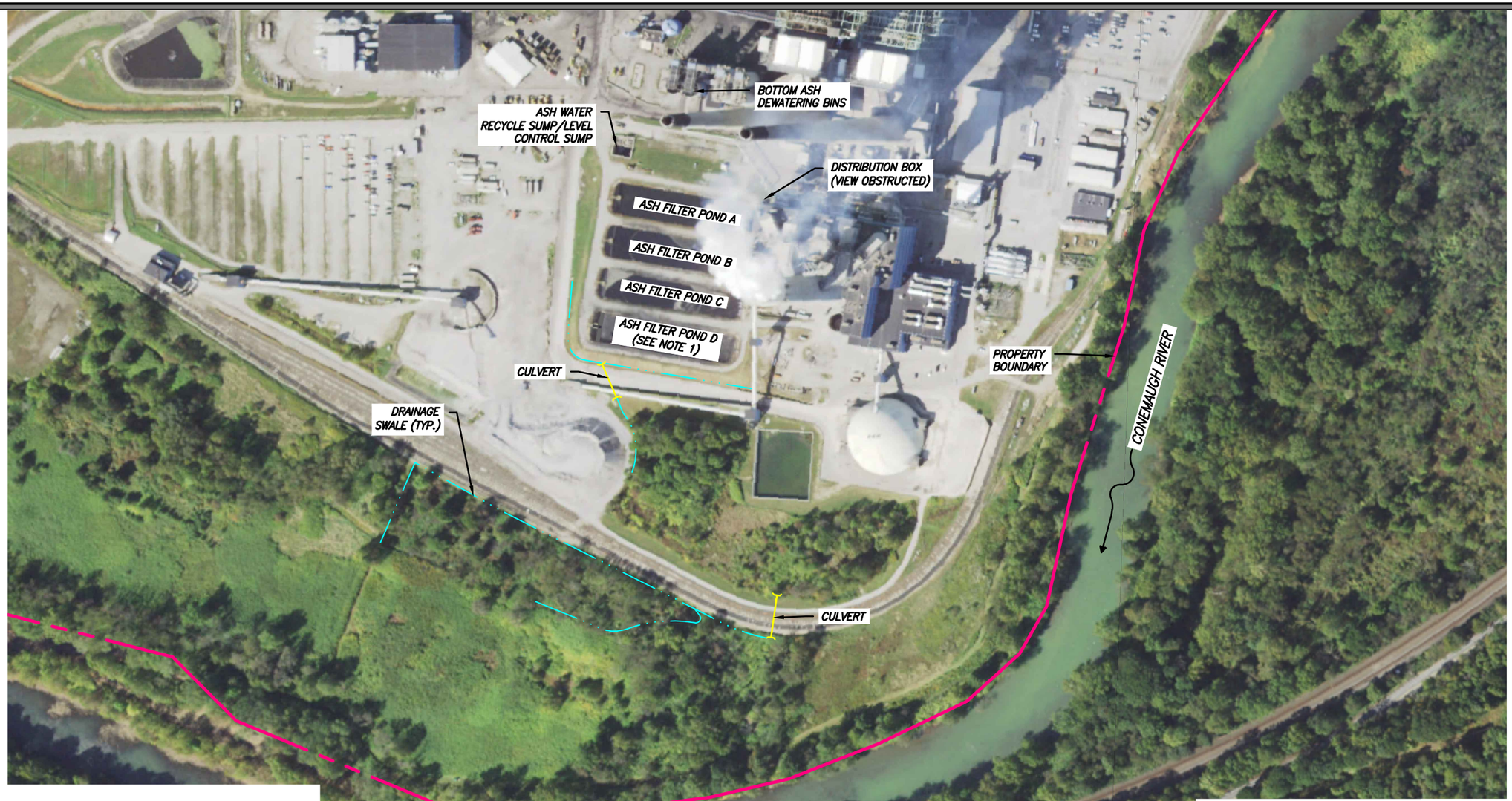
GAI FILE NUMBER:	GAI DRAWING NUMBER:	© 2026 GAI Consultants
C151611-14-C-A2-001-FIG 1	**FIGURE 1**	

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GAI CAD FILE PATH: Z:\Energy\2015\C151611.14 - Conemaugh CCR 5 Year Peri\CAD\Production DWGs\C151611-14-C-A2-001-FIG 1.dwg



NORTH

NOTES:
1. IN 2024, POND D WAS REMOVED FROM SERVICE, DRAINED, AND CLEANED. POND D IS ISOLATED FROM THE BOTTOM ASH HANDLING SYSTEM AND ONLY RECEIVES STORMWATER THAT FALLS WITHIN ITS FOOTPRINT. STORMWATER WITHIN POND D MAY DRAIN FROM THE POND THROUGH THE EXISTING DEWATERING PIPE.

MAPPING REFERENCE:
AERIAL IMAGERY TAKEN FROM GOOGLE EARTH ON JUNE 11, 2019.

SCALE: 1" = 300'

300 0 300 600

NO.:	DATE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DESCRIPTION:

REVISION RECORD

DRAWING TITLE
FIGURE 2 - PHOTOGRAPHIC MAP

PROJECT
ASH FILTER PONDS
CONEMAUGH GENERATING STATION
INDIANA COUNTY, PENNSYLVANIA

gai consultants

CLIENT
KEYSTONE-CONEMAUGH PROJECTS, LLC
BLAIRSVILLE, PA

ISSUE DATE:	DRAWN BY:
09/23/2026	S.WOLFE
SCALE:	CHECKED BY:
AS SHOWN	T.BORING
REVISION	APPROVED BY: A.SCHELLER
	SHEET NO.: 1 OF 1

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GAI FILE NUMBER: C151611-14-C-B2-002-FIG 2

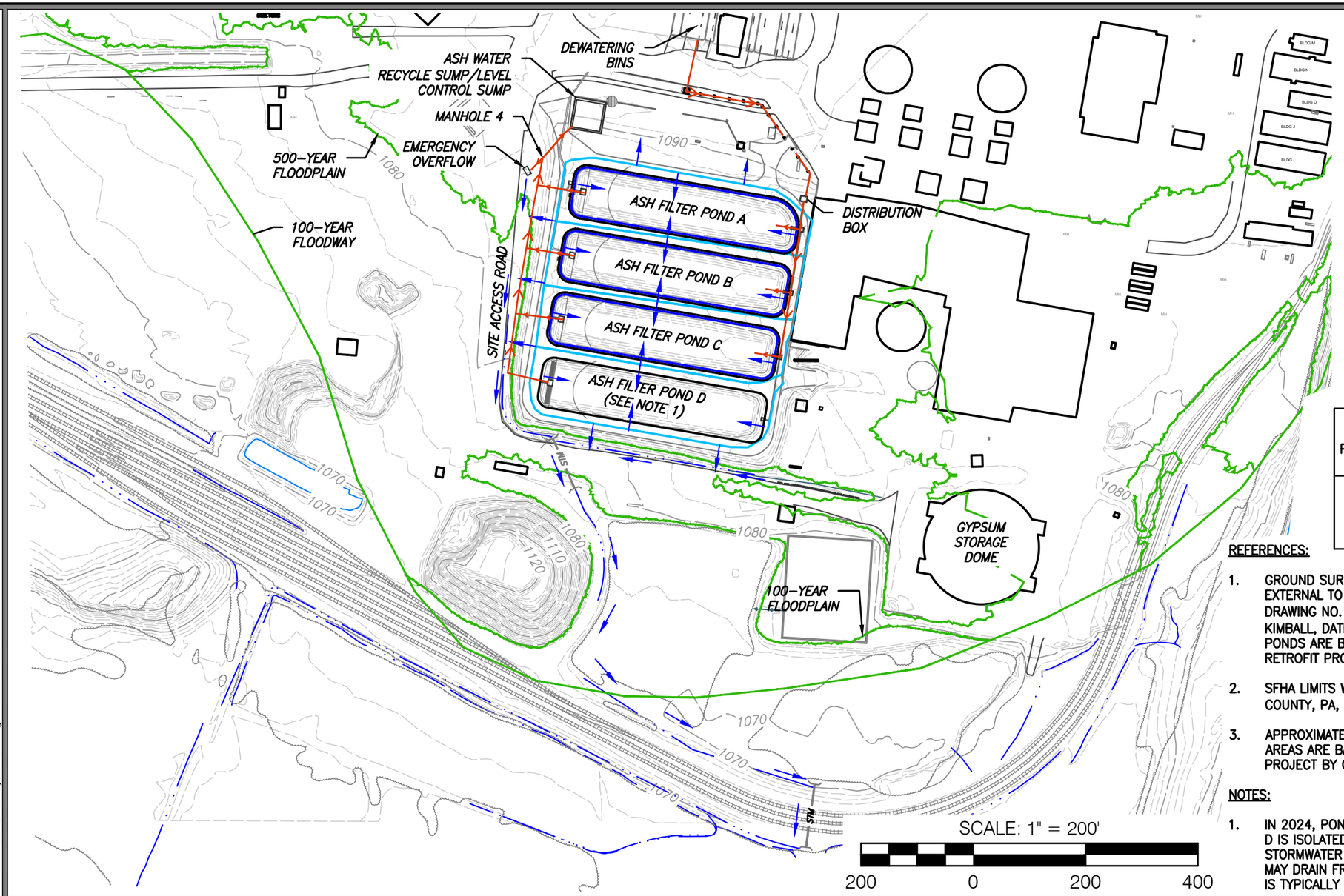
GAI DRAWING NUMBER: FIGURE 2

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GAI CAD FILE PATH: \\gaiconsultants.local\BUProj\Energy\2015\C151611.14 – Conemaugh CCR 5 Year Peri\CAD\Production DWGs\C151611-14-C-B2-002-FIG 2.dwg

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LEGEND:

- 1080 — 2-FOOT TOPOGRAPHIC CONTOUR (SEE REFERENCE 1)
- EXISTING DRAINAGE CHANNEL OR SWALE
- SURFACE WATER FLOW DIRECTION
- EXISTING STRUCTURE (SEE REFERENCE 1)
- FEMA SPECIAL FLOOD HAZARD AREA (SFHA) LIMITS (REFERENCE 2)
- STM — STORMWATER CULVERT
- APPROXIMATE POND SURFACE DRAINAGE AREA LIMITS
- APPROXIMATE POND CREST (SEE TABLE AND REFERENCE 3)
- APPROXIMATE POND NORMAL WATER OPERATING LEVEL (SEE TABLE AND REFERENCE 3)
- APPROXIMATE ASH PROCESS WATER FLOW DIRECTION

ASH FILTER POND ID	CREST		OPERATING WATER LEVEL		APPROXIMATE POND SURFACE DRAINAGE AREA (SQ. FT.)
	ELEV. (FT.)	AREA (SQ. FT.)	ELEV. (FT.)	AREA (SQ. FT.)	
A	1092.0	34,410	1090.0	30,520	50,169
B	1092.0	34,757	1090.0	30,824	51,954
C	1092.0	34,757	1090.0	30,826	51,115
D	1091.3	36,090	1079.0	–	50,518

REFERENCES:

1. GROUND SURFACE CONTOURS, EXISTING STRUCTURES AND SITE FEATURES EXTERNAL TO THE ASH FILTER PONDS WERE OBTAINED FROM SITE SURVEY DRAWING NO. E-744-3093-0, "CONEMAUGH STATION BASE MAPPING", BY LR. KIMBALL, DATED 8/4/2010. CONTOURS AND FEATURES AROUND THE ASH FILTER PONDS ARE BASED ON AS-BUILT DRAWINGS FROM THE ASH FILTER POND RETROFIT PROJECT BY GAI IN 2023 AND 2024.
2. SFHA LIMITS WERE OBTAINED FROM FEMA, NATIONAL MAP HAZARD LAYER, INDIANA COUNTY, PA, 07/17/19.
3. APPROXIMATE CREST AND NORMAL WATER OPERATING LEVEL ELEVATIONS AND AREAS ARE BASED ON AS-BUILT DRAWINGS FROM THE ASH FILTER POND RETROFIT PROJECT BY GAI IN 2023 AND 2024.

NOTES:

1. IN 2024, POND D WAS REMOVED FROM SERVICE, DRAINED, AND CLEANED. POND D IS ISOLATED FROM THE BOTTOM ASH HANDLING SYSTEM AND ONLY RECIEVES STORMWATER THAT FALLS WITHIN ITS FOOTPRINT. STORMWATER WITHIN POND D MAY DRAIN FROM THE POND THROUGH THE EXISTING DEWATERING PIPE. THE POND IS TYPICALLY EMPTY.

NO.:	DATE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DESCRIPTION:

REVISION RECORD

DRAWING TITLE: **FIGURE 3 - HYDROLOGIC MAP**

PROJECT: **ASH FILTER PONDS**
CONEMAUGH GENERATING STATION
INDIANA COUNTY, PENNSYLVANIA

gai consultants

CLIENT: **KEYSTONE-CONEMAUGH PROJECTS, LLC**
BLAIRSVILLE, PA

ISSUE DATE:	DRAWN BY:
10/07/2026	S.WOLFE
SCALE:	CHECKED BY:
AS SHOWN	T.BORING
REVISION	APPROVED BY:
	A.SCHELLER
	SHEET NO.:
	1 OF 1

This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

ISSUING OFFICE: Pittsburgh | 385 E. Waterfront Drive, Homestead, PA 15120

GAI FILE NUMBER: C151611-14-C-B2-003-FIG 3

GAI DRAWING NUMBER: FIGURE 3

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GAI CAD FILE PATH: Z:\Energy\2015\C151611.14 – Conemaugh CCR 5 Year Peri\CAD\Production DWGs\C151611-14-C-B2-003-FIG 3.dwg

PLOTTED ON: 10/16/2026 1:51:28 PM PLOTTED BY: Taylor Boring PLOT FILE: GAI.stb

ATTACHMENT A
Hydrologic Calculations

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Conemaugh CCR Pond Stormwater Inflow Analysis			By:	TRB	Date:	10/16/2026
Conemaugh Generating Station - Ash Filter Ponds			Checked By:	LLR	Date:	10/20/2026

gai consultants

I. Purpose

To evaluate the stormwater inflow volume that will result from the design flood (storm) as specified by 40 CFR §257.82(a)(3) and to compare this volume with the available storage capacity for each subject pond.

II. Given

Four CCR impoundments located in New Florence, PA, each having a Low Hazard Rating and the following design information (From References 1 and 2):

Ash Filter Pond A (See Note 1)		
Crest Elevation, E_c	1092.0	ft
Pond Area at Crest, A_c	34,410	sq. ft
Operating Water Level, E_w	1,090	ft
Area at Operating Water Level, A_w	30,520	sq. ft
Approximate Inflow Area, A_{IN}	50,169	sq. ft
Freeboard, FB = E_c-E_w	2.0	ft

Ash Filter Pond B (See Note 1)		
Crest Elevation, E_c	1092.0	ft
Pond Area at Crest, A_c	34,757	sq. ft
Operating Water Level, E_w	1,090	ft
Area at Operating Water Level, A_w	30,824	sq. ft
Approximate Inflow Area, A_{IN}	51,954	sq. ft
Freeboard, FB = E_c-E_w	2.0	ft

Ash Filter Pond C (See Note 1)		
Crest Elevation, E_c	1092.0	ft
Pond Area at Crest, A_c	34,757	sq. ft
Operating Water Level, E_w	1,090	ft
Area at Operating Water Level, A_w	30,826	sq. ft
Approximate Inflow Area, A_{IN}	51,115	sq. ft
Freeboard, FB = E_c-E_w	2.0	ft

Ash Filter Pond D (see Note 2)		
Crest Elevation, E_c	1091.3	ft
Pond Area at Crest, A_c	36,090	sq. ft
Operating Water Level, E_w	1,079	ft
Area at Operating Water Level, A_w	-	sq. ft
Approximate Inflow Area, A_{IN}	50,518	sq. ft
Freeboard, FB = E_c-E_w	12.3	ft

Notes:

1. Ash Filter Ponds A, B, and C were reconstructed in 2023 (Ponds B and C) and 2024 (Pond A). The provided design information reflects the updated parameters following reconstruction efforts.
2. In 2024, Ash Filter Pond D was isolated from the bottom ash handling system, cleaned, and stabilized. Pond D is now idled and recieves only stormwater that falls within its footprint. Stormwater within Pond D drains from the unit via the existing drainpipe, and water depths are not maintained to support operations. Pond D is typically empty.

III. Methodology

Step 1:

Determine the appropriate Rainfall Depth (D_R) for the stormwater inflow calculations.

From 40 CFR §257.82(a)(3), the CCR units must adequately manage flow resulting from the following design floods:

* For an incised impoundment, the 25-year flood.
* For a non-incised, Low Hazard impoundment, a 100-year design flood.
* For a non-incised, Significant Hazard impoundment, a 1000-year design flood.
* For a non-incised, High Hazard impoundment, the probable maximum flood.

Step 2:

Determine the Inflow Volume (V_{IN}). For a pond with a limited inflow area (i.e., with inflow limited to rainfall directly on top of the pond footprint and on berm areas right around the pond perimeter), compute the volume directly as the Rainfall Depth (D_R) times the Inflow Area (A_{IN}). For ponds with run-on from additional upstream areas, compute V_{IN} using HydraFlow.

Step 3:

Compute the Available Capacity (V_{AVAIL}) of each pond to contain stormwater runoff as the volume between the pond operating water level and the pond crest elevation. Use the Average End Area Method.

Step 4:

Compare the volume of inflow (V_{IN}) for the specified design flood (storm) to the pond's available capacity (V_{AVAIL}) for stormwater runoff to determine if the pond will manage the specified stormwater inflow without overtopping.

Conemaugh CCR Pond Stormwater Inflow Analysis			By:	TRB	Date:	10/16/2026
Conemaugh Generating Station - Ash Filter Ponds			Checked By:	LLR	Date:	10/20/2026

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IV. Calculations

Step 1: Determine the appropriate Rainfall Depth (D_R).

None of the ponds are completely incised, and all are assigned Low Hazard classifications.
Pursuant to 40 CFR §257.82(a)(3), the ponds must manage flow from the 100-year flood (storm).
From NOAA (NOAA, 2006), the rainfall depth (D_R) in inches associated with the 24-hour, 100-year storm is:

D_R =

5.8	0.4833	ft

Step 2: Determine the Inflow Volume (V_{IN}).

Inflow is limited to rainfall directly on top of each pond footprint and upon a limited area around each pond.
Therefore, directly compute V_{IN} as follows:

Inflow , V_{IN} (cu ft) = Rainfall depth, D_R (ft) x Inflow Area, A_{IN} (sq ft)

For Ash Filter Pond A:

V_{IN} = 0.4833 ft x 50,169 sq ft
V_{IN} = 24,248 cu ft

For Ash Filter Pond B:

V_{IN} = 0.4833 ft x 51,954 sq ft
V_{IN} = 25,111 cu ft

For Ash Filter Pond C:

V_{IN} = 0.4833 ft x 51,115 sq ft
V_{IN} = 24,705 cu ft

For Ash Filter Pond D:

V_{IN} = 0.4833 ft x 50,518 sq ft
V_{IN} = 24,417 cu ft

Step 3:

Compute the Available Capacity (V_{AVAIL}) of each pond to contain stormwater runoff as the volume between the pond operating water level and the pond crest elevation. Use the Average End Area method.

Available Capacity, V_{AVAIL} (cu ft) = $[(A_c + A_w)/2]$ x FB

Pond	Area at water operating level (sq ft)	Area At Crest (sq ft)	Freeboard (ft)	Available Capacity (cu ft)
	A_w	A_c	FB	V_{AVAIL}
A	30,520	34,410	2.0	64,930
B	30,824	34,757	2.0	65,581
C	30,826	34,757	2.0	65,583
D	-	36,090	12.3	239,691

V. Results

Step 4:

For each pond, compare the Inflow Volume (V_{IN}) for the specified design flood (storm) to the Available Capacity (V_{AVAIL}) for stormwater runoff to determine if it will manage the specified inflow without overtopping.

Percent of Freeboard Capacity Utilized, $\%V_{FB} = V_{IN}/Vout$

Pond	Vin (cu ft)	Vavail (cu ft)	% Freeboard Capacity Used
A	24,248	64,930	37%
B	25,111	65,581	38%
C	24,705	65,583	38%
D	24,417	239,691	10%

VI. Conclusions

Ash Filter Ponds A, B, C, and D have adequate capacity to meet the temporary storage requirements for a 100-year design flood (storm). Ash Filter Ponds A, B, and C maintain adequate storage above their normal operating levels. Ash Filter Pond D is no longer used for storing, settling, receiving, and supplying water for bottom ash sluicing activities and does not maintain normal water depths to support operations. As such, Pond D has additional freeboard capacity.

VII. References

1. GAI. "Figure 3 Hydrologic Map, Conemaugh Generating Station." Dated October 7, 2026.
2. GAI. Ash Filter Ponds Reconstruction Plan View, Drawing 739-5059, Rev B (Record Drawing). Dated November 15, 2024.
3. NOAA. "Point Precipitation Frequency (PF) Estimates,West Wheatfield Twp, PA." NOAA Atlas 14, Vol. 2, Version 3. 2006

ATTACHMENT A-1
NOAA Point Precipitation Frequency Estimates

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NOAA Atlas 14, Volume 2, Version 3
Location name: New Florence, Pennsylvania, USA*
Latitude: 40.3833°, Longitude: -79.0626°
Elevation: 1091 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.319** (0.289-0.353)	**0.381** (0.346-0.422)	**0.461** (0.418-0.510)	**0.525** (0.474-0.579)	**0.608** (0.546-0.670)	**0.674** (0.603-0.741)	**0.741** (0.659-0.814)	**0.812** (0.718-0.891)	**0.911** (0.799-0.998)	**0.988** (0.861-1.08)
10-min	**0.496** (0.449-0.548)	**0.595** (0.540-0.658)	**0.717** (0.649-0.793)	**0.810** (0.731-0.894)	**0.930** (0.835-1.02)	**1.02** (0.914-1.12)	**1.12** (0.992-1.22)	**1.21** (1.07-1.33)	**1.34** (1.18-1.47)	**1.44** (1.25-1.57)
15-min	**0.608** (0.551-0.672)	**0.728** (0.660-0.805)	**0.880** (0.797-0.974)	**0.997** (0.899-1.10)	**1.15** (1.03-1.27)	**1.26** (1.13-1.39)	**1.39** (1.23-1.52)	**1.51** (1.33-1.65)	**1.67** (1.47-1.83)	**1.80** (1.57-1.97)
30-min	**0.804** (0.729-0.889)	**0.974** (0.883-1.08)	**1.20** (1.09-1.33)	**1.38** (1.25-1.53)	**1.62** (1.46-1.79)	**1.81** (1.62-1.99)	**2.00** (1.78-2.20)	**2.20** (1.95-2.41)	**2.48** (2.17-2.71)	**2.70** (2.35-2.95)
60-min	**0.982** (0.890-1.09)	**1.20** (1.08-1.32)	**1.51** (1.37-1.67)	**1.76** (1.59-1.94)	**2.10** (1.89-2.32)	**2.38** (2.13-2.62)	**2.68** (2.38-2.94)	**2.99** (2.64-3.28)	**3.43** (3.00-3.75)	**3.79** (3.30-4.14)
2-hr	**1.16** (1.05-1.28)	**1.40** (1.27-1.55)	**1.78** (1.61-1.96)	**2.08** (1.88-2.29)	**2.52** (2.26-2.76)	**2.87** (2.57-3.15)	**3.26** (2.90-3.57)	**3.68** (3.24-4.02)	**4.29** (3.75-4.68)	**4.80** (4.16-5.24)
3-hr	**1.25** (1.13-1.38)	**1.51** (1.37-1.67)	**1.90** (1.73-2.10)	**2.23** (2.01-2.46)	**2.70** (2.42-2.96)	**3.09** (2.75-3.38)	**3.51** (3.11-3.84)	**3.97** (3.49-4.33)	**4.65** (4.04-5.07)	**5.22** (4.50-5.69)
6-hr	**1.51** (1.38-1.68)	**1.82** (1.66-2.03)	**2.28** (2.07-2.53)	**2.66** (2.40-2.95)	**3.21** (2.88-3.54)	**3.67** (3.28-4.04)	**4.17** (3.70-4.59)	**4.73** (4.15-5.19)	**5.54** (4.81-6.07)	**6.24** (5.37-6.82)
12-hr	**1.84** (1.67-2.04)	**2.20** (2.01-2.45)	**2.73** (2.48-3.04)	**3.18** (2.88-3.52)	**3.84** (3.46-4.24)	**4.40** (3.94-4.85)	**5.02** (4.45-5.52)	**5.70** (5.01-6.26)	**6.73** (5.83-7.37)	**7.60** (6.52-8.31)
24-hr	**2.16** (2.00-2.36)	**2.59** (2.40-2.82)	**3.19** (2.95-3.48)	**3.71** (3.41-4.03)	**4.46** (4.08-4.84)	**5.10** (4.63-5.52)	**5.80** (5.22-6.27)	**6.57** (5.86-7.10)	**7.70** (6.77-8.34)	**8.67** (7.53-9.40)
2-day	**2.50** (2.31-2.72)	**2.98** (2.76-3.25)	**3.65** (3.38-3.98)	**4.22** (3.89-4.58)	**5.03** (4.61-5.45)	**5.72** (5.21-6.20)	**6.46** (5.84-6.99)	**7.26** (6.51-7.87)	**8.44** (7.46-9.16)	**9.43** (8.22-10.3)
3-day	**2.68** (2.49-2.91)	**3.19** (2.97-3.47)	**3.88** (3.60-4.21)	**4.46** (4.12-4.82)	**5.28** (4.86-5.70)	**5.95** (5.45-6.43)	**6.68** (6.07-7.22)	**7.45** (6.72-8.06)	**8.57** (7.62-9.29)	**9.49** (8.34-10.3)
4-day	**2.87** (2.67-3.10)	**3.41** (3.18-3.68)	**4.11** (3.83-4.44)	**4.70** (4.36-5.06)	**5.52** (5.10-5.95)	**6.19** (5.69-6.67)	**6.90** (6.30-7.44)	**7.64** (6.92-8.26)	**8.70** (7.78-9.43)	**9.55** (8.46-10.4)
7-day	**3.47** (3.26-3.71)	**4.10** (3.85-4.39)	**4.89** (4.58-5.23)	**5.53** (5.17-5.91)	**6.40** (5.97-6.85)	**7.11** (6.60-7.60)	**7.83** (7.23-8.37)	**8.57** (7.87-9.18)	**9.59** (8.72-10.3)	**10.4** (9.37-11.2)
10-day	**4.06** (3.84-4.32)	**4.79** (4.53-5.09)	**5.64** (5.32-5.99)	**6.31** (5.95-6.70)	**7.23** (6.78-7.66)	**7.94** (7.43-8.43)	**8.66** (8.07-9.20)	**9.39** (8.71-9.99)	**10.4** (9.53-11.1)	**11.1** (10.2-11.9)
20-day	**5.78** (5.49-6.08)	**6.76** (6.44-7.14)	**7.81** (7.42-8.24)	**8.63** (8.19-9.10)	**9.71** (9.20-10.2)	**10.5** (9.97-11.1)	**11.4** (10.7-12.0)	**12.2** (11.4-12.9)	**13.2** (12.3-14.0)	**14.0** (13.0-14.8)
30-day	**7.33** (7.02-7.69)	**8.56** (8.19-8.99)	**9.78** (9.35-10.3)	**10.8** (10.3-11.3)	**12.0** (11.4-12.6)	**13.0** (12.3-13.6)	**13.9** (13.2-14.6)	**14.8** (14.0-15.5)	**15.9** (15.0-16.8)	**16.8** (15.7-17.7)
45-day	**9.46** (9.06-9.90)	**11.0** (10.6-11.6)	**12.5** (11.9-13.0)	**13.6** (13.0-14.2)	**15.0** (14.3-15.7)	**16.0** (15.3-16.8)	**17.0** (16.2-17.8)	**18.0** (17.0-18.9)	**19.1** (18.1-20.1)	**20.0** (18.8-21.1)
60-day	**11.5** (11.0-11.9)	**13.3** (12.8-13.9)	**14.9** (14.3-15.6)	**16.2** (15.5-16.9)	**17.7** (17.0-18.5)	**18.8** (18.0-19.7)	**19.9** (19.0-20.8)	**20.9** (19.9-21.8)	**22.1** (21.0-23.1)	**22.9** (21.8-24.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

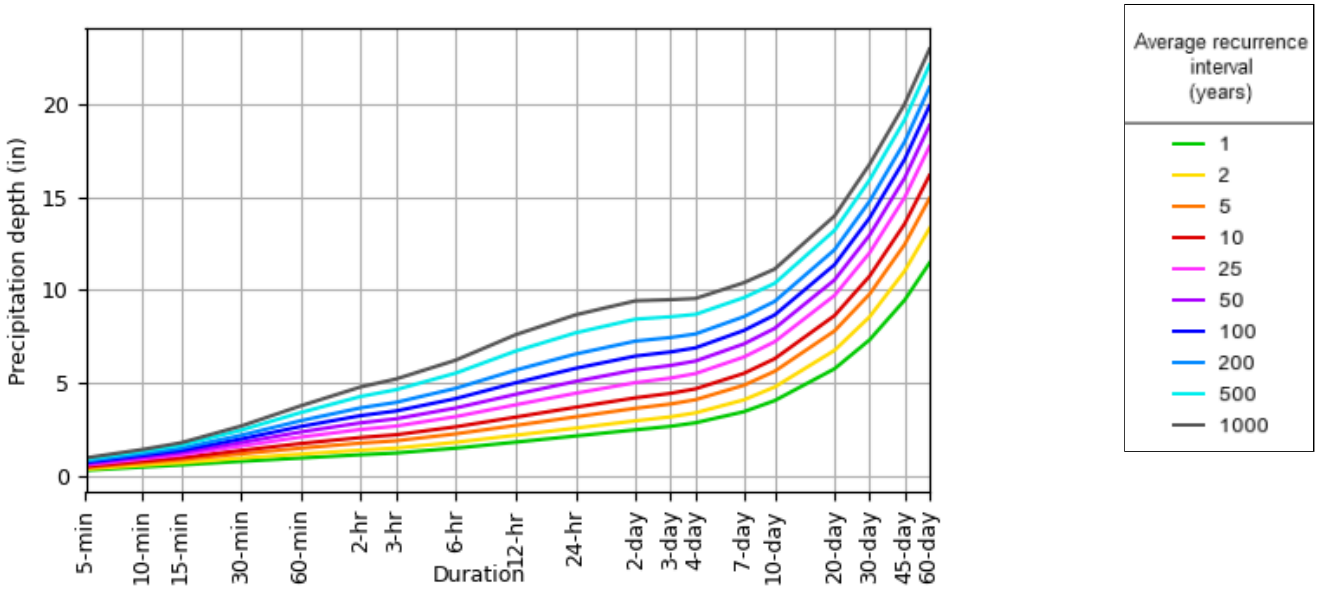
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

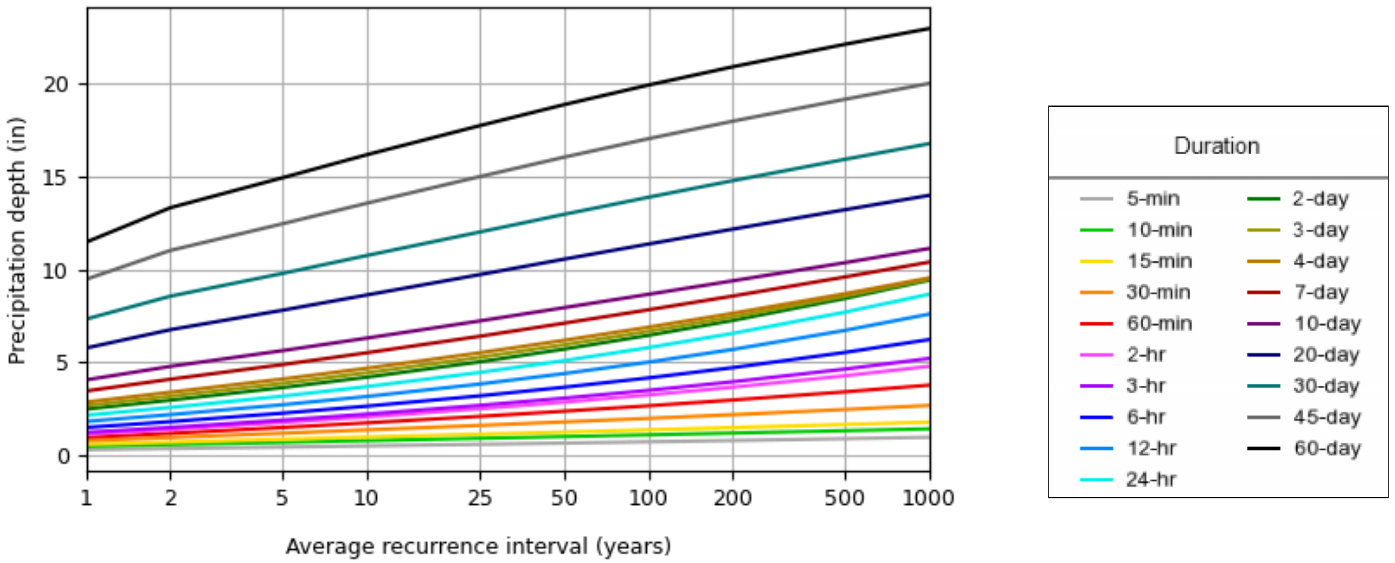
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Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 40.3833°, Longitude: -79.0626°





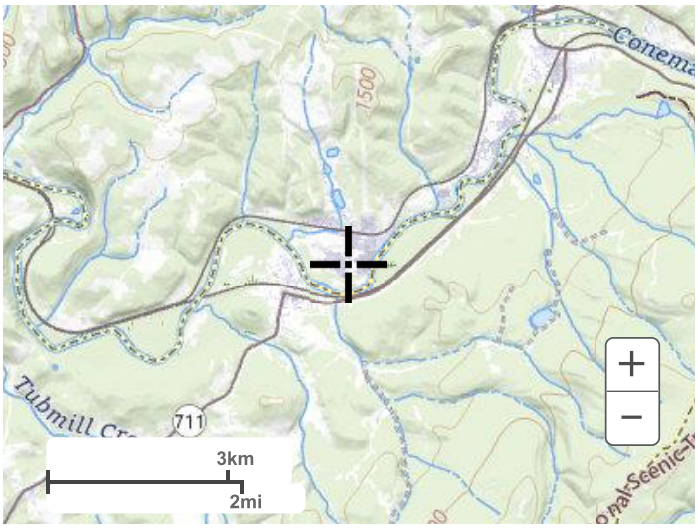
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Back to Top

Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



Back to Top

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