Pre-Application Document
Old Forge Pumped Storage Project FERC Project No. P-15411 Original License Application Integrated Licensing Process

Renewable Energy Aggregators, Inc.

118 Armstrong Road Pittston, Pa 18640.

July 7, 2026

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1.0 Executive Summary and Project Scope

1.1 Applicant, Project, and Licensing Objective

Renewable Energy Aggregators, Inc. proposes to license, construct, and operate the Old Forge Pumped Storage Project, FERC Project No. P-15411, as a new closed-loop pumped storage hydropower facility in Luzerne and Lackawanna Counties, Pennsylvania. The Project is located in the lower Lackawanna River watershed, in the vicinity of Old Forge Borough, Duryea Borough, and Ransom Township, and is proposed as an original hydropower license proceeding under Part 5 of the Federal Energy Regulatory Commission regulations. This Pre-Application Document is prepared for the Integrated Licensing Process and provides the Commission, resource agencies, Indian Tribes, local governments, and interested members of the public with existing, relevant, and reasonably available information concerning the proposed Project, the existing environment, known and potential Project effects, and anticipated information needs. Under 18 C.F.R. § 5.6, the PAD is filed simultaneously with the notification of intent required by 18 C.F.R. § 5.5 and is distributed to the appropriate agencies, tribes, governments, and public participants.

1.2 Applicant, Authorized Agent, and Official Contact

The exact name of the potential applicant is Renewable Energy Aggregators, Inc. The Applicant's business address is 118 Armstrong Road Pittston, Pa 18640

The person authorized to act as agent for the Applicant is Adam Rousselle Sr., President and Chief Executive Officer, Renewable Energy Aggregators, Inc., 118 Armstrong Road Pittston, Pa 18640 The telephone number for Mr. Rousselle is 267-254-6107, and the electronic mail address identified in the Project record is arousselle@reaggregators.com.

The Applicant requests that the Commission and participants use the above contact information for service and correspondence unless the Applicant files an updated designation of representative in the Project docket.

The Project is a new original-license project. There is no existing FERC hydropower license for the Project site, no existing licensed generation record, no five-year record of licensed Project outflow, and no existing FERC license compliance record. The purpose of this PAD is therefore to describe the proposed project works, proposed operation, existing information, resource setting, and study needs for a new closed-loop pumped storage hydropower facility rather than to describe relicensing of an existing project.

1.3 Hydropower Project Scope and Associated Pumping-Energy Facility

The Project is a closed-loop pumped storage project. The hydropower works proposed for licensing consist of an upper reservoir, a lower reservoir, two penstocks connecting those reservoirs, an underground powerhouse containing two ternary pump-turbine motor-generator units, appurtenant intakes, gatehouses, spillways, surge-relief and safety facilities, powerhouse electrical equipment, control systems, access and construction areas necessary for the hydropower works, and primary hydropower electrical facilities extending to the first point of Project use.

The Project pumping cycle is supplied by a 200-megawatt behind-the-meter natural gas generating facility located within the Project property and immediately adjacent to the pumped-storage works. The natural gas generator uses an existing natural gas main adjacent to the property and supplies the Project pump motors through the behind-the-meter electrical system and pumping-energy supply bus. The natural gas generator is disclosed in this PAD because Project pumping depends on it and because its construction and operation may involve reasonably foreseeable air-quality, noise, fuel-supply, safety, land-use, and environmental-justice considerations.

The natural gas generator is not counted as hydropower installed capacity. The Applicant identifies the generator as an associated pumping-energy facility located within the mapped Project property and licensing study area

and requests that FERC determine during the Integrated Licensing Process whether the generator itself, or only the electrical facilities connecting the generator to the pumping-energy bus and ternary motor-generator units, should be included as licensed project works. The proposed mapping distinguishes hydropower works from associated pumping-energy facilities and identifies off-project context features, including the existing utility-owned natural gas main and any non-project load-serving facilities, where shown.

Older project materials referring to broader development concepts are not part of the FERC hydropower Project described in this PAD except where they provide source information for the hydropower works, the mine pool water source, or the associated pumping-energy supply configuration. The current PAD and NOI define the Project as the closed-loop pumped storage development, the associated on-site pumping-energy facility necessary to support the pumping cycle, and the hydropower electrical facilities necessary to connect the ternary units to the behind-the-meter Project use and load interface, subject to FERC's final boundary and jurisdictional treatment during the ILP.

1.4 Closed-Loop Purpose and Principal Facility Concept

The Old Forge Pumped Storage Project is designed to provide approximately 184 megawatts of installed generating capacity using two 92-megawatt ternary pump-turbine units. The basic storage concept is a long-duration daily-cycle pumped storage project in which the upper reservoir stores water at high elevation for release during generation and the lower reservoir receives that water during generation and supplies it back to the upper reservoir during pumping. The available engineering record identifies an approximate ten-hour generation cycle at rated flow and an approximate 13.5-hour pumping cycle for full recharge, which is consistent with the Project's intended function as a long-duration storage resource rather than a conventional run-of-river hydropower facility (Renewable Energy Aggregators, 2021).

The Project is not dependent on grid-supplied pumping energy. In pumping mode, the ternary motor-generator units operate as motors and draw power from the associated behind-the-meter natural gas generator through the Project pumping-energy bus and powerhouse electrical equipment. In generation mode, stored water released from the upper reservoir through the ternary units produces hydropower output for the behind-the-meter load and backup-use function. The natural gas generator may supply the behind-the-meter load directly when pumped-storage generation is not dispatched, while pumped storage provides stored-energy generation when reservoir and operational conditions support generation.

The Project's principal engineering feature is the pairing of high-head closed-loop reservoirs with ternary hydroelectric machinery. In ternary pumped storage configuration, each unit contains a turbine, a pump, a hydraulic torque converter, and an electric machine capable of operating as a generator or motor. The independent pump and turbine elements permit rapid switching between pumping and generation without reversing the direction of rotation, and short-circuit operation may permit the pump and turbine to operate simultaneously under selected conditions (Voith Hydro, 2014; Renewable Energy Aggregators, 2021).

1.5 Mine Pool and Old Forge Borehole Source Water

The water source for the Project is the regional abandoned mine pool system and the Old Forge Borehole discharge. The Project's water-source concept is grounded in the hydrogeologic context of the Northern Anthracite Coal Field, where extensive underground mining created interconnected voids that flooded after mine dewatering ceased. Tetra Tech identified the Old Forge Borehole and the Duryea Outfall as the principal abandoned mine drainage discharges from the Scranton Mine Pool near the Project site and reported that the Old Forge Borehole discharges approximately 97 cubic feet per second based on Growitz's 1985 data, while the Duryea Outfall discharges approximately 34 cubic feet per second (Growitz, 1985, as cited in Tetra Tech, 2018).

Tetra Tech further identifies the Old Forge Borehole as a major discharge located approximately three miles upstream of the Lackawanna River's confluence with the Susquehanna River, with measured flows at the outfall

reported between approximately 38,500 and 54,500 gallons per minute, equivalent to approximately 55 to 78 million gallons per day, and an approximate average discharge of 65 million gallons per day (Tetra Tech, 2018). The Project treats this mine pool and borehole system as the primary hydrologic supply for initial reservoir filling, operational make-up, and long-term closed-loop balancing. Conditioning of this source water may be used to protect Project equipment, reservoir operation, and downstream water-quality objectives, but the Project is not dependent on a speculative future water treatment plant as a licensing premise.

EPCAMR's mine water resource work frames anthracite mine pools as complex but very large hydrologic systems, explaining that the Anthracite Region contains billions of gallons of mine water in flooded abandoned underground mines and that those mine pools can be understood as both a legacy pollution problem and a potential water resource when appropriately managed (EPCAMR, 2011). The Project source-water analysis is based on a water-balance and water-quality evaluation of continuous borehole discharge, regional mine pool storage, precipitation-responsive recharge, operational cycling, evaporation, seepage, reservoir conditioning, and potential effects of withdrawals or make-up use on existing mine-drainage behavior.

1.6 Summary of Environmental Setting

The Project is located within a watershed and landscape affected by historical anthracite mining, abandoned mine drainage, upland forest, fallow fields, wetlands, streams, former industrial land, local roads, rail corridors, and residential and municipal areas. RETTEW's representative aquatic-resource areas are identified in the broader RETTEW area of investigation, to the extent relevant to the current hydropower-only Project boundary. The Lackawanna River Watershed Conservation Plan describes the lower Lackawanna River as severely impaired by abandoned mine drainage from the Old Forge Borehole and Duryea discharge in the lower reach to the Susquehanna River confluence, while also recognizing the ecological and recreational importance of the broader watershed (Lackawanna River Corridor Association, 2001).

The Project's potential benefits and impacts are evaluated together. The proposed development adds a new long-duration hydropower storage resource in a region with extensive legacy mine lands and a major existing abandoned mine drainage discharge. It provides dispatchable behind-the-meter generation, energy storage, reliability support, and beneficial reuse of an impaired mine-water resource. At the same time, the Project involves substantial excavation, embankment construction, clearing, access-road use, subsurface work, potential wetland and stream impacts, construction noise and traffic, geotechnical risks, dam-safety considerations, water-quality issues, cultural and species consultation requirements, and associated-facility air-quality issues tied to the 200-megawatt natural gas pumping-energy source. This PAD identifies those resource issues and carries them into the proposed study plan framework.

2.0 Integrated Licensing Process and Regulatory Framework

2.1 Federal Power Act and Part 5 Licensing Framework

The Applicant is preparing this PAD for an original hydropower license under the Federal Power Act and Part 5 of the Commission's regulations. FERC's guidance for closed-loop pumped storage projects at abandoned mine sites explains that a hydropower license authorizes construction and operation of a hydroelectric project, subject to engineering, environmental, and administrative license conditions, and that the licensing process includes pre-filing consultation with agencies, Tribes, landowners, and other stakeholders before a license application is filed (Federal Energy Regulatory Commission, 2019).

The Applicant uses the Integrated Licensing Process. The filing does not request use of the Traditional Licensing Process or Alternative Licensing Process. The Commission's closed-loop mine-site guidance states that the ILP is the default licensing process and is appropriate for projects with complex issues and study needs requiring close coordination among the applicant, agencies, Tribes, stakeholders, and Commission staff (Federal Energy Regulatory Commission, 2019). The Old Forge Project's mine pool hydrology, abandoned mine setting, water-

quality conditioning, reservoir seepage, geotechnical design, wetlands and streams, special-status species, cultural-resource sensitivity, and community outreach needs make the ILP the appropriate framework.

2.2 PAD Purpose and Due-Diligence Basis

The PAD provides the Commission and consulted entities with existing information relevant to the Project proposal that is in the Applicant's possession or that the Applicant can obtain through the exercise of due diligence. The purpose is to allow agencies, Tribes, local governments, non-governmental organizations, landowners, and the public to identify resource issues, information needs, study requests, study methodologies, and potential protection, mitigation, and enhancement measures early in the process. The PAD is not the final license application, but it is the required foundation for the ILP scoping and study-plan process under 18 C.F.R. Part 5.

The source basis for this PAD includes the original and revised Old Forge PAD materials, the Kleinschmidt design basis and drawing packages, Voith Hydro ternary unit and control-system materials, Haley & Aldrich geotechnical data and preliminary design reports, RETTEW aquatic resource investigation materials, Tetra Tech mine pool review and borehole water-quality materials, EPCAMR mine water resource reports, Lackawanna River watershed planning materials, PADEP-related permitting records, SRBC water-use materials, and FERC Part 5 guidance documents. These sources are cited throughout the PAD and are listed in Section 11.0.

The Applicant's due-diligence record includes early field consultation with federal, state, watershed, and local stakeholders. On August 1, 2018, representatives of the U.S. Department of the Interior and U.S. Fish and Wildlife Service participated in a Project site visit. Applicant consultation records identify the same August 1, 2018 site visit as a broader multi-stakeholder site walk attended by participants associated with the Pennsylvania Department of Environmental Protection, the Lackawanna River Corridor Association, Congressman Matt Cartwright, the Mayor of Duryea, and local Project stakeholders. The consultation record for this PAD preserves those materials as evidence of early stakeholder engagement and distinguishes them from the later July 2022 PADEP PACT conference call and written all-department summary (Renewable Energy Aggregators, 2018; U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018).

Following that August 1, 2018 site visit, DOI and the Service issued correspondence dated August 14, 2018 documenting the Service's participation in the site visit and the agencies' review of the Applicant's updated Project footprints. That correspondence stated that DOI and the Service had determined that the updated Project footprints no longer overlapped Commerce Clause streams or waters, that the Red Spring Run tributary formerly associated with the lower reservoir footprint no longer existed within that footprint due to past mining activities, and that the relocated upper reservoir footprint did not overlap streams. This PAD cites that letter as important evidence of early federal resource-agency review of the revised Project footprint while recognizing that the current Project is proceeding as a FERC original hydropower license application under the Integrated Licensing Process (U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018).

The PADEP July 29, 2022 all-department summary is a separate consultation record from the August 1, 2018 site visit. PADEP's summary documents information submitted through the Permit Application Consultation Tool on April 23, 2020, May 5, 2020, May 11, 2020, and July 19, 2022, and a PADEP multi-program conference call held on July 20, 2022. The PAD treats that PADEP record as a later multi-program permitting and consultation response, not as evidence of the 2018 field walk (Pennsylvania Department of Environmental Protection, 2022).

2.3 Process Plan and Schedule

This process plan uses July 7, 2026 as Day 0 for the NOI and PAD filing. The Applicant files and distributes the NOI and PAD on that date to federal, state, interstate, tribal, local-government, regional, landowner, commenter, intervenor, and interested-public recipients identified in the service and consultation appendix.

The schedule incorporates the Integrated Licensing Process sequence in Part 5 and proposes an early Applicant-hosted public information meeting and site walk on August 7, 2026 at the Project site on Coxton Road in Duryea, Pennsylvania, at the Project location provided by the Applicant as approximately 41°21'32.44" N, 75°45'14.57" W.

The August 7, 2026 meeting is included as a proposed Applicant-hosted public information meeting and walk-through to promote early transparency. The Commission-scheduled scoping meeting and site visit under 18 C.F.R. § 5.8 occur on the schedule established by FERC after issuance of the Notice of Commencement and Scoping Document 1. If the Commission is able to coordinate its scoping schedule with the July 15 meeting, the Applicant makes the Coxton Road site available for that purpose; otherwise, the July 15 meeting supplements the formal Commission scoping process.

Integrated Licensing Process schedule:

Milestone	Target date	Regulatory basis	Project action
NOI and PAD filed and served	July 7, 2026	18 C.F.R. §§ 5.5 and 5.6	Applicant filing and distribution date; Day 0 for this schedule.
Proposed public information meeting and site walk	August 7, 2026	PAD process plan; applicant-hosted early outreach	Project site, Coxton Road, Duryea, Pennsylvania, at approximately 41°21'32.44" N, 75°45'14.57" W. This meeting supplements, and does not replace, any Commission-scheduled scoping meeting.
FERC Notice of Commencement and Scoping Document 1	By August 14, 2026	18 C.F.R. § 5.8	Commission notice and SD1 expected within 60 days after the NOI/PAD filing.
Commission scoping meeting and site visit	By September 14, 2026	18 C.F.R. § 5.8(b)(3)(viii)	Commission-scheduled scoping meeting and site visit occur within 30 days after the notice of commencement, unless FERC establishes a different date.
Comments on PAD, SD1, information requests, and study requests	October 13, 2026	18 C.F.R. § 5.9	Stakeholders file comments, study requests, and information requests.
Proposed Study Plan	November 27, 2026	18 C.F.R. § 5.11	Applicant files the formal PSP within 45 days after the PAD comment/study-request deadline.
Study Plan Meeting	December 28, 2026	18 C.F.R. § 5.11	Applicant conducts the study plan meeting within the regulatory schedule.
Comments on Proposed Study Plan and modified study requests	February 25, 2027	18 C.F.R. § 5.12	Stakeholders comment on the PSP and submit any modified study requests.
Revised Study Plan	March 29, 2027	18 C.F.R. § 5.13	Applicant files the RSP after the comment period.
Commission Study Plan Determination	April 28, 2027	18 C.F.R. § 5.13	Commission issues the study plan determination.
Initial Study Report	April 28, 2028	18 C.F.R. § 5.15	Applicant reports study progress, data, variances, and proposed modifications.
Updated Study Report, if a second study season is required	April 28, 2029	18 C.F.R. § 5.15	Applicant reports second-season progress and remaining study matters, if applicable.
Preliminary Licensing Proposal or Draft License Application planning target	September 25, 2029	18 C.F.R. § 5.16	Applicant circulates the PLP or DLA after study completion and integration of consultation.
Final license application planning target	December 31, 2029	18 C.F.R. Part 5 and Part 4 application requirements	Applicant files the final original license application before expiration of the preliminary permit priority period.

Preliminary permit compliance calendar:

Permit compliance milestone	Date	Basis	Action

Preliminary permit effective date	May 1, 2026	FERC preliminary permit order	Permit period begins on the first day of the month in which the order issued.
First Article 4 progress report	April 30, 2027	Preliminary permit Article 4	Annual progress report covering the first 12-month permit period.
Second Article 4 progress report	April 30, 2028	Preliminary permit Article 4	Annual progress report covering the second 12-month permit period.
Third Article 4 progress report	April 30, 2029	Preliminary permit Article 4	Annual progress report covering the third 12-month permit period.
Permit expiration / final progress-report deadline if no license application is accepted earlier	April 30, 2030	Preliminary permit term	Forty-eight-month preliminary permit priority period ends unless a development application has been accepted earlier.

The Applicant maintains this schedule as the PAD process plan and updates it if FERC establishes different scoping, study-plan, or filing dates during the proceeding.

2.4 Coordination with NEPA and Other Federal Requirements

The Commission serves as lead federal agency for the licensing action under the Federal Power Act and conducts environmental review under the National Environmental Policy Act. FERC's 2025 NEPA staff guidance states that Commission staff evaluates the potentially affected environment and the degree of effects, and may consider geology, soils, water resources, wetlands, fisheries and aquatic resources, vegetation, terrestrial resources, special-status species, cultural and tribal resources, recreation, land use, visual resources, air quality, noise, socioeconomics, reliability, and safety (Federal Energy Regulatory Commission, 2025). The study plan in Section 9.0 is structured to generate the information needed for that environmental review.

The Project is coordinated with other federal and state regulatory processes, including Endangered Species Act consultation, National Historic Preservation Act consultation, Clean Water Act authorization and certification where required, PADEP dam safety and waterway permitting, SRBC water-use review, floodplain review, PNDI and state special-status species consultation, construction stormwater permitting, and local land-use or municipal approvals as applicable. These processes are coordinated through the ILP to the extent practicable.

2.5 Public Utility Regulatory Policies Act of 1978

The Applicant does not seek benefits under section 210 of the Public Utility Regulatory Policies Act of 1978 for the Old Forge Pumped Storage Project in this PAD. The Project is proposed as an approximately 184-megawatt original-license closed-loop pumped storage hydropower project and is not presented as a qualifying hydroelectric small power production facility under 18 C.F.R. § 292.203. The Applicant reserves the right to evaluate any separate PURPA, qualifying-facility, or behind-the-meter energy-supply issues associated with non-hydropower facilities outside the FERC Project boundary, but no PURPA § 210 benefits are requested for the licensed hydropower Project in this PAD.

2.6 Source Information Availability, Confidentiality, and Data-Room Protocol

The Applicant maintains a Project source-information repository for the public, confidential, and security-sensitive materials referenced in this PAD. Public source information includes the design-basis documents, public engineering drawings, public environmental and consultation materials, public water-resource information, public agency correspondence, service-list information, and non-sensitive figures included or cited in the PAD. These public materials are made available electronically to PAD recipients and interested participants, and hard-copy access is provided upon request consistent with 18 C.F.R. § 5.6(c).

Confidential cultural-resource materials, archaeological site-location information, tribal-sensitive information, and security-sensitive or CEII-type engineering details are separated from the public PAD and maintained in restricted appendices or a restricted data room. The public PAD provides summaries sufficient for issue identification and study planning while withholding protected location data and sensitive infrastructure details from general public distribution. Confidential cultural-resource information is handled consistent with federal protection for archaeological location information and the Commission's confidentiality procedures, and security-sensitive or CEII information is handled through the Commission's applicable non-public filing procedures.

PAD recipients may request source information referenced in the PAD. The Applicant responds to source-information requests within the time period required by 18 C.F.R. § 5.6(c)(2), uses electronic distribution where practicable, and provides hard-copy materials where required or reasonably requested. The source index identifies which materials are public, confidential, security-sensitive, proprietary, or available upon request so that agencies, Tribes, municipalities, intervenors, commenters, and interested persons can understand the record without compromising protected cultural-resource or security information.

3.0 Project Location, Boundary, Facilities, and Principal Project Works

3.1 Project Location

The Project is located in northeastern Pennsylvania in Luzerne County and Lackawanna County, generally in the vicinity of Old Forge Borough, Duryea Borough, and Ransom Township, within the Lackawanna River watershed of the Susquehanna River Basin. The Project is situated in a historically mined landscape associated with the Northern Anthracite Coal Field. The proposed hydropower works occupy a development corridor extending from an upland upper-reservoir area to a lower-reservoir and underground-powerhouse area near the lower Lackawanna River valley. The RETTEW aquatic resource investigation identifies the broader area of investigation as located in Ransom Township and Old Forge Borough in Lackawanna County and Duryea Borough in Luzerne County, and as appearing on the Pittston and Ransom, Pennsylvania, United States Geological Survey 7.5-minute quadrangle maps (RETTEW, 2020).

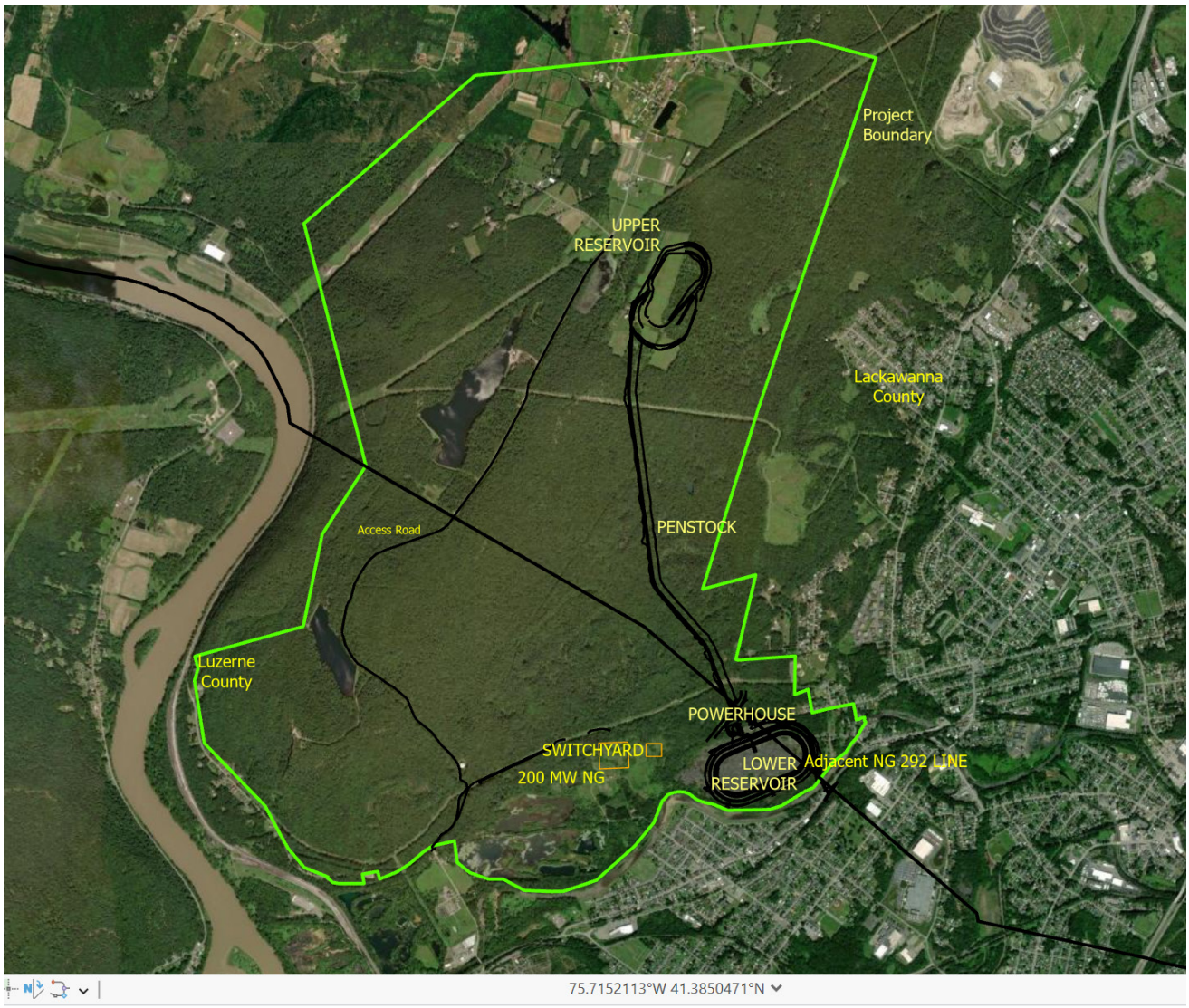


Figure 3-1. Project Boundary Map

Figure 3-1 includes the upper reservoir, lower reservoir, penstocks, powerhouse, gatehouses, spillways, access roads, primary hydropower electrical facilities, 200-MW BTM natural gas generator compound, BTM pumping-energy bus/switchgear, adjacent natural gas main, county boundaries.

3.2 Project Boundary

The proposed Project boundary encloses only the lands, waters, and facilities necessary for the FERC hydropower project. The boundary includes the upper reservoir, lower reservoir, reservoir embankments, intake and gatehouse structures, spillways, penstocks, surge-relief facilities, underground powerhouse, powerhouse access and safety areas, appurtenant controls and electrical facilities, construction and maintenance access necessary for hydropower operation, and the primary hydropower electrical facilities extending to the first point of Project use. The proposed FERC Project boundary includes the hydropower works and the electrical facilities necessary for pumped-storage operation, including the upper reservoir, lower reservoir, penstocks, underground powerhouse, ternary pump-turbine motor-generator units, hydropower controls, pumping-energy supply bus, unit electrical equipment, and the electrical interconnection facilities necessary to connect the units to the behind-the-meter energy supply and load interface. The associated 200-megawatt natural gas generator, natural gas main interconnection, and fuel-supply facilities are disclosed and mapped because the natural gas generator supplies the Project pumping load. The Applicant treats the natural gas generator as an associated behind-the-meter

pumping-energy facility and requests that FERC determine through the Integrated Licensing Process whether the generator itself, or only the electrical facilities connecting it to the pump motors, should be included within the licensed Project boundary. Off-project retail load-serving facilities and non-primary transmission facilities are not proposed as licensed hydropower works.

Figure 3-2. Principal Hydropower Project Features

Figure 3-5. Overall Isometric Site Layout (Source: Kleinschmidt Drawing Package)

Figure 3-6. Upper Reservoir Site Plan (Source: Kleinschmidt Drawing Package)

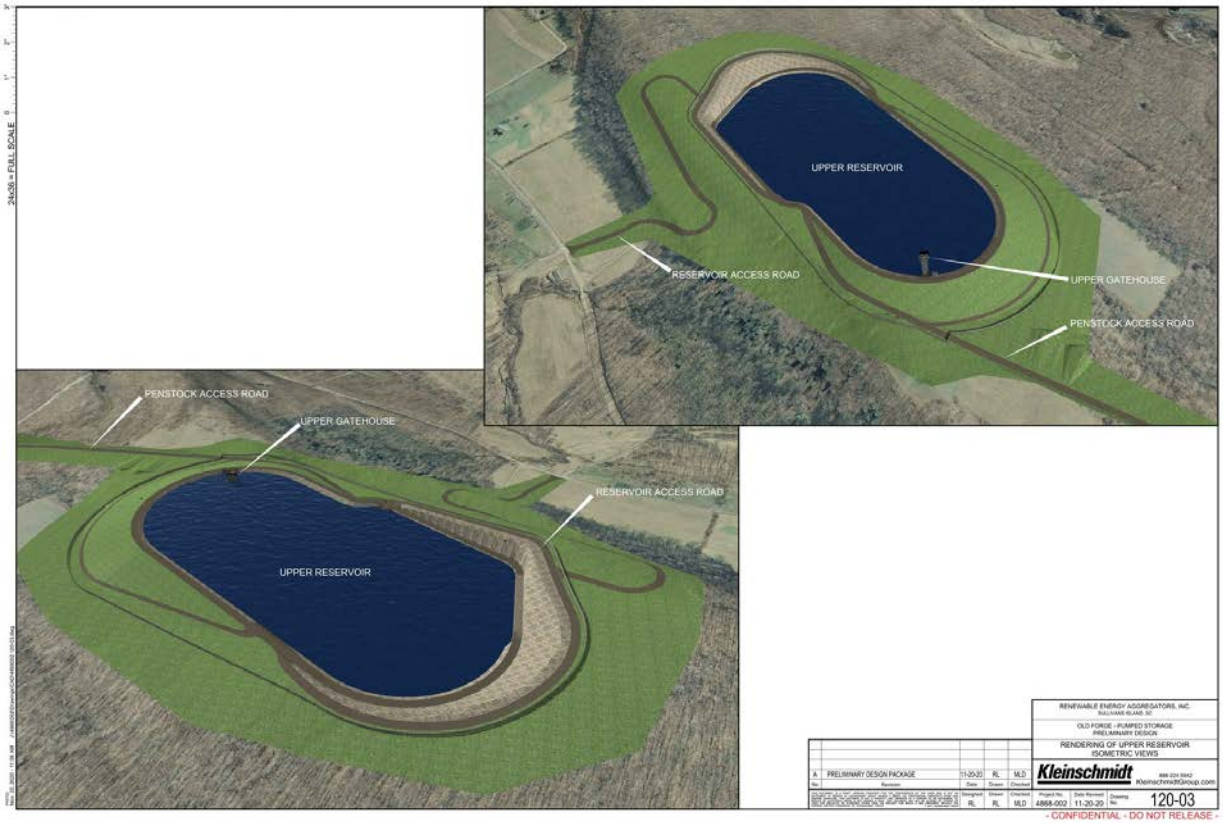


Figure 3-7. Upper Reservoir Isometric Views (Source: Kleinschmidt Drawing Package)

Figure 3-8. Lower Reservoir Site Plan (Source: Kleinschmidt Drawing Package)

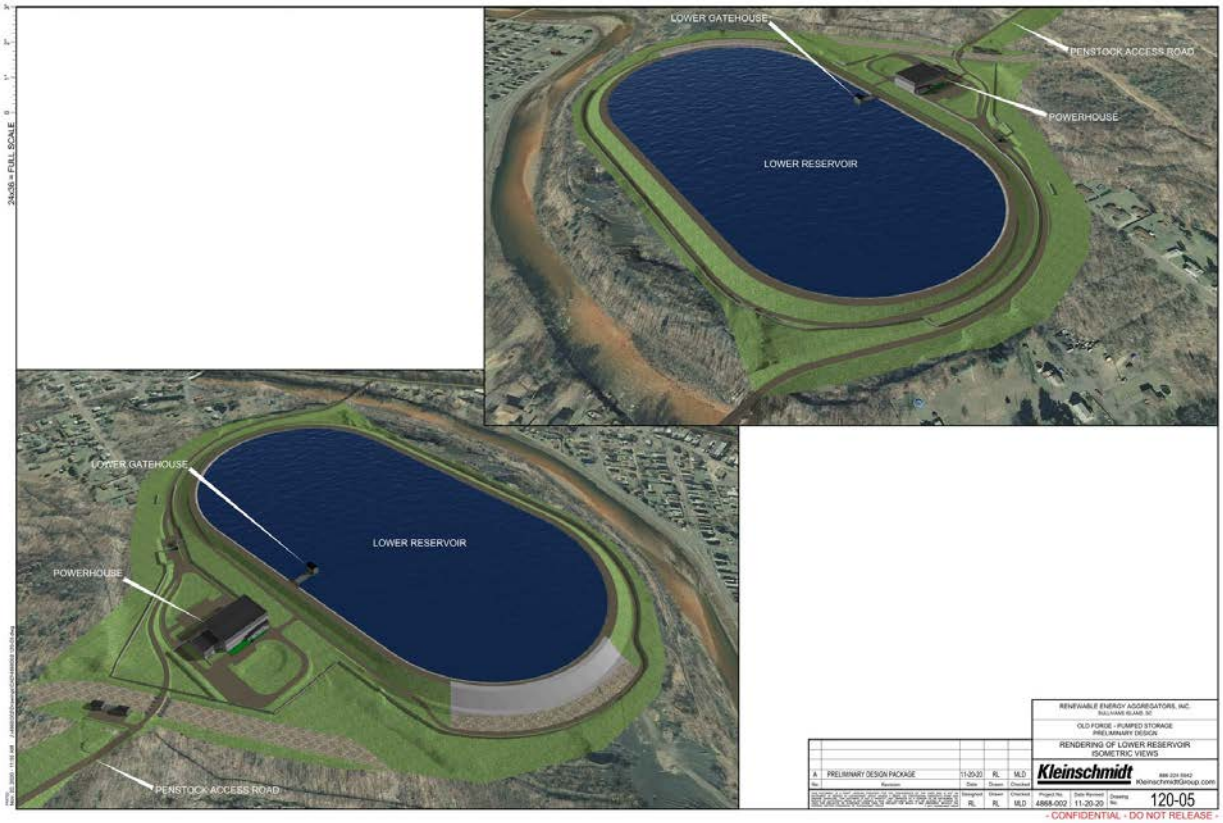


Figure 3-9. Lower Reservoir Isometric Views (Source: Kleinschmidt Drawing Package)

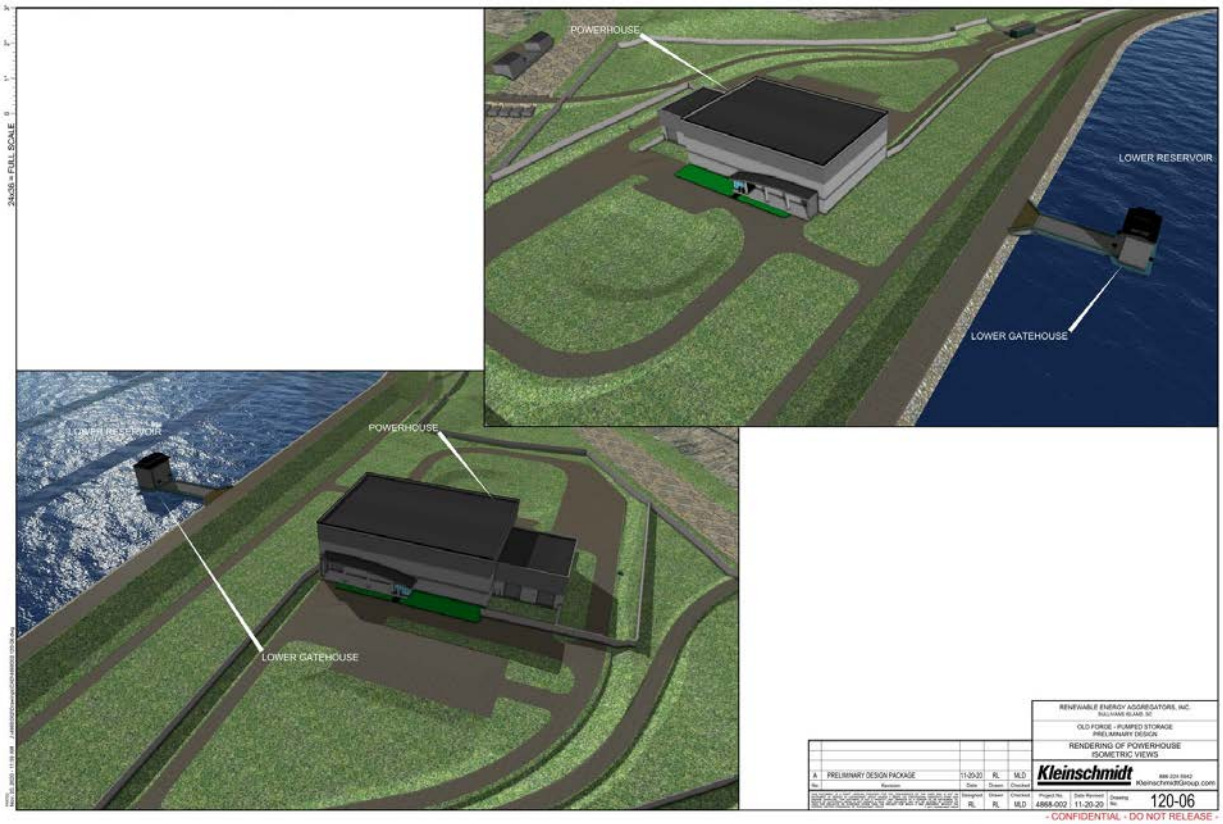


Figure 3-10. Powerhouse Isometric Views (Source: Kleinschmidt Drawing Package)

3.3 Upper Reservoir and Upper Gatehouse

The upper reservoir is formed as an engineered off-stream storage impoundment sized to support the Project's daily closed-loop generation cycle. The design basis materials identify an embankment crest elevation of approximately 1,522 feet, a spillway crest elevation of approximately 1,516 feet, a normal high water surface elevation of approximately 1,513 feet, a normal low water surface elevation of approximately 1,445 feet, a normal operating range of approximately 68 feet, a nominal reservoir invert elevation of approximately 1,442 feet, and a minimum operational water depth of approximately three feet. The same design basis identifies approximately 77 acre-feet of volume at normal low water surface, approximately 2,042 acre-feet at normal high water surface, and approximately 2,143 acre-feet at the spillway crest, subject to confirmation by the final storage curves and survey-controlled design drawings (Kleinschmidt Associates, 2020).

The upper reservoir gatehouse controls flow into the two penstocks and provides operating, isolation, inspection, and emergency-closure functions. The preliminary design record states that the intake location was selected to reduce total penstock length, satisfy submergence requirements, anchor the gatehouse foundation directly to rock, and allow the penstocks to be encased in concrete below the embankment settlement zone, thereby reducing the risk of differential movement, seepage concentration, and embankment piping. The gatehouse concept includes two independently isolatable intake structures, roller headgates designed for operation at full unit flow during emergency stop conditions, upstream bulkheads sized to match the 12.5-foot by 12.5-foot headgate opening, trashracks governed by unit-protection requirements, and an access arrangement capable of supporting gate and bulkhead installation and removal (Kleinschmidt Associates, 2020).

Because the Project is a closed-loop facility and the upper reservoir is not a natural lake or riverine impoundment, fish-screening requirements are materially different from conventional run-of-river hydropower projects. The preliminary intake record states that no fish screens were required for the isolated closed-loop configuration and that trashrack spacing would be governed by equipment-protection requirements, with approach velocities targeted to reduce submergence requirements and avoid adverse hydraulic behavior near gate slots. The design basis carries this assumption forward subject to confirmation through the reservoir source-water plan, agency consultation, and equipment-protection criteria.

The upper reservoir spillway is treated as a dam-safety and emergency-routing feature, not as an ordinary project-discharge facility. The design basis materials describe an integral spillway associated with the upper gatehouse, with a spillway crest at approximately elevation 1,516 feet and a discharge route designed to convey abnormal overflow safely away from the embankment. The preliminary record states that the upper reservoir was sized to contain the probable maximum precipitation without activating the spillway; nevertheless, the final license record evaluates spillway hydraulics, freeboard, wave run-up, discharge routing, erosion protection, and receiving-area stability in the supporting design report and dam-safety materials (Kleinschmidt Associates, 2020).

The upper reservoir is a newly constructed off-stream reservoir located on upland terrain generally north of the lower reservoir. The earlier engineering materials identify the upper reservoir embankment crest at approximately elevation 1,522 feet, the spillway crest at approximately elevation 1,516 feet, the normal high water surface elevation at approximately 1,513 feet, the normal low water surface elevation at approximately 1,445 feet, a normal operating range of approximately 68 feet, a nominal reservoir invert at approximately elevation 1,442 feet, and storage of approximately 2,042 acre-feet at the normal high water surface. The same source materials identify approximately 2,143 acre-feet of storage at the spillway crest and approximately 77 acre-feet at the normal low water surface (Renewable Energy Aggregators, 2021).

The upper reservoir configuration was refined during preliminary design to respond to property boundaries, cut-and-fill balance, seepage control, dam-safety considerations, material reuse, and geotechnical information. The design record states that the revised configuration reduced embankment height, improved stability and seepage considerations, used in-situ rock where practicable, and sought to reduce reliance on high embankment sections near residences (Renewable Energy Aggregators, 2021). The upper reservoir includes an intake and gatehouse

structure designed to control flow into the penstocks, isolate the reservoir from the conveyance system when necessary, provide maintenance and emergency closure capability, support trashrack and intake protection, and integrate with reservoir access and inspection requirements.

3.4 Lower Reservoir and Lower Gatehouse

The lower reservoir operates as the Project's receiving reservoir during generation and source reservoir during pumping. The design basis materials identify a lower reservoir embankment crest elevation of approximately 609 feet, a spillway crest elevation of approximately 605 feet, a normal high water surface elevation of approximately 604 feet, a normal low water surface elevation of approximately 559 feet, a normal operating range of approximately 45 feet, a nominal invert elevation of approximately 556 feet, approximately 101 acre-feet of volume at normal low water surface, approximately 2,026 acre-feet at normal high water surface, and approximately 2,077 acre-feet at spillway crest, subject to verification against the final design drawings and storage curves (Kleinschmidt Associates, 2020).

The lower reservoir was configured to avoid acting as a catchment for uncontrolled watershed inflows. The design record states that the lower reservoir was removed from the flow path of Red Spring Run and arranged so that, during ordinary operation, its surface-water inflow would consist principally of direct rainfall on the reservoir surface. This design approach reduces the likelihood that the lower reservoir would need to be designed as a regional flood-control basin and helps preserve the closed-loop pumped-storage operating premise, while still requiring stormwater, floodplain, spillway, and emergency-flow analyses for abnormal conditions.

The lower reservoir gatehouse supports generation discharge receipt, pumping withdrawal, unit isolation, emergency closure, and maintenance dewatering. The preliminary lower-gatehouse concept includes independently isolatable intake structures, emergency-capable headgates, a maintenance gate, bridge access for gate installation and removal, and trashrack approach-velocity considerations. The gatehouse design must account for the lower site's mine-affected foundation conditions and the possibility that settlement and seismic displacement may become critical loading conditions if portions of the gatehouse are not founded on competent rock (Kleinschmidt Associates, 2020; Haley & Aldrich, 2020).

The lower reservoir spillway concept is treated as an emergency and abnormal-operation feature. Preliminary engineering materials describe an armored lowered embankment or spillway reach capable of passing a flow greater than the combined generating capacity of the two units, with discharge routed to a swale or floodplain area rather than across an unprotected embankment face. The final supporting design report addresses spillway capacity, floodplain interaction, erosion protection, water-quality consequences of abnormal release, inspection access, and emergency response coordination.

The lower reservoir is a newly constructed off-stream reservoir at the lower Project area. The earlier engineering record identifies the lower reservoir embankment crest at approximately elevation 609 feet, the spillway crest at approximately elevation 605 feet, the normal high water surface elevation at approximately 604 feet, the normal low water surface elevation at approximately 559 feet, a normal operating range of approximately 45 feet, a nominal reservoir invert at approximately elevation 556 feet, and storage of approximately 2,026 acre-feet at the normal high water surface. The same source identifies approximately 2,077 acre-feet at the spillway crest and approximately 101 acre-feet at normal low water surface (Renewable Energy Aggregators, 2021).

The lower reservoir is located in a mine-affected area that has been significantly altered by historical coal production and processing. Haley & Aldrich describes the lower reservoir area as situated in the southern portion of the site at ground surface elevations generally ranging from approximately 550 to 600 feet and as affected by coal dump materials, wooded land, former mining activity, and historical coal production and processing operations (Haley & Aldrich, 2020). The lower reservoir includes a lower intake and gatehouse arrangement designed to support pumping, generation, maintenance isolation, emergency closure, and reservoir safety.

3.5 Penstocks and Hydraulic Conveyance

The two-penstock configuration is a deliberate design selection rather than an incidental layout feature. Kleinschmidt's preliminary penstock concept review identified independent penstocks for each unit as the preferred arrangement and reported that the two-penstock configuration was approximately $3.25 million less expensive than a single larger common penstock alternative while also allowing each unit to operate independently. Independent conveyance improves Project availability because one unit and its hydraulic path can be isolated, dewatered, inspected, or maintained while the other unit remains available within reservoir and interconnection constraints (Kleinschmidt Associates, 2020).

The preliminary penstock design uses high-strength steel, welded joints, coatings, and cathodic protection appropriate for a buried high-head conveyance. The design basis describes a penstock system using ASTM A572 Grade 65 steel, double V-groove circumferential welds with full joint efficiency, a buried configuration for the full length except where specific exposed conditions are required, internal and external protective coatings meeting AWWA liquid epoxy or polyurethane coating criteria, an optional fiberglass-reinforced polymer internal coating, and an impressed-current cathodic protection system. The final design confirms corrosion allowance, coating selection, cathodic protection, bedding, backfill, inspection provisions, and compatibility with conditioned mine-pool source water.

The penstock diameter and wall-thickness concept varies along the alignment in response to hydraulic head, pressure, velocity, and cost. The preliminary design split the penstocks into several segments and identified a 12.5-foot diameter section near the upper intake, a long 10.25-foot diameter reach through most of the alignment, and a transition to a manifold near the pump-turbine equipment. The preliminary diameter and thickness schedule included segments of approximately 400 feet at 12.5 feet diameter and 0.625-inch wall thickness; 3,055 feet, 1,257 feet, 2,112 feet, 1,368 feet, and 919 feet at 10.25 feet diameter with wall thicknesses increasing from approximately 0.625 inch to 1.125 inches, including an additional corrosion allowance (Kleinschmidt Associates, 2020).

The penstock alignment was selected to maintain a direct route while responding to geotechnical, environmental, and constructability constraints. The design basis states that the route was developed from existing topographic survey data, supported the penstocks on rock beneath the upper reservoir embankment, avoided potential wetlands and steeper Red Spring Run conditions to the extent practicable, minimized the crossing of a small stream ravine by approaching it near perpendicular, avoided a major ravine and potential wetland areas along the central to southern alignment, avoided a subdivision, and avoided certain apparent coal exploration strips in the southern alignment area (Kleinschmidt Associates, 2020).

The conveyance system is evaluated under a full hydraulic transient analysis. The preliminary design record identifies six governing transition cases for final modeling: generation startup, pumping startup, generation emergency shutdown, pumping emergency shutdown, generation-to-pumping transition, and pumping-to-generation transition. Preliminary engineering results indicate conveyance velocities ranging from approximately 7 to 30 feet per second depending on location, and the design basis notes the industry benchmark of limiting conveyance headloss to approximately five percent of gross head. The final hydraulic transient study integrates unit characteristics, reservoir elevations, wicket-gate closure, pump trip, surge-relief routing, pressure rise, air admission, emergency shutdown, and inspection conditions.

The Project conveyance system consists of two high-pressure steel penstocks connecting the upper reservoir to the underground powerhouse and lower reservoir system. The current project configuration identifies two penstocks, each approximately 9,110 feet long, generally ranging from approximately 12.5 feet in diameter to approximately 10.25 feet in diameter, with manifold transitions near the units. The two-penstock configuration supports independent unit operation and maintenance and reduces the operational risk associated with a single common conduit (Renewable Energy Aggregators, 2021).

The penstocks are designed for both generating and pumping modes. In generation mode, water moves from the upper reservoir through the upper gatehouse and penstocks to the turbine portions of the ternary units in the underground powerhouse and then discharge to the lower reservoir. In pumping mode, the motor-generator operates as a motor and the pump portion of each ternary unit moves water from the lower reservoir back to the upper reservoir through the same closed-loop conveyance system. The high head and long penstock alignment require careful hydraulic transient evaluation because unit starts, stops, emergency closures, wicket-gate movements, pump trips, and turbine-generator load rejection can create water hammer and surge conditions that affect facility safety and emergency discharge pathways.

3.6 Underground Powerhouse and Ternary Units

The powerhouse design basis provides substantially more detail than a simple description of an underground building. The powerhouse is designed as a secure, durable industrial facility rather than a public assembly space. Interior and exterior finishes are consistent with manufacturing facilities, sanitary facilities are provided near the control-room area, elevators are included for personnel and small tools, and the superstructure is designed for security and durability. These features are integral to long-term operation and maintenance because the powerhouse must support heavy equipment, high-voltage electrical systems, high-pressure hydraulic equipment, and emergency access while remaining secure from unauthorized entry (Kleinschmidt Associates, 2020).

The preliminary layout places the powerhouse in the lower Project area near Red Spring Run and the lower reservoir while avoiding higher ground that would require unnecessary excavation. The 0.2-percent annual-chance FEMA flood elevation identified in the design basis is approximately elevation 572 feet NAVD88, and the powerhouse access elevation is planned well above that elevation to protect the entrance from floodwater intrusion. This flood-related access criterion is carried forward in the PAD because powerhouse flooding would affect equipment safety, worker safety, project reliability, and emergency response (Kleinschmidt Associates, 2020).

The powerhouse excavation concept reflects both rock mechanics and groundwater control. The preliminary design describes an excavation approximately 152 feet deep from existing ground surface, consisting of approximately 30 feet in soil and approximately 122 feet in rock. A circular footprint in rock was selected to minimize required rock support and to resolve exterior hydrostatic and rock-pressure loads into hoop-compression stresses, reducing bending stresses, seepage-related cracking, and concrete shrinkage crack risk. From the top of rock to the surface, the footprint expands toward a rectangular configuration to provide equipment laydown, shop, office, and surface access functions (Kleinschmidt Associates, 2020).

Equipment handling is a controlling powerhouse design element. The powerhouse includes a loading dock where an overhead crane can remove equipment from trucks and lower it to the generator floor, and the generator level includes laydown space for initial installation and major maintenance. The main powerhouse crane is sized with capacity to install the heaviest turbine component. The preliminary layout also provides a central equipment shaft for pump equipment and torque-converter installation and maintenance, a second equipment shaft for upstream spherical valves, operators, and hydraulic power units, and a third equipment shaft for downstream butterfly valves, operators, and hydraulic power units. Smaller overhead cranes are provided in the valve equipment shafts to move valves from the bottom of each shaft to final installed locations (Kleinschmidt Associates, 2020).

The powerhouse foundation elevation remains tied to the site’s mine geology. The preliminary design basis states that the foundation must consider the Bottom Red Ash vein at approximately elevation 435 feet and that the powerhouse foundation may need to be lowered by approximately 15 feet if final geotechnical data require avoidance, treatment, or support of mine-related conditions. The PAD therefore treats the powerhouse as a geotechnically controlled underground facility requiring final mine-void probing, rock-mass classification, uplift analysis, seepage management, excavation support, and instrumentation (Kleinschmidt Associates, 2020; Haley & Aldrich, 2020).

The ternary machinery arrangement is central to the Project's flexibility. Each unit is specified to include a Francis turbine, hydraulic torque converter, single-stage pump, and electric machine capable of operating as a generator or motor. The configuration allows rapid transition between generation and pumping without reversing direction of rotation and allows short-circuit operation under selected conditions, in which the fixed pump discharge can be routed through the turbine to reduce net pumping-energy input while the machine is in pumping mode. The manufacturer's final unit data sheets, head-capability curves, efficiency information, protection requirements, and mechanical and electrical interfaces support the later license-application exhibits and the final equipment specification (Voith Hydro, 2014; Kleinschmidt Associates, 2020).

The underground powerhouse is located in the lower Project area near the lower reservoir and at the downstream end of the penstock alignment. Haley & Aldrich reports that the revised powerhouse location is north of the proposed lower reservoir footprint at the downhill terminus of the approximately 1.5-mile penstock alignment, with the base of the powerhouse structure anticipated at approximately elevation 435 feet NAVD88, about 150 feet below existing ground surface and about 110 feet below the top of competent bedrock (Haley & Aldrich, 2020). The powerhouse contains two ternary pump-turbine motor-generator units, unit valves and gates as applicable, generator and motor equipment, control systems, station service equipment, drainage and dewatering systems, inspection access, safety systems, and electrical equipment required to transform, protect, and deliver Project power to the first point of Project use and to receive pumping energy from the behind-the-meter generator supply bus.

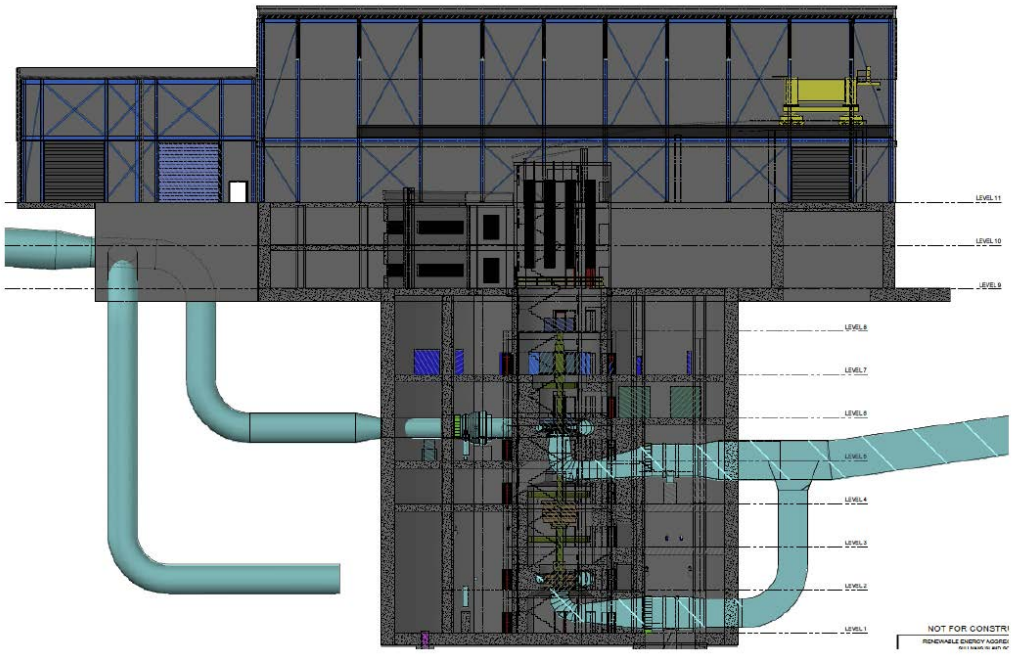


Figure 3-3. Preliminary Powerhouse Cross Section

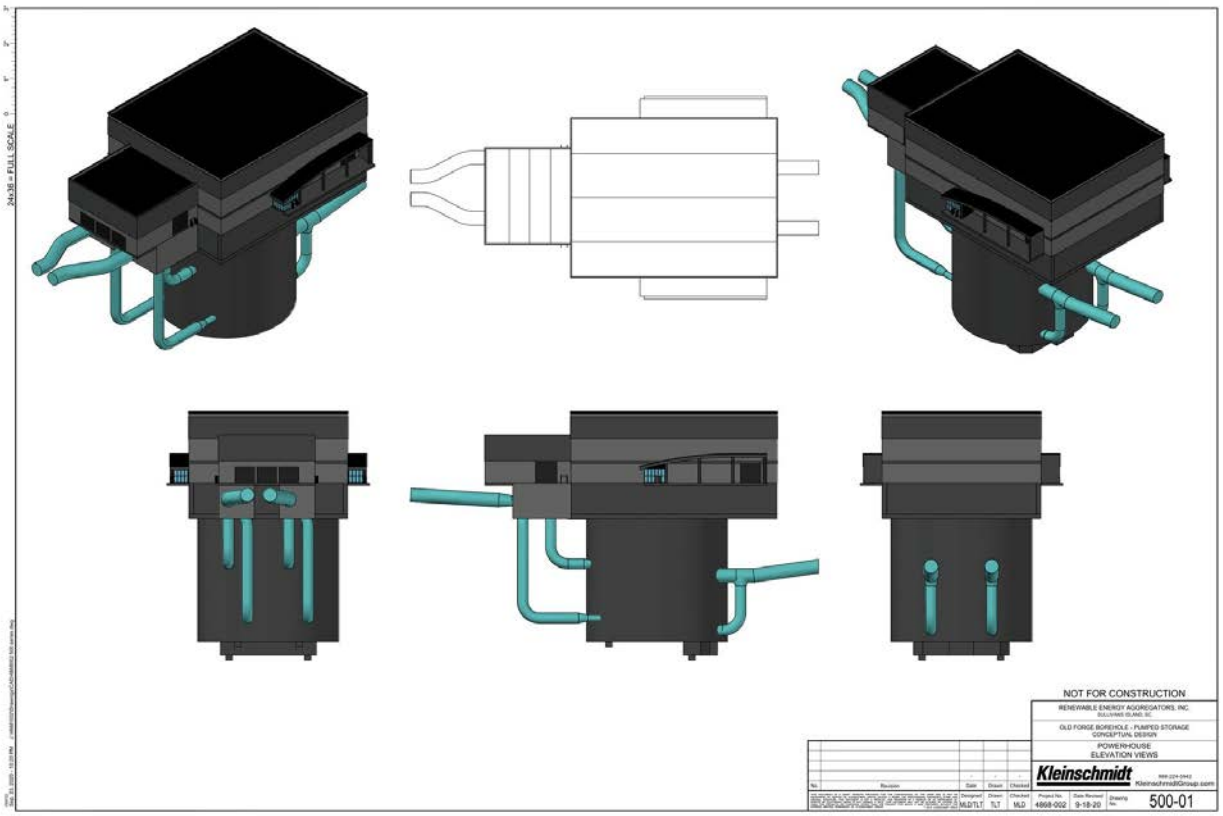


Figure 3-11. Powerhouse Elevation Views (Source: Powerhouse Drawing Package)

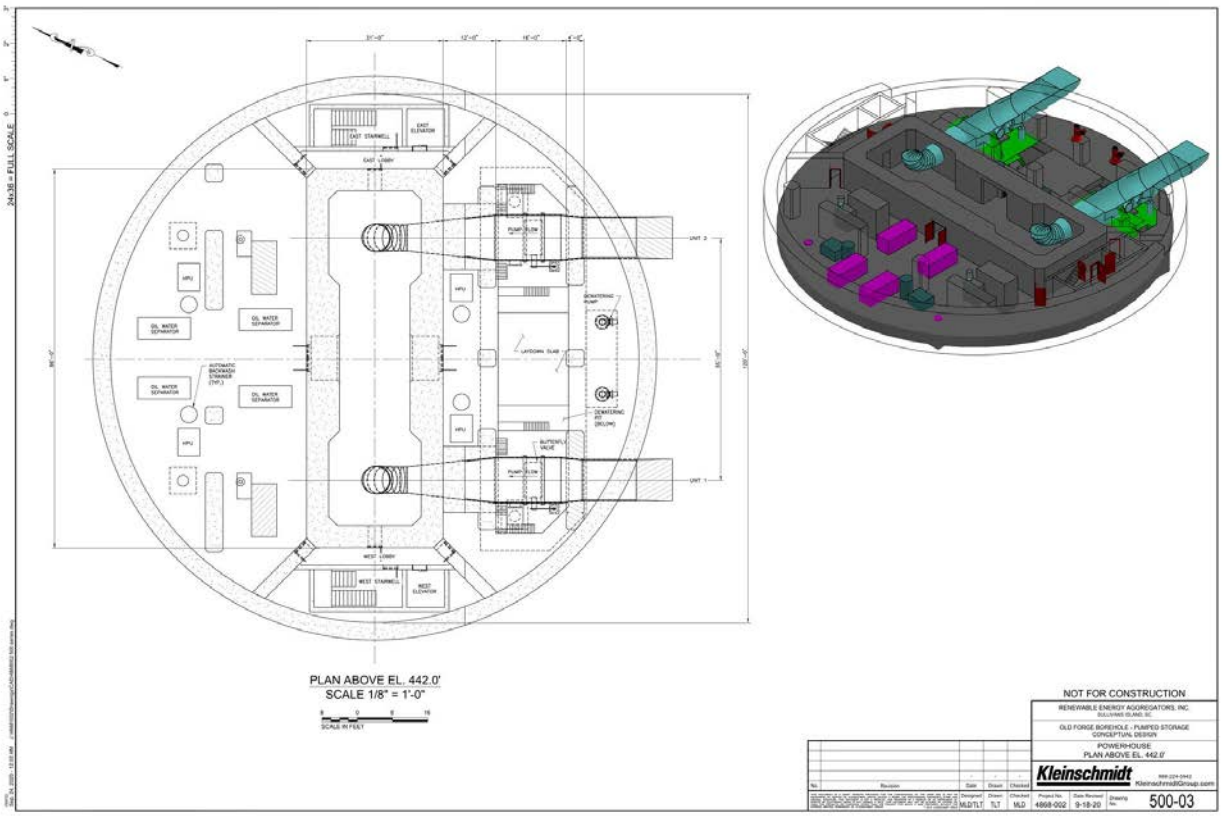


Figure 3-12. Powerhouse Plan Above Elevation 442 Feet (Source: Powerhouse Drawing Package)

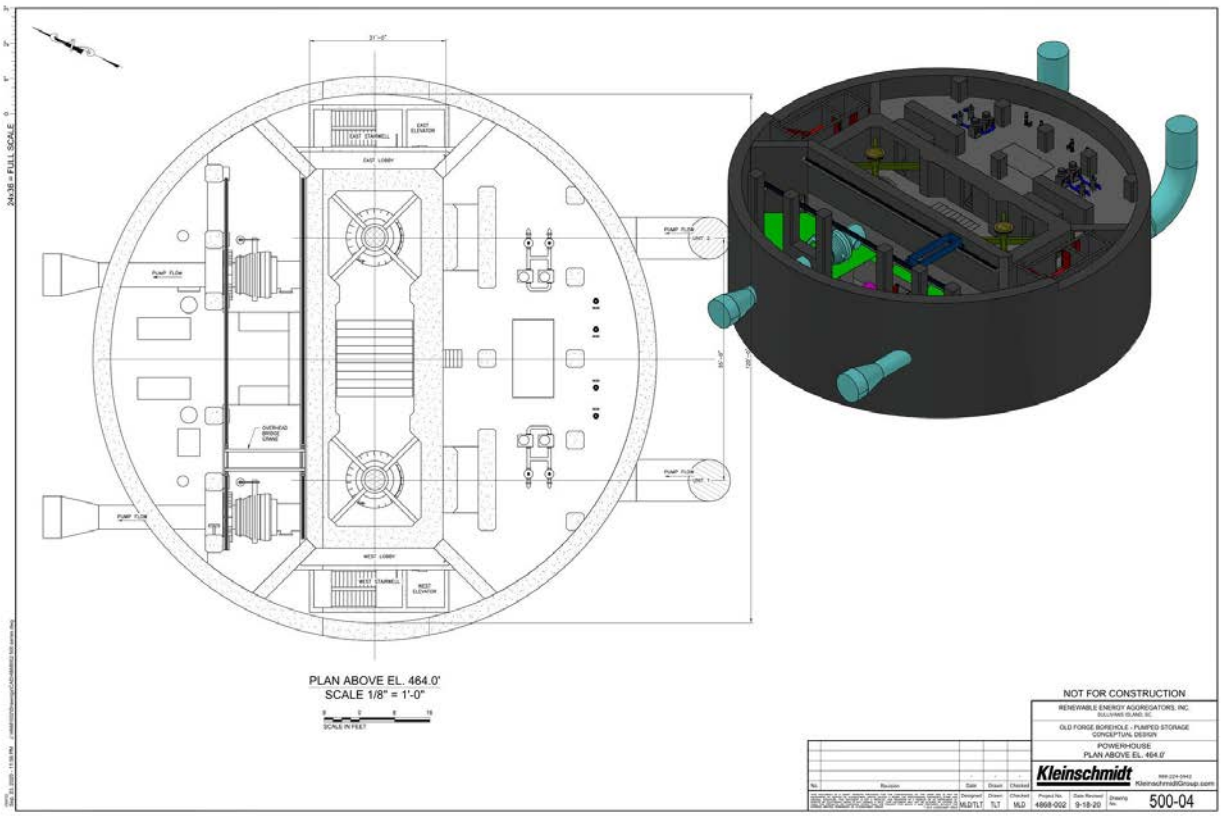


Figure 3-13. Powerhouse Plan Above Elevation 464 Feet (Source: Powerhouse Drawing Package)

The Project uses two ternary units with a combined installed generating capacity of approximately 184 megawatts. The legacy engineering record states that the facility was specified as having 184 megawatts of generation capacity and a maximum pump input of approximately 225 megawatts, and that the units were anticipated to be two 92-megawatt ternary pump-turbine type machines. The ternary unit configuration consists of a separate Francis turbine, hydraulic torque converter, and single-stage pump on a single shaft with an electric machine that can operate as either generator or motor, allowing rapid switching between pump and turbine modes without reversing the direction of rotation and allowing simultaneous pump and turbine operation under selected short-circuit conditions (Renewable Energy Aggregators, 2021; Voith Hydro, 2014).

3.7 Primary Hydropower Electrical Facilities, Pumping Energy Supply, and BTM Interconnection

The electrical scope in this PAD is defined by the Project's behind-the-meter operating configuration. The hydropower Project includes the electrical equipment necessary to connect the ternary motor-generator units to the Project pumping-energy supply bus and to deliver hydropower output to the first point of Project use. That equipment includes generator-motor terminals, generator breakers or equivalent protection equipment, excitation and control systems, station service, transformation equipment as applicable to final design, switchgear, protection and metering, and primary hydropower electrical leads. The Project is not configured as a grid-pumped storage project and does not rely on grid-supplied pumping energy.

The Project's sole pumping-energy source is a 200-megawatt behind-the-meter natural gas generating facility located within the Project property immediately adjacent to the pumped-storage works and supplied from a natural gas main adjacent to the property. In pumping mode, the ternary motor-generator units operate as motors and draw electrical power from that behind-the-meter generator through the Project electrical equipment and pumping-energy bus. Because the generator is necessary for pumping operation, the generator

compound is shown on the Project boundary and site maps as an associated pumping-energy facility for FERC boundary and environmental review.

The 200-megawatt generator capacity is treated as the available pumping-energy supply cap at PAD stage. Available preliminary source documents identify pump-input values that differ by design basis and equipment iteration. For PAD-stage review, the Applicant identifies the 200-megawatt behind-the-meter generator as the available pumping-energy supply and carries final pump input, recharge duration, unit sequencing, and operating limits into the hydraulic and electrical design studies.

In generation mode, stored water released from the upper reservoir through the ternary units produces hydropower output for the behind-the-meter load and backup-use function. The associated natural gas generator can also supply the behind-the-meter load directly when pumped-storage generation is not dispatched or when reservoir conditions require pump-back operation. The Applicant does not characterize the natural gas generator as hydropower installed capacity. The Applicant discloses it as an associated pumping-energy facility used and useful for Project pumping operation and requests FERC's boundary-treatment determination during the ILP. The environmental record addresses the generator's reasonably foreseeable air-quality, noise, fuel-supply, safety, land-use, and environmental-justice effects.

Figure 3-14 presents the preliminary two-unit ternary electrical single-line diagram for the hydropower plant equipment. The manufacturer and Kleinschmidt single-line information depicts the two motor-generator units, generator-side equipment, generator step-up transformers, station service, and high-voltage equipment within the hydropower electrical system.

Figure 3-15 presents the current behind-the-meter pumping-energy supply concept, including the adjacent natural gas main, 200-megawatt natural gas generator, Project pumping-energy bus, ternary motor-generator units, reservoirs, and behind-the-meter load interface. It is a conceptual PAD-stage electrical single-line prepared to disclose the Project's behind-the-meter pumping-energy configuration for ILP scoping. Detailed relay, protection, breaker-rating, grounding, gas-tie, fault-duty, cyber/control, and security-sensitive information is filed or maintained separately as CEII or non-public material, and final equipment ratings and settings are developed during the study and design phase.

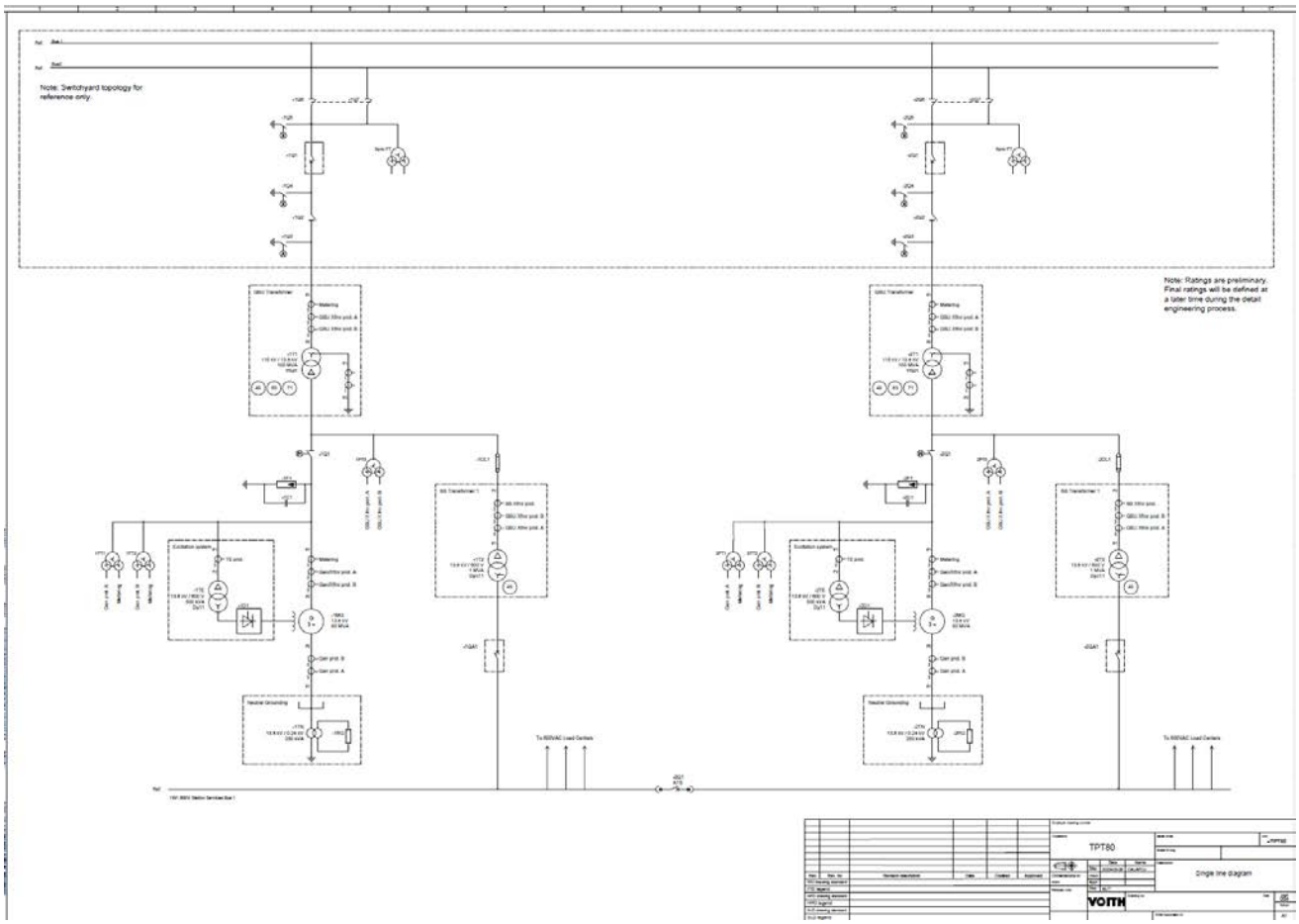


Figure 3-14. Two-Unit Ternary Pumped Storage Single-Line Diagram (Source: Voith/Kleinschmidt Electrical Drawing)

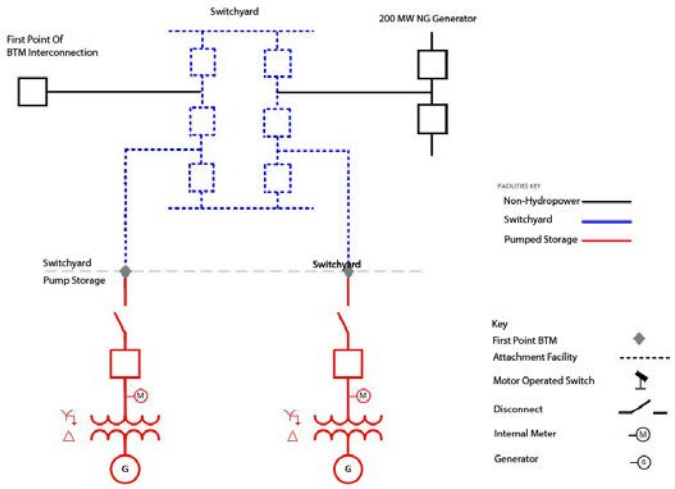


Figure 3-15. Conceptual PAD-Stage Behind-the-Meter Natural Gas Pumping-Energy Supply and Hydropower Generation Interface.

3.8 Facility Design Data Supporting License Application Exhibits

The engineering drawing package incorporated into this PAD provides the principal facility views required for PAD-stage review, including the overall site layout, upper reservoir site plan and isometric views, lower reservoir site plan and isometric views, powerhouse isometric views, powerhouse elevation views, powerhouse floor plans, upper and lower reservoir profiles, representative reservoir sections, penstock profile, preliminary rock reinforcement details, preliminary powerhouse excavation support concepts, and the two-unit electrical single-line diagram. The detailed electrical, protection, control, and security-sensitive drawings are filed or maintained separately in Appendix J, while public-safe drawings remain in the public PAD. These figures are preliminary design drawings marked not for construction, but they contain the facility geometry, arrangement, and engineering relationships necessary to support ILP scoping and agency review.

The construction access concepts in the design basis identify primary site access roads as two-directional roads with a minimum width of approximately 25 feet, maximum grade of approximately 10 percent, and minimum inner turn radius of approximately 25 feet. The penstock access road is identified as a two-directional road with a minimum width of approximately 30 feet, maximum grade of approximately 12 percent, and minimum inner turn radius of approximately 25 feet. Secondary site roads are identified as one-lane roads with pullouts, a minimum width of approximately 15 feet, and maximum grade of approximately 12 percent. Crane pads are sized for a 120-ton rough-terrain crane with minimum dimensions of approximately 28 feet in width and 34 feet in length. These access and construction criteria support the construction-effects analysis, emergency access planning, erosion and sediment control plan, and transportation review.

The construction laydown and material-management concepts in the design basis identify separate stockpile and disposal areas for common excavation, rock excavation, and coal waste, together with material-processing areas sized to support staged reuse of excavated material. The design basis recognizes that upper reservoir glacial till materials contain a high percentage of fines and may require drying before placement and compaction in embankments; embankment construction therefore favors drier and warmer construction periods. These construction constraints are relevant to the Project schedule, erosion and sediment control requirements, construction traffic, dust and noise control, wetland and stream protection, and material characterization commitments.

The existing engineering record provides the principal facility dimensions and performance data used for this PAD. The upper reservoir design basis identifies a normal high water surface elevation of approximately 1,513 feet and approximately 2,042 acre-feet of storage at that elevation, while the lower reservoir design basis identifies a normal high water surface elevation of approximately 604 feet and approximately 2,026 acre-feet of storage at that elevation. The gross head values in the design basis are approximately 954 feet maximum, 841 feet minimum, and 897.5 feet average, with preliminary rated headloss values of approximately 24 feet during generation and 44 feet during pumping. These values are based on the existing Kleinschmidt preliminary design record and are used in this PAD as the facility-capacity and hydraulic-design basis for ILP scoping (Kleinschmidt Associates, 2020).

The unit data available at PAD stage identify two ternary pump-turbine motor-generator units operating at approximately 13.9 kilovolts, 60 hertz, 450 revolutions per minute, and power factor of 0.9 to 1.0, with a turbine maximum rated flow of approximately 1,416 cubic feet per second per unit, rated turbine output of approximately 82.87 megawatts per unit in the design basis, pump maximum rated flow of approximately 1,092 cubic feet per second per unit, and maximum pump input of approximately 77.67 megawatts per unit in the design basis. The Project’s current public capacity description is 184 megawatts. The PAD identifies the engineering data available from the preliminary design record and preserves the distinction between public capacity, design-basis machine values, and manufacturer proposal values for the engineering record.

The primary electrical information available at PAD stage identifies the hydropower electrical equipment needed between the underground powerhouse, the generator-motor units, the Project pumping-energy bus, and the first

point of behind-the-meter Project use. Older Kleinschmidt interconnection materials identify a prior 230-kilovolt PPL/PJM interconnection concept, including a potential connection to a PPL Electric Utilities-owned switchyard between the Stanton and Summit substations. The current Project concept does not rely on grid-supplied pumping energy. The current PAD uses those older PPL/PJM materials only as historical electrical-system source information and relies on the behind-the-meter natural gas generator and Project-use bus as the current pumping-energy and load-delivery configuration.

The Project includes appurtenant electrical, mechanical, hydraulic, control, safety, access, and monitoring systems. Those systems include reservoir level instrumentation, intake gates, headgates, bulkheads, trashracks, valves, access roads, powerhouse drainage and dewatering equipment, crane systems, ventilation, fire protection, transformer and switchgear equipment, station service, supervisory controls, protection systems, and communications needed to operate the two-unit closed-loop pumped storage system safely.

3.9 Design Drawings, Supporting Design Report, and Project Maps

The Project drawing record includes Kleinschmidt preliminary drawing packages, powerhouse drawing sets, design-basis documents, and Haley & Aldrich geotechnical design reports. Figure 3-1, Figure 3-2, Figure 3-3, Figure 3-4, Figure 4-1, Figure 4-2, Figure 5-1, Figure 5-2, Figure 6-3, and Figure 7-1 provide the core drawing and figure set used in this PAD. These figures show the Project location and boundary context, principal hydropower features, powerhouse cross section, primary electrical single-line diagram, ternary equipment flow, plant controls architecture, mine-pool context, upper reservoir layout, penstock profile, and aquatic resource mapping.

The supporting design record addresses suitability of site conditions, the geological and geotechnical setting, laboratory test reports, borrow and material sources, stability and stress analyses for major structures, seismic loading, spillway design flood, embankment concepts, powerhouse excavation, penstock routing, and major equipment configuration. The Kleinschmidt design basis and Haley & Aldrich geotechnical reports provide the preliminary supporting-design basis for this PAD and identify the design-level analyses carried into the study plan.

The Project boundary and land maps identify the location of the principal Project works, the proposed hydropower Project boundary, property ownership or control information available at PAD stage, municipal and county context, rivers and tributaries, wetlands, floodplain limits, access roads, primary hydropower electrical facilities, and lands associated with construction or Project operation. The boundary mapping is limited to hydropower project works and required lands and waters. Context features shown outside the boundary are identified as off-project context and are not proposed as licensed hydropower works.

4.0 Project Operation, Energy Production, and Operational Control

4.1 Closed-Loop Operating Cycle

The Project’s daily operating cycle is based on storage, head, and behind-the-meter pumping energy rather than on natural streamflow diversion or grid-supplied pumping. The design basis identifies a generation cycle of approximately ten hours at or near rated flow and a preliminary pumping cycle of approximately 13.5 hours for full recharge under the preliminary pump-input assumptions. Under the current behind-the-meter configuration, pumping energy is supplied by the associated 200-megawatt natural gas generator and the actual recharge duration is governed by the final pump curves, the 200-megawatt electrical supply cap, unit sequencing, reservoir levels, and hydraulic operating limits.

During generation, both ternary units may operate concurrently subject to reservoir levels, unit availability, behind-the-meter load demand, operating limits, and water-quality and dam-safety requirements. Water stored in the upper reservoir passes through the upper intake and gatehouse, enters the two penstocks, descends under

the available gross head to the underground powerhouse, passes through the turbine portions of the ternary units, and discharges to the lower reservoir. Hydropower output serves the behind-the-meter load and backup-use function through the Project electrical equipment and first point of Project use.

During pumping, one or both motor-pump units return water from the lower reservoir to the upper reservoir using electrical power supplied by the associated 200-megawatt natural gas generator. The ternary arrangement supports independent unit operation and selected short-circuit operating modes that can reduce net pumping energy requirements by hydraulically routing part of the pumped flow through the turbine under controlled conditions. Pumping operation is controlled by reservoir water levels, pump submergence, pressure limits, generator availability, BTM load priority, hydraulic transient limits, and equipment protection. The gas generator compound is located on Project property and immediately adjacent to the pumped-storage works

Because the Project is closed loop, the normal operating cycle does not establish a bypassed reach, a downstream hydropeaking reach, or a conventional minimum-flow release point. The Project nevertheless has water-resource consequences because initial fill, make-up water, seepage, evaporation, emergency spillway events, maintenance dewatering, stormwater, and surge-relief discharges can create pathways between the closed-loop reservoirs, the mine pool, groundwater, wetlands, streams, and the Lackawanna River. Figure 4-1 illustrates the ternary equipment flow path and the relationship among the upper reservoir, pump, turbine, motor-generator, torque converter, and lower reservoir.

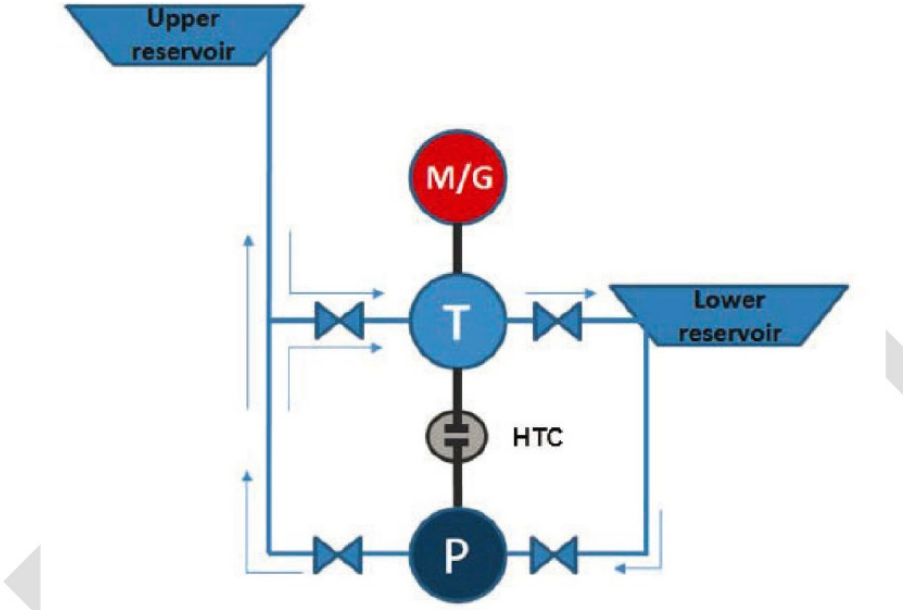


Figure 4-1. Ternary Equipment Flow Diagram

4.2 Reservoir Operation and Closed-Loop Balance

The upper reservoir normal high water surface elevation of approximately 1,513 feet and normal low water surface elevation of approximately 1,445 feet produce an operating range of approximately 68 feet. The lower reservoir normal high water surface elevation of approximately 604 feet and normal low water surface elevation of approximately 559 feet produce an operating range of approximately 45 feet. These operating ranges are large compared to natural recreational reservoirs and therefore require careful treatment of reservoir access, shoreline protection, riprap or armoring, intake submergence, rapid drawdown stability, warning signs, fencing, and wildlife safety.

The lower reservoir storage is intentionally coordinated with the upper reservoir to reduce the risk of over-pumping. The design basis indicates that the upper reservoir is larger than the lower reservoir so that operator or control-system error cannot readily activate the upper reservoir spillway through excessive pumping from a

full lower reservoir. This design concept is implemented through reservoir-level instrumentation, high-high and low-low reservoir permissives, pump and turbine trip logic, alarm setpoints, operator procedures, and automated control interlocks.

The Project is not operated as a flood-control project for the Lackawanna River watershed. The reservoirs are designed to manage direct precipitation, freeboard, wave run-up, spillway design events, and dam-safety requirements, but they are not relied upon to store regional floodwaters or to regulate natural river flows. During significant storm events, the Applicant monitors reservoir levels, spillway status, dam-safety instrumentation, access conditions, and downstream drainage routes in accordance with operating procedures and the emergency action plan.

The closed-loop balance of the Project is maintained by matching the operating volume of the upper and lower reservoirs with the generation and pumping schedules of the two ternary units. The legacy PAD and design-basis materials identify that the reservoir storage capacity was selected to support a daily generation cycle of approximately ten hours at or near the rated flow of approximately 1,416 cubic feet per second and a daily pumping cycle of approximately 13.5 hours for full recharge (Renewable Energy Aggregators, 2021; Kleinschmidt, 2020). This operating duration supports the current Project description of approximately 184 megawatts of installed capacity and approximately 1,840 megawatt-hours of long-duration storage capability.

The upper reservoir is operated between defined normal high and normal low water surface elevations. The prior engineering record identifies the upper reservoir normal high water surface elevation at approximately 1,513 feet NAVD88, the normal low water surface elevation at approximately 1,445 feet NAVD88, the normal operating range at approximately 68 feet, the nominal invert at approximately 1,442 feet NAVD88, and a storage volume of approximately 2,042 acre-feet at normal high water surface. The lower reservoir is operated within defined normal limits, with normal high water surface elevation at approximately 604 feet NAVD88, normal low water surface elevation at approximately 559 feet NAVD88, normal operating range at approximately 45 feet, nominal invert at approximately 556 feet NAVD88, and storage volume of approximately 2,026 acre-feet at normal high water surface (Renewable Energy Aggregators, 2021).

4.3 Water Source for Initial Fill and Make-Up

The Project’s primary water source for initial reservoir fill and operational make-up is mine pool water and Old Forge Borehole discharge. Tetra Tech identified the Old Forge Borehole as one of the major abandoned mine drainage discharges from the Scranton Mine Pool near the Project site and described measured flows ranging from approximately 38,500 to 54,500 gallons per minute, equivalent to approximately 55 to 78 million gallons per day, with an approximate average discharge of 65 million gallons per day (Tetra Tech, 2018). The Project uses the mine pool and borehole water-source concept as the hydrologic basis for initial filling and replacement of operational losses, subject to water-balance, water-quality, legal availability, and permitting studies developed through the ILP.

The Project is not described as dependent on a future water treatment plant. The water source is the existing regional mine pool and Old Forge Borehole discharge system, and any treatment or conditioning required for Project operation is evaluated as a water-quality management measure. Tetra Tech’s conceptual treatment work recognizes that the Old Forge Borehole discharge has high flow, variable flow, and water-quality conditions requiring data collection, effluent objective discussions, and treatment criteria development, including criteria for pumped storage hydroelectric use and discharge or restoration objectives for the Lackawanna River (Tetra Tech, 2019). For this Project, mine pool and borehole water is withdrawn, conveyed, and conditioned as necessary to protect Project equipment, maintain reservoir water quality, and avoid adverse impacts to the water resources of the basin.

4.4 Unit Control, Automation, and Manual Operation

The Project's two ternary units are capable of independent operation. Each unit is designed so that it can operate independently of the readiness of the adjacent unit, allowing one unit to be dewatered or maintained while the other unit retains operational capability within safe reservoir, hydraulic, and electrical limits. Independent operation supports power-system reliability and maintenance planning because the two-unit project can continue reduced operation during unit-specific maintenance, inspection, testing, or repair.

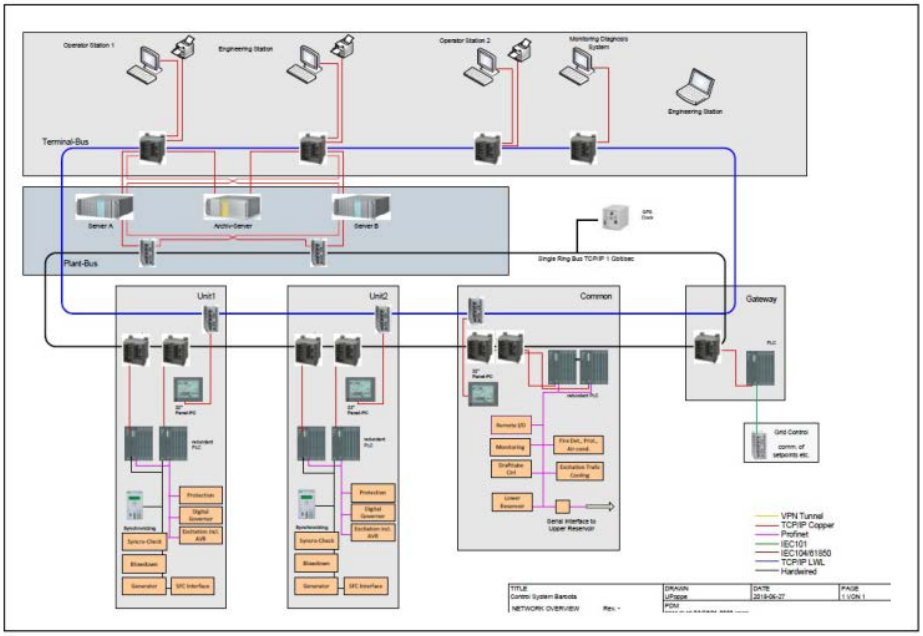
The Project is designed for automatic and manual operating capability. Voith's control-system technical description states that the plant control architecture is based on the HyCon control system, with high availability, safe operation, redundant local control boards for the two units and common auxiliary systems, redundant PLC systems, industrial Ethernet communications, process-data archiving, GPS time synchronization, individual synchronizing systems, and independent emergency shutdown protection (Voith Hydro, 2018). The control architecture includes reservoir level measurement overview screens and control-room operator stations, which are essential to enforcing reservoir operating limits and protecting against over-pumping, inadequate submergence, or unauthorized spillway activation.

VOITH

2 Architecture of the Control System

The basic design for the control system is based on our proven HyCon™ control system which is used for control of the power plant. It has been our guiding principle that the required functions could best be performed by using standard devices only.

The configuration of the control system emphasizes high availability, safe operation and high performance. This is accomplished by using homogenous hardware and optimal distribution of the functions.



1 Control System Configuration Network Overview

Figure 4-2. Preliminary Plant Control System Architecture

4.5 Hydraulic Transients, Spillways, and Emergency Operation

The Project's startup, shutdown, and emergency-stop operations are governed by transient pressure limits, unit protection, reservoir levels, and electrical system conditions. The preliminary design record identified assumed wicket-gate closing times supplied by Voith, while recognizing that those values were preliminary and subject to final transient modeling. The hydraulic transient study evaluates generation startup, pumping startup, generation emergency shutdown, pumping emergency shutdown, generation-to-pumping transition, and pumping-to-generation transition under relevant reservoir elevations, unit states, and emergency conditions.

The Project is not operated as a flood-control project for the Lackawanna River or its tributaries. The reservoirs are designed as pumped-storage water-retaining structures, not as flood storage reservoirs for regional stormwater management. The upper reservoir safely manages direct precipitation, wave run-up, freeboard, design storm, and dam-safety criteria through the embankment, spillway, and reservoir operating design. The lower reservoir similarly manages direct rainfall and abnormal water-level conditions, and the Kleinschmidt design basis addresses its relationship to the Lackawanna River floodplain. Spillway activation, surge-relief operation, construction dewatering, maintenance drawdown, or other Project water discharged outside the closed loop is evaluated for water quantity, water quality, erosion, floodplain, and aquatic-resource effects through the ILP study plan.

4.6 Energy Production and Dependable Capacity

At the planning level, operation at 184 megawatts for approximately ten hours produces a daily hydropower generation quantity of approximately 1,840 megawatt-hours. If that daily cycle were repeated every day without allowance for maintenance, outage, source-water restriction, reservoir-balance limitation, or environmental limitation, gross annual generation is approximately 671,600 megawatt-hours. The Project distinguishes gross hydropower generation from pumping energy consumption, auxiliary load, natural-gas generator operation, and net useful energy delivered to the behind-the-meter load.

Average Monthly Energy Production. At PAD stage, the Project's preliminary gross energy-production estimate assumes one full generation cycle per day at approximately 184 megawatts for approximately 10 hours, yielding approximately 1,840 megawatt-hours per day (1,840,000 kilowatt-hours per day) and approximately 671,600 megawatt-hours per year (671,600,000 kilowatt-hours per year). On that PAD-stage basis, the estimated average monthly gross energy production is: January 57,040,000 kWh; February 51,520,000 kWh; March 57,040,000 kWh; April 55,200,000 kWh; May 57,040,000 kWh; June 55,200,000 kWh; July 57,040,000 kWh; August 57,040,000 kWh; September 55,200,000 kWh; October 57,040,000 kWh; November 55,200,000 kWh; and December 57,040,000 kWh. These PAD-stage values are gross hydropower generation estimates only and do not deduct pumping energy consumption, station service, round-trip losses, maintenance outages, forced outages, dispatch limits, or final environmental and operating constraints. Final Exhibit B will refine monthly and net energy values using the Project operating model, dispatch assumptions, and final license-application engineering.

Dependable hydropower capacity is based on installed capacity, usable storage, net head, unit availability, primary BTM electrical equipment capability, reservoir operating limits, pump-back capability, and the ability to maintain the closed-loop balance with mine-pool and borehole make-up water. Because the Project is not a run-of-river facility, dependable capacity is not determined by natural streamflow duration curves in the same manner as a conventional hydropower project. The dependable-capacity analysis relies on stored water volume, unit readiness, net head, BTM generator-supported pump-back capability, and the operating limits established through the hydraulic transient, water-balance, and dam-safety analyses. the gas generator compound is located on Project property and immediately adjacent to the pumped-storage works

The associated 200-megawatt natural gas generator supplies the pumping-energy input and can also serve the behind-the-meter load directly when pumped-storage generation is not dispatched. The hydropower Project's

184-megawatt output is available to serve the behind-the-meter load during generation and backup operation. The Applicant does not characterize the natural gas generator as hydropower installed capacity, but discloses it as an associated pumping-energy facility used and useful for Project pumping operation and requests FERC's boundary treatment determination during the ILP. The PAD therefore evaluates natural-gas pumping supply, air quality, noise, fuel-source, safety, and environmental justice effects in the environmental and consultation sections.

The operation analysis addresses adverse, mean, and high-water years by focusing on mine-pool and Old Forge Borehole source-water availability, reservoir make-up requirements, evaporation, seepage, source-water quality, and spillway or abnormal discharge conditions rather than variable natural river inflow through a turbine. During drought periods, the key issue is the availability and quality of borehole or mine-pool make-up water and the magnitude of consumptive losses. During high-flow and storm periods, the key issues are source-water quality variation, construction and operation stormwater control, reservoir freeboard, spillway routing, floodplain conditions, and water-quality protection.

5.0 Water Resources, Mine Pool Hydrology, Source Water, and Water Quality

5.1 Watershed and Mine Pool Setting

The Lackawanna River flows nearly sixty miles through an approximately 350-square-mile watershed before reaching the North Branch Susquehanna River, and the lower watershed includes a long history of anthracite mining, mine drainage, culm banks, stormwater, combined sewer influences, and river-corridor redevelopment. The watershed conservation plan describes the lower three miles of the Lackawanna River below the Old Forge Borehole as severely degraded by acid mine drainage, iron deposition, and loss of aquatic habitat, while also describing upper and middle watershed reaches with recovering coldwater fisheries and important riparian, recreational, and cultural resources (Lackawanna River Corridor Association, 2001).

The Old Forge Project's hydrologic setting is inseparable from the Northern Anthracite Coal Field. EPCAMR explains that anthracite mine pools formed when mine dewatering ceased and underground workings flooded until spillover points were reached at tunnels, shafts, boreholes, or other openings. The mine pools may contain billions of gallons of water, are often stratified into shallow top water and deeper bottom water, and can serve both as sources of abandoned mine drainage and as potential water resources when characterized and managed carefully (EPCAMR, 2011).

The mine pool cross-section included in the Project source record depicts the Lackawanna River corridor, the Lackawanna-Wyoming Syncline, mined and unmined coal veins, the Old Forge Borehole, the Duryea Outfall, the pool-level relationship near the lower valley, and the schematic system of gangways, shafts, barrier pillars, and flooded mine voids. This conceptual figure supports the PAD's characterization of the Old Forge Borehole as a continuous discharge from a regional mine-pool system rather than a small local seep or speculative supply source (Lackawanna River Corridor Association, n.d.).

The Project is proposed in the Lackawanna River watershed of the Susquehanna River Basin. The Lackawanna River Watershed Conservation Plan describes the Lackawanna River as flowing nearly sixty miles through an approximately 350-square-mile watershed in northeastern Pennsylvania before entering the North Branch Susquehanna River, and identifies the Lackawanna Valley as part of the northern anthracite coal field, a landscape extensively altered by historical coal mining, abandoned mine lands, culm banks, mine drainage, urban development, stormwater, and combined-sewer influences (Lackawanna River Corridor Association, 2001).

The lower Lackawanna River has a long history of water-quality impairment associated with abandoned mine drainage. The watershed plan states that aquatic health declines downstream through Scranton toward Pittston, with the Old Forge Borehole identified as a principal source of abandoned mine drainage effects in the lower three miles of the river to the confluence. The Project is evaluated against this existing watershed baseline and

distinguishes existing mine-drainage impairment from effects caused by Project construction, operation, source-water capture, conditioning, storage, or discharge (Lackawanna River Corridor Association, 2001).

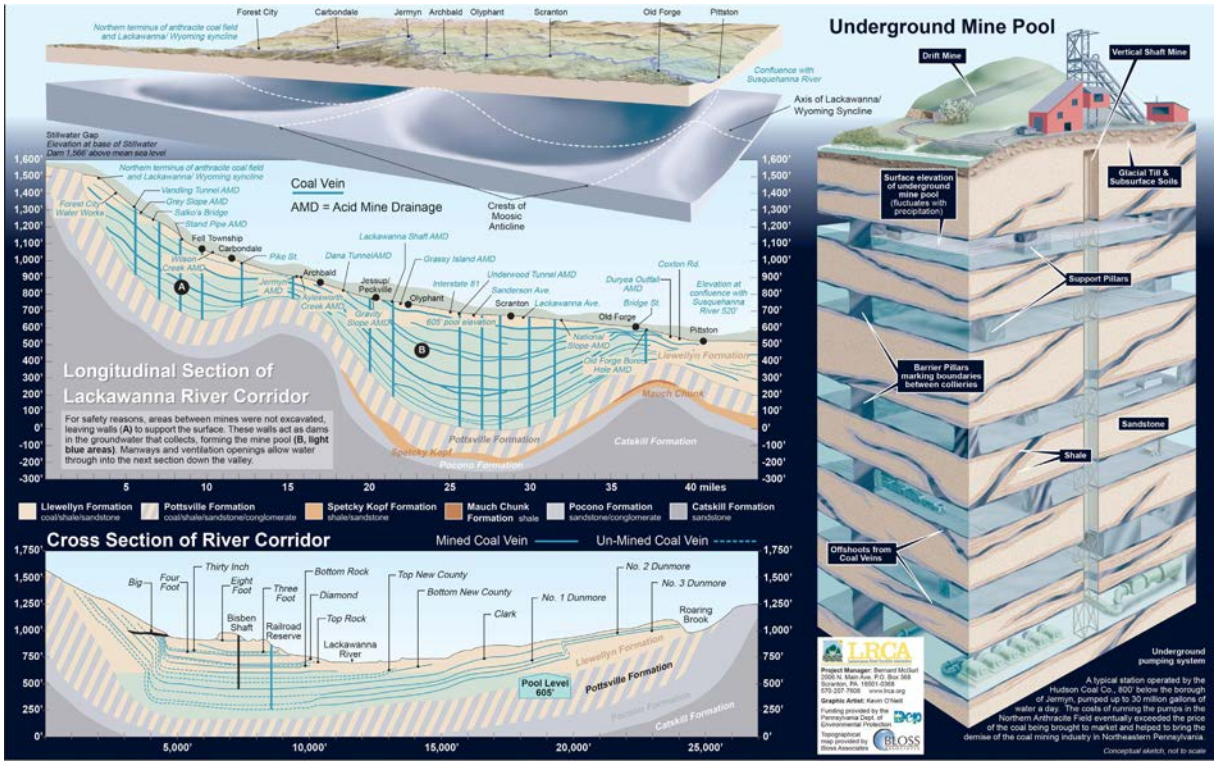


Figure 5-1. Mine Pool and Old Forge Borehole Context

5.2 Old Forge Borehole and Mine Pool Source Water

Tetra Tech's mine pool review identifies the Old Forge Borehole and the Duryea Outfall as the principal discharges from the Scranton Mine Pool near the Project site. The Old Forge Borehole was drilled next to the Lackawanna River streambed and is reported to discharge approximately 97 cubic feet per second based on Growitz's 1985 data. The Duryea Outfall is located downstream and is reported to discharge approximately 34 cubic feet per second. Tetra Tech further identifies the Old Forge Borehole as approximately three miles upstream of the Lackawanna-Susquehanna confluence and reports measured flows ranging from approximately 38,500 to 54,500 gallons per minute, equivalent to approximately 55 to 78 million gallons per day, with an approximate average of 65 million gallons per day (Tetra Tech, 2018).

The initial fill volume of the upper and lower reservoirs at normal high water surface is approximately 4,068 acre-feet before accounting for penstock volume, unit waterways, operational freeboard, seepage, evaporation, and conditioning system volume. That reservoir volume is approximately 1.325 billion gallons. At an average borehole discharge of approximately 65 million gallons per day, the gross reservoir volume is equivalent to about twenty days of average borehole flow; at the lower and upper reported borehole-flow range of approximately 55 to 78 million gallons per day, the same volume is equivalent to roughly seventeen to twenty-four days of borehole flow. These calculations are provided only to frame the scale of the source-water resource; the actual initial-fill plan is governed by water-quality conditioning, legal availability, SRBC review, reservoir construction sequencing, and operational controls (Tetra Tech, 2018; Kleinschmidt Associates, 2020).

Tetra Tech reports that the Metropolitan Scranton Mine Pool extends from Old Forge upstream under Scranton, Dunmore, and other mid-valley communities to Archbald, that south of Archbald the mines form one large underground pool of approximately 33 square miles, and that U.S. Bureau of Mines estimates placed the lower Lackawanna Basin mine pools at approximately 5.5 billion gallons of water, with approximately 3.7 billion gallons in the Metropolitan Scranton Mine Pool. Those values demonstrate that the mine-pool resource is

regional in scale and requires a source-water analysis that addresses both continuous discharge and stored mine-pool volume (Tetra Tech, 2018).

The source-water plan captures or otherwise use mine pool and Old Forge Borehole water for initial fill and operational make-up. Treatment is not described as a speculative external dependency. Instead, water conditioning is evaluated as a Project management measure to protect turbines, pumps, penstocks, gates, reservoirs, cooling and auxiliary systems, and any receiving waters affected by Project discharges. The conditioning analysis identifies the source-water quality needed for equipment protection, the water quality needed for reservoir management, and the water quality required for any discharge under PADEP or SRBC review.

The regional mine pool system is an extensive anthropogenic groundwater reservoir created by the flooding of abandoned underground anthracite mines. EPCAMR explains that after the decline of deep mining and the end of mine dewatering, underground mines throughout the Anthracite Region filled with groundwater until spillover points were reached at the lowest available mine openings, shafts, boreholes, tunnels, or other discharge features, producing numerous large abandoned mine discharges that persist across the region (EPCAMR, 2011).

The Old Forge Borehole is the central source-water feature for this Project. Tetra Tech's mine pool review identifies the Old Forge Borehole and Duryea Outfall as the principal discharges from the Scranton Mine Pool near the Project site and reports that the Old Forge Borehole was drilled next to the streambed of the Lackawanna River and discharges approximately 97 cubic feet per second based on the Growitz record cited in that report (Tetra Tech, 2018). Tetra Tech further states that the Old Forge Borehole is located approximately three miles upstream of the Lackawanna River and Susquehanna River confluence in Old Forge Borough, that it discharges at approximately elevation 578 feet above sea level, and that measured flows at the borehole have ranged from approximately 38,500 to 54,500 gallons per minute, with an average discharge of approximately 65 million gallons per day (Tetra Tech, 2018).

5.3 Water Quality

Tetra Tech's 1975 through 2012 summary of Old Forge Borehole samples reports average discharge of approximately 100 cubic feet per second, average water temperature of approximately 14.5 degrees Celsius, average sulfate of approximately 490 milligrams per liter, average total iron of approximately 29 milligrams per liter, average manganese of approximately 2.9 milligrams per liter, average alkalinity of approximately 86 milligrams per liter, average total suspended solids of approximately 6 milligrams per liter, and average total dissolved solids of approximately 734 milligrams per liter. Those data characterize the borehole as an impaired mine-drainage source requiring chemical and operational management (Tetra Tech, 2018).

Tetra Tech's later conceptual design proposal summarized EPCAMR sampling from 2011 through 2013 and reported average field pH of approximately 6.33, average laboratory pH of approximately 6.57, average alkalinity of approximately 100 milligrams per liter as calcium carbonate, average acidity of approximately negative 71 milligrams per liter as calcium carbonate, average total iron of approximately 15.8 milligrams per liter, average manganese of approximately 1.93 milligrams per liter, average sulfate of approximately 294.5 milligrams per liter, average total suspended solids of approximately 5.83 milligrams per liter, and average total dissolved solids of approximately 721 milligrams per liter. These later data indicate that water chemistry is variable. The current source record does not contain a new seasonal or storm-event sampling campaign beyond the historical Tetra Tech and EPCAMR data; current water-quality sampling is identified as a proposed study need if requested by agencies or required for final conditioning and permit criteria (Tetra Tech, 2019).

Water-quality conditioning evaluates iron oxidation and precipitation, manganese behavior, sulfate, acidity, alkalinity, hardness, total dissolved solids, total suspended solids, dissolved oxygen, corrosion, scaling, sedimentation, and water temperature. Conditioning requirements may differ for reservoir fill, pump-turbine use, cooling-water use, emergency discharge, spillway flow, maintenance dewatering, and any return to the

Lackawanna River. The Project does not assume that one historical sample or one conceptual treatment calculation is sufficient to define operational water quality.

The water-quality analysis addresses reservoir chemistry after cycling and storage using the historical Tetra Tech and EPCAMR data as the existing information base. Because mine pool water may be stratified and may contain elevated dissolved constituents, cycling through the reservoirs is evaluated for potential changes in dissolved oxygen, temperature, iron precipitation, turbidity, sediment accumulation, pH, and scaling potential. Additional sampling is not represented as complete in this PAD; it is identified as an ILP study element that supplies current source-water, reservoir-water, and discharge-pathway data if FERC, PADEP, SRBC, or equipment criteria require updated chemistry.

The water-quality record for the Old Forge Borehole indicates mine drainage with elevated dissolved constituents requiring conditioning and management for hydropower use. Tetra Tech's 2018 review summarizes Old Forge Borehole samples from 1975 through 2012 and reports an average discharge of approximately 100 cubic feet per second, average water temperature of approximately 14.5 degrees Celsius, average sulfate of approximately 490 milligrams per liter, average total iron of approximately 29 milligrams per liter, average manganese of approximately 2.9 milligrams per liter, average alkalinity of approximately 86 milligrams per liter, average total suspended solids of approximately 6 milligrams per liter, and average total dissolved solids of approximately 734 milligrams per liter (Tetra Tech, 2018).

Tetra Tech's 2019 conceptual work provides additional water-quality information from EPCAMR sampling during 2011 through 2013. That record reports average field pH of approximately 6.33, average laboratory pH of approximately 6.57, average alkalinity of approximately 100 milligrams per liter as calcium carbonate, average acidity of approximately negative 71 milligrams per liter as calcium carbonate, average total iron of approximately 15.8 milligrams per liter, average total manganese of approximately 1.93 milligrams per liter, average total aluminum of approximately 0.05 milligrams per liter, average sulfate of approximately 294.5 milligrams per liter, average total suspended solids of approximately 5.83 milligrams per liter, average total dissolved solids of approximately 721 milligrams per liter, and average specific conductance of approximately 1,065 microsiemens per centimeter (Tetra Tech, 2019).

5.4 Closed-Loop Water Balance

The closed-loop water balance distinguishes between working storage, source-water withdrawal, make-up water, consumptive loss, discharge, and return to the basin. Working storage is the volume cycled between the two reservoirs during generation and pumping. Source-water withdrawal is the water captured from the mine pool or Old Forge Borehole for initial fill or make-up. Consumptive losses include evaporation, unrecovered seepage, water retained in sediments or treatment residuals, and any water not returned to the Susquehanna River Basin. Discharge includes spillway flow, surge-relief flow, construction dewatering, maintenance drawdown, or other Project water leaving the closed-loop reservoirs.

The existing source-water balance record combines Tetra Tech's Old Forge Borehole flow information with Kleinschmidt's reservoir storage and operating data. The upper reservoir storage at normal high water is approximately 2,042 acre-feet and the lower reservoir storage at normal high water is approximately 2,026 acre-feet, for a PAD-stage combined reservoir storage reference of approximately 4,068 acre-feet, or approximately 1.326 billion gallons. Tetra Tech's reported Old Forge Borehole flow range of approximately 55 to 78 million gallons per day and approximate average discharge of 65 million gallons per day provides a preliminary source-water basis for evaluating fill duration, subject to actual capture rate, conditioning capacity, regulatory approvals, reservoir sequencing, operational constraints, and environmental conditions.

The SRBC consumptive-use analysis focuses on water lost to the basin rather than water cycled internally between the reservoirs. SRBC's general guidance regulates withdrawals of 100,000 gallons per day or more over a 30-day average and consumptive water use of 20,000 gallons per day or more when water is not returned to the basin undiminished in quantity. SRBC correspondence in the Project record also states that water passing

through a project and ending up back in the river or stream is not considered consumptive use, while water lost during the process may be subject to consumptive-use fees and review (Susquehanna River Basin Commission, 2017, 2022).

The closed-loop balance is maintained through reservoir storage, cycling limits, make-up water from the mine pool and borehole system, and monitoring of evaporation, seepage, precipitation, and operational losses. The final water-balance calculation for the license application accounts for initial fill, fill rate, source-water withdrawal, direct precipitation, evaporation, seepage through reservoir foundations and embankments, maintenance dewatering, emergency discharge, and any return-flow or consumptive-use accounting needed for SRBC review. This PAD identifies the existing data inputs and the study method; it does not represent that a final calibrated mine-pool model or final regulatory water-balance calculation has already been completed.

Figure 5-2. Upper Reservoir Layout

Figure 5-3. Lower Reservoir Layout (Source: Kleinschmidt Drawing Package)

5.5 SRBC and PADEP Water-Resource Coordination

SRBC Policy No. 2021-04 encourages the use and reuse of waters impacted by abandoned mine drainage, while preserving full regulatory review and requiring that such use avoid adverse impacts to basin waters. The policy applies to abandoned-mine-drainage-impacted surface waters, mine pools, mine workings, groundwater, and connected discharges when regulatory thresholds are met. The Old Forge Project is aligned with the policy objective of beneficially using impacted water rather than higher-quality supplies, but the Project still requires a technically complete SRBC application or consultation record addressing withdrawal quantity, consumptive loss, return-flow disposition, and monitoring (Susquehanna River Basin Commission, 2021).

PADEP's Clean Water Program comments identify the need to address the Project's effect on the overall Q7-10 of the Lackawanna River, and also state that a reservoir-related NPDES permit may be required and that a Water Quality Management permit or NPDES permit may be required for conditioning facilities depending on final design. The PAD therefore carries forward a Q7-10 and low-flow water-quality analysis that considers both flow quantity and pollutant loading. The analysis evaluates whether source-water capture, conditioning, storage, or return-flow management alters low-flow conditions, iron loading, pH, dissolved oxygen, temperature, or aquatic habitat in the lower Lackawanna River (Pennsylvania Department of Environmental Protection, 2022).

The Project coordinates water-resource study development with PADEP, SRBC, EPCAMR, USGS, watershed organizations, county conservation districts, and affected municipalities. The coordination record includes the source-water plan, water-balance calculation, historical water-quality record, conditioning criteria, Q7-10 discussion, reservoir seepage evaluation, and consultation on any NPDES, Water Quality Management, SRBC withdrawal, or consumptive-use review that applies to the final hydropower-only design.

The Susquehanna River Basin Commission regulatory framework is relevant to the Project's source-water and operational make-up strategy. SRBC's water-use guidance states that withdrawals of 100,000 gallons per day or

more over a 30-day average from any source or combination of sources within the basin are regulated, and that consumptive water use of 20,000 gallons per day or more is regulated when water is not returned to the basin undiminished in quantity (Susquehanna River Basin Commission, 2017). SRBC Policy No. 2021-04 encourages use and reuse of waters impacted by abandoned mine drainage while making clear that withdrawal and consumptive use remain subject to full regulatory review under 18 C.F.R. Part 806 and must avoid adverse impacts to basin waters (Susquehanna River Basin Commission, 2021).

PADEP's Clean Water Program comments identify the need for careful water-resource evaluation. PADEP stated that, based on the SIC Code provided, an NPDES permit for discharges of stormwater associated with industrial activities was not required, but that an NPDES permit for the pumped storage reservoir may be required, and that, based on final design, a Water Quality Management permit or NPDES permit may be required for water-conditioning facilities associated with the mine drainage source. PADEP also stated that the application submission is to include a discussion of the Project impact on the overall Q7-10 of the Lackawanna River (Pennsylvania Department of Environmental Protection, 2022). The Project's water-resource studies therefore include low-flow, Q7-10, water-quality, source-water, and consumptive-use evaluations.

The Lackawanna River Corridor Association, now operating as the Lackawanna River Conservation Association, is a key watershed stakeholder for the Project because its watershed planning materials identify the Old Forge Borehole and the lower Lackawanna River abandoned mine drainage discharges as major watershed concerns. The LRCA watershed planning record supports the public-interest basis for addressing Old Forge Borehole mine drainage while preserving the need for a current FERC licensing record evaluating Project-specific water quantity, water quality, construction, and operation effects (Lackawanna River Corridor Association, 2001).

The August 1, 2018 multi-stakeholder site walk, including DOI/FWS and participants associated with PADEP, LRCA, Congressman Cartwright, the Mayor of Duryea, and local stakeholders as reflected in Applicant records, is relevant to the water-resource record because it preceded DOI/FWS correspondence resolving earlier federal resource concerns about the revised Project footprints and Commerce Clause waters. The Project does not rely on that historical site visit as a current agency approval, but the record shows that the mine pool and lower Lackawanna River setting, Red Spring Run condition, relocated upper reservoir footprint, and lower reservoir footprint were reviewed in the field during early Project development (Renewable Energy Aggregators, 2018; U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018).

6.0 Geology, Soils, Mine Conditions, Geotechnical Engineering, and Dam Safety

6.1 Regional Geology and Physiography

The Project lies along the boundary of the Appalachian Plateaus and Ridge and Valley physiographic provinces, within the Northern Anthracite Coal Field and the Lackawanna Basin. Haley & Aldrich describes the Project site as an approximately two-mile stretch of land north of the Lackawanna River between Old Forge, Duryea, and Ransom Township areas in Lackawanna and Luzerne Counties. The upper reservoir site is situated on a topographic upland with ground surface elevations generally ranging from approximately elevation 1,400 to elevation 1,600 feet, while the lower reservoir site is situated at the base of that upland with ground surface elevations generally ranging from approximately elevation 550 to elevation 600 feet (Haley & Aldrich, 2020).

The regional geology consists of folded and faulted sedimentary rocks associated with the Anthracite Valley Section of the Ridge and Valley Province. Haley & Aldrich reports that the proposed upper reservoir area lies in a geologic setting that includes the Pocono Formation and the Pottsville Group, while the lower Project area is underlain by the Llewellyn Formation, which is generally described as interbedded sandstone, siltstone, shale, conglomerate, and coal (Haley & Aldrich, 2020). EPCAMR similarly describes the Northern Anthracite Field

as part of an intensely folded and faulted coal-bearing region, with mine hydrology influenced by the structural and stratigraphic framework of the anthracite coal measures (EPCAMR, 2011).

6.2 Historical Mining and Mine Conditions

The prior mining history of the lower Project area is a controlling design consideration. Haley & Aldrich states that the lower reservoir site was historically used as a coal production and processing facility in the early and mid-1900s and that the former coal facility included a coal breaker, boiler house, vertical coal mine shafts, a railroad loading yard, and sediment basins in the western and southern portions of the property. Anthracite coal mining in the area was dominated by the William A. Colliery and the Hallstead Colliery, and the Main Shaft, Tender Shaft, and Babylon Shaft were among the shafts associated with mining of the Marcy Vein, Clark Vein, Top Red Ash Vein, Middle Red Ash Vein, and Bottom Red Ash Vein (Haley & Aldrich, 2020).

The abandoned mine setting is evaluated in the manner contemplated by FERC's mine-site pumped storage guidance. FERC's 2019 guidance explains that abandoned mine sites may present safety and environmental hazards associated with underground workings, shafts, openings, subsidence, mine drainage, contaminated materials, unstable slopes, and incomplete mine records, and recommends using federal and state abandoned mine databases, mine maps, county records, local publications, and other sources to identify site-specific abandoned mine conditions (Federal Energy Regulatory Commission, 2019).

6.3 Subsurface Investigation Record

Haley & Aldrich's preliminary exploration program included twenty-four geotechnical test borings, observation wells, acoustic and optical televiewer surveys, seismic refraction surveys, downhole packer testing, laboratory testing, and soil resistivity testing. Borings were advanced to depths ranging from approximately 20 to 230 feet below ground surface and were distributed across upper reservoir, lower reservoir, penstock, and powerhouse areas. This investigation provides a substantial preliminary basis for the PAD and remains a preliminary design record to be supplemented by design-level investigations at the final facility locations (Haley & Aldrich, 2020).

The seismic refraction surveys provide important depth-to-rock and rock-profile information. Upper reservoir arrays were interpreted as having bedrock depths ranging from approximately 4 to 145 feet below ground surface, while lower reservoir arrays were interpreted as having depth to bedrock ranging from approximately 19 to 95 feet below ground surface in areas where historical mining disturbance affected data quality. Those results explain why reservoir layout, penstock routing, embankment height, and powerhouse excavation concepts were refined during preliminary design (Haley & Aldrich, 2020).

Groundwater data from observation wells are essential to the reservoir seepage, powerhouse dewatering, mine-pool interaction, and uplift analyses. The preliminary data report identifies groundwater-elevation ranges at several upper and lower project locations, including upper-area readings near elevations 1,496 to 1,458 feet and lower-area readings near elevations 560 to 545 feet. Those measurements are combined with long-term monitoring, packer testing, mine-pool-level review, and seepage modeling to determine construction and operating effects (Haley & Aldrich, 2020).

The Project team has completed substantial preliminary subsurface investigation work. Haley & Aldrich conducted a preliminary design-phase exploration program between June and July 2020, including twenty-four geotechnical test borings designated HA20-01 through HA20-22, with supplemental offset borings where drilling complications occurred. The borings were advanced to depths ranging from approximately 20 to 230 feet below ground surface, and the investigation included soil sampling, rock coring, groundwater observation wells, acoustic and optical televiewer surveys, seismic refraction surveys, downhole packer testing, and soil resistivity testing (Haley & Aldrich, 2020).

The seismic refraction work provides information concerning depth to bedrock and rock profile variability. Haley & Aldrich reports that Hager-Richter Geoscience performed seismic refraction surveys along fourteen

seismic arrays totaling approximately 27,100 linear feet, with arrays in the upper reservoir, lower reservoir, and penstock areas. Near the upper reservoir, overburden compressional wave velocities ranged from approximately 1,400 to 7,200 feet per second and bedrock velocities ranged from approximately 9,400 to 17,200 feet per second, while depth to bedrock varied from approximately 4 to 145 feet below ground surface. Near the lower reservoir, overburden velocities ranged from approximately 1,350 to 3,100 feet per second and interpreted bedrock velocities ranged from approximately 8,900 to 16,200 feet per second, with depth to bedrock interpreted between approximately 19 and 95 feet below ground surface (Haley & Aldrich, 2020).

6.4 Reservoir Foundations, Seepage, and Embankment Design

The preliminary reservoir geotechnical design record states that the upper reservoir is approximately 72 acres and is created by constructing an earthen dam, and requires significant clearing, grading, and excavation, with preliminary grading quantities on the order of 5.5 million cubic yards of soil and rock excavation. The same record states that the lower reservoir is approximately 92 acres and is created by an earthen dam, and requires approximately 2.1 million cubic yards of soil excavation, with rock excavation not anticipated for the lower reservoir. These quantities are material to construction sequencing, haul routes, erosion and sedimentation control, dust, noise, material reuse, and environmental mitigation (Haley & Aldrich, 2020).

The preliminary embankment approach is to reuse suitable onsite material to the maximum practicable extent while ensuring that embankment zones satisfy stability, permeability, compaction, and filter criteria. The design basis identifies the use of earthen embankments, seepage control through and under embankments, inspection roads along crests and toes, interior stabilization for rapid drawdown, exterior slopes generally around 3H:1V where appropriate, interior earth cuts around 2H:1V where appropriate, steeper rock cuts where stable, and piezometers within and downstream of embankments. These features is refined in the supporting design report and dam-safety design package (Kleinschmidt Associates, 2020; Haley & Aldrich, 2020).

Seepage control is evaluated as a safety, environmental, and water-balance issue. For the upper reservoir, seepage analysis focuses on glacial till, weathered bedrock, bedrock discontinuities, abutment contacts, embankment core performance, and high-head hydraulic gradients. For the lower reservoir, seepage analysis focuses on coal refuse, fill, alluvium, glaciolacustrine silt, outwash, weathered bedrock, and possible mine-influenced groundwater. The preliminary design basis includes seepage cutoffs, drains, filters, low-permeability zones, liners, and related foundation-treatment measures where the final design analysis identifies the need for such features.

The upper reservoir subsurface conditions generally consist of glacial till over bedrock, with local reworked natural fill, shallow weathered bedrock, and variable bedrock depths. These conditions provide potential sources of embankment materials and foundation support but require detailed evaluation of variable overburden thickness, ravine-shaped bedrock topography, seepage potential, rapid drawdown, and long-term embankment stability. The lower reservoir subsurface conditions are more strongly influenced by historical mining, coal refuse, alluvium, outwash, glaciolacustrine deposits, and mine-related fill, and require evaluation of settlement, seepage, excavation, foundation improvement, material reuse, coal refuse management, and potential mine-subsidence hazards (Haley & Aldrich, 2020).

Reservoir seepage is evaluated as both an engineering issue and an environmental issue. Haley & Aldrich's preliminary reservoir report includes reservoir seepage evaluations for the upper and lower reservoirs, discussion of hydrogeologic parameters, preliminary SEEP/W models, and final design evaluation needs. The upper reservoir's high-elevation upland location requires evaluation of seepage through glacial till, bedrock discontinuities, embankment cores, abutments, and foundation contact zones. The lower reservoir's mine-affected and valley-bottom setting requires evaluation of seepage through coal refuse, alluvium, glaciolacustrine silt, outwash, weathered bedrock, and mine-influenced groundwater (Haley & Aldrich, 2020).

6.5 Underground Powerhouse and Red Ash Vein Conditions

The powerhouse foundation and excavation is evaluated against known and suspected historical mine workings. Haley & Aldrich identified the revised powerhouse footprint as within the mapped limits of the Top, Middle, and Bottom Red Ash Veins, with approximate elevations near 450 to 460 feet for the Top Red Ash Vein, 435 to 445 feet for the Middle Red Ash Vein, and 425 to 435 feet for the Bottom Red Ash Vein in the revised powerhouse area. These elevations overlap the anticipated powerhouse foundation zone and require mine-map review, additional borings, probing, grout evaluation, rock support, and construction contingency planning (Haley & Aldrich, 2020).

The powerhouse support-of-excavation design addresses soil excavation, rock excavation, rockfall, seepage inflow, hydrostatic uplift, lateral pressures, foundation support, temporary and permanent rock reinforcement, Red Ash Vein conditions, and instrumentation. Haley & Aldrich's preliminary powerhouse report identifies these topics as design issues, and the Project's final supporting design report develops them into construction-level procedures, monitoring thresholds, and contingency responses (Haley & Aldrich, 2020).

The circular excavation concept below generator level is evaluated in final design because it offers potential structural advantages under external hydrostatic and rock pressures. The final design evaluates whether the powerhouse is lowered or otherwise adjusted to avoid or better manage coal seam conditions, whether grouting or backfill treatment is needed, and how to manage groundwater inflow and mine-pool interaction during construction and operation.

The underground powerhouse is the most geotechnically complex Project feature because it is located deep below existing ground surface, within rock, and near historical mine workings. Haley & Aldrich states that the revised powerhouse location is north of the proposed lower reservoir footprint at the downhill terminus of the approximately 1.5-mile penstock, with the powerhouse foundation level anticipated at approximately elevation 435 feet NAVD88, approximately 150 feet below existing ground surface and approximately 110 feet below the top of competent bedrock (Haley & Aldrich, 2020).

The powerhouse design must account for the Red Ash coal veins and associated historic room-and-pillar mining. Haley & Aldrich reports that historical mine plans indicate the revised powerhouse footprint is within the limits of the Top, Middle, and Bottom Red Ash Veins, with approximate elevations of the Top Red Ash Vein near elevation 450 to 460 feet, Middle Red Ash Vein near elevation 435 to 445 feet, and Bottom Red Ash Vein near elevation 425 to 435 feet at the revised powerhouse area (Haley & Aldrich, 2020). These elevations overlap or lie near the anticipated powerhouse foundation level, and any collapsed or partially collapsed mine workings could materially affect excavation support, foundation design, rock reinforcement, grouting, and long-term powerhouse stability.

6.6 Penstock Alignment and Profile

The penstock alignment traverses steep terrain, variable overburden, mine-affected materials, utility corridors, and rock and soil slopes. Haley & Aldrich's geotechnical data report states that the northern penstock seismic array showed overburden velocities between approximately 3,600 and 5,200 feet per second, bedrock velocities between approximately 9,400 and 13,300 feet per second, and depth to bedrock varying from approximately 17 to 58 feet below ground surface, while the southern penstock array showed overburden velocities between approximately 1,800 and 2,050 feet per second, bedrock velocities between approximately 9,900 and 12,500 feet per second, and depth to bedrock varying from approximately 18 to 67 feet below ground surface (Haley & Aldrich, 2020).

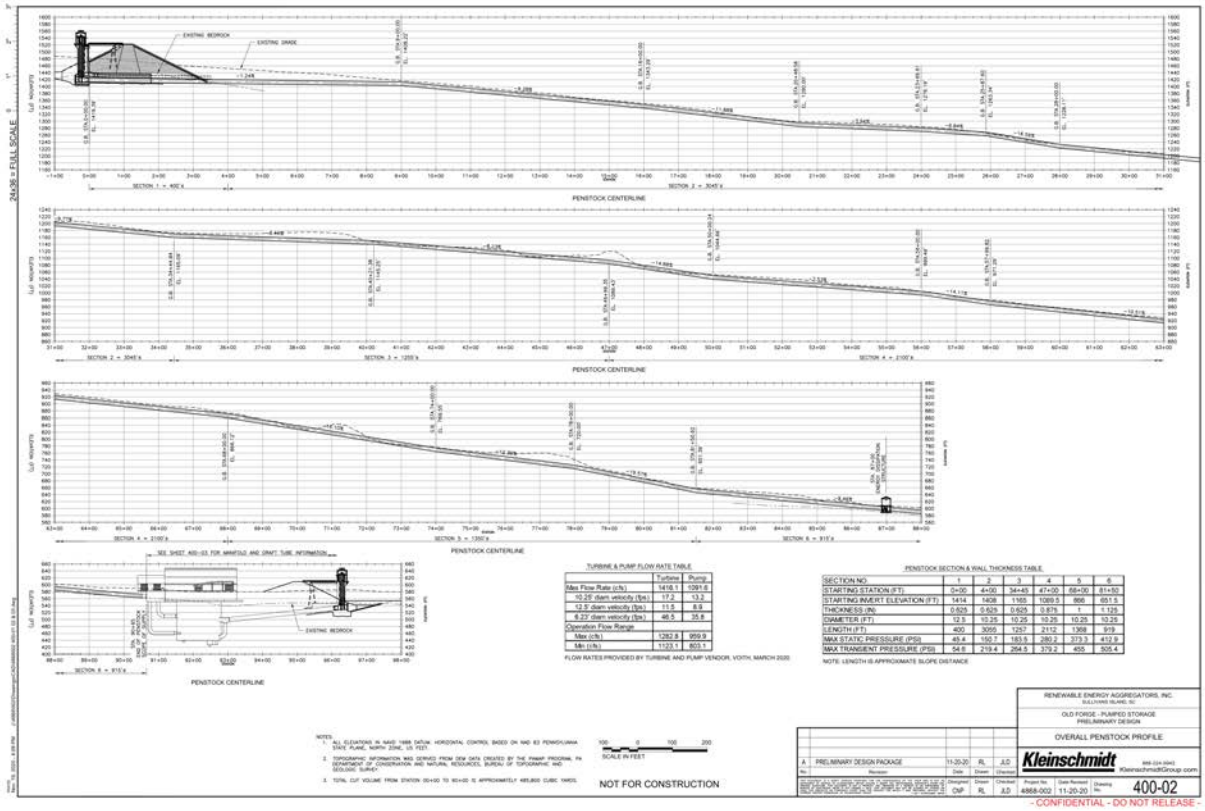


Figure 6-3. Penstock Profile

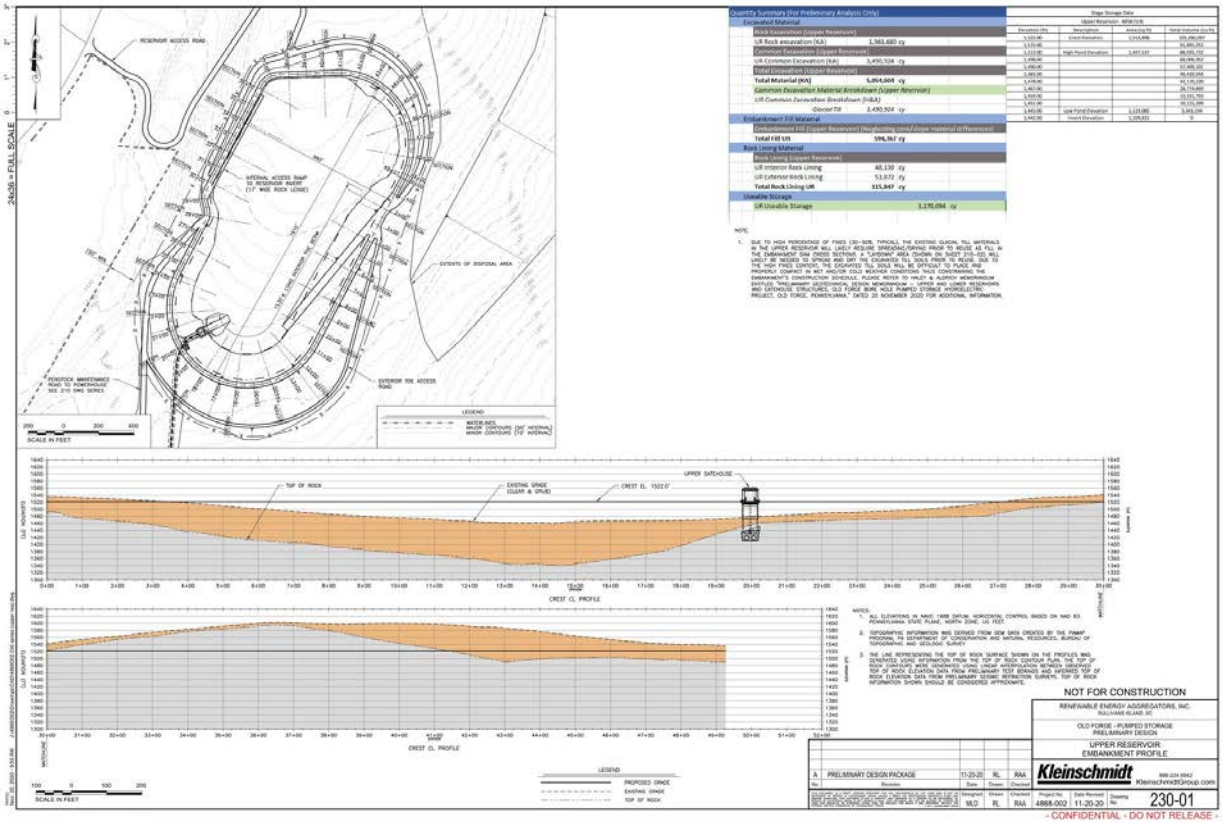


Figure 6-4. Upper Reservoir Embankment Profile (Source: Kleinschmidt Drawing Package)

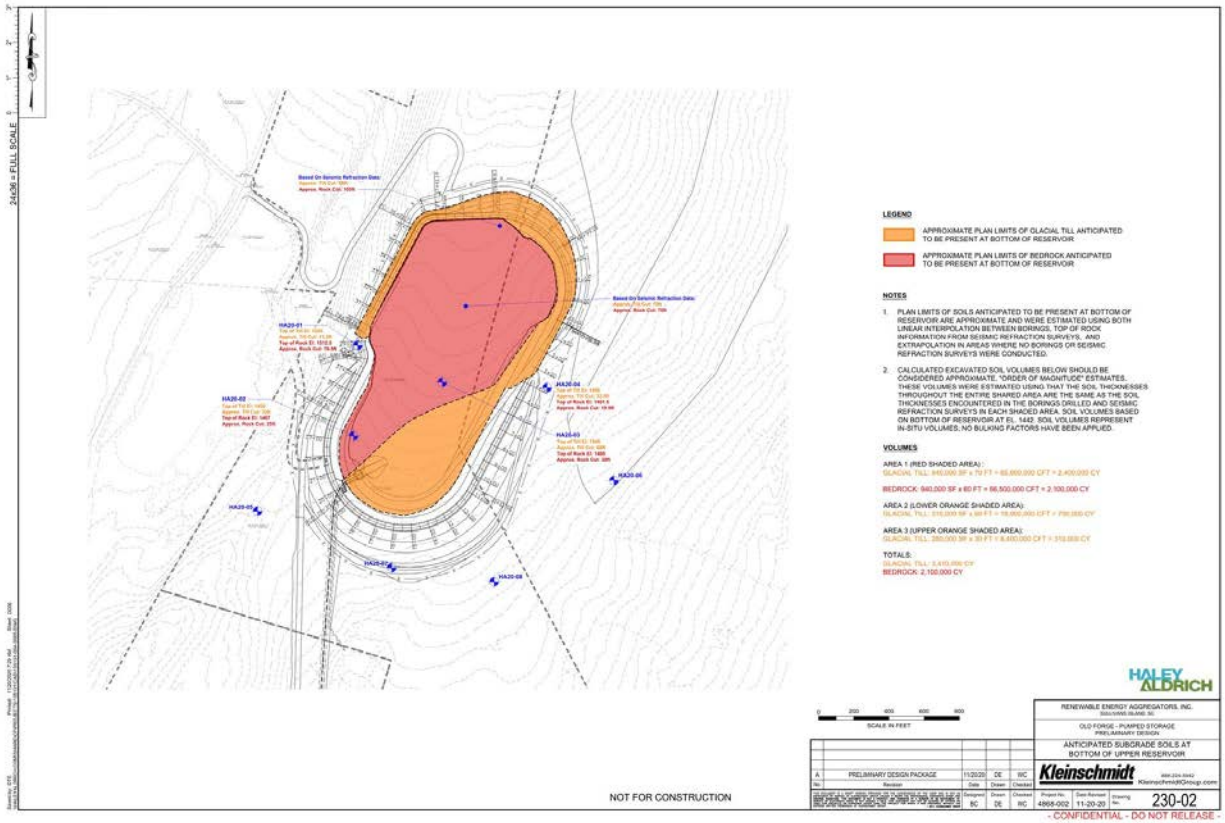


Figure 6-5. Upper Reservoir Excavation and Bedrock Plan (Source: Kleinschmidt Drawing Package)

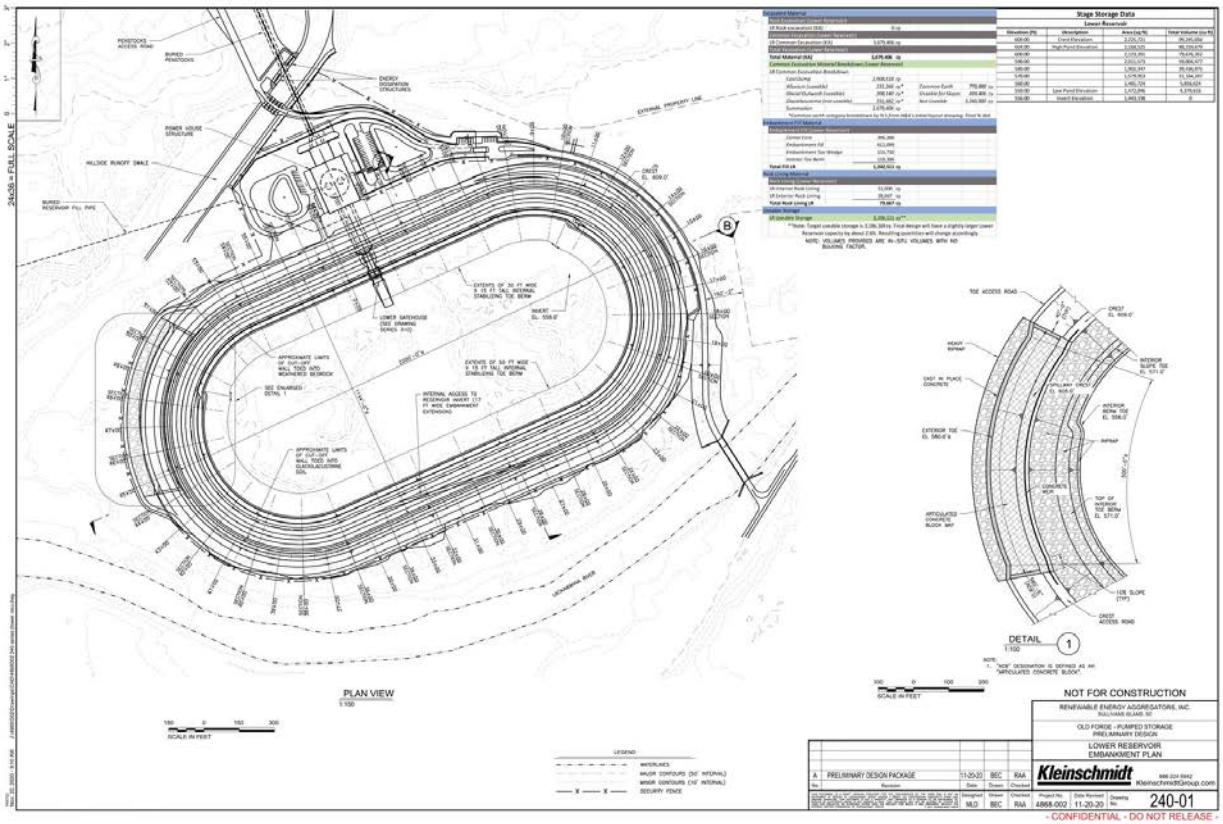


Figure 6-6. Lower Reservoir Layout and Subgrade Conditions (Source: Kleinschmidt Drawing Package)

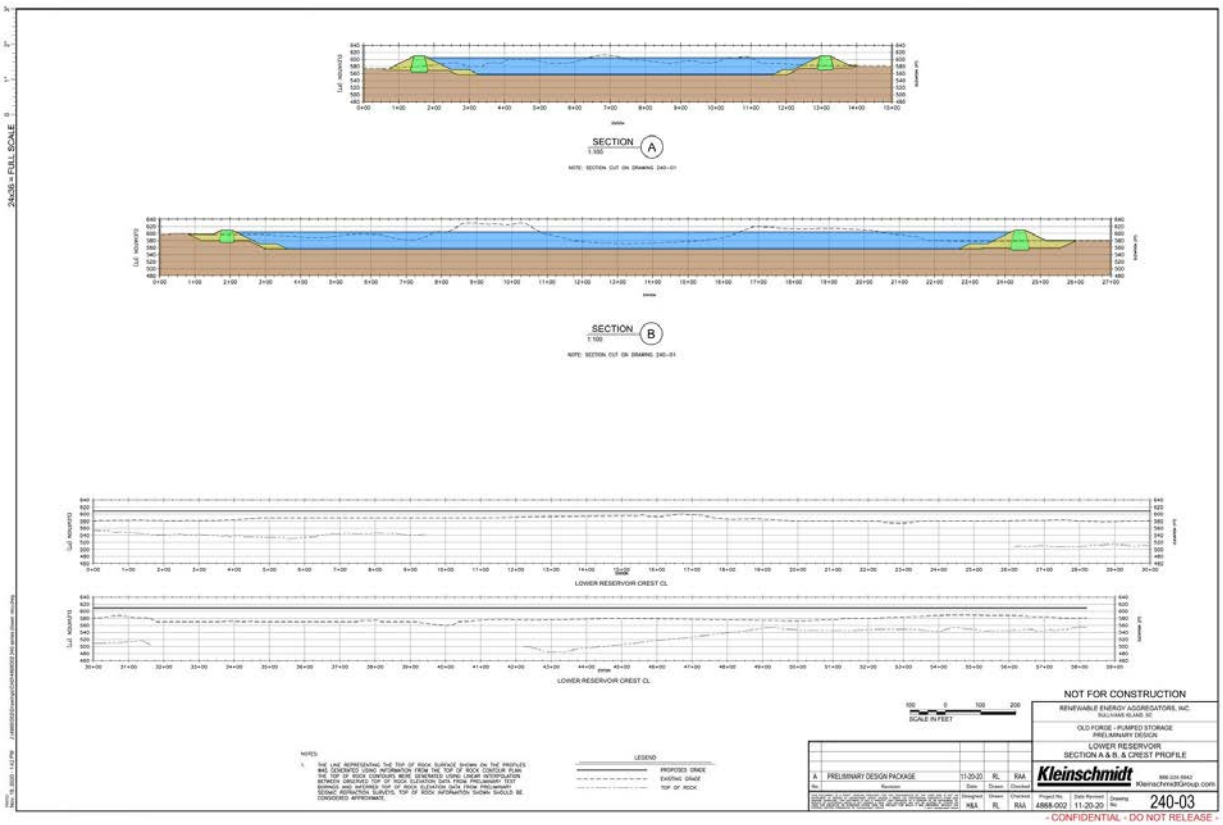


Figure 6-7. Lower Reservoir Embankment Profile (Source: Kleinschmidt Drawing Package)

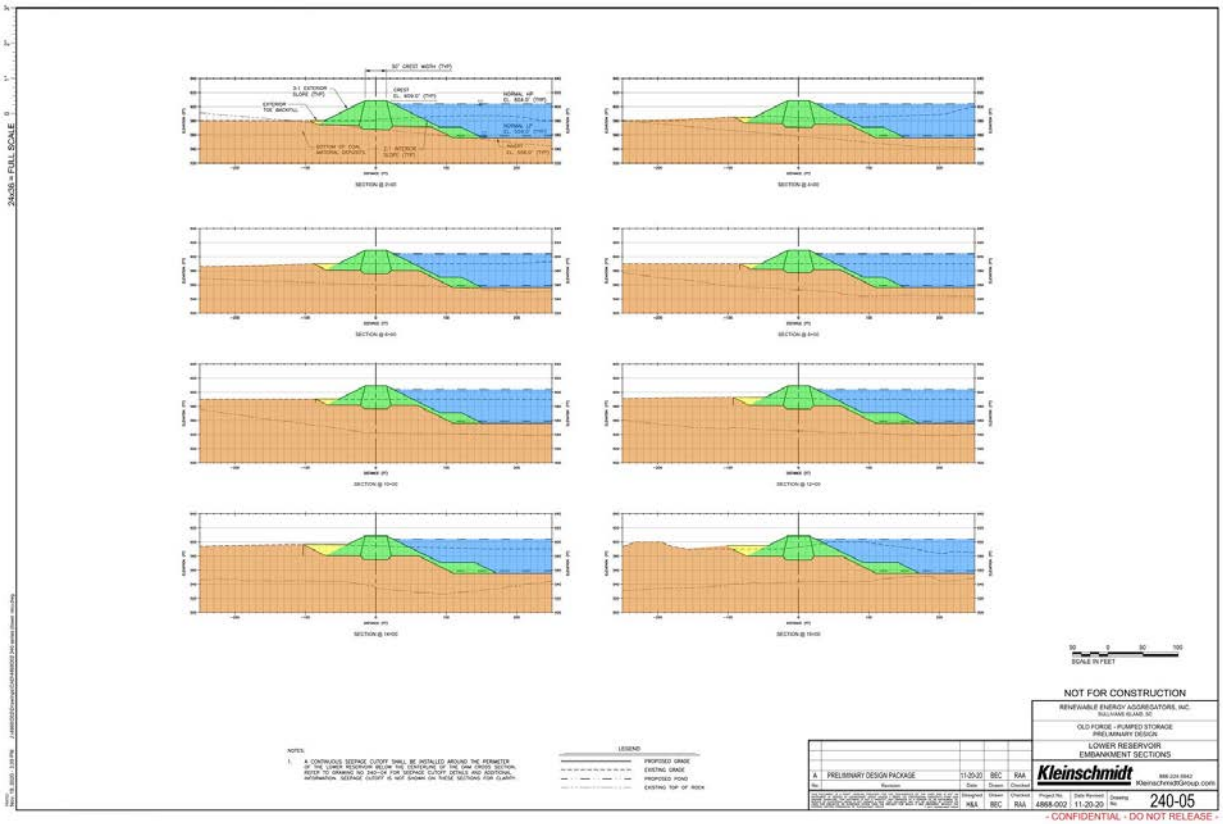


Figure 6-8. Lower Reservoir Representative Sections (Source: Kleinschmidt Drawing Package)

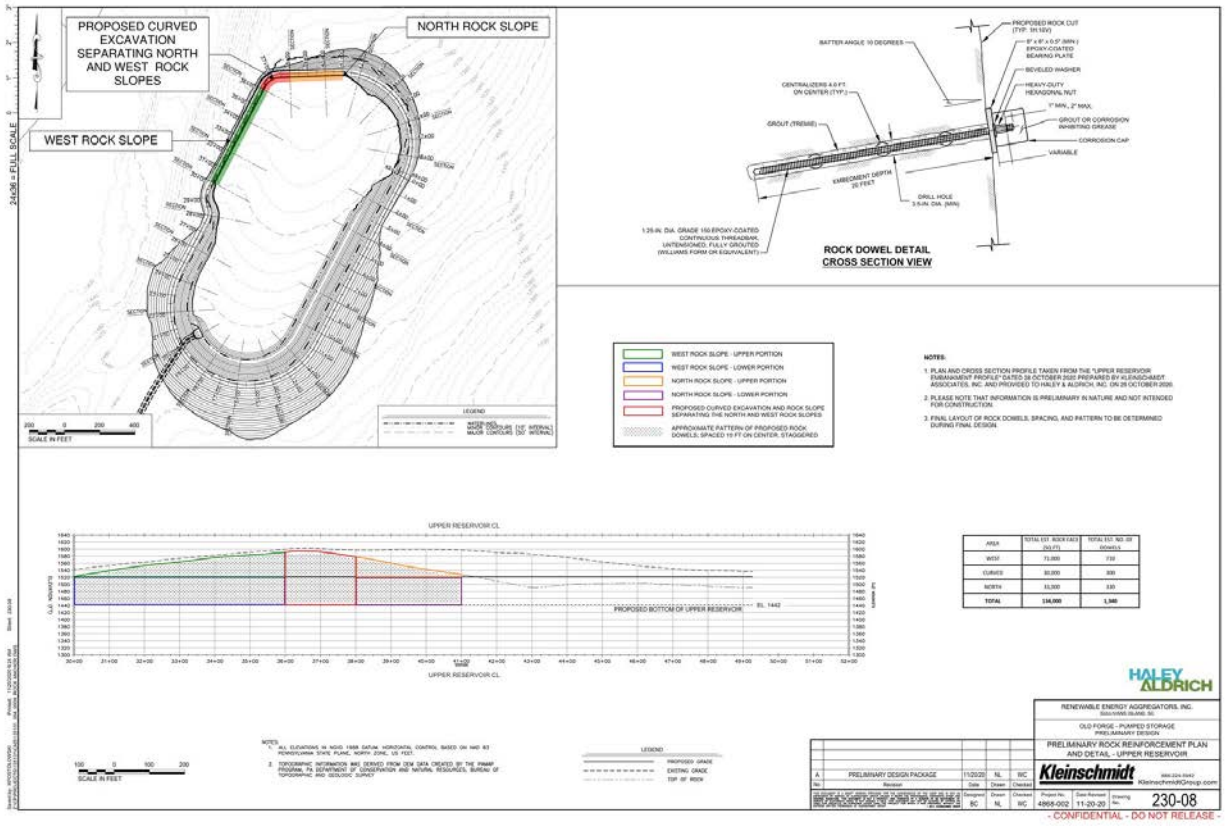


Figure 6-9. Preliminary Rock Reinforcement Plan and Detail - Upper Reservoir (Source: Haley & Aldrich/Kleinschmidt)

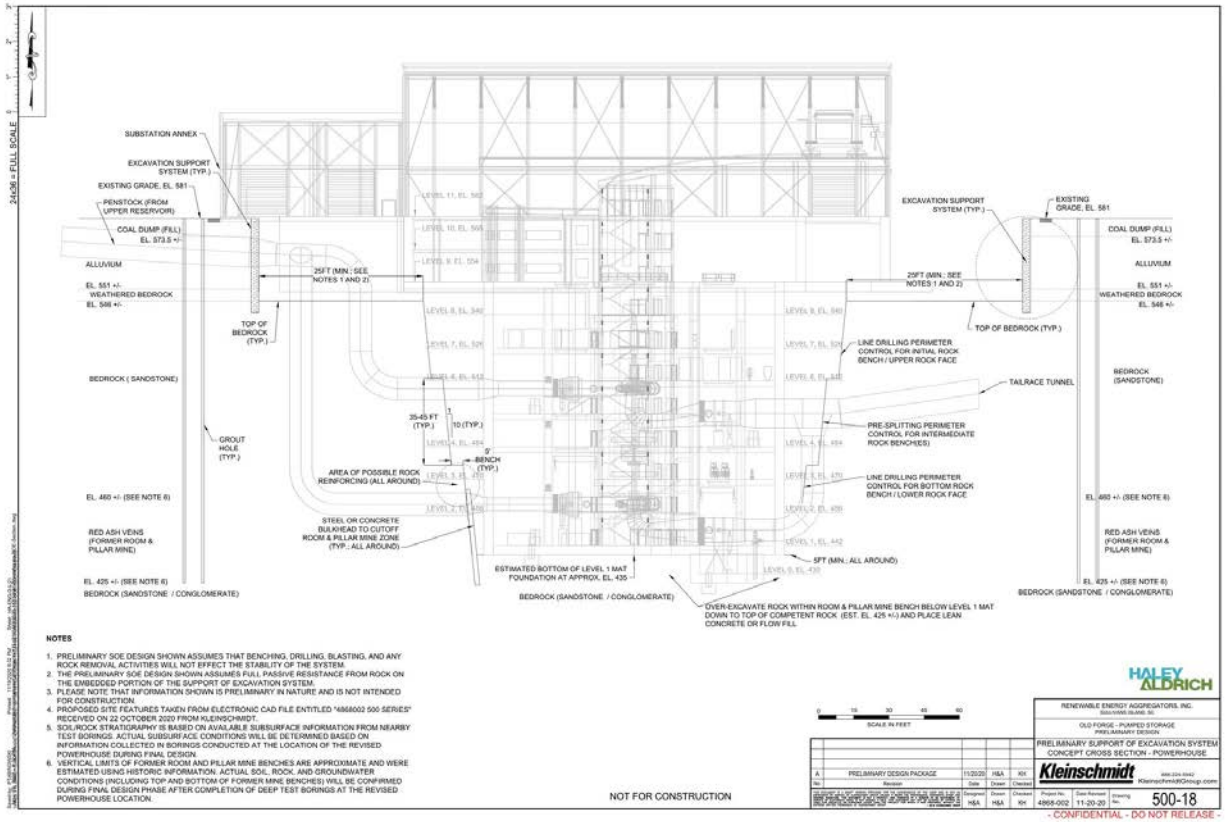


Figure 6-10. Preliminary Powerhouse Excavation Support Concept (Source: Haley & Aldrich/Kleinschmidt)

6.7 Dam Safety

The reservoir geotechnical and dam-safety design record includes upper and lower reservoir embankment profiles, representative sections, bedrock and subgrade condition plans, rock reinforcement concepts, and seepage-control concepts. These figures demonstrate that the Project is not relying on a generic reservoir configuration; the reservoir layouts have been refined against site-specific topography, bedrock depth, material reuse, embankment height, spillway routing, and settlement considerations. The upper reservoir design uses the upland topographic relief and incorporates gatehouse, spillway, and embankment geometry into a single closed-loop storage facility. The lower reservoir design accounts for coal dump materials, glacial outwash, alluvium, glaciolacustrine deposits, floodplain proximity, and the need to support generation discharge and pumping withdrawal without acting as a regional flood-control basin.

The powerhouse excavation support concept identifies a deep excavation extending from existing ground surface near elevation 581 feet to a Level 1 mat foundation near elevation 435 feet, with estimated rock excavation below the top of bedrock and temporary support from existing grade to competent rock. The excavation support figure also illustrates the anticipated relationship between existing grade, bedrock, intermediate rock benches, excavation support, pre-splitting perimeter control, the Level 1 foundation elevation, and the historical Red Ash coal-vein environment. This design information supports the PAD analysis of mine-subsidence risk, foundation support, rock reinforcement, hydrostatic uplift, temporary excavation support, worker safety, and construction sequencing.

The Project is reviewed as a FERC hydropower project and is coordinated with applicable PADEP dam-safety requirements. The corrected PAD does not state that FERC lacks jurisdiction and does not allocate dam safety exclusively to the Commonwealth. Instead, the Applicant prepares the hydrologic, hydraulic, structural, geotechnical, seismic, and emergency-action documentation needed for Commission and PADEP review. The dam-safety record addresses inflow design flood, probable maximum precipitation where applicable, spillway capacity, freeboard, wave run-up, rapid drawdown, static and seismic stability, internal erosion, instrumentation, surveillance, emergency access, and emergency action planning.

The preliminary design basis identifies the upper reservoir as having higher consequences of failure because it is located near the top of a ridge and portions of the eastern area are above residential areas. It also states that the upper reservoir was reshaped to reduce embankment size along the eastern section, that the lower reservoir lies closer to the Lackawanna River valley, and that the upper reservoir is sized to contain the probable maximum precipitation without activating the spillway. These preliminary risk considerations is refined through final hazard classification, breach analysis, inundation mapping, emergency action planning, and agency review (Kleinschmidt Associates, 2020).

The dam-safety design includes an instrumentation and monitoring framework. Anticipated monitoring includes reservoir water-level instruments, piezometers, seepage measurement points, settlement monuments, inclinometers where needed, deformation monitoring, groundwater observation wells, powerhouse excavation monitoring, mine-pool monitoring where practicable, and post-construction inspection features. Monitoring thresholds and response procedures are integrated with the dam-safety, operations, and emergency-action planning framework.

Dam safety is a core licensing and engineering issue for both reservoirs. The water-retaining structures are designed in coordination with FERC dam safety requirements and applicable PADEP dam safety requirements. The upper reservoir is considered to present higher consequences of failure because it is located near the top of a ridge and portions of the eastern section are above residential areas, while the lower reservoir is adjacent to the Lackawanna River valley and former mining features. The reservoirs are supported by stability analyses,

seepage analyses, hydrologic and hydraulic studies, seismic analyses, emergency action planning materials, instrumentation plans, and construction quality-control requirements.

The preliminary seismic design discussion from the legacy record indicates that PADEP requires a 2,500-year return event as the seismic design event for dam safety projects and that preliminary sensitivity analysis investigated more infrequent 5,000-year and 10,000-year events. The final dam-safety design record includes current seismic hazard analysis, site class determination, liquefaction screening, post-earthquake deformation assessment, embankment stability evaluation, powerhouse seismic design criteria, penstock seismic flexibility, and gatehouse and intake seismic evaluation using current standards and the governing FERC and PADEP criteria.

The Kleinschmidt design basis supplies the PAD-stage supporting design report basis for dam safety. It identifies PADEP dam-safety criteria, classifies the upper reservoir as the higher-consequence reservoir because of its ridge-top location and nearby residences, states that the upper reservoir is sized to contain probable maximum precipitation without activating the spillway, describes spillway activation as an abnormal condition requiring scour and erosion control rather than a routine operation, establishes minimum freeboard requirements above maximum anticipated pond level, provides vehicle access requirements along the embankment crest, and incorporates instrumentation and piezometer monitoring. Haley & Aldrich's reservoir and powerhouse geotechnical reports supply the complementary foundation, stability, seepage, settlement, seismic, excavation-support, and instrumentation basis. Together, those documents constitute the preliminary supporting-design basis for the PAD, while the sealed Exhibit F supporting design report is prepared from the same record and final design calculations for the license application.

7.0 Aquatic, Wetland, Riparian, Terrestrial, Botanical, Wildlife, and Special-Status Species Resources

7.1 Biological Resource Setting

The Project is located in a mine-affected portion of the Lackawanna River watershed where the biological resource analysis must evaluate both the hydropower construction footprint and the surrounding watershed, wetlands, streams, upland forest, abandoned mine lands, special-status species habitat, and disturbed industrial landscape. The biological setting is a mosaic of upland deciduous forest, fallow fields, roads, utility corridors, residential areas, abandoned strip mine and mine-affected lands, wetlands and watercourse features identified within the broader environmental study area, together with the Lackawanna River corridor and disturbed former coal-processing lands., the Lackawanna River corridor, and disturbed former coal-processing lands.

RETTEW's aquatic resource investigation of the proposed Old Forge Pumped Storage Facility area covered approximately 1,308 acres in Ransom Township, Old Forge Borough, and Duryea Borough. RETTEW's methods included review of published resource information, soils and National Wetlands Inventory mapping, systematic field coverage of the area of investigation, and wetland delineation under the 1987 Corps of Engineers Wetland Delineation Manual and the 2012 Northcentral and Northeast Regional Supplement (RETTEW, 2020).

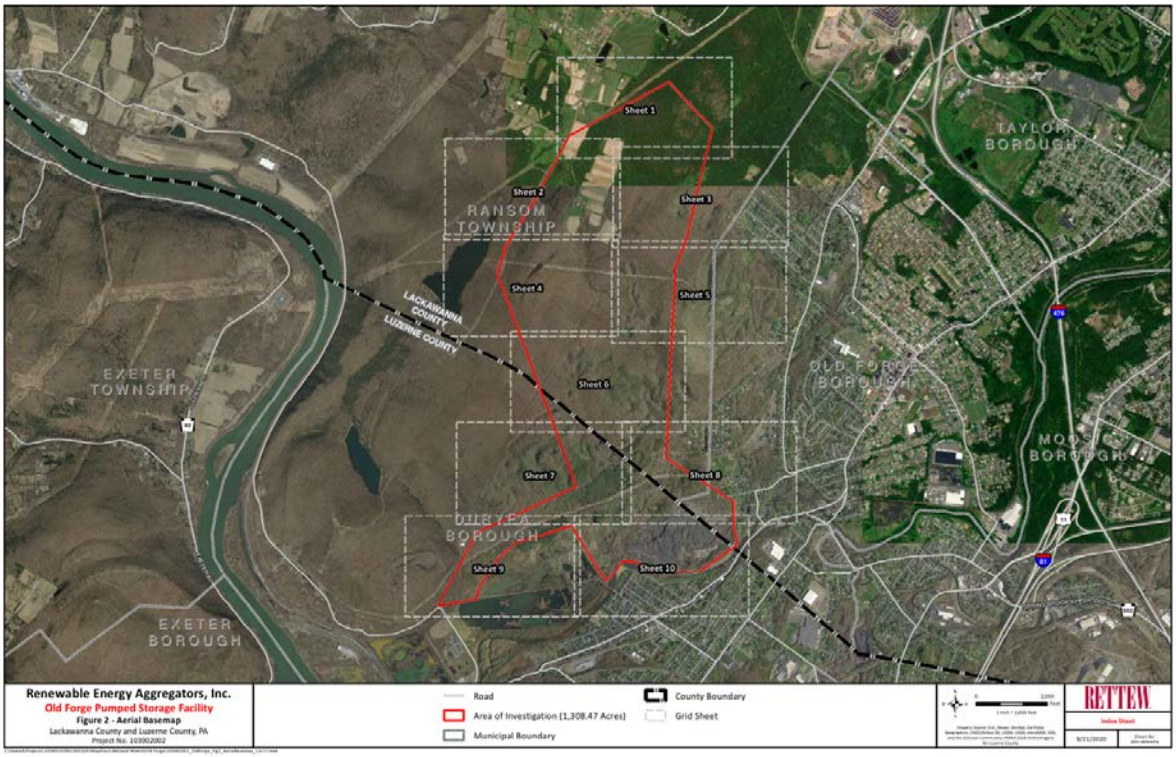


Figure 7-1. Aquatic Resource Investigation Mapping

7.2 Wetlands and Streams

RETTEW's aquatic-resource investigation evaluated an area broader than the current proposed FERC hydropower Project boundary. The RETTEW area of investigation encompassed approximately 1,308 acres in Ransom Township and Old Forge Borough in Lackawanna County and Duryea Borough in Luzerne County, and was designed for broad due-diligence review of potential aquatic resources associated with the pumped storage development area. The DOI/FWS consultation record is separately relevant to the current Project-footprint history. Following the August 1, 2018 site visit and review of the Applicant's updated Project footprints, DOI and the U.S. Fish and Wildlife Service determined that the revised Project footprints no longer overlapped Commerce Clause streams or waters, that the Red Spring Run tributary formerly associated with the lower reservoir footprint no longer existed within that footprint due to past mining activities, and that the relocated upper reservoir footprint did not overlap streams. This PAD therefore distinguishes aquatic resources identified within RETTEW's broader area of investigation from aquatic resources, if any, within the current hydropower-only Project boundary.

RETTEW identified ninety wetlands and sixty-one streams within the broader area of investigation. The wetland inventory included fifty-seven palustrine emergent wetlands, two palustrine scrub-shrub wetlands, fourteen palustrine forested wetlands, ten palustrine unconsolidated-bottom wetlands, one mixed palustrine emergent and scrub-shrub wetland, and four mixed palustrine emergent and unconsolidated-bottom wetlands. RETTEW characterized wetland conditions at thirty-seven sample points, and the observed hydrophytic vegetation, hydric soils, and wetland hydrology supported the wetland determinations. The stream inventory included two perennial streams, ten intermittent streams, and forty-nine ephemeral streams. RETTEW reported that those streams are within the Lackawanna River watershed and that the relevant reach is designated under Pennsylvania water-quality standards as Cold Water Fishes and Migratory Fishes. RETTEW also noted that PADEP does not have a separate Existing Use classification for the identified streams and that PFBC does not identify those streams as naturally reproducing trout streams or stocked trout waters, although the Lackawanna

River is identified as a naturally reproducing trout stream upstream of the Lackawanna-Luzerne county line, located just over one-half mile from the Project area.

The Project impact analysis uses the RETTEW delineation as a broad existing-information baseline and overlays the current hydropower-only Project footprint and construction limits on the mapped aquatic resources. The analysis distinguishes the upper reservoir, lower reservoir, embankments, gatehouses, penstock trenching, access roads, powerhouse surface works, primary hydropower electrical facilities, construction staging, stormwater basins, spillway routes, surge-relief discharge routes, and material-management areas from aquatic features located outside the current Project boundary. Avoidance and minimization are documented before compensatory mitigation is proposed for any unavoidable impact. Where the final hydropower-only Project footprint avoids regulated wetlands, streams, or other waters, the PAD documents that avoidance rather than treating the broader RETTEW inventory as a direct Project impact.

Wetlands, streams, and other surface waters in Pennsylvania are regulated through PADEP and U.S. Army Corps of Engineers authorities depending on jurisdictional status, activity type, impact area, and federal permitting triggers. The PAD treats the RETTEW delineation as both an ILP existing-information source and a permitting-screening tool. Updated ordinary high-water determinations, delineation verification, jurisdictional review, and impact calculations are carried into the ILP study plan and any later PADEP Chapter 105, Clean Water Act Section 401, or Corps Section 404 review if the current Project footprint or construction limits affect regulated resources.

7.3 Aquatic Resources and Fisheries

The Project is closed-loop and does not routinely divert the Lackawanna River through a powerhouse for generation. The proposed generation and pumping cycle moves water between the Project's constructed upper and lower reservoirs through the penstocks and underground powerhouse. This design reduces certain aquatic-resource issues typical of riverine hydropower projects, including continuous turbine entrainment from a natural river intake, bypassed-reach flow depletion, and downstream hydropeaking in a natural channel. The closed-loop design does not eliminate environmental review because construction may affect wetlands, watercourse features, or aquatic resources where such resources occur within or adjacent to the current hydropower-only Project boundary or construction limits.

The Lackawanna River Watershed Conservation Plan reports that the upper and middle river contain recovering coldwater and trout fishery resources, while the lower three miles below the Old Forge Borehole are severely degraded by abandoned mine drainage, iron loading, and loss of aquatic habitat (Lackawanna River Corridor Association, 2001). The Project's aquatic effects are therefore evaluated against a degraded but ecologically meaningful watershed baseline. Source-water capture, conditioning, reservoir storage, and any return-flow management are evaluated for effects on pollutant loading, temperature, dissolved oxygen, pH, iron precipitation, and aquatic habitat conditions in the lower Lackawanna River.

7.4 Terrestrial Habitat, Vegetation, and Invasive Species

Terrestrial resources in the Project vicinity include forest, fallow fields, mine-affected lands, disturbed industrial lands, utility corridors, and early successional habitats. Vegetation clearing occurs for reservoirs, penstocks, powerhouse area, access roads, construction staging, and primary transmission facilities. The biological study quantifies permanent and temporary clearing by cover type, evaluate forest fragmentation and edge effects, identify restoration opportunities, and develop native revegetation and invasive-species controls.

Invasive species is evaluated as both an existing condition and a Project-related risk. Disturbed mine lands, utility corridors, roadsides, streambanks, and construction areas often support invasive plants, and major earthwork can spread invasive seed or propagules unless controlled. The Project incorporates equipment

cleaning, topsoil handling, revegetation with native species, monitoring, and post-construction control measures into construction and restoration planning.

7.5 Rare, Threatened, Endangered, Candidate, and Special-Status Species

Federal and state species consultation is based on existing species-screening records and is updated for the final hydropower action area through current IPaC and PNDI review. The existing Project record identifies Indiana bat, northern long-eared bat, northeastern bulrush, migratory birds, timber rattlesnake, and multiple state-sensitive plant species as consultation issues. Because species lists, status designations, critical-habitat information, agency records, and survey protocols can change over time, current IPaC and PNDI outputs for the final hydropower action area are being requested and are included in the ILP study and consultation record when received. Until those current outputs are received, the PAD treats the prior species-screening record as existing information and carries current species verification into the rare, threatened, endangered, candidate, and special-status species study. Bat habitat is a significant issue because reservoir construction, penstock installation, access improvements, and primary transmission may require tree clearing. The Indiana bat guidance recommends early planning, avoidance and minimization of forest impacts, riparian and wetland buffers, co-location of project features to reduce clearing, and seasonal tree-cutting restrictions. The Project identifies forest-clearing acreage, suitable roosting and foraging habitat, proposed clearing windows, lighting controls, reforestation or restoration measures, and any acoustic or mist-net survey requirements developed through consultation (U.S. Fish and Wildlife Service, 2012).

The timber rattlesnake habitat evaluation identified potential overwintering and gestation habitat in parts of the Project area but did not confirm rattlesnake presence. The PAD therefore carries forward avoidance, buffering, worker awareness, seasonal restrictions, and additional survey evaluation as appropriate. If the final footprint can avoid the identified habitat polygons and maintain adequate buffers, the Applicant documents that avoidance in consultation with PFBC; if avoidance is not practicable, the Applicant completes additional survey and protection measures before construction.

Federal and state special-status species consultation is incorporated into the ILP record and the PAD identifies updated IPaC and PNDI information as necessary for the final action area and carries those outputs into the ILP consultation record when received for the final action area. Prior Project materials identified potential federal and state resource-agency issues involving Indiana bat, northern long-eared bat, northeastern bulrush, migratory birds, timber rattlesnake, and state-sensitive plants. Current species-list verification and agency consultation are part of the proposed rare, threatened, endangered, candidate, and special-status species study.

Indiana bat and northern long-eared bat issues receives particular attention because the Project may involve forest clearing, tree removal, construction lighting, and disturbance of potential roosting and foraging habitat. The U.S. Fish and Wildlife Service’s Indiana Bat Conservation Plan guidance states that land development and land-use activities can cause loss, degradation, and fragmentation of Indiana bat habitat and that early project planning can avoid or reduce potential adverse effects. The Project evaluates roosting habitat, tree-clearing acreage, seasonal clearing restrictions, lighting controls, forest retention, riparian buffer protection, and reforestation or habitat compensation measures as appropriate (U.S. Fish and Wildlife Service, 2012).

Timber rattlesnake has been identified as a state special-status species requiring careful analysis. The legacy PAD reports that PNDI review for the Project identified timber rattlesnake as likely to occur within the Project area and that WEST conducted a desktop review and field survey in September 2020. The field evaluation did not confirm timber rattlesnake presence, but it identified potentially suitable overwintering and gestation habitat in the central-western portion and northern corner of the Project area. The Project maps these habitats relative to the current hydropower-only footprint, consult with PFBC, and implement avoidance, buffer, timing, exclusion, worker training, and relocation protocols as required.

8.0 Recreation, Land Use, Aesthetic, Cultural, Tribal, Socioeconomic, and Environmental Justice Resources

8.1 Recreation and Public Safety

The Project reservoirs are hydropower storage reservoirs with steep engineered slopes, deep water, restricted intakes, gatehouses, large daily water-level fluctuations, and high-head hydraulic equipment. They are not designed as public boating, swimming, or fishing reservoirs. Public-safety measures include controlled access, fencing, gates, warning signs, surveillance or monitoring, emergency-response coordination, and operating procedures that address rapidly changing water levels and restricted hydraulic facilities.

The broader lower Lackawanna River corridor has important recreation and greenway values. The Lackawanna River Heritage Trail planning record identifies trail and greenway concepts extending through the river corridor, including connections near Old Forge, Duryea, Coxton Yard, Pittston Junction, and the Lackawanna-Susquehanna confluence. The Project consults with trail sponsors, municipalities, and county planning entities to identify whether Project lands, construction access, security fencing, reservoir setbacks, or the primary hydropower electrical corridor overlap planned trail routes and whether compatible trail preservation is possible outside hazardous areas (Lackawanna River Corridor Association, 2001).

The Project area lies in the lower Lackawanna River corridor, where the surrounding landscape has been shaped by anthracite mining, rail transportation, urban and borough development, sewer and water infrastructure, river-corridor reclamation, and evolving greenway and trail planning. Recreation resources in the immediate hydropower Project footprint are limited by the private, disturbed, mine-affected, and utility-corridor character of much of the area. Existing source materials do not identify developed public recreation facilities within the proposed upper reservoir, lower reservoir, penstock, or powerhouse footprints. The lower Lackawanna River corridor, however, has been the subject of extensive greenway, trail, open-space, and river-reclamation planning.

The Lackawanna River Heritage Trail planning record is relevant to Project recreation and land-use coordination. The Lackawanna River Corridor Association’s trail planning materials describe a mission to develop a trail and greenway along the Lackawanna River from its confluence with the North Branch Susquehanna River at Duryea and Pittston to the headwaters near Union Dale, with routes proposed along the river corridor between Old Forge and Vandling (Lackawanna River Corridor Association, 2001). The Project evaluates whether construction access, lower reservoir configuration, primary hydropower electrical facilities to the first point of Project use, security fencing, powerhouse setbacks, and reservoir safety buffers conflict with or can accommodate planned trail and greenway routes outside hazardous operating zones.

Pumped storage reservoirs with steep embankments, deep water, large daily water-level fluctuations, intake structures, gatehouses, restricted access, security needs, and high-head hydraulic equipment are not ordinary recreational lakes. The upper reservoir and lower reservoir are designed for energy storage, not public boating or swimming. Public access to the reservoirs, gatehouses, penstocks, underground powerhouse, and surge-relief facilities are controlled through fencing, signage, gates, warning systems, surveillance, and emergency-response coordination. Any recreation or greenway accommodation adjacent to Project lands is designed outside hazardous operating zones and coordinated with dam-safety, security, and emergency-management requirements.

8.2 Land Use and Aesthetic Resources

Existing land use in the upper Project area includes upland forest, fallow fields, farmland, and rural or low-density residential structures. Haley & Aldrich describes the upper reservoir site as a topographic upland with ground surface elevations ranging generally from approximately 1,400 to 1,600 feet and notes that three residential buildings, a barn, farmland, and wooded area were present within the broader upper reservoir site. The upper reservoir would convert upland land uses to an engineered water-retaining facility with embankments,

access roads, gates, monitoring instrumentation, security measures, and operation and maintenance restrictions (Haley & Aldrich, 2020).

Existing land use in the lower Project area includes former coal production and processing lands, mine refuse piles, wooded areas, utility and transportation corridors, the Lackawanna River corridor, nearby municipal development, and former or potential rail-trail corridors. The lower reservoir and powerhouse would convert portions of this mine-affected landscape to reservoir, embankment, underground powerhouse, access, construction staging, and primary electrical facilities. The land-use analysis recognizes the potential redevelopment and reclamation value of placing pumped storage infrastructure on disturbed mine lands while evaluating construction impacts, altered drainage, floodplain considerations, traffic, visual changes, public access restrictions, and compatibility with Old Forge, Duryea, and Ransom Township planning objectives.

Existing aesthetic resources in the Project vicinity include the forested upland reservoir area, disturbed former mine lands in the lower reservoir and powerhouse area, the Lackawanna River corridor, local roads, rail and utility corridors, nearby residential viewpoints, and potential greenway or trail viewpoints. The PAD includes existing project-location figures, reservoir renderings, powerhouse drawings, site-context mapping, and preliminary facility-layout figures sufficient to identify the principal visual changes at PAD stage. Formal photo simulations are deferred to the visual and land-use study because final grading, reservoir embankment geometry, security fencing, natural gas generator layout, primary electrical configuration, lighting, landscape treatment, and construction limits remain subject to final engineering and ILP consultation. The visual and land-use study identifies representative viewpoints from nearby residences, public roads, the lower Lackawanna River corridor, potential trail corridors, Coxton Road, Spring Drive, and reservoir-adjacent areas, and develops a photo log, viewshed assessment, and photo simulations if requested by FERC or resource agencies during scoping. Preliminary visual mitigation includes use of previously disturbed lands where practicable, underground powerhouse placement, controlled lighting, native revegetation of temporary work areas, slope stabilization, security fencing design, and screening where needed to reduce long-term visual contrast

8.3 Cultural and Tribal Resources

RETTEW’s cultural resources desktop review identified the Lackawanna Path northern and southern spurs within or near the Project area, nearby linear historic resources, unevaluated buildings, a nearby pre-contact archaeological site, and field-observed stone foundations, stone walls, and historic farm or industrial features. The review also cautioned that archaeological site locations are not publicly disclosed in public maps. The Project therefore defines direct and indirect Areas of Potential Effects, conduct appropriate Phase I archaeological and architectural studies, consult with the Pennsylvania SHPO, and protect confidential site information (RETTEW, 2020).

Tribal consultation is coordinated through FERC’s process and addresses Native American trails, river confluence context, rock-shelter sensitivity, ridgelines, watercourses, pre-contact archaeological potential, and any traditional cultural concerns raised by Tribes. The Applicant requests designation as FERC’s non-federal representative for appropriate pre-filing consultation if FERC approves that approach, while recognizing that FERC retains responsibility for compliance with Section 106 of the National Historic Preservation Act.

The cultural-resource protection framework includes avoidance of known or suspected resources where practicable, construction exclusion zones pending evaluation, archaeological monitoring where appropriate, an Unanticipated Discovery Plan, inadvertent discovery procedures for human remains, tribal and SHPO consultation protocols, confidentiality measures, and contractor training before ground disturbance begins.

Cultural resources in the Project area require careful analysis because the Project involves extensive ground disturbance in a landscape with both pre-contact Native American sensitivity and historic industrial, agricultural, transportation, and mining associations. RETTEW conducted a Cultural Resources Desktop Review and Sensitivity Study for the Old Forge Pumped Storage Facility and reviewed Pennsylvania’s Cultural Resources

Geographic Information System to identify recorded historic properties and cultural resources within one-half mile of the proposed pumped storage facility in Lackawanna and Luzerne Counties (RETTEW, 2020).

RETTEW identified the Lackawanna Path as a central cultural-resource issue. The desktop review identified two Native American trail resources within the Project area, with the northern spur of the Lackawanna Path bisecting the project area and the southern spur extending along the southern edge of the project area. These resources were depicted in CRGIS as aggregate resources that may contain numerous contributing elements and may require project-specific segments to be surveyed and evaluated for National Register of Historic Places eligibility and effect (RETTEW, 2020). The Project treats these resources as potentially significant cultural and tribal resources until consultation with the Pennsylvania State Historic Preservation Office, FERC, and affected Indian Tribes determines the appropriate identification and evaluation approach.

RETTEW also identified field-observed historic archaeological features within the project area during aquatic resource delineations, including stone foundations, a stone wall of indeterminate function, a foundation likely associated with extraction or manufacturing, and concrete and stone foundations associated with a nineteenth-century farm along Coxton Road that is no longer extant. RETTEW concluded that these features and areas within 500 feet of them have moderate to high potential for historic archaeology (RETTEW, 2020). The Project includes a direct and indirect Area of Potential Effects, Phase I archaeological survey in areas of ground disturbance, architectural reconnaissance for above-ground resources within the indirect APE, evaluation of known foundations and historic features, an Unanticipated Discovery Plan, tribal consultation protocols, and confidentiality protections for archaeological and culturally sensitive information.

The RETTEW cultural-resource memorandum is treated as the source basis for the Project's confidential cultural-resource appendix. The memorandum identifies archaeological resources and sensitive cultural-resource locations and states that archaeological site locations are not public information under 16 U.S.C. § 470hh. The public PAD therefore includes a non-sensitive cultural and tribal resource summary and reproduces only non-sensitive cultural-resource narrative excerpts. The confidential mapping, precise archaeological locations, and protected site information are reserved for a separate confidential filing with FERC and the Pennsylvania State Historic Preservation Office, consistent with federal confidentiality requirements and FERC practice.

8.4 Socioeconomics and Environmental Justice

The Project has the potential to provide construction employment, local procurement, long-duration energy storage, tax-base support, redevelopment of mine-affected lands, and beneficial use of an impaired mine-water resource. It also has the potential to impose temporary burdens through construction traffic, haul routes, dust, noise, blasting, access restrictions, visual changes, land acquisition, and emergency-service coordination. The socioeconomic analysis therefore evaluates both benefits and burdens, and it does not assume that mine-land redevelopment is impact-free.

The environmental justice review uses current FERC, EPA, CEQ, and PADEP data and identifies whether environmental justice communities, disadvantaged communities, or legacy-burdened communities are present in the Project study area. The analysis considers the lower Lackawanna River's historical burden from abandoned mine drainage, coal refuse, disturbed industrial land, flooding, and water-quality impairment, while also evaluating whether Project construction and operation create localized impacts. Outreach is tailored to Old Forge Borough, Duryea Borough, Ransom Township, Lackawanna County, Luzerne County, nearby residents, watershed groups, trail interests, and emergency responders.

Socioeconomic resources in the Project area reflect a long transition from anthracite mining and rail-based industry to a mixed economy of municipal, residential, commercial, transportation, institutional, and redevelopment uses. The Project may produce socioeconomic benefits through construction employment, local procurement, tax base support, redevelopment of mine-affected land, long-duration energy storage, and mine-

water management. It may also produce socioeconomic burdens through construction traffic, noise, blasting, dust, temporary road disruptions, altered access, visual change, land acquisition, emergency-service demands, and restrictions on public access to new reservoir and powerhouse areas.

Environmental justice is addressed with current data and community outreach. Kleinschmidt's 2023 regulatory update identified PADEP environmental justice policy implementation and community outreach as open issues, noting that greater outreach requirements may apply under the updated policy (Kleinschmidt, 2023). The lower Lackawanna River communities have long experienced environmental burdens from mine drainage, coal refuse, disturbed lands, flooding, industrial decline, transportation corridors, and water-quality impairment. The Project's use of mine pool and Old Forge Borehole discharge may provide a beneficial reuse pathway for impaired water, while construction and operation may impose localized traffic, noise, dust, access, and land-use burdens. The environmental justice analysis evaluates whether benefits and burdens are equitably distributed and includes outreach to affected municipalities, residents, watershed groups, trail interests, and community organizations.

8.5 Air Quality, Noise, and Associated Natural Gas Pumping-Energy Facility

The current Project configuration includes a 200-megawatt behind-the-meter natural gas generator supplied from a natural gas main adjacent to the property. The generator supplies the electrical energy needed for pumping and can also serve the behind-the-meter load directly when pumped-storage generation is not dispatched. The generator is an associated non-hydropower facility rather than a licensed hydropower project work, but it is disclosed in the PAD because Project pumping depends on its availability and because its construction and operation have reasonably foreseeable air-quality, noise, fuel-supply, safety, and environmental justice effects.

The PADEP all-department summary previously stated that the proposed facilities did not appear to produce operational air pollutant emissions based on the presentation then provided, except for potential construction-phase permits for portable crushing or generator equipment. The current behind-the-meter pumping-energy configuration changes that air-quality premise. A permanent 200-megawatt natural gas generator is treated as an associated facility requiring updated PADEP Air Quality review, including evaluation of equipment type, heat rate, permitted operating hours, criteria pollutants, greenhouse-gas emissions, controls, fuel specifications, noise, and any applicable major-source, minor-source, general permit, plan approval, or Title V operating permit requirements. That associated-facility review is coordinated with the ILP environmental record, PADEP consultation, and community outreach.

9.0 Proposed Study Plan, Information Needs, and Preliminary Protection, Mitigation, and Enhancement Framework

9.1 Study Plan Framework

This PAD identifies the existing information and proposed study framework for ILP scoping and for later development of the formal Proposed Study Plan under 18 C.F.R. § 5.11. The framework is based on the authoritative Project source files, including the Kleinschmidt design basis and drawings, Haley & Aldrich geotechnical reports, Tetra Tech mine-pool and water-quality materials, EPCAMR mine-water resources, RETTEW aquatic and cultural-resource materials, Voith equipment information, PADEP and SRBC consultation, the FERC preliminary-permit order, and comments filed in the preliminary-permit docket.

The table below tracks the principal issues identified by FERC's preliminary-permit order, agency records, and preliminary-permit comments, identifies where the PAD already contains existing information, and identifies the study product or follow-up consultation used to complete the license-application record.

Issue or resource area	Existing information already included in the PAD	Study product or follow-up record	Status for PAD filing

Project description, boundary, and BTM natural-gas pumping source	Sections 1.2, 3.2, 3.7, 4.1, 8.5, and 11.6 describe the hydropower-only works and the associated 200-MW behind-the-meter natural-gas pumping-energy source.	Boundary refinement, BTM electrical one-line finalization, and environmental review of the associated non-hydropower generator.	Substantially addressed for PAD; final GIS/legal and electrical drawings remain filing refinements.
Water quality, mine-pool source water, and Q7-10	Sections 5.1 through 5.5 use Tetra Tech, EPCAMR, PADEP, and SRBC source records for Old Forge Borehole flow, chemistry, source-water use, and regulatory comments.	Water-balance calculation, Q7-10/low-flow screening, and current chemistry sampling if requested by agencies.	Existing data included; calculations and any agency-requested updates occur through ILP/PSP.
Fishery and aquatic resources	Sections 7.2 and 7.3 distinguish broader RETTEW area-of-investigation aquatic resources from current hydropower footprint issues and explain that the Project is not a river-diversion project.	Aquatic-resource and receiving-water evaluation tied to final boundary, construction limits, discharge paths, and source-water handling.	Existing information included; final impact overlay remains.
Terrestrial, botanical, wildlife, and special-status species	Sections 7.4 and 7.5 incorporate existing habitat, bat, timber rattlesnake, PNDI, IPaC, and botanical consultation history.	Current IPaC/PNDI for final action area; species-specific consultation and survey determinations. PNDI-656074	Existing information included; current searches remain.
Wetlands, floodplains, and waters	Sections 5, 7.2, 9.4, and 10.3 use RETTEW, Kleinschmidt, PADEP, and floodplain design-basis information.	Final aquatic-resource overlay; floodplain/no-rise determination if final design triggers local or FEMA requirements.	Existing information included; final overlay/determination remains.
Geotechnical, dam safety, and groundwater/private wells	Section 6 incorporates Haley & Aldrich, Kleinschmidt, mine conditions, groundwater observations, powerhouse excavation, Red Ash vein, seepage, and dam-safety design basis.	Final geotechnical study plan, groundwater/well-impact evaluation, dam-safety application support, and instrumentation plan.	Preliminary investigations complete; final design-level work remains.
Recreation, land use, aesthetics, and economics	Sections 8.1, 8.2, and 11.4 address local land use, trail/greenway planning, visual context, public safety, cost categories, and project economics.	Representative viewpoints/photo log, local outreach, and refined cost/economic analysis.	PAD baseline included; field-viewpoint work remains.
Cultural and tribal resources	Section 8.3 and Appendices G and I provide public-safe cultural-resource summary and confidential filing protocol based on RETTEW materials.	APE confirmation, SHPO and tribal consultation, confidential mapping, and discovery procedures.	Existing confidential basis included; consultation record must be current.
Environmental justice, traffic, noise, and community outreach	Sections 8.4, 8.5, 10.4, and 10.5 incorporate PADEP local-government and environmental-justice comments and BTM natural-gas generator considerations.	Current EJ screening, local outreach plan, and construction traffic/noise/dust/blasting review.	PAD narrative included; current screening and outreach continue.
Preliminary permit comments and municipal participation	Section 10.5 incorporates the permit-order/comment themes into ILP scoping and study planning; Appendix H includes the expanded recipient list.	Comment tracking, June/July outreach, municipal consultation, and study-request response matrix.	Substantially addressed for PAD; ongoing consultation continues.

The formal Proposed Study Plan filed after scoping contains the detailed methodologies, study areas, field protocols, data-sharing procedures, schedules, deliverables, and level-of-effort information required by 18 C.F.R. § 5.11. This PAD framework identifies the issues and existing information necessary for the Commission, agencies, Tribes, municipalities, landowners, commenters, intervenors, and interested persons to develop study requests and scoping comments.

9.2 Water Resources, Source Water, and Water Quality Studies

The water-resource study program is based on the Tetra Tech Old Forge Borehole mine pool analysis, EPCAMR mine-water resource information, SRBC water-use guidance, PADEP Clean Water comments, Kleinschmidt reservoir design data, and Haley & Aldrich groundwater and seepage information. The Mine Pool Hydrology and Old Forge Borehole Source Water Study compiles mine maps, mine-pool level records, borehole flow records, Tetra Tech and EPCAMR data, USGS-referenced information, SRBC records, and site-specific groundwater data. The study evaluates continuous borehole flow, regional mine-pool storage, seasonal and storm variability, drought-period conditions, source-water withdrawal effects, mine-pool stratification, mine-pool elevation changes, and potential interaction with the Duryea Outfall and the lower Lackawanna River.

The Water Balance and Closed-Loop Operations Study calculates initial fill, fill rate, daily working storage, generation volume, pumping volume, reservoir evaporation, seepage, direct precipitation, maintenance losses, emergency discharge, surge-relief discharge if any, operational make-up needs, and SRBC withdrawal and consumptive-use accounting. The source record already includes the principal inputs for PAD-stage

evaluation: Old Forge Borehole discharge and water-quality data from Tetra Tech and EPCAMR, upper and lower reservoir storage volumes and operating elevations from the Kleinschmidt design basis, and groundwater and seepage data from Haley & Aldrich. The study distinguishes internal reservoir cycling from consumptive loss and identifies any SRBC withdrawal, consumptive-use, monitoring, hydroelectric project, or fee-incentive review triggers.

The Water Quality and Conditioning Study uses the existing Tetra Tech and EPCAMR historical chemistry record and PADEP Clean Water comments. The source record includes Old Forge Borehole sampling data for discharge, temperature, specific conductance, pH, dissolved oxygen, sulfate, iron, manganese, aluminum, alkalinity, acidity, total suspended solids, and total dissolved solids. No current 2026 seasonal, storm-event, or low-flow sampling record is included in the available source folder. Accordingly, this PAD relies on the historical Tetra Tech/EPCAMR record for existing information and identifies updated sampling as a proposed ILP study component if FERC, PADEP, SRBC, or other agencies require current chemistry for license application review.

The Q7-10 and low-flow component responds directly to PADEP's Clean Water Program comment requesting discussion of the Project's effect on the overall Q7-10 of the Lackawanna River. The analysis evaluates source-water capture, conditioning, reservoir storage, emergency or maintenance discharge pathways, return-flow conditions, pollutant loading, pH, iron, manganese, sulfate, dissolved oxygen, temperature, and aquatic-resource implications in the lower Lackawanna River. This work links the source-water balance, water-quality conditioning, SRBC consumptive-use accounting, and PADEP water-quality authorization record.

9.3 Engineering, Geotechnical, and Dam-Safety Studies

The engineering study program is based on the existing Kleinschmidt design-basis record, Voith ternary-unit information, Haley & Aldrich geotechnical investigations, powerhouse design materials, reservoir geotechnical studies, the Project drawing packages, and the Applicant's current behind-the-meter pumping-energy configuration. The reservoir operations and hydraulic transient study addresses the operational transitions that control safe closed-loop pumped storage operation, including generation startup, pumping startup, load rejection, pump trip, emergency turbine shutdown, emergency pump shutdown, wicket-gate closure, gate closure, generation-to-pumping transition, pumping-to-generation transition, surge-relief operation, maintenance dewatering, and abnormal reservoir conditions. The study uses the Project's defined reservoir elevations, two-penstock configuration, two ternary motor-generator units, preliminary unit flows, gatehouse arrangements, spillway routing, powerhouse layout, and 200-megawatt behind-the-meter pumping-energy cap to establish operating permissives, ramping limits, reservoir-level controls, pressure-rise limits, surge-discharge routing, and emergency shutdown procedures.

The geotechnical, mine conditions, seepage, and dam-safety study is grounded in the Haley & Aldrich subsurface record and the Kleinschmidt reservoir and powerhouse design basis. The existing record includes geotechnical borings, observation wells, seismic refraction surveys, acoustic and optical televiewer surveys, downhole packer testing, soil resistivity testing, soil and rock laboratory data, preliminary embankment design, powerhouse support-of-excavation concepts, Red Ash vein considerations, groundwater observations, reservoir seepage evaluation, and preliminary dam-safety design criteria. The study program addresses final borings, mine-map review, mine-void probing, groundwater monitoring, packer testing, rock-mass classification, laboratory testing, slope stability, rapid drawdown, seismic design, liquefaction screening, seepage modeling, settlement analysis, material characterization, powerhouse support of excavation, foundation treatment, and instrumentation. PADEP's all-department summary confirms that the proposed pumped storage hydro facility and appurtenant works require Dam Safety and Limited Power Permits from PADEP's Division of Dam Safety and that hydrology, hydraulics, and geotechnical information are normally

reviewed before final design application submittal (Pennsylvania Department of Environmental Protection, 2022).

The construction, material-management, and stormwater study integrates the Project's preliminary excavation quantities, reservoir construction concepts, penstock construction methods, powerhouse excavation, access requirements, erosion and sediment control, dewatering, blasting controls, dust control, haul-route planning, and post-construction stabilization. The study also incorporates PADEP's Waste Management comments that contaminated soils or solid waste encountered during development are handled properly and that clean fill moved offsite complies with PADEP's Management of Fill Policy and clean-fill certification requirements. The construction study supports the PAD environmental review, state permit strategy, dam-safety application, and license-application construction schedule.

The associated pumping-energy supply study addresses the 200-megawatt behind-the-meter natural gas generator, the adjacent natural gas main, BTM pumping-energy bus, load-priority operation, pump-motor electrical supply, generator dispatch during pump-back, hydropower output to the behind-the-meter load, standby and backup operation, fuel-supply reliability, air-quality permitting, greenhouse-gas emissions, noise, safety, and environmental justice. This study is included because the Applicant does not characterize the natural gas generator as hydropower installed capacity, but discloses it as an associated pumping-energy facility used and useful for Project pumping operation and requests FERC's boundary treatment determination during the ILP9.4 Environmental Resource Studies.

The water-resource and biological study program is based on the Tetra Tech mine pool analysis, EPCAMR mine-water resource information, SRBC water-use guidance, PADEP Clean Water comments, RETTEW aquatic resource delineation, and the existing species-screening and habitat-assessment record. The source-water and water-balance study addresses the Old Forge Borehole, regional mine pool storage, initial reservoir fill, operational make-up, evaporation, seepage, maintenance losses, emergency discharge pathways, consumptive-use accounting, and return-flow accounting required for SRBC review. Tetra Tech identifies the Old Forge Borehole as a major Scranton Mine Pool discharge with a reported flow of approximately 97 cubic feet per second and describes measured Old Forge Borehole flows between approximately 38,500 and 54,500 gallons per minute, with an average discharge of approximately 65 million gallons per day (Tetra Tech, 2018).

The water-quality and conditioning study uses the existing Tetra Tech and EPCAMR historical chemistry record and the PADEP Clean Water comments. The source record includes Old Forge Borehole 1975 through 2012 sampling data for discharge, temperature, specific conductance, pH, dissolved oxygen, sulfate, iron, manganese, aluminum, alkalinity, acidity, total suspended solids, and total dissolved solids. PADEP's Clean Water Program states that an industrial stormwater NPDES permit is not required based on the SIC Code provided, that an NPDES permit for the pumped storage reservoir may be required, that WQM or NPDES authorization may be required for conditioning facilities depending on final design, and that the application submission includes a discussion of the Project's impact on the overall Q7-10 of the Lackawanna River (Pennsylvania Department of Environmental Protection, 2022). This study addresses source-water chemistry, equipment protection, reservoir water quality, Q7-10 and low-flow effects, discharge pathways, and conditioning criteria needed for Project operation.

The wetland, stream, and aquatic-resource study uses the RETTEW delineation as the existing baseline and overlays the hydropower-only Project boundary and construction limits on mapped aquatic resources. The PAD record identifies RETTEW's finding of wetlands and streams within the broader area of investigation, and the study evaluates avoidance, minimization, permanent impact acreage, temporary impact acreage, ordinary high-water mark conditions, state and federal jurisdictional status, stormwater routing, spillway and surge-discharge pathways, construction dewatering, and mitigation needs. The aquatic-resources component evaluates potential effects on the Lackawanna River, Red Spring Run, other tributaries, delineated streams, wetlands, constructed reservoirs, and potential receiving waters, including whether Project source-water

management alters pollutant loading or flow conditions and whether reservoir fish exclusion or other aquatic management measures are appropriate.

The terrestrial, botanical, wildlife, and special-status species study updates habitat mapping, forest-clearing acreage, invasive species mapping, current IPaC and PNDI reviews, bat habitat assessment, timber rattlesnake habitat evaluation, rare plant survey needs, migratory bird considerations, and wildlife movement or safety issues. The study develops avoidance measures, seasonal restrictions, habitat buffers, native revegetation, invasive-species controls, and monitoring based on current agency consultation and the final action area.

9.5 Cultural, Recreation, Socioeconomic, and Construction-Effects Studies

The cultural and tribal resource study is based on the RETTEW Cultural Resources Desktop Review and Sensitivity Study, the regional Lackawanna River cultural context, the Project's extensive ground-disturbance footprint, and FERC's Section 106 consultation responsibilities. The existing record identifies Native American trail resources, historic linear resources, nearby unevaluated buildings, a nearby pre-contact archaeological site, potential rockshelter sensitivity, stone foundations, a stone wall, and other historic archaeological features. The public PAD describes these resources without disclosing protected archaeological locations, while the confidential cultural-resource appendix preserves sensitive mapping and supporting data for FERC, SHPO, and tribal consultation.

The recreation, land-use, and visual study addresses the lower Lackawanna River corridor, nearby municipal land uses, the former mining and rail landscape, planned trail and greenway corridors, reservoir and powerhouse security, primary hydropower electrical facilities, construction access, and the associated natural gas generator location. The study evaluates whether the Project footprint, access roads, lower reservoir, powerhouse, primary electrical facilities, and BTM generator site conflict with existing or planned recreational corridors and identifies public-safety measures appropriate for fluctuating pumped-storage reservoirs and industrial energy-supply facilities.

The socioeconomic and environmental-justice study is based on PADEP comments, municipal consultation, construction access, traffic, noise, dust, BTM natural gas generator operation, fuel-supply infrastructure, and community-outreach considerations. PADEP's Local Government Program comments state that local legislators, county commissioners, and local officials remain aware of Project progress because truck traffic, noise, dirt, hours of operation, and similar issues are likely local concerns. PADEP's Environmental Justice Program comments state that under the newer block-group-based policy, Duryea and Old Forge include DEP-defined environmental justice areas and that a project of this scope is likely to be of interest to nearby communities, including environmental justice communities throughout and beyond Lackawanna and Luzerne Counties (Pennsylvania Department of Environmental Protection, 2022).

The construction-effects study addresses construction sequencing, access, traffic, noise, vibration, dust, blasting, air emissions from construction equipment, work windows, emergency response, environmental justice outreach, cultural-resource avoidance, wetland and stream protection, and construction associated with both the hydropower Project and the associated BTM pumping-energy supply facility. This study supports FERC's NEPA record and the state and local permit record by distinguishing FERC-licensed hydropower works from associated non-hydropower facilities while evaluating reasonably foreseeable combined effects.

9.6 Preliminary PM&E Framework

The preliminary PM&E framework integrates study findings into measures for water quality, mine-pool monitoring, reservoir operation, groundwater and seepage monitoring, dam-safety instrumentation, wetland and stream avoidance, erosion and sediment control, species protection, cultural-resource confidentiality, public safety, traffic management, environmental justice outreach, trail and greenway coordination, and air-quality and noise controls related to the associated natural gas pumping-energy facility. These measures are

tied to the Project boundary, construction limits, operating rules, agency consultation, and final license application exhibits.

The study products consist of technical memoranda, GIS overlays, impact calculations, agency consultation records, updated resource maps, engineering evaluations, water-balance calculations, water-quality analysis, geotechnical and dam-safety support, cultural-resource documentation, and proposed protection, mitigation, and enhancement measures. The PAD contains the existing information needed to begin ILP scoping, including the engineering drawings, reservoir and powerhouse design basis, geotechnical investigations, mine pool and borehole data, PADEP and SRBC consultation, RETTEW aquatic and cultural-resource work, FERC closed-loop mine-site guidance, and the current behind-the-meter pumping-energy concept.

10.0 Agency Consultation, Required Authorizations, and Public Outreach

10.1 Federal, State, Interstate, Tribal, and Local Consultation

The Applicant has conducted substantial early consultation with federal, state, regional, local, watershed, and community stakeholders concerning the Old Forge Pumped Storage Project and the associated Old Forge Borehole and mine pool water-resource setting. The central early field consultation occurred on August 1, 2018, when representatives of the U.S. Department of the Interior and U.S. Fish and Wildlife Service participated in a Project site visit. Applicant consultation records identify the August 1, 2018 site visit as a broader multi-stakeholder site walk also attended by participants associated with the Pennsylvania Department of Environmental Protection, the Lackawanna River Corridor Association, Congressman Matt Cartwright, the Mayor of Duryea, and local Project stakeholders. The Applicant includes the available August 1, 2018 attendance record, correspondence, photographs, or other substantiating materials in the consultation appendix so that the Commission and consulted entities can evaluate the complete participant record (Renewable Energy Aggregators, 2018; U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018).

Following the August 1, 2018 site visit, DOI and the Service provided written correspondence to FERC dated August 14, 2018. In that letter, DOI and the Service explained that DOI had previously raised concerns regarding possible streams within the proposed work area, that the Service participated in the August 1, 2018 Project site visit, and that after reviewing the updated Project footprints shown in the Applicant’s August 9, 2018 supplemental filing, DOI and the Service determined that the revised Project footprints no longer overlapped Commerce Clause streams or waters. DOI and the Service further stated that the Red Spring Run tributary formerly associated with the proposed lower reservoir footprint no longer existed within that footprint due to past mining activities, that the relocated upper reservoir footprint did not overlap streams, and that DOI and the Service were no longer requesting that the Commission reconsider its earlier ruling regarding licensing jurisdiction. For this PAD, the Applicant relies on the August 14, 2018 DOI/FWS letter as important evidence of early federal resource-agency review of the revised Project footprints, while recognizing that the current proceeding is an original FERC hydropower licensing matter under Part 5 and that current studies, consultation, and environmental review is completed through the ILP record (U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018).

The Pennsylvania Department of Environmental Protection consultation record is separate from the August 1, 2018 site visit and reflects later multi-program review through the Permit Application Consultation Tool. The Applicant submitted information through PADEP’s PACT process on April 23, 2020, May 5, 2020, May 11, 2020, and July 19, 2022, and participated in a PADEP multi-program conference call on July 20, 2022. PADEP issued an all-department summary on July 29, 2022 addressing Safe Drinking Water, Waste Management, Air Quality, Clean Water, Act 537 sewage facilities planning, and related program issues. The Applicant includes that PADEP summary in the consultation appendix and uses it as program-specific permitting guidance, not as evidence of the 2018 field walk (Pennsylvania Department of Environmental Protection, 2022).

PADEP's July 29, 2022 all-department summary is favorable in several respects and materially informs the permitting strategy. PADEP stated that the Safe Drinking Water Program required no permits or approvals based on the information provided; that the Waste Management Program did not require permits for transmission-line construction while preserving obligations to properly handle contaminated soils, solid waste, and clean-fill movement if encountered; that the Air Quality Program did not identify routine operational air emissions from the proposed facilities, except that construction-phase use of portable stone crushers or portable generators could trigger general permits; that the Clean Water Program stated industrial stormwater NPDES coverage was not required based on the SIC Code provided, while reservoir-related NPDES, water-quality management, or conditioning-related approvals may be required depending on final design; and that Act 537 planning may not be required or may qualify for exemption if PADEP confirms the final information submitted by the Applicant (Pennsylvania Department of Environmental Protection, 2022).

The Susquehanna River Basin Commission consultation record further supports the Applicant's water-resource coordination. SRBC correspondence acknowledges invitations extended to SRBC technical staff for site visits, identifies April 2022 as the most recent SRBC technical site visit reflected in the current record, and encourages pre-application coordination regarding possible approvals that may be required depending on how water is withdrawn and used for the facility. SRBC staff also described the proposal as significant because it could help address the Old Forge Borehole, which has contributed pollutants to the Lackawanna and Susquehanna Rivers for decades. The Applicant uses that consultation record to support the mine pool and Old Forge Borehole water-balance study, consumptive-use analysis, abandoned mine drainage impacted-water review, and any SRBC pre-application or project-review filing (Susquehanna River Basin Commission, 2022).

The Lackawanna River Corridor Association, now operating as the Lackawanna River Conservation Association, is a key watershed stakeholder. LRCA's Lackawanna River Watershed Conservation Plan identifies the Old Forge Borehole and related lower Lackawanna River abandoned mine drainage discharges as major watershed concerns and recommends consideration of comprehensive acid mine drainage treatment and mitigation addressing the Old Forge Borehole, Duryea Outfall, and Butler Mine Tunnel discharges. The Applicant includes LRCA in the PAD and NOI distribution and coordinates with LRCA regarding the Project's mine pool water-source concept, lower Lackawanna River water-quality context, trail and greenway planning, and potential restoration-related benefits or concerns (Lackawanna River Corridor Association, 2001).

The consultation record demonstrates that the Project is not entering the ILP without prior agency and stakeholder engagement. DOI/FWS already participated in a site visit and issued correspondence resolving earlier concerns regarding the revised Project footprints; PADEP has provided multi-program consultation identifying several permits or approvals that were not required or may not be required based on the information provided; SRBC has engaged the Applicant on technical site visits and water-use issues; and LRCA's watershed planning record supports the public-interest rationale for addressing the Old Forge Borehole. The Applicant recognizes that this early record strengthens the PAD's due-diligence basis but does not eliminate the need for the current ILP record, updated studies, current PNDI and IPaC review, current Project boundary maps, current service list, current tribal consultation, and final hydropower-only drawings.

10.2 SRBC Coordination

SRBC coordination is central to the Project because the Project uses mine pool water and Old Forge Borehole discharge as the primary water source for initial reservoir fill and operational make-up. Tetra Tech identifies the Old Forge Borehole as one of the principal discharges from the Scranton Mine Pool, with a reported flow of approximately 97 cubic feet per second, and describes the Old Forge Borehole as a major discharge approximately three miles upstream of the Lackawanna River and Susquehanna River confluence with an average discharge of approximately 65 million gallons per day. Tetra Tech further states that the Old Forge

Borehole is the largest AMD discharge in the Susquehanna River Basin, producing approximately 11.5 percent of the AMD, 16.8 percent of the total iron loading, and 13.4 percent of the manganese loading identified in the cited SRBC record (Tetra Tech, 2018).

The SRBC regulatory framework applies to the Project's source-water strategy because SRBC regulates withdrawals of 100,000 gallons per day or more over a 30-day average and regulates consumptive water use of 20,000 gallons per day or more where water is not returned to the basin undiminished in quantity. The Project's SRBC analysis distinguishes initial fill, internal reservoir cycling, operational make-up, evaporation, seepage, maintenance losses, emergency discharge, consumptive use, and return flow. The water cycled internally between the upper and lower reservoirs is not treated as a consumptive loss; the SRBC analysis focuses on water withdrawn from the mine pool or borehole, water lost to the basin, and any Project water returned to the basin.

SRBC Policy No. 2021-04 supports the beneficial use of waters impacted by abandoned mine drainage while preserving full regulatory review and requiring that the use of impacted waters not adversely affect basin water resources. The Project's source-water concept aligns with that policy because it uses an impaired mine-water discharge rather than higher-quality surface or groundwater supplies, but SRBC review remains necessary for applicable withdrawal, consumptive-use, hydroelectric project, monitoring, and fee-incentive questions. SRBC's regulatory fee schedule also identifies annual compliance and monitoring fees for hydroelectric facilities greater than 40 megawatts and for withdrawal, consumptive use, and diversion approvals, confirming SRBC review as a regulatory workstream for the Project (Susquehanna River Basin Commission, 2021; Susquehanna River Basin Commission, 2022).

10.3 Clean Water Act, Floodplain, Species, and Cultural Authorizations

The PADEP PACT record provides a program-by-program permitting framework for the Project. PADEP's Safe Drinking Water Program found that, based on the information provided, no Safe Drinking Water Program permits or approvals were required. PADEP's Waste Management Program stated that construction of the transmission line did not require Waste Program permits, while also cautioning that contaminated soils or solid waste encountered during construction must be properly handled and that clean fill moved offsite must comply with PADEP's Management of Fill Policy and clean-fill certification requirements. PADEP's Air Quality Program stated, based on the project presentation then provided, that the proposed facilities did not appear to produce operational air pollutant emissions, except that construction-phase use of a portable stone crusher or portable electrical generator could trigger Air Quality General Permit requirements (Pennsylvania Department of Environmental Protection, 2022).

The current behind-the-meter pumping-energy configuration adds a permanent 200-megawatt natural gas generator as an associated non-hydropower facility. That configuration supersedes any assumption that the overall development has no operational air-emissions component. The associated generator requires updated PADEP Air Quality review covering equipment type, heat rate, controls, operating hours, fuel source, emissions, greenhouse gases, noise, environmental justice, and any plan approval, general permit, minor-source, major-source, or Title V operating permit requirement applicable to the generator. The PAD treats that review as an associated-facility issue rather than as a FERC hydropower project work, while also including it in the NEPA and consultation record because pumping depends on generator availability.

PADEP Clean Water Program comments define the principal water-quality authorization issues at PAD stage. PADEP states that an NPDES permit for discharges of stormwater associated with industrial activities is not required based on the SIC Code provided. PADEP also states that an NPDES permit for the pumped storage reservoir may be required, that a WQM permit or NPDES permit may be required for AMD treatment or conditioning facilities depending on final design, and that the application submission includes a discussion of the Project's impact on the overall Q7-10 of the Lackawanna River (Pennsylvania Department of

Environmental Protection, 2022). The PAD therefore treats industrial stormwater NPDES as not required based on the existing PADEP comment, while preserving reservoir, conditioning, Q7-10, Chapter 102, Chapter 105, Section 401, and Section 404 issues for analysis where final design and jurisdictional impacts require them.

Waterways and wetlands authorization is tied to the final hydropower-only Project footprint and the RETTEW delineation. PADEP's Waterways and Wetlands Program requested pre-application coordination after ground survey and preliminary design are complete so that permitting can be determined based on the planned project schedule, and PADEP indicated that it coordinates with county conservation districts to process permit applications. Where Project work affects regulated wetlands, streams, floodplains, or other waters, the permit path may include PADEP Chapter 105 authorization, Clean Water Act Section 404 authorization, Section 401 water-quality certification, and construction stormwater permits under Chapter 102 and NPDES requirements. Where final design avoids regulated waters or floodplain effects, the permit record documents that avoidance rather than assuming that a permit is required if present within the final Project footprint or construction limits.

The Kleinschmidt design basis provides the PAD-stage floodplain avoidance and design-elevation basis. The lower reservoir embankment is located above the 0.2-percent annual-chance floodwater elevations, which range from approximately elevation 586 feet at the southeast corner of the property to approximately elevation 565 feet at the southwest corner according to FEMA FIRM panel 0232E, thereby preventing embankment scour and erosion from Lackawanna River flood events. The Design Basis also describes the lower reservoir spillway as an armored 500-foot-long lowered embankment crest section discharging to a swale that acts as a Lackawanna River floodplain, thereby limiting velocities, reducing energy dissipation needs, and simplifying scour protection. A HEC-RAS model, no-rise certification, CLOMR, or LOMR is needed only if the final design or local floodplain administrator determines that the final footprint creates mapped floodplain or floodway effects requiring that documentation (Kleinschmidt Associates, 2020).

Dam-safety authorization is not speculative. PADEP's all-department summary states that the proposed pump storage hydro facility and appurtenant works require Dam Safety and Limited Power Permits from PADEP's Division of Dam Safety, and that hydrology, hydraulics, and geotechnical information are typically reviewed and approved during pre-submittal before final design and application submission. The PAD therefore treats dam-safety review as a central authorization path alongside FERC dam-safety review (Pennsylvania Department of Environmental Protection, 2022).

Endangered Species Act, state special-status species, cultural, and tribal consultation are integrated into the ILP. The existing record identifies federal and state species issues, including bat habitat, timber rattlesnake, plant species, and migratory birds, and the PAD treats current PNDI and IPaC outputs as necessary for the final action area. Cultural and tribal-resource consultation proceeds through FERC's Section 106 process, with the RETTEW cultural-resource material handled as confidential where it identifies archaeological or culturally sensitive locations.

10.4 Public Outreach and Environmental Justice Engagement

The Applicant has completed meaningful pre-filing consultation with federal, state, regional, and local stakeholders, and the PAD carries that consultation forward into the ILP record. The August 1, 2018 site visit included DOI/FWS participation as documented by DOI/FWS correspondence, and Applicant consultation records identify PADEP, LRCA, Congressman Cartwright, the Mayor of Duryea, and local stakeholders as participants in the same multi-stakeholder site walk. The August 14, 2018 DOI/FWS correspondence documents the federal agency site visit and revised-footprint review. The PADEP consultation record separately documents PACT submissions on April 23, May 5, and May 11, 2020; a later submission on July 19, 2022; a PADEP multi-program conference call on July 20, 2022; and PADEP's all-department written

summary dated July 29, 2022 (U.S. Department of the Interior and U.S. Fish and Wildlife Service, 2018; Pennsylvania Department of Environmental Protection, 2022).

The PADEP Local Government Program comments confirm the need for direct local outreach. PADEP advised the Applicant to keep local legislators, county commissioners, and local officials aware of Project progress before future public input because truck traffic, noise, dirt, hours of operation, and similar construction issues are likely local concerns. PADEP further advised that public input is often a factor with large projects and that municipal officials and zoning or code enforcement officials are kept informed concerning permit applications (Pennsylvania Department of Environmental Protection, 2022). The PAD therefore treats Old Forge Borough, Duryea Borough, Ransom Township, Lackawanna County, Luzerne County, county conservation districts, local legislators, and emergency-response entities as consultation recipients and public-outreach participants.

The PADEP Environmental Justice Program comments also create a substantive outreach issue. PADEP stated that the Project location may automatically trigger the Environmental Justice Public Participation Policy depending on the permits applied for and the date of the final application. PADEP further stated that under its then-current census-tract policy, the Project did not include policy-defined environmental justice areas, but under the newer block-group policy, the Boroughs of Duryea and Old Forge include DEP-defined environmental justice areas. PADEP also stated that a project of this scope is likely to be of interest to nearby communities, including EJ communities throughout and beyond Lackawanna and Luzerne Counties, and that PADEP is available to provide guidance on enhanced public participation whether required or voluntary (Pennsylvania Department of Environmental Protection, 2022).

The associated 200-megawatt natural gas generator increases the importance of public outreach because permanent operational air emissions, fuel-supply infrastructure, generator noise, emergency operation, and direct service to the behind-the-meter load are reasonably foreseeable community concerns. The public-outreach record therefore addresses both the FERC hydropower Project and the associated pumping-energy supply facility, while maintaining a clear boundary between licensed hydropower works and non-hydropower facilities. The generator is located on Project property adjacent to the lower Project works.

10.5 Preliminary Permit Order, Intervenor Comments, and Issues Incorporated into ILP Scoping

FERC issued the preliminary permit for Project No. P-15411-000 and identified construction, operation, environmental, land-use, and community concerns as matters for any later licensing proceeding. The Applicant incorporates those issues into this PAD and the ILP study framework rather than treating them as resolved by the preliminary permit. The preliminary permit does not authorize construction, ground disturbance, reservoir filling, operation, property acquisition, or entry on private or municipal property; it preserves priority while the Applicant studies the Project and prepares any license application.

The preliminary-permit docket comments identify a consolidated set of issues that are addressed in the PAD and carried into the study framework:

Comment theme	PAD response and existing record	ILP follow-up
Municipal notice and service list	Ransom Township, Duryea Borough, affected counties, local officials, intervenors, commenters, and known interested persons are included in Appendix H and NOI Appendix A.	Service list verification and continued outreach.
Project boundary and land ownership	Sections 3.2, 8.2, 10.5, and 11.6 describe hydropower-only boundary intent, land-status review, Duryea Borough comments, and DCNR-related consultation.	Final GIS/legal boundary, property ownership, and land-rights review.
Private wells, groundwater, and mine pool interaction	Sections 5 and 6 describe mine-pool hydrology, groundwater observations, source-water use, seepage, and groundwater/well-related issues.	Groundwater and well-impact evaluation integrated with water-balance and geotechnical studies.
Dam safety and geotechnical risk	Section 6 and Section 10.3 incorporate Haley & Aldrich, Kleinschmidt, PADEP dam-safety comments, reservoir design, powerhouse excavation, Red Ash veins, and seepage.	Final dam-safety support, instrumentation, and design-level investigations.

Water quality, Q7-10, and Old Forge Borehole	Section 5 and Section 9.2 address Tetra Tech/EPCAMR chemistry, PADEP Q7-10 request, SRBC review, source-water conditioning, and reservoir water quality.	Q7-10 screening and water-balance appendix; updated sampling if requested.
Fishery, wetlands, streams, and wildlife habitat	Sections 7 and 9.4 identify broader RETTEW aquatic resources, special-status species, and habitat issues, while acknowledging DOI/FWS historical footprint review.	Final impact overlay and current PNDI/IPaC verification.
Cultural, tribal, and archaeological resources	Section 8.3 and confidential appendices provide the public-safe summary and confidential treatment protocol.	APE and Section 106 consultation.
Recreation, land use, aesthetics, quality of life, and economics	Sections 8 and 11 address trail/greenway planning, visual context, public safety, local construction effects, costs, financing, and economics.	Representative viewpoints, photo log, and continued local engagement.
Traffic, noise, dust, construction, and BTM natural-gas generator	Sections 8.5, 9.3, 9.5, and 10.4 disclose the 200-MW BTM natural-gas generator and identify air, noise, fuel-supply, traffic, and EJ issues.	Associated-facility review and construction-effects study.

The Applicant's immediate response to the preliminary-permit record includes adding Ransom Township, Duryea Borough, known intervenors, commenters, affected landowners, LRCA, county conservation districts, and other identified stakeholders to the service and consultation record. The Applicant also includes a July 15, 2026 public information meeting and site walk at the Project site to promote early local participation before the formal Commission scoping schedule is complete.

11.0 License Application Exhibit Readiness, Costs, Financing, Drawings, and Boundary Maps

11.1 Exhibit A Facility Description Readiness

This PAD incorporates the facility data needed to define the Project for ILP scoping and study planning and to support the facility-description elements of a later license application. The Project consists of a new upper reservoir, lower reservoir, two high-pressure penstocks, underground powerhouse, two ternary pump-turbine motor-generator units, appurtenant gatehouses, spillways, surge-relief and safety features, generator-motor electrical equipment, switchgear facilities, and primary hydropower electrical facilities to the first point of Project use. The associated 200-megawatt behind-the-meter natural gas generator and natural gas main interconnection are disclosed as the pumping-energy source but are disclosed as associated pumping-energy facilities located within the Project property and presented for FERC boundary review.

The reservoir and hydraulic data now carried forward include upper reservoir crest, spillway crest, normal high and normal low water surface elevations, operating range, invert elevation, and storage volumes; lower reservoir crest, spillway crest, normal high and normal low water surface elevations, operating range, invert elevation, and storage volumes; gross head, headloss, turbine flow, pump flow, penstock length, penstock diameter, unit voltage, unit speed, and unit capacity. These data respond directly to the license-application completeness items for reservoir area, gross and usable capacity, elevation, turbines, generators, transmission, and appurtenant works, while recognizing that final values are certified in the license application based on final drawings and calculations (Federal Energy Regulatory Commission, n.d.; Kleinschmidt Associates, 2020).

11.2 Exhibit B Operation Readiness

This PAD describes manual and automatic operation, the daily closed-loop generation and pumping cycle, reservoir fluctuation ranges, mine-pool and Old Forge Borehole make-up water, unit independence, short-circuit capability, hydraulic transient conditions, spillway and emergency operation, dependable-capacity basis, annual generation estimate, and the distinction among gross hydropower generation, pumping energy supplied by the associated 200-megawatt natural gas generator, auxiliary load, and net useful energy delivered to the behind-the-meter load. Section 4.0 provides the operational basis for ILP scoping and study planning.

Because the Project is not a conventional streamflow project, recorded minimum, mean, and maximum natural flows and monthly natural-flow duration curves are not the controlling generation resource. The equivalent operating basis for this closed-loop project is reservoir storage, mine-pool and borehole source-water availability, consumptive losses, source-water quality, hydraulic capacity, net head, unit availability, BTM

electrical capability, and reservoir balance. River and borehole flow information are provided where needed to evaluate source-water use and environmental effects.

11.3 Exhibit C Construction Schedule and Construction History Readiness

The Project is a proposed new original-license development and has no existing licensed construction history, commercial operation date, or licensed modifications. The proposed construction schedule is based on the existing engineering schedule materials, which identify prior work streams for concept verification, preliminary design, geotechnical fieldwork, geophysical studies, survey, Voith coordination, upper reservoir design, lower reservoir design, penstock design, powerhouse design, substation design, transmission-line evaluation, site grading and stormwater planning, wetlands survey, timber rattlesnake survey, cultural-resource desktop review, FEMA floodplain analysis, PNDI review, PADEP permitting, and other regulatory tasks (Kleinschmidt Associates, 2020).

The proposed construction schedule covers final design, procurement, permits, site preparation, erosion and sediment controls, reservoir construction, penstock installation, powerhouse excavation, powerhouse concrete and steel, unit installation, electrical works, primary hydropower electrical facilities, reservoir filling, commissioning, testing, and commercial operation. The schedule also recognizes environmental windows and restrictions for wetlands, streams, bats, timber rattlesnake, rare plants, cultural resources, blasting, traffic, floodplain work, and dam-safety inspections.

The current planning record also includes the 2026 development roadmap, which identifies Bechtel as the project-management and delivery partner, Bechtel/Barnard as the EPC design and cost-confirmation team, Knight Piésold as independent engineer, and Kleinschmidt as permitting and design lead. The 2026 roadmap shows engineering, scope development, technical studies, estimate development, constructability and execution planning, open-book review, technical bid documents, bid evaluation, contract negotiation, permits and contracts, financial close, and construction-phase spending through 2029. That roadmap is used in this PAD as current planning context, while the hydropower-only Exhibit C schedule for the license application separates FERC Project works from non-project costs or activities.

11.4 Exhibit D Cost, Financing, and Project Economics Readiness

The Applicant’s current planning materials identify preliminary capital-cost categories for the 2026 through 2029 development roadmap, including engineering-phase and pre-financial-close activities, real estate costs, construction-phase activities, turbine and associated equipment manufacture, primary electrical facilities, and water-conditioning or treatment-related work. For PAD purposes, these values are planning-level values and are treated as preliminary cost data for the hydropower licensing record. The associated 200-megawatt natural gas generator, natural gas main interconnection, and BTM load-serving facilities are identified as associated non-hydropower facilities whose costs, financing, permitting, and environmental effects are tracked separately from FERC hydropower project costs unless FERC determines that particular appurtenant electrical facilities belong within the licensed Project.

The cost record identifies the cost categories required for later license-application development, including land or water rights, major civil and mechanical facilities, indirect construction costs, interest during construction, overhead, contingencies, annual project costs, cost of capital, taxes, depreciation, operation and maintenance expenses, administrative and general expenses, insurance, environmental measures, value of project power, on-peak and off-peak power values, application-development cost, and sources and extent of financing. This PAD provides the available planning cost basis and identifies the cost categories that are part of the hydropower licensing record.

11.5 Exhibit F Design Drawings and Supporting Design Report Readiness

The Project source record contains preliminary design drawings and design-basis information for the upper reservoir, lower reservoir, gatehouses, spillways, penstocks, powerhouse, bridge crane, superstructure, and electrical features. The drawing set supporting this PAD includes plan views, elevation views, profiles, and section views of major structures, including reservoir layouts, dam and embankment sections, spillway plans and profiles, gatehouse sections, penstock plan and profile, powerhouse plan and section, equipment arrangement, switchgear or substation drawings, primary hydropower electrical alignment, access, and appurtenant works.

The supporting design report consolidates the Kleinschmidt design basis, the Haley & Aldrich geotechnical reports, the reservoir geotechnical design report, the powerhouse geotechnical design report, Voith equipment assumptions, hydraulic transient studies, material reuse assumptions, seismic design, spillway design flood, reservoir seepage, stability, stress analyses, borrow and material sources, laboratory test results, and construction sequence. The report explains the suitability of the site and addresses the engineering issues that FERC's license-application checklist identifies for major constructed hydropower projects (Federal Energy Regulatory Commission, n.d.).

The supporting design basis includes specific flood, seismic, reservoir, powerhouse, penstock, access, material-management, and security criteria already developed in the Kleinschmidt and Haley & Aldrich record. Those criteria include upper-reservoir PMP containment, lower-reservoir floodplain avoidance, PADEP dam-safety design assumptions, reservoir seepage and embankment stability analysis, powerhouse access elevation above the 0.2% FEMA flood area, approximately 152 feet of powerhouse excavation, support-of-excavation and rock-support concepts, Red Ash Vein foundation considerations, penstock burial for safety and security, ASTM A572 Grade 65 penstock assumptions, surge-relief evaluation, transformer vault containment, and instrumentation and surveillance assumptions. These materials are adequate for PAD due-diligence and ILP study scoping and form the technical foundation for the final sealed design report.

11.6 Exhibit G Project Boundary and Land Map Readiness

Figure 3-1 and the supporting project mapping identify the principal Project works, the proposed hydropower Project boundary, lands and waters needed for Project purposes, property lines and ownership information available at PAD stage, counties, municipalities, rivers, streams, wetlands, floodplain context, primary hydropower electrical facilities to the first point of Project use, and mitigation lands if required by the licensing record. The mapping is based on available GIS, survey, property, and engineering data and is coordinated with the NOI service list and landowner-notification record. The legal Exhibit G boundary map is prepared from the same data set with survey, title, land-control, and GIS verification before license-application filing.

Figure 3-1 and supporting mapping show the 200-megawatt behind-the-meter natural gas generator compound within the Project property and mapped licensing study area because it is the sole pumping-energy source and is immediately adjacent to the pumped-storage works. The map distinguishes hydropower works from associated pumping-energy supply facilities and identifies off-project context features, including utility-owned natural gas main facilities and off-project load-serving facilities, where shown. The Applicant requests that FERC determine during the ILP whether the generator itself, or only the electrical interconnection facilities between the generator and pump-motor bus, should be included within the licensed Project boundary

11.7 Environmental Report and PM&E Readiness

The environmental sections of this PAD support the environmental report and NEPA record by addressing water resources, mine-pool hydrology, source-water balance, water quality, reservoir operation, geotechnical and dam-safety conditions, wetlands and streams, listed species, cultural and tribal resources, recreation, land use, aesthetics, socioeconomic resources, environmental justice, consultation, mapping, and study-plan detail.

PM&E measures are developed with sufficient specificity to identify what is done, where, when, how, and why. Likely measures include water-quality conditioning, borehole and mine-pool monitoring, reservoir water-quality monitoring, Q7-10 analysis, groundwater and seepage monitoring, dam-safety instrumentation, wetland and stream avoidance, erosion and sediment controls, spillway and surge-discharge armoring, species-specific restrictions, bat conservation, timber rattlesnake avoidance, rare plant protection, cultural-resource confidentiality and avoidance, unanticipated discovery procedures, public safety fencing and signage, construction traffic controls, environmental justice outreach, trail coordination, and construction noise and vibration controls (Federal Energy Regulatory Commission, n.d.).

11.8 Confidentiality, Security-Sensitive Information, and Professional Review

The public PAD separates publicly disclosable project information from confidential cultural-resource and security-sensitive material. RETTEW's cultural-resource memorandum and associated CRGIS and archaeological-location information provide the source basis for a confidential cultural-resource appendix, while the public PAD provides only non-sensitive summary information. Kleinschmidt's design basis identifies physical and electrical security features, including an indoor 230-kilovolt substation annex, separate GSU transformer vaults, security and HEMP/IEMI shielding assumptions, access control, intrusion detection, networked camera surveillance, controlled access gates, and powerhouse control-room security functions. CEII, security-sensitive drawings, confidential cultural-resource information, and privileged legal materials are separated from the public filing as appropriate. The professional source record includes work by the civil, licensing, geotechnical, environmental, hydro-mechanical, electrical, and water-resource teams; final filing authorization remains an owner, counsel, engineer, geotechnical engineer, environmental consultant, electrical/interconnection, GIS, and title-review governance step before FERC eFiling.

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Appendix A. Consultation Record Excerpt: DOI/FWS August 14, 2018 Letter

This appendix reproduces the U.S. Department of the Interior and U.S. Fish and Wildlife Service letter dated August 14, 2018 documenting the August 1, 2018 Project site visit and the agencies' review of the updated Project footprints. The letter is included as a consultation record excerpt for the PAD and is not relied upon to support any obsolete non-jurisdictional filing posture.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

August 14, 2018

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., N.E., Room 1A
Washington, DC 20426

Attn: Jennifer Polardino, Environmental and Project Review Branch
Division of Hydropower Administration and Compliance

RE: Old Forge Bore Hole Pumped Storage Project (FERC No. DI18-2)

Dear Ms. Bose:

On July 19, 2018, the U.S. Department of the Interior (DOI) Solicitor's Office wrote to the Federal Energy Regulatory Commission (Commission) to express, on behalf of the U.S. Fish and Wildlife Service (Service), concern that the Old Forge Bore Hole Pumped Storage Project (Project) appeared to contain several streams within the proposed work area, bringing into question the Commission's May 1, 2018 determination that the Project did not require licensing.

On August 1, 2018, the Service participated in a site visit for the Project. After a thorough exploration of the updated Project footprints as depicted in the applicant's August 9, 2018 supplemental filing,[1] the Service and the DOI have determined that Project footprints no longer overlap any Commerce Clause streams or waters. The Red Spring Run tributary that used to flow into the area of the proposed lower reservoir footprint no longer exists within this footprint due to past mining activities, and the relocated upper reservoir footprint does not overlap any streams.

Our concerns have been addressed, and DOI and the Service are no longer requesting that the Commission reconsider its ruling that the Project falls outside of the Commission's licensure jurisdiction under the Federal Power Act.

[1] FERC Accession No. 20180809-5042

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Thank you for your consideration in this matter. If you have any questions, please contact Richard McCorkle of my staff at 814-234-4090.

Sincerely,

Sonja Jahrsdoerfer

Sonja Jahrsdoerfer
Project Leader

Cc: Adam Rousselle, Renewable Energy Aggregators Inc.
Daniel Watkiss, Renewable Energy Aggregators Inc.
Heather Smiles, Pennsylvania Fish & Boat Commission

Appendix B. PADEP All-Department PACT Summary

This appendix reproduces the July 29, 2022 Pennsylvania Department of Environmental Protection all-department summary for the Old Forge Bore Hole AMD Treatment, Pump Storage Hydroelectric Facility, and Solar Field Microgrid Project PACT consultation record. The PAD text relies only on the hydropower-relevant portions of the summary and excludes non-hydropower project concepts from the FERC Project scope.

From: Ritter, Dean <dearitter@pa.gov>
Sent: Friday, July 29, 2022 10:37 AM
To: Adam Rousselle <arousselle@reaggregators.com>; Johnnie Johnson <jjohnson@reaggregators.com>; Trevor.Lykens@KleinschmidtGroup.com
Cc: Buczynski, Joseph <jbuczynski@pa.gov>; Dula, Justin <jdula@pa.gov>; Serrat, Juan <jserratgon@pa.gov>; Rocco, Domenic <drocco@pa.gov>; White, Kevin <kevwhite@pa.gov>; Kreider, Kirk <kkreider@pa.gov>; Yagiello, Brian <byagiello@pa.gov>; Kania, Pamela <pkania@pa.gov>; Wood, Todd <twood@pa.gov>; Snyder, Kim <kisnyder@pa.gov>; stiles@lccd.net; Brown, Curtis <cubrown@pa.gov>; Dresch, Justin <jdresch@pa.gov>; Malesky, Thomas <tmalesky@pa.gov>; Foley, Andrew <anfoley@pa.gov>; matechak@lccd.net; Patel, Bharat R <bhapatel@pa.gov>; Jevin, Robert <rojevin@pa.gov>; Deluca, Carl <cdeluca@pa.gov>; Bellanca, Amy <abellanca@pa.gov>; Dunlap, Rebecca <redunlap@pa.gov>; Kempa, Raymond <rkempa@pa.gov>; Wejkszner, Mark <mwejkszner@pa.gov>; Fisher, Neil <nefisher@pa.gov>; Mackowski, Brian <bmackowski@pa.gov>; Bellas, Roger <rbellas@pa.gov>; Mcgurk, Tracey <tmcgurk@pa.gov>; Novatnak, Scott <snovatnak@pa.gov>; Rustu, Tewoldemedhin <trustu@pa.gov>; Supey, Eric <esupey@pa.gov>
Subject: Renewable Energy Aggregators Old Forge Bore Hole AMD Treatment, Pump Storage Hydroelectric Facility, and Solar Field Microgrid Project PACT Meeting – "Susquehanna Microgrid Project"

Mr. Rousselle,

Thank you for attending the conference call with our staff on Wednesday, July 20, 2022 to share details of the proposed Old Forge Bore Hole AMD Treatment, Pump Storage Hydroelectric Facility, and Solar Field Microgrid Project: "Susquehanna Microgrid Project". Based on the information you provided in the Permit Application Consultation Tool on April 23rd, May 5th, May 11, 2020, July 19, 2022 and during our recent call, we offer the following comments:

Safe Drinking Water Program

Based on the information provided, the Safe Drinking Water Program finds the Old Forge Bore Hole AMD Treatment, Pump Storage Hydroelectric Facility, and Solar Field Microgrid Project require no permits or approvals.

For any questions, please contact :

Brian Yagiello, Program Manager
Department of Environmental Protection, Safe Drinking Water Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-826-2430
Email: byagiello@pa.gov

Waste Management Program

The construction of this transmission line does not require any Waste Program permits. That said, there is a chance that you may encounter some contaminated soils or solid waste during the development of the buried line. Any contaminated soils/solid waste proposed to be removed

Appendix B. PADEP All-Department PACT Summary, page 1.

from the construction area would need to be properly handled. Contaminated soils can qualify as clean or regulated fill under the DEP's Management of Fill Policy (MOF). Here is a link to that policy: http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=1526726&DocName=MANAGEMENT%20OF%20FILL.PDF%20%20%3Cspan%20style%3D%22color%3Agreen%3B%22%3E%3C%2Fspan%3E%20%3Cspan%20style%3D%22color%3Ablue%3B%22%3E%3C%2Fspan%3E

Within the MOF is a requirement to submit forms to the DEP if clean fill material is to leave the site for use as fill elsewhere:

> "If any person wants to use clean fill under this policy, complete Form FP-001, Certification of Clean Fill, and submit it to DEP electronically on the DEP website at https://www.dep.pa.gov/Business/Land/Waste/SolidWaste/Residual/Pages/default.aspx . Complete and submit the FP-001 prior to movement of clean fill to the receiving site. Complete and submit FP-001 regardless of whether sampling and analysis are performed as part of environmental due diligence."

For any questions, please contact:

Tracey McGurk, Facilities Supervisor
Department of Environmental Protection, Waste Management Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570.826.2076
Email: tmcgurk@pa.gov

Roger Bellas, Waste Management Program Manager
Department of Environmental Protection, Waste Management Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-826-2201
Email: rbellas@pa.gov

Air Quality Program

Based on the presentation provided for the three projects associated with the Old Forge Bore Hole AMD Treatment, Pump Storage Hydroelectric Facility, and Solar Field Microgrid Project, there does not appear to be any air pollutant emissions from any proposed facilities. The only potential air quality issue would be during land development and construction that may involve the use of a portable stone crusher or portable electrical generators at the site. In the event that this occurs, an Air Quality General Permit No. 3 would be needed for the crusher with the application that can be found at the following link: - DEP eLibrary (state.pa.us) and the engine for the portable generator requiring a General Permit No. 9 found at: - DEP eLibrary (state.pa.us) .

For any questions, please contact:

Appendix B. PADEP All-Department PACT Summary, page 2.

Raymond Kempa, Environmental Engineer Manager, New Source Review
PA Department of Environmental Protection, Air Quality Program
Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18711
Phone: 570-826-2507
Email: rkempa@pa.gov

Clean Water Program – Permits Section

Based upon the SIC Code provided, a NPDES Permit for Discharges of Stormwater Associated with Industrial Activities is not required. A NPDES permit for the pump storage reservoir may be required. The NPDES forms can be found at: - DEP eLibrary (state.pa.us). Based upon final design, WQM Permit and /or NPDES Permit may be required for the AMD treatment facility. The WQM forms can be found at - DEP eLibrary (state.pa.us). A discussion of the impact on the overall Q7-10 to the Lackawanna River should be included in the application submission.

For any questions, please contact:

Amy Bellanca, P.E. Environmental Group Manager
Department of Environmental Protection, Clean Water Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-826-2318
Email: abellanca@pa.gov

Clean Water Program – 537 Section

The proposed project may not need a plan revision or may qualify for exemption from Act 537 sewage facilities planning requirements. For the Department to determine whether planning will be required or not, please submit the items listed below. Upon receiving the items, the Department will render the final decision and will notify both the applicant and the municipality of its decision.

1) A completed Sewage Facilities Application Mailer.
   The Sewage Facilities Planning Module Application Mailer can be found at **(copy attached)**: https://www.dep.pa.gov/Business/Water/CleanWater/WastewaterMgmt/Act537/Pages/Sewage-Facilities-Planning.aspx (3800-CD-BCW0359), or http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=43634
2) Attach a plot plan for the proposed project.
   The plan must depict the lot(s), estimated existing sewer line runs (the sanitary sewer to be relocated), proposed public sewer line(s) (new location of the sewer line) and/or the tie in with the existing sewer system.
3) Project Narrative.
   Please include a description of the project, including but not limited to, information regarding the type of proposed facility or establishment and whether any wastewater, including sewage, will be generated at the project site.

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4) Certification or supporting letter from the permittees of the collection, conveyance and treatment facilities which are being involved or impacted by project or the relocation of the existing sanitary sewer.
5) If the project will generate any sewage or wastewater, provide certification from the permittees of the collection, conveyance and treatment facilities proposed for use that capacity is available in these facilities to receive and treat the sewage flows from the proposed project; and that these added flows will not cause an overload or 5-year projected overload in the facilities. If the facilities proposed for use are owned and operated by an authority, or authorities, then attach a letter from each to the mailer.

The above information or any questions should be forwarded to:
Tewoldemedhin D. Rustu, CPSS, Sewage Planning Supervisor
Department of Environmental Protection , Clean Water Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-826-2334
Email: trustu@pa.gov

Mr. Scott Novatnak, Environmental Group Manager
Clean Water Program
2 Public Square
Wilkes Barre, PA 18701
Phone: 570.826.2337
Email: snovatnak@pa.gov

Environmental Cleanup and Brownfield Program

The Environmental Cleanup & Brownfields Program does not expect to be directly involved with the projects unless plans change or contamination is encountered during construction or the project will include bulk storage of chemicals or liquid fuels. ECB staff will assist DEP's Waterways & Wetlands Program with Potential Pollutant determinations as part of their NPDES permitting process. Information related to storage tanks and remediation can be found on DEP's website:

https://www.dep.pa.gov/Business/Land/Tanks/Pages/default.aspx and

https://www.dep.pa.gov/Business/Land/LandRecycling/Pages/default.aspx

For any questions, please contact:

Eric Supey, Program Manager
Department of Environmental Protection, Environmental Cleanup and Brownfields Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-826-2515
Email: esupey@pa.gov

Appendix B. PADEP All-Department PACT Summary, page 4.

NERO Waterways & Wetlands Program / Regional Permit Coordination Office - Chapter 102 and Chapter 105 Requirements

The proposed project will require coverage under one or more National Pollutant Discharge Elimination System (NPDES) Permits for Stormwater Discharges Associated with Construction Activities as well as a Joint Chapter 105 / 404 Water Obstruction and Encroachment Permit for each county. Once additional information is provided regarding the acreage of the proposed earth disturbance at each location and a planned sequence of permitting and construction, a determination can be made between PA DEP WW, the Regional Permit Coordination Office (RPCO), and the county conservation districts regarding the best approach for obtaining Ch. 102 and 105 permit authorizations.

All of DEP's guidance documents for NPDES can be found on PADEP E&S resource page: https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater%20Construction/Pages/E-S%20Resources.aspx

Solar Panel Farms FAQ – Link for guidance for Solar Parks
- http://files.dep.state.pa.us/Water/BPNPSM/StormwaterManagement/ConstructionStormwater/Solar_Panel_Farms_FAQ.pdf

For 105 permits, here is the link to access the applications: http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4044

Regional Permit Coordination Office: www.dep.pa.gov/RPCO

Please contact Robert Jevin (NERO WW) and Kevin White (RPCO) to schedule a pre-application meeting once a ground survey has been conducted and a preliminary design has been completed so that permitting can be determined based on the planned project schedule. The DEP will coordinate with the county conservation districts to set up the meeting and process the permit applications for the project.

For any questions, please contact:

Robert J. Jevin III, P.E. | Environmental Group Manager
Department of Environmental Protection | Waterways and Wetlands Program
Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-830-3093 | Email: rojevin@pa.gov

Kevin S. White, P.E. | Environmental Group Manager
Department of Environmental Protection | Regional Permit Coordination Office
Rachel Carson State Office Building
400 Market St. | Harrisburg PA 17101
Phone: 570.826.2015 | Email: kevwhite@pa.gov

Dam Safety

Appendix B. PADEP All-Department PACT Summary, page 5.

The proposed pump storage hydro facility and appurtenant works will require Dam Safety and Limited Power Permits from the Division of Dam Safety. The Dam Safety Program encourages a program specific preapplication meeting be scheduled prior to submitting the completed applications for review. Typically, key hydrology and hydraulics and geotechnical information is reviewed and approved as a pre-submittal prior to final design and submittal of the actual application. This process is usually discussed during conceptual design conversations or the preapplication meeting. Additional information, application forms, and guidance documents can be found on the Department's website by searching "Dam Safety" or visiting https://www.dep.pa.gov/Business/Water/Waterways/DamSafety/Pages/default.aspx .

For any questions, please contact:

Kirk A. Kreider, P.E., Acting Chief
Division of Dam Safety
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street, Harrisburg, Pa 17101
Phone: 717-772-5981
Email: kkreider@pa.gov

Bureau of Abandoned Mine Reclamation

The Bureau of Abandoned Mine Reclamation is a non-regulatory program that mainly focuses on alleviating human health and safety issues related to past mining practices. The program is also involved in remediating mine water and environmental problems caused by past mining; however, these issues are a lower program priority. To address mine water and other environmental problems, the program is required to alleviate the problems on a watershed basis.

For any questions, please contact:

Todd Wood, P.E., Environmental Group Manager
Bureau of Abandoned Mine Reclamation
2 Public Square, Wilkes-Barre, PA 18701-1915
Phone: 570-830-3171
Email: twood@pa.gov

Local Government Programs

Please keep your local legislators office, county Commissioners, and local officials aware of progress for project ahead of public input in the future. Truck traffic, noise, dirt, hours of operation, etc may be items of local concern. Public input is often a factor with all large projects and it is good to alert municipal officials as they will likely receive complaints. Keep the municipality informed along with zoning/code enforcement officials pertaining to the permit applications.

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For any questions please contact:

Robert Sax, Local Government Liaison
Department of Environmental Protection, Northeast Regional Office
2 Public Square, Wilkes-Barre, PA 18701
Phone: 570-826-2471
Email: rsax@pa.gov

Environmental Justice Program

The Office of Environmental Justice helps ensure that all community members have equal opportunity to participate in DEP decision making processes. The location of this project may automatically trigger the Environmental Justice Public Participation Policy, depending on the permits applied for and the date of the final application. Under DEP's current policy using census tracts, the project doesn't include policy defined EJ areas, but under the new policy containing block groups the Boroughs of Duryea and Old Forge do include DEP defined EJ Areas as identified on our EJ viewer at dep.pa.gov/EJViewer by typing the address into the EJ Viewer search block on the upper left. This information is also available for download from Pennsylvania's Open Data Portal in the General Section for use by your GIS team.

The list of automatically triggered permits are in Appendix A of the EJ Policy. The policy allows DEP to include projects of significant concern by way of the opt-in process as outlined in II.A.2 of the EJ Policy. We are available to provide guidance on enhanced public participation, whether required or not.

Regardless, a project of this scope will be of interest to nearby communities, including EJ communities throughout and beyond Lackawanna and Luzerne County. The Office of Environmental Justice has a goal of fostering economic opportunities in EJ communities. This goal is beyond the strictly proscribed EJ Policy. We are happy to work with the marketing team on ideas of how local or statewide EJ communities can help benefit from this project.

For any questions please contact:

Justin Dula, AICP, Regional Coordinator
Department of Environmental Protection, Office of Environmental Justice
2 E. Main Street, Norristown, PA 19401
Phone: 484.250.5820, Mobile: 484.661.7996
Email: jdula@pa.gov

These comments and recommendations are based solely on information you provided through July 20, 2022. Any modifications to the project or other details not disclosed can affect your permitting needs. If we can assist you further with this project, please contact me or any of the staff identified above.

Thank you,

Dean J. Ritter | Acting Assistant Regional Director

Appendix B. PADEP All-Department PACT Summary, page 7.

He/Him/His
Department of Environmental Protection
Northeast Regional Office
2 Public Square | Wilkes-Barre, PA 18701
Phone: 570.826.2366 | Fax: 570.826.2357
www.dep.pa.gov

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Appendix C. SRBC Correspondence

This appendix reproduces SRBC correspondence concerning Old Forge Borehole project coordination, site-visit history, pre-application coordination, and consumptive-use considerations.

Outlook

RE: Old Forge Borehole Treatment - Susquehanna Microgrid Project

From Gavin, Andrew <AGavin@srbc.net>
Date Tue 8/9/2022 10:21 AM
To Adam Rousselle <arousselle@reaggregators.com>

Thursday at 10am works for me – I'll block out the time. Feel free to call my office line at 717-238-0425 EXT 1107. Look forward to speaking with you.

Thanks,
Andy

From: Adam Rousselle <arousselle@reaggregators.com>
Sent: Tuesday, August 9, 2022 9:45 AM
To: Gavin, Andrew <AGavin@srbc.net>
Subject: RE: Old Forge Borehole Treatment - Susquehanna Microgrid Project

Andy,
Good morning.
What would be a good time for you this week?
How is tomorrow or Thursday between 10 am and 1?
Looking forward to the discussion.

From: Gavin, Andrew <AGavin@srbc.net>
Sent: Tuesday, August 9, 2022 8:46 AM
To: Adam Rousselle <arousselle@reaggregators.com>
Subject: Old Forge Borehole Treatment - Susquehanna Microgrid Project

Mr Rousselle -

I wanted to reach out and extend an offer at your convenience to discuss any possible approvals that may be needed from the Commission for your project associated with the Old Forge Borehole. I realize you've spoken to our Executive Director, Drew Dehoff, in the past about the project. I also have appreciated the invites extended to our technical staff for site visits to better understand the project (most recently April 2022).

In any case, I just wanted to extend an offer for a phone call or meeting if it would help provide any clarity on how your project may fit within our regulatory framework depending on how water is withdrawn and used for the future facility. We recently were discussing this project and thought we'd reach out since we weren't sure what the project timeline may be for securing certain permits.

It certainly is exciting to have a proposed project that would clean up the Old Forge Borehole, which has been significant contributor of pollutants to the Lackawanna and Susquehanna rivers for decades.

Appendix C. SRBC Correspondence, page 1.

Thanks,
Andy

Andrew J. Gavin
Deputy Executive Director
Susquehanna River Basin Commission
4423 North Front Street
Harrisburg, PA 17110-1788
www.srbc.net
maps.srbc.net
Phone: 717-238-0425 EXT 1107
Email: agavin@srbc.net

SRBC
SUSQUEHANNA RIVER
BASIN COMMISSION
NY ■ PA ■ MD ■ USA

Appendix C. SRBC Correspondence, page 2.

Outlook

RE: Susquehanna Project

From Gavin, Andrew <AGavin@srbc.net>
Date Thu 8/11/2022 11:58 AM
To Adam Rousselle <arousselle@reaggregators.com>; Johnnie Johnson <jjohnson@reaggregators.com>

3 attachments (891 KB)
Regulating-water-uses-in-srb.pdf; Regulatory-program-fee-schedule.pdf; Fee-incentives-withdrawal-consumptive-use-impacted-waters-2021-04.pdf;

Hi Adam/Johnnie-

Thanks again for carving out the time from your schedules this AM to speak with me – appreciate the information shared and figure we'll want to have our technical staff start to coordinate soon.

But as mentioned during our call – I wanted to pass along the following information:

1. Quick reference sheet on Commission regulations (attached) – for our full set of regulations, see https://www.srbc.net/regulatory/regulations/
2. Fee incentives for the withdrawal and consumptive use of water (attached)
3. Fee schedule for projects (attached)

So if you sketch out the basics of your project and compare against #2, our fee incentive policy with respect to abandoned mine drainage, you can see the potential for fee relief with application and consumptive use fees. And further consideration regarding consumptive use, those fees only apply to water lost during the process. If I understand the project concept, I'm assuming most of the water will pass through the project and be discharged. So any water that passes through a project and ends up back in the river/stream is not considered consumptive use. I also attached our regular fee schedule for reference.

Lastly, as mentioned, it would probably be good to meet with our staff in the next month or so for what we commonly call a "pre-application" meeting. Given the schedule you mentioned, I figure it would be good to start that process sooner rather than later. Let me know when you have contacts identified for submitting application and I can connect them with our project review staff.

Thanks again,
Andy

Andrew J. Gavin
Deputy Executive Director
Susquehanna River Basin Commission
4423 North Front Street
Harrisburg, PA 17110-1788
www.srbc.net
maps.srbc.net
Phone: 717-238-0425 EXT 1107
Email: agavin@srbc.net

Appendix C. SRBC Correspondence, page 3.

SRBC
SUSQUEHANNA RIVER BASIN COMMISSION
NY ■ PA ■ MD ■ USA

-----Original Appointment-----
From: Adam Rousselle <arousselle@reaggregators.com>
Sent: Tuesday, August 9, 2022 10:45 AM
To: Adam Rousselle; Gavin, Andrew; Johnnie Johnson
Subject: Susquehanna Project
When: Thursday, August 11, 2022 10:00 AM-10:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Meeting ID: 299 201 075 752
Passcode: RCi8PX
Download Teams | Join on the web

Learn More | Meeting options

Appendix C. SRBC Correspondence, page 4.

Appendix D. LRCA, SRBC, and PADEP Meeting Record

This appendix reproduces the LRCA, SRBC, and PADEP meeting record available in the Project source folder. LRBC references in older notes are treated as LRCA references for this PAD.

Outlook

RE: Old Forge Thoughts Post Meeting

From Bernie McGurl <Director@LRCA.ORG>
Date Thu 5/12/2022 2:50 PM
To Clark, Tom <tclark@srbc.net>; Adam Rousselle <arousselle@reaggregators.com>; Johnnie Johnson <jjohnson@reaggregators.com>; Paul Davis <LRCATech@LRCA.ORG>; Bernie McGurl <Director@LRCA.ORG>
Cc King, Andrew <aking@srbc.net>; Malesky <tmalesky@pa.gov>; pawebb@pa.gov <pawebb@pa.gov>; Bradley, Brian J <brbradley@pa.gov>; Green, John <jodgree@pa.gov>

Adam, Tom,

I agree with Tom's assessment. We need to build for the capacity to treat flows up to 100 MGD. We can work on getting the Duryea flow over there presently in due time. The public interest is best served by having the capacity at hand to treat both flows plus a reasonable high flow margin. BTW we recorded flows in excess of 120 MGD for several weeks until high flows from the Tropical Storm Lee event ripped out our transducers in 2011. Flows above 100 MGD will do to the rivers ecosystem what they will do regardless of what we do or don't do. But I do think we need to take on both AMD flows and some reasonable storm margin above that.

I joined Congressman Cartwright and Senator Casey on Monday in Scranton for an announcement on the Streams Act amendment that will set aside some AML|AMD funds long term for O &M on AMD facilities. That can help support this project in the long term as well. Here is a link to a video of that event: https://youtu.be/nocTX-i2V5w

I'd also like to revisit having an LRCA/501c3 component as part of the mix for long term O&M and to facilitate work with DEP and REA and others to get the Duryea flow over for treatment. That could relieve REA of some long-term responsibility and liability and have a range of other community benefits.

I think there is plenty of room for interim to mid-term onsite or nearby storage for the sludge until market uses can be obtained or developed.

I look forward to more discussion on these items. Bernie

From: Clark, Tom <tclark@srbc.net>
Sent: Thursday, May 5, 2022 11:30 AM
To: Adam Rousselle <arousselle@reaggregators.com>; Bernie McGurl <Director@LRCA.ORG>
Cc: King, Andrew <aking@srbc.net>; Malesky <tmalesky@pa.gov>; pawebb@pa.gov; Bradley, Brian J <brbradley@pa.gov>; Green, John <jodgree@pa.gov>
Subject: Old Forge Thoughts Post Meeting

Adam and Bernie,

Meant to get this out sooner, but spring has been very busy. Will try to keep this short and sweet.

1. 45 MGD Plant is way too small. I think Old Forge averages 65 MGD and Duryea another 20 MGD or so. You have to size the plant to be able to treat the high flow discharges, particularly post a stream returning to normal flows after a precip event because there will be a lag between the stream decreasing in flow and the discharges decreasing in flow, which will take longer. If you don't have the capacity to treat during that time, you will lose all the gains you have made during normal flow events.

Appendix D. LRCA, SRBC, and PADEP Meeting Record, page 1.

2. Sounded to me that Duryea needs to be a pump/conveyance project outside the main Old Forge/Hydroelecytric Project Team since a HDD permitting timeline to get under the river is untenable. As long as the plant is sized in a way that it can adequately treat Old Forge and Duryea together, then there are people like me who would be interested in assisting where needed on the Duryea Pump/Conveyance Projects side. Lackawanna will not be restored unless both are treated.
3. What will be done with the sludge produced as I don't think I caught that during the meeting if it was spoken about?

Let me know where I can assist,

TC

Appendix D. LRCA, SRBC, and PADEP Meeting Record, page 2.

Appendix E. SRBC Water-Use Guidance

This appendix reproduces SRBC water-use guidance used to frame withdrawal and consumptive-use thresholds for Project source-water consultation.

SRBC
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NY ▪ PA ▪ MD ▪ USA
January 2017

REGULATING WATER USES IN THE SUSQUEHANNA RIVER BASIN

OVERVIEW

The waters of the Susquehanna River are used for many purposes — domestic, municipal, agricultural, commercial, industrial, power, environmental, and recreational. These competing needs led to the drafting of the Susquehanna River Basin Compact, which was signed into law on December 24, 1970.

The authorities of the Commission are outlined in the Compact and the adopted implementing regulations dictate the procedures for the submission, review, and consideration of projects. The main purposes of the Commission's regulations are to:

- protect public health, safety and welfare;
- regulate water flows and supplies of surface and ground waters;
- protect fisheries and aquatic habitat;
- consider economic development factors;
- protect flows to the Chesapeake Bay; and
- avoid conflicts among water users.

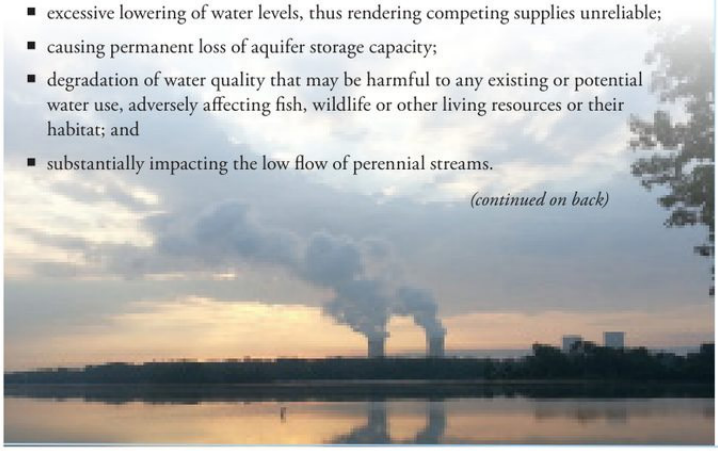
WHY IS IT IMPORTANT TO REGULATE WITHDRAWALS?

By regulation, withdrawals are limited to the amount of water (quantity and rate) that is needed to meet the reasonably foreseeable needs of a project and can be withdrawn sustainably without causing adverse impacts.

Adverse impacts may include:

- excessive lowering of water levels, thus rendering competing supplies unreliable;
- causing permanent loss of aquifer storage capacity;
- degradation of water quality that may be harmful to any existing or potential water use, adversely affecting fish, wildlife or other living resources or their habitat; and
- substantially impacting the low flow of perennial streams.

(continued on back)



WHAT DOES THE COMMISSION REGULATE?

WITHDRAWALS

Removal or withdrawal of 100,000 gallons per day (gpd) or more over a 30-day average from any source or combination of sources within the Basin is regulated. All withdrawals that supply water to a regulated consumptive use are also regulated.

CONSUMPTIVE WATER USES

Any consumptive water use of 20,000 gpd or more from any water source is regulated.

Consumptive water use is defined as water that is withdrawn either from groundwater or surface-water sources, or from public water supplies, and is used in such a way that it is not returned to the Basin undiminished in quantity.

Water is considered *lost* to the Basin when it is evaporated, transpired due to irrigation, incorporated into manufactured products or injected underground.

DIVERSIONS

Any quantity of water diverted into the Basin is subject to review and approval. Water withdrawn from any source within the Basin and diverted out of the Basin is regulated if the quantity is 20,000 gpd or more.

Standards for review are specified in regulation. In general, diversions into the Basin are scrutinized for water quality impacts; diversions out of the Basin are regulated as consumptive use because the water withdrawn is lost to the Basin.

Susquehanna River Basin Commission ▪ 4423 N. Front Street ▪ Harrisburg, Pennsylvania 17110 ▪ (717) 238-0423 ▪ srbc.net

Appendix E. SRBC Water-Use Guidance, page 1.

WHY IS IT IMPORTANT TO REGULATE CONSUMPTIVE WATER USE?

Droughts are naturally occurring events that cannot be prevented. However, one of the Commission's roles is to minimize the impacts of consumptive use to water resources. The Commission adopted consumptive water use regulations to help manage and reduce human impacts caused by consumptive water use during low flows and return to natural flow conditions. Regulated consumptive water users are required to mitigate for impact from their use and submit a plan for that mitigation in the application. Several options are listed in regulation, and provisions are in place to allow a project sponsor to propose and implement another alternative approved by the Commission.

The primary methods utilized by approved projects are:

- reduce withdrawal in amount equal to the consumptive use, and withdraw from alternative surface or underground storage facilities;
- release water for flow augmentation, in amount equal to the consumptive use, from surface or underground storage facilities;
- discontinue the project's consumptive use;
- use a consumptive use source that maintains a conservation release; and
- provide monetary payment for annual consumptive use.

Monetary payments for consumptive use go into a special water management fund that is used to investigate, develop, and maintain Commission controlled water storage and other alternate strategies for mitigating the cumulative impacts of consumptive water use throughout the Basin.

Consumptive water uses take many forms. Left: Recreational irrigation Right: Incorporation into mining products

WHY IS IT IMPORTANT TO REGULATE DIVERSIONS?

Out of Basin diversions are generally discouraged because they reduce streamflow while providing no benefits to the water resources of the Basin. There are, however, instances where diversions out of the Basin are appropriate, such as legitimate public welfare considerations. These projects are required to mitigate for impact from their use. Into Basin diversions of acceptable water quality are generally acceptable.

THE PROCESS OF REVIEWING A PROJECT

PRE-APPLICATION

- ☑ A meeting with Project Review staff is encouraged.
- ☑ Pre-approved aquifer test required for groundwater withdrawal applications.

ADMINISTRATIVE REVIEW & INTERAGENCY COORDINATION

- ☑ Project entered into Commission database for tracking.
- ☑ Comments solicited from the public, federal, state and local agencies.
- ☑ Coordination with state/federal agencies.

TECHNICAL REVIEW

- ☑ Site investigation conducted.
- ☑ Evaluation of impacts on public interests and water resources.
- ☑ Adjustments to withdrawals, consumptive water uses, or diversions may be made to limit or eliminate impacts.
- ☑ Monitoring requirements specified.
- ☑ Agency coordination completed.
- ☑ Recommendations for action presented to the Commissioners.
- ☑ Formal action - Commission may approve, approve with conditions, table, or deny a project docket/ permit.

COMPLIANCE MONITORING

- ☑ Project sponsors must abide by monitoring requirements and quarterly reporting.
- ☑ Commission will conduct routine audits and inspections to ensure compliance with docket conditions.

Appendix E. SRBC Water-Use Guidance, page 2.

Appendix F. SRBC AMD-Impacted Water Fee-Incentive Policy Excerpt

This appendix reproduces the first four pages of SRBC Policy No. 2021-04 concerning fee incentives for withdrawal and consumptive use of abandoned mine drainage impacted waters and treated wastewater.

Policy Number:	**Policy No. 2021-04**
Title:	**Fee Incentives for the Withdrawal and Consumptive Use of AMD Impacted Waters & Treated Wastewater**
Effective Date:	**December 17, 2021**
Authority:	SRB Compact, § 3.5, Public Law 91-575, 84 Stat. 1509 *et seq.*
Policy:	The Susquehanna River Basin Commission (Commission or SRBC) encourages the use and reuse of impacted water, specifically waters impacted by abandoned mine drainage and treated wastewater, through the use of fee and timing review incentives. It shall be the policy of the Commission to offer incentives to projects using these impacted waters, to the extent such projects conform with any and all criteria established by the Commission as part of this policy and that the use of these waters avoids adverse impacts to waters of the Basin. The withdrawal and consumptive use of these waters is subject to the full regulatory review process under 18 CFR Part 806. The use of impacted waters must not be adverse to the water resources of the Basin.
Purpose:	This policy supports the Commission's fundamental philosophy regarding the use of a subset of impacted waters, those that are 1) impacted by abandoned mine drainage, or 2) treated wastewater for recycling or reuse. These waters generally are a detriment when released to the environment, so diminishing their introduction to local hydrology offsets concerns for alteration of flow regime and/or hydrologic cycle, while at the same time leaving more pristine waterways and aquifers undiminished in quantity. This policy will offer fee and timing review incentives for applications associated with the withdrawal or consumptive use of impacted waters. Additionally, this policy will offer incentives to the growing number of projects looking to recycle and reuse wastewater for beneficial purposes. More effective recycling and reuse of wastewater could provide important new water supplies for a variety of uses, particularly in areas where climate change may affect local drought resiliency. Finally, promoting and prioritizing the use of impacted waters offers the potential to address legacy pollution issues that have plagued some communities for decades.

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Applicability: This policy applies to the review of any consumptive use or water withdrawal application, aquifer test plan/alternative hydrogeologic evaluation, including applications for new projects, project modifications, project renewals, and notices of intent. The document has been developed to provide guidance to the regulated community and Commission staff regarding application of fee and timing of review incentives for the use of these impacted waters. It may also be used by the public to gain information and insight on the Commission's approach to incentivizing the use of impacted waters in place of more pristine/clean water sources.

Disclaimer: The policy outlined in this document is intended to supplement existing requirements. Nothing in this policy shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. This document establishes the framework within which the Commission will exercise its administrative discretion in the future and provides guidance for the public, project sponsors and Commission staff. The Commission reserves the discretion to deviate from this policy statement if circumstances warrant.

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I. Introduction

The largest category of impacted waters in the Susquehanna River Basin (Basin) results from abandoned mine drainage (AMD). Pennsylvania is home to a massive bituminous coal region in the western part of the Basin and hosts the largest anthracite coal region in the United States, located in the northeastern part of the Basin. AMD is the result of historic mining and occurs when the mineral pyrite (FeS_2), contained in many formations throughout the coal regions of the Basin, is exposed to air and water. This combination of pyrite, water, and air results in the formation of sulfuric acid and iron hydroxide, which can dissolve other harmful metals from surrounding rock formations. AMD that enters surface waters, either through drainage or as base flow from AMD-impacted groundwater, in most cases has extreme and significant impacts to water quality and aquatic ecosystem health, which has the potential to result in "dead streams" if the AMD is concentrated and not diluted by higher streamflow volumes. Both of the coal regions in the Basin bear the legacy of past mining, with close to 2,000 of the Basin's 49,000 miles of streams, and billions of gallons of groundwater, impacted by AMD.

The other source of water subject to this policy is treated wastewater from a variety of sources for recycling or reuse. A project that can use treated wastewater for facility operations reduces or eliminates a withdrawal from a higher quality water in the Basin, thus reserving such waterways or aquifers, in part, for natural ecosystem functions and recreational uses.

The SRBC has broad authority for water resources management under Articles 3, 4, 7, 14, and 15 of the Susquehanna River Basin Compact (SRBC, 1972[1]). This includes a duty to adopt and promote uniform and coordinated policies for water resources conservation and management in the Basin. The Compact provides clear directives for the Commission pertaining to water quality, including impacted waters.

This policy fulfills a part of the Commission's mission concerning the conservation, utilization, allocation, development, and management of water resources within the Basin, through promotion of the withdrawal and use of impacted waters. The withdrawal and consumptive use of these waters that can satisfy a proposed project offers opportunities to potentially reduce a project's reliance on higher quality water, as well as encourage the use of alternative supplies to increase resiliency in the face of changing climate conditions and improve conditions for disadvantaged communities burdened by legacy industrial and mining impacts. This policy offers incentives for the use of impacted waters with respect to the management and protection of the water resources of the Basin.

A. Applicability

This policy is intended to offer fee and timing review incentives to a project that proposes to withdraw and/or consumptively use AMD-impacted water or treated wastewater for project purposes. This includes:

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[1] SRBC, 1972. Susquehanna River Basin Compact. https://www.srbc.net/about/about-us/docs/srbc-compact.pdf.

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1. Surface water and groundwater withdrawals of 100,000 gallons per day (gpd) or more over a 30-day average from any source or combination of sources within the Basin. These include:
    a. AMD-impacted surface waterbodies listed on member jurisdiction impaired waters lists or a waterbody with data that demonstrably support impacts from AMD;
    b. AMD-impacted mine pools or mine workings;
    c. AMD-impacted groundwater; and
    d. AMD-impacted surface seeps/discharges connected to (b) or (c) above.
2. Any consumptive water use of 20,000 gpd or more over a 30-day average from any AMD-impacted water source or treated wastewater from a pipe or storage;
3. Any AMD-impacted or treated wastewater from a pipe or storage water withdrawn for natural gas activities, regardless of volume.

Any project that utilizes the incentives in this policy remains entirely subject to Commission regulations and project review standards, as well as those of all member jurisdictions.

This policy does not apply to any project beyond the scope of Commission regulations nor does it allow for the treatment of AMD or wastewater in any manner different than that regulated by existing federal/state/local laws. This policy does not apply to the withdrawal or use of treated wastewater discharge within a stream channel. This policy generally will not apply to the use of AMD-impacted water or treated wastewater as sources for potable water supply, and will require a pre-application meeting prior to any application to use these sources as a public water supply.

B. Policy History

Previously, the Commission adopted a policy and resolution that encouraged the use of lesser quality waters. Over time, the Commission found that the policy was cumbersome in certain areas, rather than incentivizing, and that the resolution, while appropriate, could have included additional opportunities for the use of these waters.

In 2009 the Commission adopted Policy No. 2009-01 *Application Fee Policy for Mine Drainage Withdrawals,* which supported application fee waivers or fee reductions for projects that utilized water degraded primarily by coal mining activities. The policy prescribed a set of requirements and water quality criteria that, if met, would result in a full or partial waiver of application fees. However, in almost all cases, the requirements and criteria to be met were infeasible for project sponsors and the waiver of application fees was not formulaic or predictable. As such, the policy largely went unused by the regulated community and the Commission's goal to incentivize the use of AMD-impacted waters was not being met.

In 2012, the Commission passed Resolution No. 2012-01 establishing a policy to encourage and require the use and reuse of lesser quality water. The resolution prioritized review of applications for projects proposing to use mine-degraded and other lesser-quality

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Appendix H. Initial Distribution and Service Recipients Identified Under 18 C.F.R. § 5.5(b)(8)

This appendix identifies the initial distribution and consultation recipients for the NOI and PAD. The roster incorporates the Applicant's service list, FERC preliminary-permit service-list parties, intervenors and commenters with available contact information, federal and state agencies, counties, municipalities, regional and special-purpose entities, watershed stakeholders, utility/interconnection entities, potentially affected landowners and property entities, and affected or interested Tribes and Nations. Addresses and electronic contacts are verified again immediately before service.

Category	Recipient / Party	Service detail
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Renewable Energy Aggregators, Inc., through Adam R. Rousselle Sr.	118 Armstrong Road Pittston, pa 18640 Email: arousselle@reaggregators.com Telephone: 267-254-6107
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Bonnie Bozzacco	11046 Spring Drive, Ransom Township, Pennsylvania 18411 Email: bonnie.11046@gmail.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Sheri Brown	2421 Ransom Road, Clarks Summit, Pennsylvania 18411 Email: brownsjmj@comcast.net
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Charles A. McCrea	11052 Spring Drive, Ransom Township, Pennsylvania 18411 Email: cmccrea11052@comcast.net
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	J. E. D'Alessandro	7, 9, 11 & 12 Simpson Street; P.O Email: dalessandro4devoir@gmail.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	David A. Smith	11022 Spring Drive, Ransom Township, Pennsylvania 18411 Email: david@dasworks.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Eric Neishell	11050 Spring Drive, Ransom Township, Pennsylvania 18411 Email: EricN24@outlook.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Karen Bartnikowski	234 Overlook Drive, Falls, Pennsylvania 18615 Email: karenb@michaelcutlerco.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	John Ocwieja	11041 Spring Drive, Ransom Township, Pennsylvania 18411 Email: kiwi6263@comcast.net
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Lackawanna River Conservation Association	2043 North Main Avenue, Scranton, Pennsylvania 18508 Email: lrca@lrca.org Telephone: 570-347-6311
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Marc Bozzacco	11046 Spring Drive, Ransom Township, Pennsylvania 18411 Email: marcbozz@yahoo.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Thomas Gilbride	11038 Spring Drive, Ransom Township, Pennsylvania 18411 Email: ttop33@aol.com
FERC Preliminary-Permit Service List, Intervenors, Commenters, and Interested Persons	Ransom Township, Pennsylvania, through William J. Rinaldi, Esq.	538 Biden Street, Suite 600, Scranton, Pennsylvania 18503 Email: wjr@rinaldilaw.com Telephone: 570-343-7334
Counties	Lackawanna County	Lackawanna County Government Center, 123 Wyoming Avenue, Scranton, Pennsylvania 18503
Counties	Luzerne County	Luzerne County Courthouse, 200 North River Street, Wilkes-Barre, Pennsylvania 18711
Municipal and Local Government Recipients	Borough of Old Forge	Municipal Building, 310 South Main Street, Old Forge, Pennsylvania 18518
Municipal and Local Government Recipients	Borough of Duryea	315 Main Street, Duryea, Pennsylvania 18642
Municipal and Local Government Recipients	Mayor of Duryea Borough	c/o Borough of Duryea, 315 Main Street, Duryea, Pennsylvania 18642
Municipal and Local Government Recipients	Ransom Township	2435 Hickory Lane, Clarks Summit, Pennsylvania 18411
Municipal and Local Government Recipients	City of Scranton	340 North Washington Avenue, Scranton, Pennsylvania 18503
Municipal and Local Government Recipients	Borough of Moosic	715 Main Street, Moosic, Pennsylvania 18507
Municipal and Local Government Recipients	Borough of Taylor	122 Union Street, Taylor, Pennsylvania 18517
Municipal and Local Government Recipients	Dunmore Borough	400 South Blakely Street, Dunmore, Pennsylvania 18512
Municipal and Local Government Recipients	Blakely Township	1439 Main Street, Peckville, Pennsylvania 18452

Municipal and Local Government Recipients	Borough of Clarks Summit	304 South State Street, Clarks Summit, Pennsylvania 18411
Municipal and Local Government Recipients	City of Pittston	35 Broad Street, Pittston, Pennsylvania 18640
Municipal and Local Government Recipients	Pittston Township	421 Broad Street, Pittston, Pennsylvania 18640
Municipal and Local Government Recipients	Borough of Avoca	752 Main Street, Avoca, Pennsylvania 18641
Municipal and Local Government Recipients	Borough of Dupont	600 Chestnut Street, Dupont, Pennsylvania 18641
Municipal and Local Government Recipients	Borough of Hughestown	42 Center Street, Hughestown, Pennsylvania 18640
Municipal and Local Government Recipients	Borough of West Pittston	555 Exeter Avenue, West Pittston, Pennsylvania 18643
Municipal and Local Government Recipients	Borough of Exeter	1101 Wyoming Avenue, Exeter, Pennsylvania 18643
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Department of Environmental Protection	Rachel Carson State Office Building, 400 Market Street, Harrisburg, Pennsylvania 17101
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Department of Conservation and Natural Resources	Rachel Carson State Office Building, 400 Market Street, Harrisburg, Pennsylvania 17101
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Fish and Boat Commission	1601 Elmerton Avenue, Harrisburg, Pennsylvania 17110. PFBC consultation, aquatic resources, timber rattlesnake, and state fish and boat resources
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Game Commission	2001 Elmerton Avenue, Harrisburg, Pennsylvania 17110-9797. PGC consultation for state wildlife resources
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Historical and Museum Commission, State Historic Preservation Office	400 North Street, Harrisburg, Pennsylvania 17120. SHPO/NHPA Section 106 consultation
Interstate, State, Federal, and Regional Resource Agencies	U.S. Fish and Wildlife Service, Pennsylvania Field Office	110 Radnor Road, Suite 101, State College, Pennsylvania 16801. ESA and fish/wildlife consultation
Interstate, State, Federal, and Regional Resource Agencies	U.S. Department of the Interior, Office of Environmental Policy and Compliance	Office to be confirmed from current FERC Initial Consultation Contact List
Interstate, State, Federal, and Regional Resource Agencies	U.S. Army Corps of Engineers, Baltimore District, Pennsylvania Field Office	1631 South Atherton Street, Suite 101, State College, Pennsylvania 16801
Interstate, State, Federal, and Regional Resource Agencies	U.S. Environmental Protection Agency, Region 3	Four Penn Center, 1600 John F
Interstate, State, Federal, and Regional Resource Agencies	Federal Emergency Management Agency, Region 3	615 Chestnut Street, One Independence Mall, Sixth Floor, Philadelphia, Pennsylvania 19106
Interstate, State, Federal, and Regional Resource Agencies	U.S. Geological Survey, Pennsylvania Water Science Center	215 Limekiln Road, New Cumberland, Pennsylvania 17070
Interstate, State, Federal, and Regional Resource Agencies	Office of Surface Mining Reclamation and Enforcement, Appalachian Region	3 Parkway Center, Pittsburgh, Pennsylvania 15220
Interstate, State, Federal, and Regional Resource Agencies	National Park Service, Northeast Region	1234 Market Street, Philadelphia, Pennsylvania 19107
Interstate, State, Federal, and Regional Resource Agencies	Advisory Council on Historic Preservation	401 F Street NW, Suite 308, Washington, District of Columbia 20001-2637. NHPA consultation recipient as applicable
Interstate, State, Federal, and Regional Resource Agencies	Pennsylvania Department of Transportation, District 4	55 Keystone Industrial Park, Dunmore, Pennsylvania 18512
Interstate, State, Federal, and Regional Resource Agencies	Lackawanna County Conservation District	1027 South Abington Road, South Abington Township, Pennsylvania 18411
Interstate, State, Federal, and Regional Resource Agencies	Luzerne Conservation District	325 Smiths Pond Road, Shavertown, Pennsylvania 18708
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Lower Lackawanna Valley Sanitary Authority	302 Oak Street, Old Forge, Pennsylvania 18518; physical facilities at 398 Coxton Road, Duryea, Pennsylvania 18642
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Pennsylvania Northeast Regional Railroad Authority	280 Cliff Street, Scranton, Pennsylvania 18503
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Lackawanna Heritage Valley Authority	213 South 7th Avenue, Scranton, Pennsylvania 18505
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Eastern Pennsylvania Coalition for Abandoned Mine Reclamation	101 South Main Street, Ashley, Pennsylvania 18706
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Greater Scranton Chamber of Commerce	222 Mulberry Street, Scranton, Pennsylvania 18503
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Office of U.S. Representative Matt Cartwright	226 Wyoming Avenue, Scranton, Pennsylvania 18503
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Lackawanna County Regional Planning Commission	123 Wyoming Avenue, Scranton, Pennsylvania 18503
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	Luzerne County Planning and Zoning	200 North River Street, Wilkes-Barre, Pennsylvania 18711
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	PJM Interconnection, L.L.C.	2750 Monroe Boulevard, Audubon, Pennsylvania 19403
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	PPL Electric Utilities Corporation	827 Hausman Road, Allentown, Pennsylvania 18104

Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	South Carolina Office of the Governor	1100 Gervais Street, Columbia, South Carolina 29201
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	South Carolina Public Service Commission	101 Executive Center Drive, Columbia, South Carolina 29211
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	U.S. Senator Tim Scott	United States Senate, Washington, District of Columbia 20510
Special-Purpose Subdivisions, Utility, Transportation, Watershed, and Community Stakeholders	U.S. Senator Lindsey Graham	United States Senate, Washington, District of Columbia 20510
Potentially Affected or Interested Landowners and Property Entities	Duryea Borough as asserted owner of parcels formerly identified in prior materials	315 Main Street, Duryea, Pennsylvania 18642
Potentially Affected or Interested Landowners and Property Entities	KF Real Estate LLC	587 Gravel Pond Road, South Abington Township, Pennsylvania 18411
Potentially Affected or Interested Landowners and Property Entities	KF Real Estate	601 Salem Road, Archbald, Pennsylvania 18403
Potentially Affected or Interested Landowners and Property Entities	Pagnotti Enterprises, Inc.	46 Public Square, Suite 600, Wilkes-Barre, Pennsylvania 18701
Potentially Affected or Interested Landowners and Property Entities	Pitreal Corp.	144 Brown Road, Yatesville, Pennsylvania 18640
Potentially Affected or Interested Landowners and Property Entities	County Line River & Land Company LLC	9 Fellows Avenue, Hanover Township, Pennsylvania 18706
Potentially Affected or Interested Landowners and Property Entities	Edward J. Kovalik and Cheryl L. Kovalik	2412 Red Oak Drive, Ransom Township, Pennsylvania 18411
Potentially Affected or Interested Landowners and Property Entities	James W. Brown and Sheri L. Brown	2421 Ransom Road, Ransom Township, Pennsylvania 18411
Potentially Affected or Interested Landowners and Property Entities	The Preserve at Blue Ridge LLC	Blue Ridge LLC is identified for service at 1140 Route 315, Wilkes-Barre, Pennsylvania 18711
Potentially Affected or Interested Landowners and Property Entities	F & L Realty Co.	400 Mill Street, Dunmore, Pennsylvania 18512
Potentially Affected or Interested Landowners and Property Entities	Davlisa Enterprises, Inc.	144 Brown Road, Yatesville, Pennsylvania 18640
Potentially Affected or Interested Landowners and Property Entities	Clinton Properties, Inc.	18 Hamilton Road, Dallas, Pennsylvania 18612
Potentially Affected or Interested Landowners and Property Entities	D & L Realty Co.	400 Mill Street, Dunmore, Pennsylvania 18512
Affected Indian Tribes and Nations Identified for Initial Consultation	Absentee-Shawnee Tribe of Indians of Oklahoma	Governor John R
Affected Indian Tribes and Nations Identified for Initial Consultation	Delaware Nation, Oklahoma	Tribal President Deborah Dotson, P.O
Affected Indian Tribes and Nations Identified for Initial Consultation	Delaware Tribe of Indians	Chief Brad KillsCrow, 5100 Tuxedo Boulevard, Bartlesville, Oklahoma 74006; THPO Martina Thomas and GIS Specialist Joanna Maurer at the same address
Affected Indian Tribes and Nations Identified for Initial Consultation	Eastern Shawnee Tribe of Oklahoma	Chief Glenna Wallace, P.O
Affected Indian Tribes and Nations Identified for Initial Consultation	Oneida Indian Nation	Nation Representative Ray Halbritter, 2037 Dream Catcher Plaza, Oneida, New York 13421; Historic Preservation Specialist Jesse Bergevin at the same address; Land Administrator Laura Misita, 5218 Patrick Road, Verona, New York 13478
Affected Indian Tribes and Nations Identified for Initial Consultation	Onondaga Nation	Chief Sidney Hill and Faithkeeper Tony Gonyea, 4040 Route 11, Administrative Building, Nedrow, New York 13120
Affected Indian Tribes and Nations Identified for Initial Consultation	Seneca-Cayuga Nation	Chief Charlie Diebold, P.O
Affected Indian Tribes and Nations Identified for Initial Consultation	Shawnee Tribe	Tribal Administrator Cassie Harper and THPO Tonya Tipton, P.O
Affected Indian Tribes and Nations Identified for Initial Consultation	Stockbridge-Munsee Community, Wisconsin	Tribal President Shannon Holsey, N8476 MohHeConNuck Road, Bowler, Wisconsin 54416; THPO Jeffrey C
Affected Indian Tribes and Nations Identified for Initial Consultation	Tuscarora Nation	GIS Manager Bryan Printup, 5226 Walmore Road, Lewiston, New York 14092
Affected Indian Tribes and Nations Identified for Initial Consultation	Seneca Nation of Indians	President J
Affected Indian Tribes and Nations Identified for Initial Consultation	Saint Regis Mohawk Tribe	Chief Beverly Kiohawiton Cook and THPO Darren Bonaparte, 71 Margaret Terrance Memorial Way, Akwesasne, New York 13655, if consultation indicates known Mohawk burials, sites, or other resources within the action area

Old Forge Pumped Storage Project - Public Protected Appendices Register

This public register identifies non-public appendices filed or maintained separately from the public PAD. The protected appendices contain confidential cultural-resource information, CEII/security-sensitive engineering information, privileged commercial/property/cost information, and sensitive species-location material. Public summaries and redacted/generalized figures remain in the public PAD.

Appendix G. Confidential Cultural Resources Appendix. RETTEW Cultural Resources Desktop Review and Sensitivity StuPublic dy; confidential CRGIS materials; archaeological site-location information; Native American trail-resource information if sensitive; potential rockshelter, historic-foundation, stone-wall, and archaeological feature mapping.

Appendix J. Non-Public CEII Engineering Appendix. Detailed BTM natural gas/PSH electrical single-line; Voith two-unit SLD; Kleinschmidt electrical design-basis excerpts; station service, protection, controls, GIS, GSU transformer, switchgear, control-system architecture, security-sensitive operation, and related CEII engineering material.

Appendix K. Privileged Commercial, Cost, Property, and Land Information Appendix. Proprietary project-development material, preliminary CAPEX, EPC schedule/cost backup, financing, vendor, gas-supply, project-company, property/title, acquisition, appraisal, and land-control materials.

Appendix L. Sensitive Species and Biological Resource Location Appendix. Timber rattlesnake potential overwintering and gestation habitat information; rare species occurrence data; bat roost or survey-location data; rare plant points; current PNDI/IPaC sensitive outputs when obtained; agency-restricted species-location material.