UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Mahoning Creek Hydroelectric Company, LLC Project No. 12555-004-PA

NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT

(March 23, 2010)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission (Commission) regulations, 18 CFR Part 380 (Order No. 486, 52 F.R. 47879), the Office of Energy Projects has reviewed the application for an original license for the Mahoning Creek Hydroelectric Project, to be located on Mahoning Creek in Armstrong County, Pennsylvania, and prepared an environmental assessment (EA). In the EA, Commission staff analyze the potential environmental effects of licensing the project and conclude that issuing a license for the project, with appropriate environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

Because the Commission's headquarters was closed from February 8 to 11, 2010, due to severe weather, staff was delayed in preparing the EA. Therefore, we are waiving §5.22 of the Commission's regulations which updated the schedule for EA issuance to March 1, 2010, as the target date for EA issuance.

A copy of the EA is on file with the Commission and is available for public inspection. The EA may also be viewed on the Commission's website at http://www.ferc.gov using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at 1-866-208-3676, or for TTY, (202) 502-8659. You may also register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

Any comments should be filed within 30 days from the issuance date of this notice, and should be addressed to the Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1-A, Washington, D.C. 20426. Please affix "Mahoning Creek Project No. 12555-004" to all comments. Comments may be filed electronically via Internet in lieu of paper.

The Commission strongly encourages electronic filings. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's website under the "eFiling" link. For further information, contact Kristen Murphy at (202) 502-6236.

Kimberly D. Bose,
Secretary.

ENVIRONMENTAL ASSESSMENT FOR HYDROPOWER LICENSE

Mahoning Creek Hydroelectric Project

Project No. 12555-004

Pennsylvania

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

March 2010

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On July 27, 2009, Mahoning Creek Hydroelectric Company, LLC (Mahoning Hydro) filed an application for an original license for the proposed Mahoning Creek Hydroelectric Project No. 12555-004 (project) with the Federal Energy Regulatory Commission (Commission). The 6.0-megawatt (MW) project would be connected to the U.S. Army Corps of Engineers (Corps) Mahoning dam which is located on Mahoning Creek in Armstrong County, Pennsylvania. The project would occupy about 1.0 acre of federal land managed by the Corps.

Project Description

The project would use the existing Corps 162-foot-high, 926-foot-long Mahoning dam and would consist of: (1) a new 50-foot-high intake structure attached to the upstream face of the dam, equipped with removable trashracks (with 1-inch spacing), dewatering bulkhead panels, and a vertical slide gate; (2) a new lining on an existing (currently plugged), 108-inch-diameter conduit through Mahoning dam monolith No. 15; (3) a new buried 1,090-foot-long, 120-inch-diameter penstock on the left (south) bank, bifurcating into two new 110-foot-long, 96-inch-diameter penstocks; (4) a new powerhouse located approximately 100 feet downstream of an existing stilling basin weir containing two new Kaplan turbine generator units with a total installed capacity of 6.0 MW; (5) a new 40-foot-wide, 150-foot-long, 10-foot-deep tailrace; (6) a new 2.2-mile-long, 25-kilovolt transmission line; (7) a new 100-foot-long bridge spanning a small stream connected to (8) a refurbished existing 0.5-mile-long access road. The project would have an estimated annual generation of 20,000 megawatt-hours.

Project Operation

The Corps operates the Mahoning dam in a mode whereby inflow approximates outflow at most times except during the fall when the impoundment is drawn down 25 feet for flood control. This operation results in a surface area of 280 acres during the summer months, which supports recreational uses, and a surface area of 170 acres during the winter months. In order to lower the impoundment to the winter elevation, the Corp releases flows greater than the inflow to the project during the fall. There is currently no specified minimum flow released by the Corps at the dam; however, the Corps historically as released a minimum flow of 30 cfs at the dam into the stilling basin and increases this volume to 35-45 cfs during cold periods to prevent freezing of the ring jet (a valve that releases water through the dam).

Mahoning Hydro proposes to operate the project in a run-of-release mode (no modifications to the quantity or timing of the Corps' releases), with a preservation of the Corp's historical minimum flow release of 30 cfs. Mahoning Hydro would divert any

intended Corps releases that are greater than 30 cfs and below 905 cfs through an existing (but currently plugged) conduit in the dam to the project powerhouse for generation, releasing the flow downstream of the stilling basin weir. This proposed operation would reserve a minimum flow of 30 cfs that the Corps would pass over or through the dam into the stilling basin (bypassed reach). When total Corps releases are less than 109 cfs, which is the minimum hydraulic capacity of one turbine unit (79 cfs) plus the minimum flow of 30 cfs, Mahoning Hydro proposes to cease project operation, and all flows would be released into the bypassed reach. Releases in excess of 905 cfs, which is the maximum hydraulic capacity of the two turbines plus the 30-cfs minimum flow, would be released through or over the dam.

Proposed Environmental Measures

In addition to the proposed operation, Mahoning Hydro proposes to: (1) prepare a shoreline stability plan and employ best management practices to address stream bank and tailrace scour and erosion; (2) provide natural or forced air ventilation in the new turbine draft tubes to enhance and mitigate any project effects on dissolved oxygen (DO); (3) install a continuous DO sensor, water quality monitoring, and data collection system on the intake structure and downstream of the powerhouse to monitor and report DO, temperature and total dissolved gas and to inform any necessary changes in operation; (4) install an 870-square-foot intake structure to reduce intake approach water velocity to an average of 1 foot per second, and trash racks with 1-inch spacing, to reduce fish entrainment; (5) reseed or landscape around the powerhouse and penstock route; (6) provide a fishing pier at the stilling basin, with fish attraction structures, an interpretive display, and stairs leading from the pier to the shoreline; (7) design and construct a powerhouse to blend-in with the existing environment; and (8) implement a historic properties management plan (HPMP) to manage any historic properties within the area of potential effect.

Alternatives Considered

This Environmental Assessment (EA) analyzes the effects of the proposed action and recommends conditions for any original license issued. In addition to the proposed action, the EA considers: (1) Mahoning Hydro's proposal with additional staff modifications (staff alternative); and (2) a no action alternative.

Public Involvement and Areas of Concern

Before filing its license application, Mahoning Hydro conducted a pre-filing consultation process under the Commission's integrated licensing process. The intent of the pre-filing process is to initiate public involvement early in the project planning process and to encourage citizens, governmental entities, tribes, and other interested parties to identify and resolve issues prior to an application being formally filed with the Commission. During pre-filing consultation, we conducted scoping to determine what

issues and alternatives should be addressed. A scoping document was distributed on February 27, 2006. Scoping meetings were held on March 22, 2006, in Rural Valley, Pennsylvania, and on March 23, 2006, in Indiana, Pennsylvania. Meetings to review the status and the results of required studies were held on November 9, 2007, and November 18, 2008. On September 3, 2008, a notice that the application was ready for environmental analysis was issued that solicited conditions, prescriptions, and recommendations for the project.

Staff Alternative

The staff alternative includes Mahoning Hydro's proposed measures as well as these additional measures: increasing the amount of flow dedicated to the stilling basin (bypassed reach) from 30 cfs to 40 cfs during the winter to protect the jet valve from freezing; a water quality monitoring plan; a wetland protection plan; a recreation plan that includes installation of the proposed fishing pier; and execution of a programmatic agreement for managing historic properties, which would require implementation of the proposed HPMP and additional consultation and surveys with regards to any ground disturbance in previously undisturbed and unevaluated areas.

Geology and Soils Resources – Developing and implementing an erosion and sedimentation control plan, as proposed by Mahoning Hydro, would reduce erosion and sedimentation and minimize hazardous materials from entering the creek during project construction and operation, protecting water quality, wetlands, and aquatic habitat.

Aquatic Resources – Limiting power generation water withdrawals such that the Corps may release 30 cfs at the dam would benefit aquatic habitat downstream of the project by ensuring that a minimum flow is released into the stilling basin and downstream. Increasing this reservation of flow to 40 cfs during the winter would protect the jet valve from freezing.

Air ventilation in the turbine draft tubes would mitigate for low DO that could occur in the powerhouse discharge during summertime stratification conditions, protecting downstream biota. An 870-square-foot intake structure, with trashracks with 1-inch spacing, would decrease the likelihood and extent of fish entrainment.

Developing and implementing the proposed water quality monitoring measures, to be included in the construction and operation agreement that Mahoning Hydro would enter into with the Corps, would provide for the protection of aquatic resources. A water quality monitoring plan would serve to clearly define the protocols used for collecting water quality data at the project and for providing continuous real-time data on DO and temperature below the project site during project construction and operation.

Terrestrial Resources – Project construction would displace approximately 4 acres of riparian and upland vegetation. Including the proposed revegetation measures (i.e.,

reseeding disturbed areas) as a component of the erosion and sedimentation control plan would minimize these effects to the extent possible. Including measures to use native plant species would help to avoid the establishment of invasive species in these disturbed areas.

The proposed construction activities, including road refurbishment and the installation of a new bridge across a tributary (Camp Run), could affect the hydrology of three small wetlands located at the project. A wetland protection plan would ensure implementation of measures to protect riparian and wetland habitat during project construction.

Threatened and Endangered Species – No federally listed endangered or threatened species are known to exist in the project area.

Recreation– Installing the proposed fishing pier would benefit anglers using the stilling basin. Developing and implementing a recreation plan that includes measures to design and install a fishing pier would clarify the licensee's responsibilities for operation and maintenance and allow for consultation on final design.

Land Use, and Aesthetics– Including, in powerhouse designs, specific measures (i.e., material and color) to complement the natural surroundings, and reseeding or landscaping around the powerhouse and penstock route, would protect visual resources at the project.

Cultural Resources – Implementing Mahoning Hydro's proposed HPMP would protect known historic properties within the area of potential effects. A programmatic agreement, executed by the Commission and the SHPO would require the implementation of the HPMP and would require additional consultation and surveys, if necessary, in the case that ground-disturbing activities take place in previously undisturbed and unevaluated areas.

Draft license articles to implement the staff alternative are attached in Appendix A.

No-Action Alternative

Under the no-action alternative, the project would not be constructed and environmental conditions at the project site would remain the same.

Conclusion

Based on our analysis, we recommend the staff alternative which is licensing the project as proposed by Mahoning Hydro with staff modifications.

In section 4.2 of the EA, we estimate the likely cost of alternative power for each of the alternatives identified above. Our analysis shows that during the first year of operation under the proposed action alternative, project power would cost $286,190, or $14.31/MWh more than the likely alternative cost of power. Under the staff alternative, project power would cost $292,640, or $14.69/MWh more than the likely alternative cost of power. There are no costs associated with the no-action alternative other than Mahoning Hydro's cost to prepare the license application.

On the basis of our independent analysis, we conclude that issuing a license for the project with the staff-recommended environmental measures, would not be a major federal action significantly affecting the quality of the human environment.

We chose the staff alternative as the preferred alternative because: (1) the project would provide a dependable source of electrical energy for the region (19,914 megawatt-hours (MWh) annually); (2) the project could save an equivalent amount of fossil-fueled generation and capacity, which may help conserve non-renewable energy resources and reduce atmospheric pollution, including greenhouse gases; and (3) the recommended environmental measures proposed by Mahoning Hydro, as modified by staff, would protect and enhance environmental resources affected by the project. The overall benefits of the staff alternative would be worth the cost of the proposed and recommended environmental measures.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, D.C.

Mahoning Creek Hydroelectric Project
Project No. 12555-004 – Pennsylvania

1.0 INTRODUCTION

1.1 APPLICATION

On July 27, 2009, Mahoning Creek Hydroelectric Company, LLC (Mahoning Hydro), filed an application for an original license with the Federal Energy Regulatory Commission (Commission) for the proposed Mahoning Creek Hydroelectric Project No. 12555. The 6.0-megawatt (MW) project would be connected to the U.S. Army Corps of Engineers (Corps) Mahoning dam which is located on Mahoning Creek in Armstrong County, Pennsylvania (see figures 1 and 2). The project would occupy about 1.0-acre of federal land managed by the Corps.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The Commission must decide whether to issue a license for the project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued, such as flood control, irrigation, navigation, or water supply, the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection, mitigation of, damage to, and enhancement of fish and wildlife resources (including related spawning grounds and habitat); (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing a license for the project would allow Mahoning Hydro to construct the project and generate electricity for the term of the license, making electrical power from a renewable resource available for sale to the regional grid. This Environmental Assessment (EA) assesses the environmental and economic effects associated with the construction and operation of the project, alternatives to the proposed project, and makes recommendations to the Commission on whether to issue a license, and if so, recommends conditions to become a part of any license issued. In the EA, staff assess

the environmental and economic effects of constructing, operating, and maintaining the project: (1) as proposed by Mahoning Hydro (proposed action); and (2) with our recommended measures (staff alternative). We also consider the effects of the no-action alternative.

1.2.2 Need for Power

The project would generate an average of 19,914 MWh annually. To assess the need for project power, we reviewed Mahoning Hydro's anticipated future use of project power, together with that of the operating region in which the project would be located. Project power would be used to meet regional electrical demand. The project would be located in the Reliability First Corporation (RFC) region of the North American Electric Reliability Council (NERC). According to NERC, summer peak demand in the region is expected to increase at an average rate of 1.4 percent per year over the 10-year planning period from 2009-2018 (NERC, 2009). Therefore, project power would help meet base and summer peak demand. In addition, by producing hydroelectricity, the project would displace the need for other power plants, primarily fossil-fueled facilities, thereby avoiding some power plant emissions and creating an environmental benefit. These factors support a finding that the power from the project may help to meet both the short and long-term need for power in the RFC.

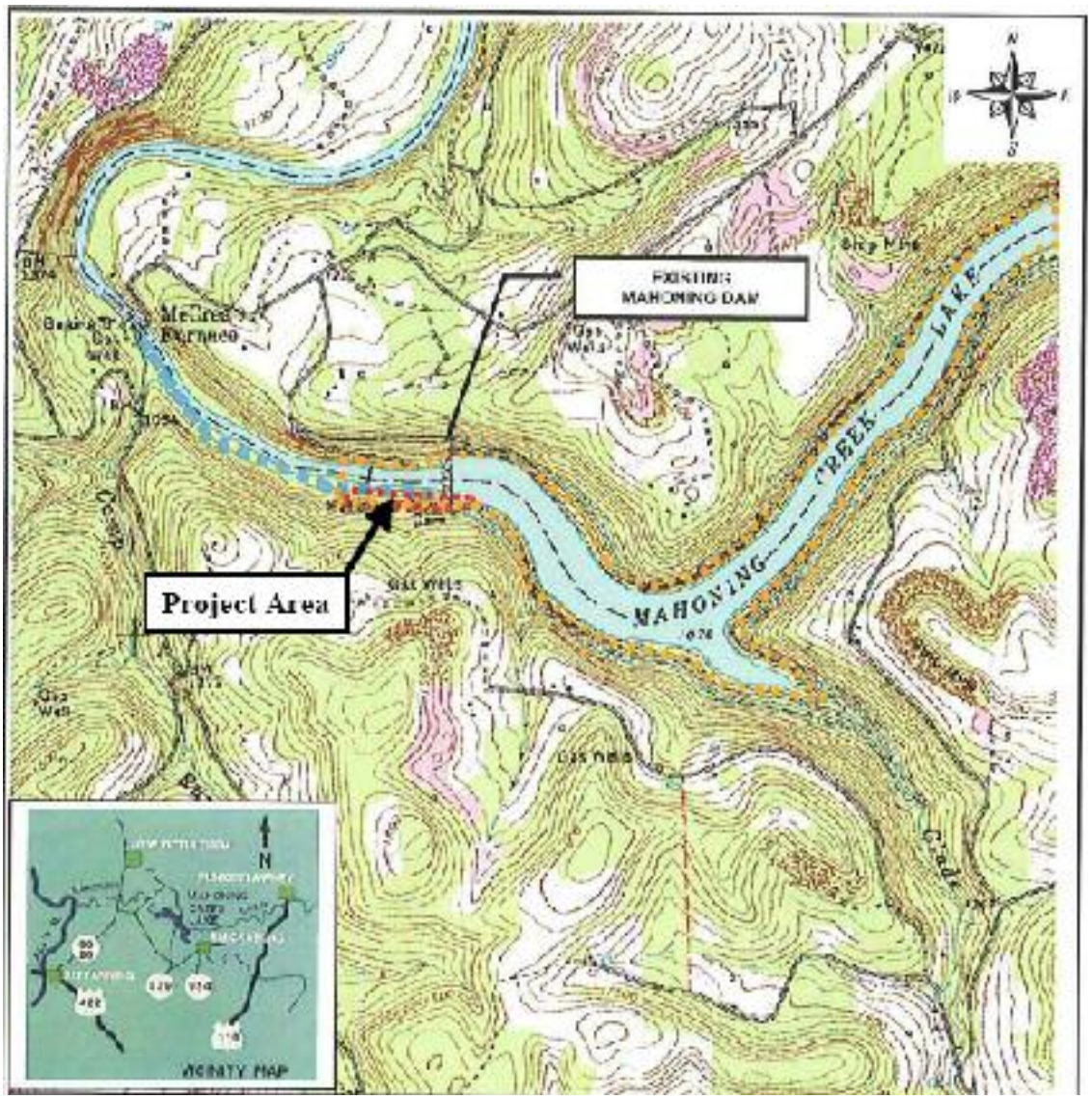

Figure 1. General location of the Mahoning Creek Project (source: license application).

Figure 2. Proposed transmission line route (source: license application).

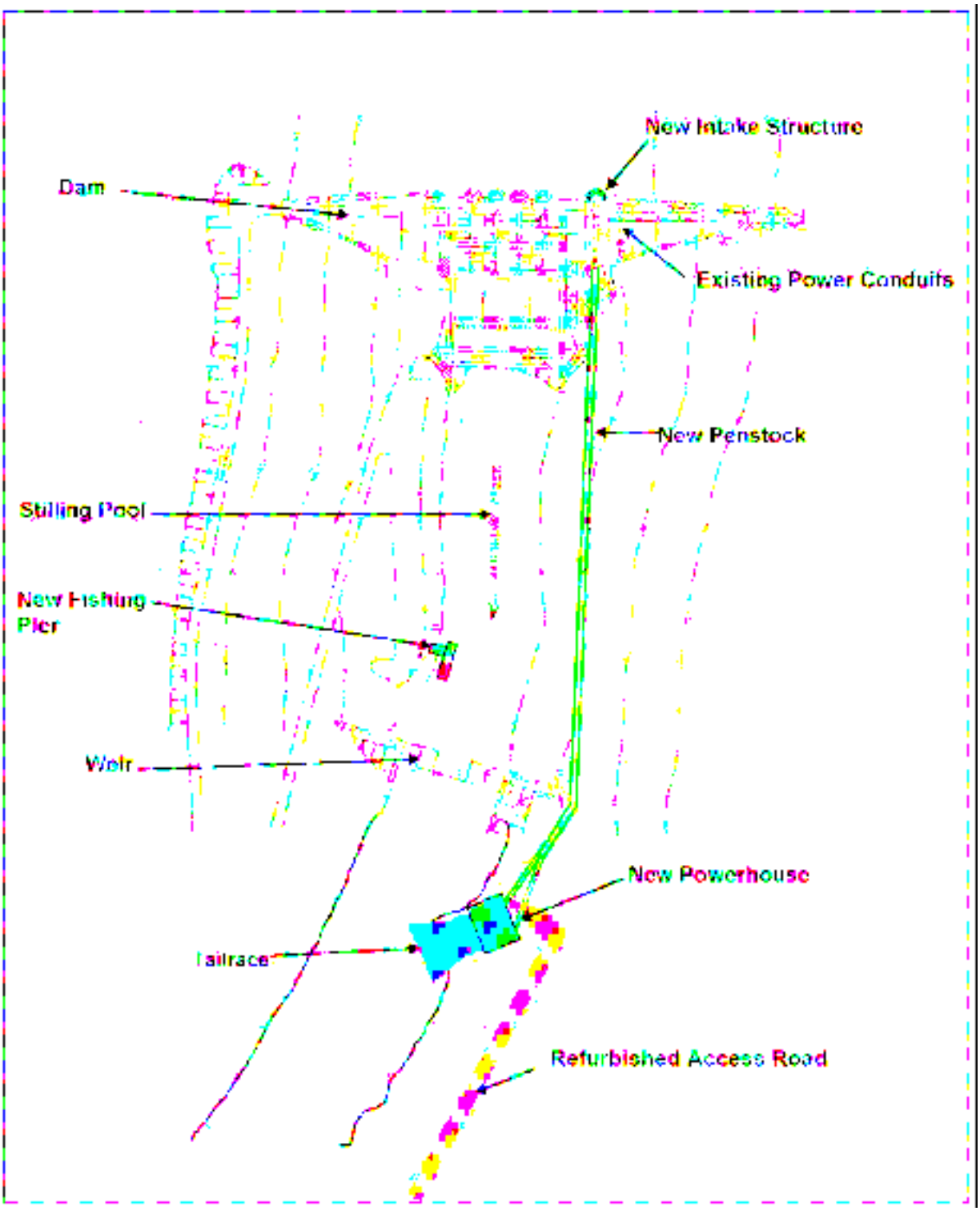

Figure 3. Mahoning Creek Project Site Plan (Source: license application, as modified by staff).

1.3 STATUTORY AND REGULATORY REQUIREMENTS

If licensed, the project would be subject to the requirements of the Federal Power Act (FPA) and other applicable statutes. We summarize the major statutory and regulatory requirements in table 1 and describe them below.

Table 1. Major statutory and regulatory requirements for the project.

Requirement	Agency	Status
Section 18 of the FPA – fishway prescriptions	U.S. Department of the Interior (Interior)	No prescriptions were filed.
Section 10(j) of the FPA	Pennsylvania Fish and Boat Commission (Pennsylvania F&BC) U.S. Fish and Wildlife Service (FWS)	No recommendations were filed.
Section 401 of the Clean Water Act (CWA) – water quality certification (certification)	Pennsylvania Department of Environmental Protection (Pennsylvania DEP)	Pennsylvania's certification is due by November 2, 2010.
Endangered Species Act (ESA)	FWS	FWS email dated July 20, 2009, filed with the license application (Appendix E), concludes that the project is not likely to adversely affect listed species.
Coastal Zone Management Act (CZMA)	Pennsylvania DEP	As confirmed by email from Pennsylvania DEP, filed March 8, 2010, Armstrong County is located outside of Pennsylvania's two coastal zones (Lake Erie and Delaware Estuary), and thus the proposed project does not require a CZMA consistency review.
Section 106 of the National Historic Preservation Act (NHPA)	State Historic Preservation Officer (SHPO)	Staff intend to execute a Programmatic Agreement with the SHPO which would require Mahoning Hydro to implement an Historic Properties Management

Plan.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior. Interior has not filed a fishway prescription or reservation of authority to prescribe fishways.

1.3.1.2 Section 10(j) Recommendations

Under section 10(j) for the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the proposed project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. No section 10(j) recommendations have been filed.

1.3.2 Clean Water Act

Under section 401 of the CWA, a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. On October 30, 2009, Mahoning Hydro applied to Pennsylvania DEP for certification for the Mahoning Creek Project. Pennsylvania DEP received this request on November 2, 2009. Pennsylvania DEP has not acted on the certification request.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. There are no known federally listed endangered or threatened

species or critical habitat for such species within the project area. In response to Mahoning Hydro's analysis of the potential effects to any Indiana bats in the vicinity, FWS concluded that the project is not likely to adversely affect listed species.

Although there is potential Indiana bat non-hibernation habitat located at the project, it is primarily located across the creek from the proposed construction. Staff conclude that the project is not likely to adversely affect this species.

1.3.4 Coastal Zone Management Act

Under section 307(c)(3)(A) of the CZMA, 16 U.S.C. §1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state's CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. The project is located in the Allegheny River drainage, outside of Pennsylvania's two coastal zones (Lake Erie and Delaware Estuary), and thus the proposed project does not require a CZMA consistency review. In an email filed March 8, 2010, the Pennsylvania DEP confirmed that the project is located outside of the coastal zones and will not affect them.

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires federal agencies to "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register).

The Mahoning dam, including the stilling basin, tailrace, and weir, is eligible for listing in the National Register. A nearby foundation is included as a component of this eligible property due to its association with dam construction.

In its 2006 letter, the SHPO notes that the proposed project will have no effect on this property. The SHPO also states that the activity described in the PAD should have no effect on historic archaeological resources, but that if the scope of the project is amended to include additional ground-disturbing activity, the SHPO should be contacted and a Phase I Archaeological Survey may be necessary to locate all potentially significant resources. Finally, the SHPO states that should the applicant become aware that unidentified historic or archaeological properties are located at the project site, or that project activities will have an effect on these properties, the SHPO should be contacted immediately.

Staff intend to execute a Programmatic Agreement (PA) with the SHPO. The PA would require Mahoning Hydro to implement an HPMP. The HPMP would ensure that historic properties within the project boundary are fully identified and would establish procedures for addressing the effects of future ground-disturbing activities on cultural resources at the project.

1.4 PUBLIC REVIEW AND CONSULTATION

The Commission's regulations (18 CFR sections 5.1-5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the Endangered Species Act, the National Historic Preservation Act, and other statutes. Prefiling consultation must be complete and documented according to the Commission's regulations.

Licensing of the Mahoning Creek Project was formally initiated on December 27, 2005 when Mahoning Hydro filed with the Commission a Pre-Application Document (PAD) and a Notice of Intent (NOI) to license the Mahoning Creek Project using the Integrated Licensing Process (ILP). The Commission issued a Notice of Commencement of Proceeding on February 28, 2006.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. On February 27, 2006, the Commission distributed a scoping document for the Mahoning Creek Project to the parties on the Commission's mailing list and the applicant's distribution list. Scoping meetings were held on March 22 and 23, 2006, in Rural Valley and Indiana, Pennsylvania, respectively, to request oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these comments are part of the Commission's public record

for the project. In addition to comments provided at the scoping meetings, the following entities provided written comments:

Table 2. Comments filed during scoping.

Commenting Entity	Date Filed
North Central Pennsylvania Regional Planning and Development Commission	April 11, 2006
Seneca Nation Tribal Historic Preservation	April 19, 2006
FWS	April 26, 2006

1.4.2 Interventions

On September 3, 2009, the Commission issued a notice that the application had been accepted for filing. This notice set November 2, 2009, as the deadline for filing protests and motions to intervene. No protests or motions to intervene were filed.

1.4.3 Comments on the License Application

The September 3, 2009, notice also stated the application was ready for environmental analysis and requested comments, recommendations, preliminary terms, conditions, and prescriptions be filed by November 2, 2009. The following entities commented:

Table 3. Comments on the license application.

Commenting Entity	Date Filed
County of Armstrong, Pennsylvania	October 27, 2009
Corps	November 3, 2009
Interior	November 4, 2009
Pennsylvania State Representative Donna Oberlander	November 2, 2009
Pennsylvania State Senator Don White	November 11, 2009

Mahoning Hydro did not file reply comments.

1.4.4 U.S. Army Corps of Engineers – Terms and Conditions

Pursuant to a Memorandum of Understanding (MOU) between the Commission[1] and the Department of the Army, licensed hydropower facilities that will be an integral part of or that could affect the structural integrity or operation of a Corps' project are to be designed and constructed in consultation with and subject to the review and approval of the appropriate Corps' District Engineer. Consistent with the MOU, the Commission routinely includes special license articles which do the following:

(1) require the licensee to submit final plans and specifications for cofferdams and deep excavations to the Corps and Commission for review and approval;

(2) require the licensee to enter into a comprehensive agreement with the Corps within 90 days after a license is issued. The agreement must assure that (a) studies and construction activities for the licensed project do not interfere with Corps operations or damage Corps' facilities, and (b) the licensee compensates the Corps for its project-related personnel and construction costs;

(3) authorize the Corps to (a) inspect the construction, operation, and maintenance of any licensed facilities that may affect the structural integrity or operation of the Corps' project, and (b) order the licensee to stop any activity that may endanger the structural integrity or safety of the Corps' project;

(4) require the licensee to submit a regulating plan to the Corps for approval at least 60 days prior to the start of construction, and to enter into an operating Memorandum of Agreement (MOA) with the Corps describing the detailed operation of the power facilities acceptable to the Corps;

(5) provide that the licensee shall have no claim under the license against the United States arising from any changes made in the structure, operation, or reservoir levels of the Corps' project; and

(6) require the licensee to provide the Commission's Regional Director two copies of all correspondence between the licensee and the Corps and provide that the Commission's Regional Director shall not authorize construction until the Corps provides final written approval of the project.

The Corps submitted comments on the license application, which are discussed throughout Section 3.

[1] See Memorandum of Understanding between the Commission and the Corp of Engineers regarding Non-federal Hydropower Projects, November 1981.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the project would not be constructed and no project-related change to current environmental conditions would occur. We use existing conditions as the baseline environmental condition for comparison with other alternatives.

2.1.1 Existing Project Facilities

The existing Mahoning dam, reservoir, and appurtenant facilities were constructed by the Corps beginning in 1939 and became operational in 1941. The dam was designed with two conduits built into the south abutment of the dam for future hydropower development. The Corps facilities consist of: a 162-foot-high, 926-foot-long dam with a 192-foot-long spillway section equipped with five 29-foot-high, 30-foot-long vertical lift gates, impounding a 5-mile-long, 280-acre reservoir with a normal pool elevation of 1,077 feet mean sea level (msl); and a 192-foot-wide, 950-foot-long stilling basin connected to a 180-foot-long flat crested stilling basin weir.

2.1.2 Existing Project Operation

The Mahoning dam is one of 16 flood control projects in the Pittsburg District providing flood protection to the lower Allegheny River Valley and the upper Ohio River. The Corps operates the dam generally in a modified run-of-river mode to augment flow during dry periods to improve downstream water quality and for domestic, industrial and recreational uses. The Corps manages the summer pool elevation at 1,100 feet msl ± 0.5 feet, and during the fall, the pool level is lowered to elevation 1,075 feet msl to provide a flood reserve. There is currently no specified minimum flow released by the Corps at the dam; however, a 30-cfs minimum flow has historically been released to Mahoning Creek, and a minimum flow of between 35 and 45 cfs is released into the stilling basin during cold periods to prevent freezing of the ring jet, a valve that releases water through the dam.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities

As proposed by Mahoning Hydro, the project would be located on the downstream side of the existing Corps' Mahoning dam. Building the project would involve constructing: (1) a new 50-foot-high intake structure attached to the upstream face of the dam, equipped with removable trashracks (with 1-inch spacing), dewatering

bulkhead panels, and a vertical slide gate; (2) a new lining on the existing (currently plugged), 108-inch-diameter conduit that passes through dam monolith 15; (3) a new buried 1,090-foot-long, 120-inch-diameter penstock on the left (south) bank, bifurcating into two new 110-foot-long, 96-inch-diameter penstocks; (4) a new powerhouse located approximately 100 feet downstream of an existing stilling basin weir containing two new Kaplan turbine generator units with a total installed capacity of 6.0 MW; (5) a new 40-foot-wide, 150-foot-long, 10-foot-deep tailrace; (6) a new 2.2-mile-long, 25-kilovolt transmission line; (7) a new 100-foot-long bridge spanning a small stream connected to; (8) a refurbished existing 0.5-mile-long access road; and (9) appurtenant facilities.

The proposed project boundary maps, filed on July 27, 2009, enclose the above facilities, including the proposed bridge and refurbished access road. The project would occupy about 1.0 acre of federal land managed by the Corps. There are no existing or proposed recreation facilities located within the proposed project boundary.

2.2.2 Proposed Project Operation

Mahoning Hydro proposes to operate the project in a run-of-release mode (no modifications to the quantity or timing of the Corps' releases), with a preservation of the Corp's historical minimum flow release of 30 cfs. Mahoning Hydro would divert any intended Corps releases that are greater than 30 cfs and below 905 cfs to the project powerhouse for generation, releasing the flow downstream of the stilling basin weir. This proposed operation would reserve a minimum flow of 30 cfs that the Corps would pass over or through the dam into the bypassed reach. When total Corps releases are less than 109 cfs, which is the minimum hydraulic capacity of one turbine unit (79 cfs) plus the minimum flow of 30 cfs, Mahoning Hydro proposes to cease project operation, and all flows would be released into the bypassed reach. Releases in excess of 905 cfs, which is the maximum hydraulic capacity of the two turbines plus the 30-cfs minimum flow, would be released through or over the dam.

Project flows would be diverted to the powerhouse through the proposed intake structure located at an existing (but currently plugged) conduit in the dam, and through the proposed penstock that would be located on the left (south) bank. Flows entering the powerhouse through the proposed bifurcated penstocks would bypass the stilling basin weir and discharge directly into Mahoning Creek below the proposed powerhouse.

The project would have an estimated annual generation of 20,000 megawatt-hours. Mahoning Hydro proposes to fully automate project operation (i.e. start, run, shut down the turbines) from a remotely controlled facility.

2.2.3 Proposed Environmental Measures

In addition to the above, Mahoning Hydro proposes to: (1) prepare a shoreline stability plan and employ best management practices to address stream bank and tailrace

scour and erosion; (2) provide natural or forced air ventilation in the new turbine draft tubes to enhance and mitigate any project effects on dissolved oxygen (DO); (3) install a continuous DO sensor, water quality monitoring, and data collection system on the intake structure and downstream of the powerhouse to monitor and report DO, temperature and total dissolved gas and to inform any necessary changes in operation; (4) install a 870-square-foot intake structure to reduce intake approach water velocity to an average of 1 foot per second, and trash racks with 1-inch spacing, to reduce fish entrainment; (5) reseed or landscape around the powerhouse and penstock route; (6) provide a fishing pier at the stilling basin, with fish attraction structures, an interpretive display, and stairs leading from the pier to the shoreline; (7) design and construct a powerhouse to blend-in with the existing environment; and (8) implement a historic properties management plan (HPMP) to manage any historic properties within the area of potential effect.

2.2.4 Modifications to Applicant's Proposal

In a letter filed on November 3, 2009, in response to the ready for environmental analysis notice, the Corp states that during cold periods it releases between 35 to 45 cfs through the ring jet valve to prevent freezing.[2] The Corps does not support Mahoning Hydro's intention to operate the project such that 30 cfs may be released at the dam because the Corps maintains a 10% flow through the ring jet (equivalent to 35 to 45 cfs) during cold periods to prevent freezing.

2.2.5 Project Safety

Under an original hydropower license, the proposed project would be subject to the Commission's project safety requirements. As part of the licensing process, Commission staff would evaluate the adequacy of the proposed project facilities. Special articles would be included in any license issued, as appropriate. Before the project is constructed, engineers from the Commission's New York Regional Office and the Corps would review the designs, plans, and specifications of the proposed intake structure, penstock, powerhouse, and other structures. During construction, engineers from the Commission and the Corps would frequently inspect the project to assure adherence to approved plans and specifications, special license articles relating to construction, operation, and maintenance, and accepted engineering practices and procedures. Once construction is complete and the project enters the operation phase, Commission engineers would inspect it on a regular basis. Because the Mahoning dam is owned and operated by the Corps, the Commission would coordinate with the Corps to fulfill its obligation to ensure that the project safety requirements are met.

[2] The ring jet valve is connected to a 4-foot-diameter low flow conduit located in the spillway monolith No. 10 used for the purpose of releasing flows into the stilling basin bypassed reach.

2.3 STAFF ALTERNATIVE

The staff alternative, in addition to Mahoning Hydro's proposed measures and the Corps' minimum bypassed flow release during cold periods includes: (1) increasing the amount of flow dedicated to the bypassed reach from 30 cfs to 40 cfs during the winter to protect the jet valve from freezing; (2) a water quality monitoring plan; (3) a wetland protection plan; (4) a recreation plan that includes installation of the proposed fishing pier; and (5) execution of a programmatic agreement for managing historic properties, which would include implementation of the proposed HPMP and additional consultation and surveys with regards to any ground disturbance in previously undisturbed and unevaluated areas. Proposed and recommended measures are discussed under the appropriate resource sections and summarized in section 5 of the EA.

Draft license articles to implement the staff alternative are attached in Appendix A.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

We have not identified any other alternatives to Mahoning Hydro's proposal.

3.0 ENVIRONMENTAL ANALYSIS

This section includes: (1) a general description of the project area, (2) the scope of our cumulative effects analysis, and (3) our analysis of the effects of the alternatives and corresponding environmental measures. Sections are organized by resource area (aquatics, recreation, etc.). Under each resource area, existing conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives.

Staff conclusions and recommended measures are discussed in section 5.2, Comprehensive Development and Recommended Alternative of the EA.[3]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The project is located in the Mahoning Creek Watershed, with a drainage area of approximately 444 square miles. Mahoning Creek, a major tributary of the Allegheny

[3] Unless otherwise indicated, our information is taken from the application for license filed by Mahoning (Mahoning, 2009a).

River, originates in the west-central part of Pennsylvania and is located 22.9 miles above the Allegheny River. Mahoning Creek, from its headwaters to its confluence with the Allegheny River, is approximately 62 miles. The Allegheny River Basin is an 11,778 square mile sub-basin of the Ohio River Basin. Flows in the Allegheny River are controlled by ten major reservoirs on the Allegheny and its tributaries, all but one operated by the Corps for flood control, flow augmentation, and other purposes.

The project is located in the Pittsburgh Low Plateau and consists of a smooth, undulating upland surface cut by numerous, narrow, relatively shallow valleys. The uplands are developed on rocks containing bituminous coal. The local relief on the uplands is generally less than 200 feet. Local relief between valley bottoms and upland surfaces may be as much as 600 feet. Valley sides are usually moderately steep except in the upper reaches of streams where the side slopes are fairly gentle. Elevations range from 660 to 1,700 feet.

The climate of northwestern Pennsylvania is generally continental and humid. The average monthly temperature near the project ranges from about 25.8 degrees Fahrenheit (ºF) in January to 70.2 ºF in July. Average annual precipitation is approximately 42.46 inches, with about 75 percent of total annual precipitation falling between April and September.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing National Environmental Policy Act (40 C.F.R. §1508.7), a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over time, including hydropower and other land and water development activities.

We have not identified any resources that would be cumulatively affected by constructing and operating the project. The project would be connected to an existing, operating dam and would only use those flows already released by the Corps. In addition, no other hydropower projects are located nearby and other developmental activities are far enough away from the project such that we do not expect that they would cumulatively interact with the project.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the project-specific effects of the alternatives analyzed on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure

effects. We then discuss and analyze the environmental issues associated with the alternatives.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Because constructing the project would not involve large numbers of workers, local infrastructure such as schools, hospitals, lodging, and service businesses would not be significantly affected. Therefore, socioeconomic resources are not assessed in this EA. We present our recommendations in section 5.2, Comprehensive Development and Recommended Alternative.

3.3.1 Geology and Soils Resources

Affected Environment

The Mahoning Creek Project is located on the Appalachian Plateau Province in west central Pennsylvania, which is characterized by rugged, deep, steep-sided stream valleys. Soils that typically dominate the project area are the Weikert and Gilpin Series. The Weikert Series consist of shallow, well-drained soils formed in material that weathered from interbedded gray and brown acid shale, siltstone, and fine-grained sandstone on gently sloping to very steep areas on uplands. The Gilpin Series consists of moderately deep, well-drained soils, typically located on gently sloping to steep, convex, dissected uplands. Bedrock occurs at depths of 1.5 to 3.5 feet.

The floodplains in the project area consist mainly of soils grouped into the Monongahela-Allegheny-Pope soils of this association. The Monongahela soils are the predominant soils of this association and are characterized as deep, moderately well-drained terrace soils formed in sediments washed from shale and siltstone uplands. This series exhibits seasonal wetness, flooding, and moderate permeability.

Environmental Effects

Construction of the proposed intake structure, penstock, powerhouse, tailrace, transmission line, 100-foot-long bridge spanning a small stream, and refurbishment of a 0.5-mile-long access road would occur within and adjacent to Mahoning Creek, which would require ground-disturbing activities and some excavation of the streambed. This could cause bank erosion, stream sedimentation, and disturbance of streambed material and re-suspension of sediments. As noted by the Corps in its June 24, 2009, letter, there is a currently a150-foot section of eroded shoreline just downstream of the existing south training wall, and such erosion has historically been an issue at Mahoning dam.

During the study phase prior to filing its license application, Mahoning Hydro conducted a hydraulic study using a two-dimensional numerical hydraulic model to evaluate existing and proposed conditions based on operation of the proposed powerhouse on Mahoning Creek downstream from the Mahoning dam stilling basin

weir. Two hydrologic scenarios with total flows of 905 (the maximum hydraulic capacity of the powerhouse including the minimum bypassed flow release) and 2,000 cfs (the maximum hydraulic capacity of the powerhouse with the balance of the flow passing over the upstream stilling basin weir) were evaluated with the model. The results of the analysis suggest that the discharge current from the proposed powerhouse would have minimal effects on the streambank on the opposite side of the powerhouse.

Further, the hydraulic model assessed the effects of project operation on the streambed. The results suggest that the proposed powerhouse discharge may cause erosion on the streambed where the tailrace discharges into the creek. The results indicate that relatively high-speed flows will occur in the proposed excavated tailrace, particularly when the project is operating at full capacity. These high-speed flows may result in the erosion and scour of the proposed excavated tailrace. High calculated flow speeds along the right upstream side of the tailrace in the creek immediately adjacent to the proposed excavated tailrace were also predicted.

To minimize erosion and sedimentation, Mahoning Hydro proposes to prepare a shoreline stability plan to identify issues, limitations, and potential problems associated with riverbank stability and document construction management procedures, such as drainage and shoreline stabilization for construction activities to prevent soil erosion. To avoid potential erosion of streambanks, particularly on the left bank immediately downstream from the excavated tailrace, the proposed plan would include measures for installing armoring. The plan would also include measures (e.g., armoring, hardening, or design considerations) for avoiding erosion and scour of the proposed excavated tailrace. Mahoning Hydro also intends to reseed disturbed areas following construction.

In its comments on the application, the Corps makes no mention of geology and soils resources.

Staff Analysis

Riverwash and well-drained terrace soils are present where the proposed project's powerhouse, tailrace, and new bridge would be constructed; in addition, three wetlands are located in the vicinity of these activities. Constructing these facilities and the proposed penstock, transmission line, and rehabilitating the access road could cause short-term erosion and sedimentation and contamination of the nearby soils, wetlands, and creeks. Implementing the types of measures proposed by Mahoning Hydro to minimize erosion and sedimentation would ensure that construction and operation related activities do not significantly adversely affect the soil and water resources in the proposed project area.

To further minimize the risk of soils and aquatic resources being contaminated by potentially hazardous materials during construction activities, an erosion and sedimentation control plan would typically include best management practices, such as:

(1) a project site plan showing the location of cofferdam dams, rip rap, staked hay bales, geo-textile silt fence areas, excavated material stockpile area, and a temporary siltation catch basin; (2) designating specific sites for fuel storage and fueling vehicles; (3) disposing of all waste material properly; (4) maintaining on-site sanitary facilities; and (5) reseeding disturbed vegetated areas with native plants once construction is complete. Providing such detail would help ensure erosion and sedimentation and hazardous material entering the creek is minimized during proposed project construction and operation.

3.3.2 Aquatic Resources

Affected Environment

Water Quantity

As noted, Mahoning Creek is an approximately 60-mile-long tributary of the Allegheny River in western Pennsylvania, which in turn is a tributary of the Ohio River. Mahoning dam is located 22 miles upstream from the creek's confluence with the Allegheny River and the dam impounds a drainage area of 340 square miles.

For the 27-year period of record (October 1981 through September 2008), the Corps has released monthly mean flows at the dam ranging from 246 cfs in August to 1,076 cfs in March. Monthly maximum releases range from 2,584 cfs in August to 6,844 in April. Monthly minimum flows range from 5 cfs in August to 150 cfs in March. The 7Q10 flow[4] for the period ending September 30, 2008 is 30 cfs. All flows released by the Corps are released either over or through the dam and flow through the stilling basin and over the stilling basin weir.

The Corps operates the Mahoning dam in a mode whereby inflow approximates outflow at most times except during the fall when the impoundment is drawn down 25 feet for flood control purposes. This operation results in a surface area of 280 acres during the summer months, which supports recreational uses, and a surface area of 170 acres during the winter months as part of the Corps' overall management of the Allegheny River basin for flood control. In order to lower the impoundment to the winter elevation, the Corp releases flows greater than project inflow during the fall.

There is currently no specified minimum flow released by the Corps at the dam. In its comments on the application, however, the Corps states that a minimum flow between 35 and 45 cfs is required during cold periods to prevent freezing of the ring jet.

Water Quality

[4] The lowest flow which has occurred on a given stream reach for seven consecutive days over the previous 10-year period of record.

The EPA's 1996 CWA Section 303(d) list identified six impaired streams in the Mahoning Creek drainage area. Four creeks upstream of the dam and two streams downstream of the dam are listed as impacted by acid mine drainage. Additionally, two other creeks upstream of the impoundment are impaired with metals contamination.

Site-specific water quality data are available from a 1993 study conducted by the Corps to evaluate a previously proposed hydroelectric project at the dam site, and Mahoning Hydro's study from 2007. Both studies documented generally high water quality. In addition, both studies indicate that although the impoundment does exhibit some level of summer stratification, the vertical thermal gradient is less than what would be typically expected in a lake of this depth. The studies concluded that the weak stratification is probably the result of low water retention time.

The extent of stratification is important because if a lake strongly stratifies, it is more likely to develop low DO in the deeper strata, which can affect downstream water quality when that water is released. Low DO also generally causes metals from the sediment to dissolve and enter the deeper water strata. In the case of Mahoning Creek, such metals include iron, manganese, aluminum, copper, and nickel, which are known to exist in the impoundment sediments and are a concern to the EPA and the Corps.

During the 2007 study, a vertical thermal gradient ranging from 4.1 degrees to 4.6 degrees Celsius was observed between the surface water and the bottom of the impoundment. During July, 2007, this resulted in a range of DO from a high of 9.5 mg/l at 10ft. below the surface to a low of .7 mg/l at a depth of 65 ft. In August, the DO ranged from 8.8 mg/l down to 5.9 mg/l, respectively. The July samples were taken during low-flow conditions and the August samples were taken during relatively wet summer conditions. This suggests that the weak stratification within the impoundment is quite sensitive to hydrologic and meteorological conditions.

During the same sampling period, DO and temperature were monitored at the downstream end of the stilling basin and just below the stilling basin weir. DO was in the range of 8.1 to 9.1 mg/l at the stilling basin sampling location, with levels of 8.5 to 9.4 mg/l at the station below the stilling basin weir, indicating the aerating effect of the weir.

Water Quality Standards

The Pennsylvania DEP classifies Mahoning Creek as a warm water fishery (WWF). Dissolved oxygen (DO) standards for WWF waters include a minimum daily average of 5.0 mg/l and a minimum value of 4.0 mg/l. Maximum water temperature standards are defined by month and range from 40 degrees up to 87 degrees.

Aquatic Habitat

The impoundment is steep-sided, with a forested shoreline, and depths near the dam ranging up to 75 feet deep. Near-shore habitat includes large woody debris, rock ledges, and sediment types ranging from sand to boulders.

The stilling basin is approximately 950 feet long and consists of fairly uniform pool habitat with an average depth of approximately 5 feet and a maximum depth of 17 feet at the weir. The banks are partially to completely forested, and substrate in the stilling basin covers the range from sand to boulder. The channel in the stilling basin is modified and straight.

Habitat in the Mahoning Creek between the stilling weir and the McCrea Furnace Bridge, approximately 4,000 feet below the dam, contains a mix of riffles, runs and pools. The average width of the stream is approximately 150 feet. Substrate ranges from sand to boulder and instream cover is abundant, including undercut banks, woody debris jams, and pools with depth exceeding 1 meter.

Aquatic Biota

In the summer of 2007, Mahoning Hydro conducted fish surveys in the project area to characterize the aquatic community. A total of 39 fish species, representing 9 families, were collected during the survey. Other studies conducted between 1986 and 2001 by the Corps and the Pennsylvania F&BC have documented a total of 48 species, including all 39 found by Mahoning Hydro in 2007. None of the species are federally listed as either threatened or endangered, nor are they listed as endangered, threatened, or candidate species in Pennsylvania. All species encountered are considered common in the Ohio River watershed.

Primary sport fish include muskellunge, smallmouth bass, largemouth bass, rock bass, walleye, yellow perch, northern pike, channel catfish, and white crappie. The Pennsylvania F&BC annually stocks the lake with walleye fingerlings and channel catfish and also stocks the creek below the dam with trout to support a put-and-take fishery.

Mahoning Hydro surveyed Mahoning Creek for mussels in 2007 from the stilling basin weir to 400 feet downstream of the weir. Of particular interest was the possible presence of the federally listed clubshell mussel. The survey documented the presence of two unlisted mussels, the flutedshell and the kidneyshell. No clubshell mussels or suitable habitat was documented.

Mahoning Hydro surveyed Mahoning Creek for macroinvertebrates in 2007 as well. Species documented included two mayfly species, one caddis fly species, and several midge species. The survey report concluded that although the low macroinvertebrate abundance and diversity was surprising, given the generally good

water quality and habitat within Mahoning Creek, algal mats and low flow conditions during the survey period may explain the survey results.

Environmental Effects

Water Quantity

Currently the Corps operates the project so that outflows approximate inflows, with the exception that during the fall period, the impoundment is drawn down 25 feet for flood control purposes and to augment streamflow and water quality downstream in the Allegheny River basin. Mahoning Hydro proposes no modifications to this mode of operation. However, because Mahoning Hydro would use the Corp's flow releases for generation at the proposed powerhouse downstream of the stilling basin weir, thereby bypassing the stilling basin weir, Mahoning Hydro proposes to divert water to the powerhouse such that a year-round minimum flow of 30 cfs year may be released into the stilling basin to protect aquatic habitat. When total Corps releases are less than 109 cfs, which is the minimum hydraulic capacity of one turbine unit (79 cfs) plus the minimum flow of 30 cfs, Mahoning Hydro proposes to cease project operation, and all flows would be released into the bypassed reach. Releases in excess of 905 cfs, which is the maximum hydraulic capacity of the two turbines plus the 30-cfs minimum flow, would be released through or over the dam.

The Corps comments that it considers the proposed minimum stilling basin flow to be inadequate for operational and environmental reasons.

Staff Analysis

Operation in Corps' current mode

With the exception of the bypassed reach, when the project is operating, Mahoning Creek stream flow volume would remain unchanged compared to existing conditions. Thus existing water quality and the aquatic community should also exhibit similar, if not identical, conditions. For example, Mahoning Creek would continue to experience slightly higher flows in the fall than would naturally occur, due to the Corps' 25-foot drawdown operations. Similarly, during the spring, some flood flows would be captured by the impoundment rather than being released immediately into Mahoning Creek, at least to the extent that storage is available.

Minimum flow in bypassed reach (stilling basin)

To protect aquatic habitat in the stilling basin, especially during periods of low flow during the summer, Mahoning Creek proposes to operate the project such that the Corps may release a year-round minimum flow of 30 cfs over or through the dam into the stilling basin (bypassed reach). Mahoning Creek proposes this flow because it matches the 7Q10 flow for Mahoning Creek.

The Corps states that the flow needs to be in the range of 35 to 45 cfs during the winter to prevent freezing of the ring jet (the valve that releases water through the dam). Additionally, the Corps states that in order to protect aquatic habitat, the minimum flow should be higher than 30 cfs, although the Corps does not provide a specific flow recommendation. Rather, the Corps states that the flow should be approximately 10 percent of the "dam's normal flow" or "drought flow" and should vary seasonally, including a spring spawning season flow (March – June) and another flow for the remainder of the year.

The Corps does not define what it means by the "dam's normal flow" or "drought flow," although we assume that this would be greater than 30 cfs, given the context of the comments. The depth, wetted width, and substrate characteristics of the stilling basin would not change under the proposed flow or any Corps-recommended flow because of the uniformly channelized shape of the basin and the presence of the weir at its downstream end. The habitat parameters that could change under the proposed minimum flow include temperature, DO, and water velocity during certain periods of the year.

According to the flow duration curves, when the project is operating, 62 percent of the time the stilling basin would receive the proposed 30 cfs minimum flow release, leaving 38 percent of the time when the stilling basin would receive additional flow which could be released either via spillage or through the dam, as the Corps chooses based on its downstream water quality protection objectives.

Habitat in the stilling basin was scored as sub-optimal in the 2007 habitat assessment component of Mahoning Hydro's aquatic resources study. The reasons for the suboptimal score are the stilling basin's channelized shape and uniformity of habitat (i.e., all pool with no riffles or runs). With the hydro project, habitat would continue to be suboptimal yet adequate for many warmwater fish, including smallmouth and largemouth bass, and various other sunfish, minnow, darter, and sucker species. Flows would be more stable during a greater period of the year compared to current conditions. Although this stability of flow levels may adversely affect habitat for certain species which prefer higher water velocities, such as certain darters, other species such as bass and sunfish may benefit from the stability and this could improve growth rates and reproductive success within the basin during the late spring and summer. Habitat downstream of the weir would be unchanged, and therefore habitat would remain for species preferring faster water found in riffles and runs.

The proposed operation with a minimum flow release should not adversely affect water quality within the stilling basin during the winter because there is no lake stratification or deep water oxygen depletion in the winter so water quality would remain high. During the summer, the minimum flow could be released through the dam or over the dam in a combination which meets the Corps' downstream water temperature and DO objectives. We address this issue further below under our discussion of Mahoning Hydro's proposed flexible operating procedures for enhancing water quality. During the winter, the Corps' recommended minimum flow of 40 cfs could be provided to prevent freezing of the ring jets.

Water Quality

Currently, water is released from the spillway or through a deep ring jet in the dam. By using the two release locations in combination, the Corps can mix water as necessary to protect water quality downstream of the dam. With the installation of the hydroelectric project, water that would otherwise be spilled at the dam and spilled again at the stilling basin weir, would be diverted through the penstock and powerhouse before being discharged in the tailrace directly below the stilling basin weir. By bypassing the dam spillway and the stilling basin weir, the water would not be exposed to the aerating effects of those two structures. Additionally, because the depth of the proposed hydro project's water intake structure is intermediate between the deep ring jet locations and the spillway, during the summer when the impoundment may become stratified, the water used for generation may have a lower DO concentration or higher temperature than the water typically released during that time of year. In combination, these two changes may lead to a reduction in DO or increases in temperature in Mahoning Creek compared to existing conditions. To address these potential effects, Mahoning Hydro proposes to monitor water quality and install an aeration feature in the draft tubes.

Mahoning Hydro proposes to install a water quality monitoring system which would include a set of sensors mounted in the forebay at the level of the penstock opening and another set of sensors approximately 200 feet downstream from the powerhouse. The penstock sensors would record temperature and DO and the downstream sensors would record temperature, DO, and total dissolved gas (TDG). Data would be collected every 5 minutes and reported every 30 minutes via a computer in the powerhouse. The results of the monitoring would be used to determine when Mahoning Hydro would implement various mitigation measures as explained below in the next section on Water Quality Enhancement.

The Corps agrees with the need for a water quality monitoring system and states that it will require real-time, continuous monitoring at the hydropower outflow, the McCrea Furnace Road Bridge (approximately 4,000 feet downstream of the dam), and in the impoundment at the surface, mid-depth, and bottom.

Mahoning Hydro proposes to install an aeration feature in the draft tubes. Mahoning Hydro proposes to use this aeration capability, combined with a flexible operational mode, to maintain water quality. Mahoning Hydro's 2007 water quality study report discussed several possible mitigation measures, including: mixing turbine discharges with water released through or over the dam; turbine venting; air injection; notching of the stilling basin weir; installation of seasonal flashboards on the weir to increase head and aeration potential; and adding blocks or rocks to the face and base of the weir for aeration enhancement. During the 2007 study report meeting, Mahoning Hydro stated that it would also reduce or curtail generation during periods when water quality monitoring indicated that other operational or structural measures could not adequately protect water quality in Mahoning Creek.

The Corps agrees with the need for an aeration capability and a flexible operational mode. However, the Corps cautions that using natural aeration, as opposed to oxygen injection, may result in gas supersaturation, which could harm aquatic life.

Staff Analysis

Water Quality Monitoring

By monitoring water in the impoundment and below the project tailrace, Mahoning Hydro, the Corps, and other agencies would be able to anticipate and respond to potential water quality problems. For example, if water quality at the penstock intake depths shows reduced DO or elevated temperature, then Mahoning Hydro and the Corps could take action to prevent declines in downstream water quality. The specific actions which could be taken are discussed further in the water quality enhancement discussion below.

Monitoring at Mahoning Hydro's proposed sites would adequately describe the project's effects on water quality. The Corps' recommended McCrea Furnace Bridge monitoring site would record changes in stream water quality between the project tailrace and the bridge, but would not be necessary for determining project effects because any effects of the project would already be detected at Mahoning Hydro's proposed station below the tailrace.

Water Quality Enhancement

Both Mahoning Hydro's 2007 water quality study and the Corps' 1993 study used the Corps' CE-QUAL-R1 model to predict the effects of installing a hydroelectric powerhouse at the Mahoning dam. Both studies concluded that the project would likely increase the temperature slightly in Mahoning Creek and, in the absence of mitigation measures, would probably cause DO to drop below state water quality standards during periods when the lake is stratified and the hypolimnion becomes oxygen depleted.

Thus, both the Corps in 1993 and Mahoning Hydro in 2007 concluded that any proposed hydroelectric project at the dam would need to address this issue.

The Corps has repeatedly stated that Mahoning Hydro's model runs probably underestimate the potential effects on water temperature because Mahoning Hydro did not recalibrate the model but instead relied on the calibration the Corps used in 1993. Mahoning Hydro maintains that because limnological conditions are the same now as in 1993, the model is still useful for predictive purposes.

Given the year to year variation in the timing, duration, and strength of lake stratification patterns, and their sensitivity to hydrologic and meteorological influences, combined with the inherent limitations of the CE-QUAL-R1 model to address this level of limnological complexity, the exact magnitude of DO and temperature mitigation which would be necessary will vary from year to year and would require an adaptive management approach to address the wide range of potential scenarios. Because Mahoning Hydro is proposing and the Corps is recommending exactly such an approach to addressing water quality issues at the project, additional modeling would not address the variability in year-to-year conditions.

Implementing water quality monitoring and responding to potential water quality problems, as necessary, using one or more of the listed operational or structural mitigation measures would ensure that water quality is protected in Mahoning Creek. For example, under worst case conditions, completely curtailing generation would ensure that the project would have no effect on water quality compared to existing conditions. It is also possible that if turbine aeration or oxygen injection is used during generation, water quality may actually be enhanced at certain times compared to without the project. Using an adaptive management approach to dealing with water quality effects would allow Mahoning Hydro, the Corps, other agencies, and Commission staff to learn through experience which measures are necessary and effective under different scenarios.

Mahoning Hydro has not proposed, nor has the Corps or any other agency recommended, a water quality monitoring plan. However, developing and implementing a plan would prevent confusion or misunderstanding about the licensee's responsibilities during critical water quality periods. Such a plan would typically incorporate not only monitoring and reporting procedures, but also a description of what would trigger mitigation measures such as turbine aeration, mixing of deep and surface water, reduced generation, etc. Revision of the plan as necessary, under an adaptive management approach, would ensure that, over time, best management practices would be developed for a range of hydrologic and meteorological scenarios. Developing, implementing, and revising the plan in consultation with the Corps would be important since certain measures (e.g., mixing deep and surface water) would require coordination and cooperation between Mahoning Hydro and the Corps.

Fish Protection

Currently the only way for fish to move from the impoundment into Mahoning Creek downstream is over the spillway. Once the project is constructed, fish would also be vulnerable to turbine entrainment or impingement on the project trashracks.

To protect fish from impingement or entrainment, Mahoning Hydro has designed the dimensions of its intake structure so that water velocities at maximum hydraulic capacity do not exceed 1 foot per second. Additionally, the intake would be screened with trashracks having a maximum clear spacing of 1 inch.

The Corps states that "any loss [of fish] greater than 5 percent can be considered degradation and will require mitigation." The Corps also notes that the downstream fishery is at least somewhat dependent on fish movement over the dam.

Staff Analysis

There are no species documented in the impoundment that require passage around the dam to complete their life history requirements. Most of the fish species documented in the impoundment are not pelagic species, but rather prefer benthic habitats or depth, substrate, and cover habitat that is most abundant near the shoreline. Exceptions to this include gizzard shad and yellow perch, two highly fecund and abundant species whose populations would not likely be adversely affected by some degree of entrainment loss.

During project operation, some fish would be entrained and some of those fish would be injured or killed. However, fish survival through Kaplan turbines operated in the 70 to 95-foot hydraulic head range, as proposed, would probably be in excess of 90 percent, based on results of numerous other turbine survival studies (EPRI 1997; Winchell et al. 2000).

The Corps' did not provide an explanation or evidence to support its comment that loss greater than 5 percent is considered degradation and would require mitigation. It is not clear whether the Corps means 5 percent of the entire fish population or just certain species. It is also not clear how that percentage was derived or how the Corps proposes to determine what percentage of fish are being lost.

We agree with the Corps' comment that the downstream fish community is likely partially dependent on recruitment of fish that move from the lake into Mahoning Creek via spillage. However, fish movement would continue to occur by means of spillage and turbine passage. As discussed above, over 90 percent of the fish that are entrained are expected to survive and would therefore contribute to the downstream fish community.

3.3.3 Terrestrial Resources

Affected Environment

A natural resource and wetland study was completed in 2007 (see report filed October 29, 2007) to document wetlands, terrestrial communities, and species that use the project area.

Upland and riparian vegetation

The proposed project is located within the Appalachian oak forest region of Pennsylvania. The land surrounding Mahoning Creek Lake and Mahoning Creek is primarily wooded, with some development (Corps facilities and recreation sites) as well as rights-of-way for roads and electrical transmission lines. Vegetation around streams is dominated by birch, red maple, and alder, while adjacent upland forest consists primarily of pitch pine, yellow birch, sugar maple, hemlock, red oak, white oak, chestnut oak, American beech, black cherry, poplar, basswood, and tulip poplar. The aquatic resources study report, filed October 29, 2007, notes that large areas of riparian vegetation exist on both sides of the stream, with vegetation extending to the banks.

Wetlands

There is one National Wetlands Inventory (NWI) mapped wetland, located just upstream from the Creek Road Bridge on the left bank of Mahoning Creek, outside of the project vicinity. This is designated as palustrine, scrub/shrub broad-leaved deciduous, seasonally flooded. A wetland study identified three palustrine emergent marshes located within the vicinity of the project area:

1. A 0.316-acre marsh (Wetland A on figure 4) is located at the mouth of Camp Run, which is located just upstream from the McCrea Furnace Bridge, in the left floodplain of Mahoning Creek. It is dominated by sedges, red osier dogwood, and silver maple. This wetland occupies a debris fan or delta formed by deposition of sediment from Camp Run and receives hydrologic inputs from both Camp Run and Mahoning Creek.

2. A 0.012-acre marsh (Wetland B) was identified in the left descending floodplain of Mahoning Creek downstream from the Mahoning dam. The depression appears to be an excavated depression that receives surface water flows off the southern ridge of the dam. The dominant vegetation within the wetland includes creeping buttercup, spice bush, common barberry, and sweet birch.

3. The left descending floodplain of Mahoning Creek supports a 0.022-acre wetland (Wetland C) that developed on a debris fan formed by sediment

contributions from a non-jurisdictional surface swale which flows from the southern ridge. The dominant vegetation in this wetland includes sedges and manna grass.

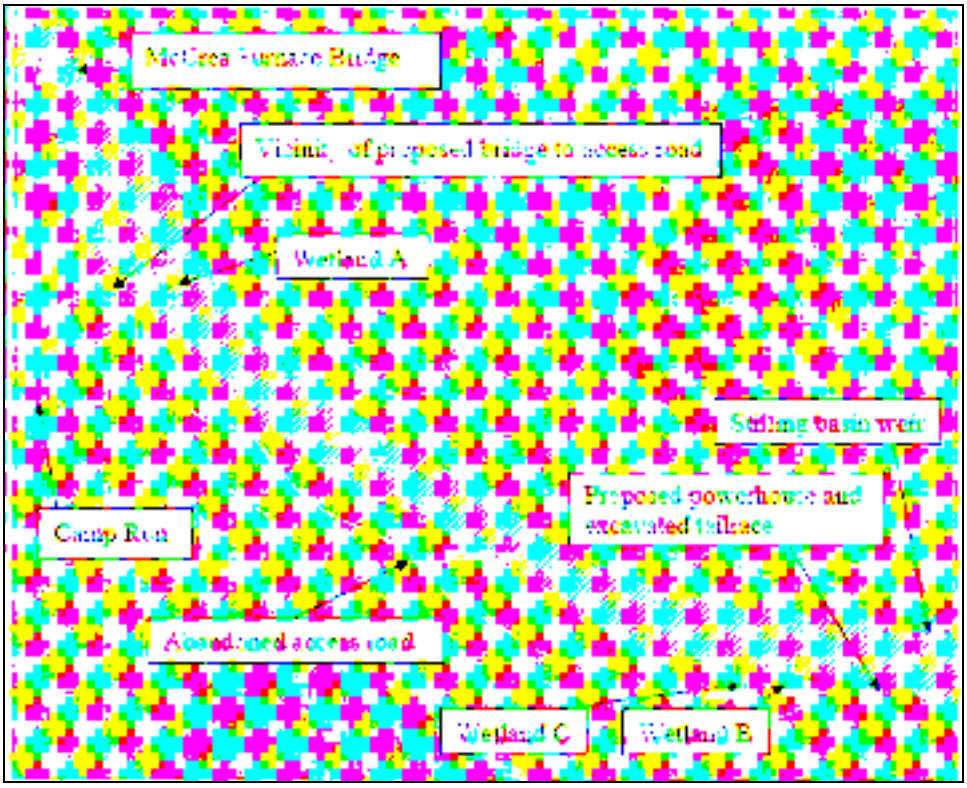

Figure 4. Location of wetlands in relation to proposed project features (source: wetlands report, 2007, as adapted by staff).

Wildlife

Wildlife species common to the general vicinity of the project area include mammals such as black bear, beaver, deer mouse, eastern fox squirrel, eastern cottontail rabbit, eastern gray squirrel, grey fox, hairytail mole, least shrew, longtailed weasel, mink, meadow vole, meadow jumping mouse, opossum, pine vole, pygmy shrew, raccoon, red fox, red squirrel, shorttail shrew, southern flying squirrel, southern bog lemming, starnose mole, striped skunk, white-tailed deer, woodchuck, and woodland jumping mouse. Birds include great-horned owl, meadowlark, red-bellied woodpecker, red-tailed hawk, ruffed grouse, and wild turkey. State listed species at the project include bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*).

Bald Eagle

On July 9, 2007, the bald eagle was removed from protection under ESA, but it remains protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bad eagle is also a Pennsylvania threatened species. They typically nest

within 0.25 to one mile of large bodies of open water, such as lakes and large rivers. Eagles nest in large, super-canopy trees or snags, often in late-successional forests. They prefer a nest site at the edge of the forest, near foraging areas, with unobstructed views. Most eagles forage primarily on fish, with lesser quantities of waterfowl, carrion, and small mammals. The license application notes that the Corps indicated a breeding pair of bald eagles nested adjacent to the lake in 2005, and the attempted rearing of an eaglet was unsuccessful (reason unknown). The nesting pair is likely to return to the site in future years. Mahoning Hydro's January 8, 2008, supplement to the initial study report notes that the Corps provided information that bald eagles nest 1.5 or 2.9 miles above the dam on the northern shore of Mahoning Creek Lake. No bald eagle activity was seen in the project area during any of the licensing studies. However, the license application also notes that there is an annual eagle migration through the area which peaks during the month of August.

Osprey

The Pennsylvania threatened osprey is a large, fish-eating bird of prey. They usually nest in large trees, but may be found nesting on channel markers, telephone poles, chimneys, and man-made platforms. Ospreys are seasonal residents in Pennsylvania and may occur at Mahoning Creek Lake from late March to approximately August (PAGC, 2007). No known nesting locations have been found within the project area. The application notes that Corps staff have observed osprey fishing in the impoundment.

Environmental Effects

Upland, riparian and wetland vegetation

The Corps previously modified the south bank of Mahoning Creek during dam construction and creation of the associated service road. However, vegetation has largely reestablished in these areas. Mahoning Hydro, in its November 5, 2008, filing, estimated that the following areas would be affected by project construction:

- Transmission line: 87,000 square feet (about 2 acres)
- Access road and penstock: 67,000 square feet (about 1.5 acres)
- Powerhouse and tailrace: 10,000 square feet (about .23 acres)
- Total area affected: 164,000 square feet (about 3.73 acres)

Mahoning Hydro proposes measures to mitigate soil erosion and sedimentation during construction, such as armoring and other measures to protect against scour and erosion under proposed operation, as well as to minimize vegetation clearing where

possible. Mahoning Hydro intends to reseed or landscape the area around the powerhouse and along the buried transmission line following construction. The Corps, in its comments on the application, notes that proposed environmental mitigation measures are inadequate, and that no mitigation measures were proposed for impacts to riparian habitat. The Corps does not make recommendations for mitigation measures, but notes that exotic, invasive plant control will be required for all disturbed areas.

Wildlife

Some trees that could provide perching for eagles and osprey would be removed to make room for the new powerhouse. However, Mahoning Hydro states that other trees in the vicinity of the powerhouse could provide alternative perching locations, and thus project effects would be minor, especially given the lack of nesting within the project area.

Staff Analysis

Riparian and upland vegetation

Although the project area was previously disturbed, the natural resource and wetland study results show that the area that would surround the proposed project structures and along the existing access road is primarily forested, and thus constructing the project would affect about 4 acres of vegetation (approximately 1 acre of permanent loss). The new transmission line would be constructed within an existing transmission right-of-way, but would likely require some widening of this corridor, which would affect the existing upland or riparian forest.

Procedures for reseeding of the disturbed areas, as proposed, could be included in the erosion and sedimentation control plan discussed in section 3.3.1, and would mitigate for a portion of the lost habitat. The new vegetation could include native species to decrease the likelihood of invasive species colonization in these disturbed areas. With these measures, as well as the wetland protection measures discussed below, wildlife in the vicinity, and their habitat, would not be significantly affected.

Wetlands

Wetlands are relatively scarce within the project vicinity and provide important habitat for wildlife species. The proposed powerhouse is not located within existing wetlands, however the proposed access road refurbishment has the potential to adversely affect Wetlands B and C due to their close proximity to the access road corridor. Clearing and discharge of fill could impact the wetlands, as could interference with the natural drainage that drives the hydrology of these two wetlands. In addition, the road construction and proposed bridge (necessary to cross Camp Run to connect to

Camp Run Road on the south end of the McCrea Furnace Bridge) will pass by close to Wetland A.

A wetland protection plan would ensure that these resources are not damaged during project construction. Measures could include appropriate placement or design of structures, equipment, and the access road to avoid or protect wetlands from clearing activities and from the effects of erosion and sedimentation.

Soil erosion and sedimentation control measures, as discussed in section 3.3.1, would help protect the quality of water entering Wetland A during project construction.

Wildlife

Project effects on up to 4 acres of habitat would be unavoidable, but minor given the prevalence of upland and riparian habitat within the area. Because hydropower dams often attract fish-eating birds of prey, loss of perching trees just downstream from the dam could have a negative effect on bald eagle and osprey but this effect would be very minor given the likelihood of alternative perching habitat in the vicinity. The National Bald Eagle Management Guidelines (published by FWS in May 2007), recommend a landscape buffer of 660 feet between any nesting eagles and construction activities; however, since eagles have not recently nested close to the dam, construction activities should not be an issue for nesting success at the lake.

Unavoidable Adverse Effects

Some upland and riparian vegetation directly within the footprint of the powerhouse, refurbished access road, bridge, transmission line expansion, and along any hardened banks would be permanently displaced. However, this habitat is common in the area and displaced or disturbed habitat would total less than four acres. Wildlife at the project may experience temporary and minor disturbance during the construction of project features.

3.3.4 Threatened and Endangered Species

Affected Environment

Commission staff, in Scoping Document 1, identified two federally listed species that could potentially use the study area: the endangered Indiana bat (*Myotis sodalis*) and the endangered clubshell mussel (*Pleurobema clava*). The 2007 natural and aquatic resources studies surveyed habitat for these species, as well as the endangered piping plover (*Charadrius melodus*), the threatened bog turtle (*Clemmys muhlenbergii*), the endangered northeastern bulrush (*Scirpus ancistrochaetus*), and the threatened small whorled pagonia (*Isotria medeoloides*.) Results indicated that suitable habitat is present for only the Indiana bat and the clubshell mussel.

Indiana bat

The Indiana bat was listed as in danger of extinction under the Endangered Species Preservation Act of 1966, and is currently listed as endangered under the Endangered Species Act of 1973, as amended. This is a migratory species found throughout much of the eastern half of the United States, hibernating colonially in caves, mines, and other underground areas (hibernacula) through the winter. The nonhibernation season includes spring emergence and migration, summer reproduction in maternity roosts, and fall migration, swarming, and mating. Summer habitat requirements include: (1) dead or live trees and snags with peeling or exfoliating bark, split tree trunks or braches, or cavities that may be used as maternity roost areas; (2) live trees such as shagbark hickory and oaks which have exfoliating bark; and (3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

The project vicinity contains small areas of habitat that may be used as summer roosting, foraging, and maternity habitat for Indiana bat. On the north bank of Mahoning Creek, occasional mature shagbark hickories to 30 inches diameter breast height, with good solar exposure, were observed. Three to five potential maternity roost trees and moderate to high quality summer roosting and foraging habitat were also identified on this side of the creek. The south bank and transmission line do not contain high quality roosting habitat, given less solar exposure and dominance of smooth-bark species.

Clubshell mussel

This endangered freshwater mussel has a historic range that includes the Ohio and St. Lawrence River systems, and it has experienced a range reduction of more than 90 percent. The clubshell is known to have been present within the Mahoning Creek basin, but few mussel surveys have been conducted in recent decades. Typical habitat for this species includes running waters of medium-sized streams or large rivers, with bottom substrates of sand and gravel. Small brooks are generally avoided. The water velocity where the species is found is generally moderate to swift. The 2007 field surveyors did not find clubshell mussels in the project area or vicinity. No dead shells or shell fragments were found along the banks or within the stream, indicating that it has not occurred in this part of the river for decades.

Environmental Effects

Based on the results of mussel surveys at the project, the clubshell mussel is not present and would therefore not be affected by the proposal.

Concerning Indiana bat, Mahoning Hydro does not propose to remove vegetation along the right descending bank of the creek, where bat habitat is present. Mahoning Hydro states it will generally minimize the amount of vegetation cleared during project

construction, and that the trees that would be cleared for project structures are not suitable for Indiana bat, and thus the project is not likely to affect Indiana bat habitat.

FWS responded, via an email dated July 20, 2009, that it concurs with the not likely to adversely affect conclusion (see Appendix E of the license application for record of this consultation).

Staff Analysis

Indiana bats require roosting trees for breeding and shelter outside of the hibernation period, so any activities at the projects that affect this habitat, such as tree clearing for powerhouse construction and right-of-way expansion, could negatively affect this species. However, given the small footprint of the construction and the low quality habitat within the construction area, the project is not likely to adversely affect this species.

3.3.5 Recreational Resources

Affected Environment

Overview of Recreation Opportunities

The Corps' Mahoning Creek Lake project area covers approximately 2,707 acres of land and 280 acres of water. The lake provides fish and wildlife habitat and recreation opportunities such as picnicking, sightseeing, hiking, camping, boating, and fishing. Sport fishing occurs for pike, walleye, muskellunge, channel catfish, crappie, and bass. Boating on Mahoning Creek Lake is limited to 10-horsepower motors and non-motorized watercraft that can access the lake at two public boat launches. The Corps leases 860 acres of land and water to the Pennsylvania F&BC. This includes two public recreation sites: (1) the 28-acre Milton Loop campground and boat launch, which is subleased to and operated by Armstrong County and located approximately 5 miles upstream from the dam; and (2) the Sportsman's Area boat launch, which is located approximately 2 miles upstream from the dam (see figure 1). Another 1,280 acres of Corps land is leased to the Pennsylvania Game Commission for wildlife management and public hunting. Hunting and trapping for white-tailed deer, black bear, small game, and game birds are permitted on these Pennsylvania Game Commission lands except in posted areas. In addition, the Baker Trail, a 141-mile-long, state-designated hiking trail extending from Allegheny National Forest to the town of Aspinwall, traverses the lake at its headwaters.

Two Corps-operated public recreation sites are located on Mahoning Creek, immediately downstream from the dam and across from the proposed project, as depicted in figure 5. The outflow fishing area provides fishing access to the stilling basin located immediately below the dam. This site includes a playground, restroom

facilities, potable water, a picnic shelter and 17 picnic tables, and bank fishing access. As noted by the Corps, there was a fishing pier in this area at one time, but it had been removed in the past. The dam site picnic area is adjacent to the fishing area and provides a picnic area with tables and grills, a playground, potable water, walking trails, an overlook pavilion, and a visitors' center. An additional parking area serves an angler trail that provides shoreline access to the impoundment.

On the southern (river left) side of Mahoning Creek, the Corps owns approximately 400 feet of the left bank downstream of the stilling weir, which is lined by a training wall. There is no formal recreational access to the left bank of the creek, because outside of the limited Corps property the land is privately owned. However, as the Corps noted in their April 14, 2008, letter, there is a mile-long rugged trail, located mostly on private property, that extends up the left bank from Camp Run and is occasionally used by fishermen. Depending on flow conditions, some fishermen also wade over to the left bank from the right bank downstream of the stilling weir.

A section of Class I-II whitewater is located downstream of the proposed project site on Mahoning Creek. This 12.5-mile section runs from McCrea Furnace (approximately 4,000 feet below the dam) to the Route 66 Bridge.

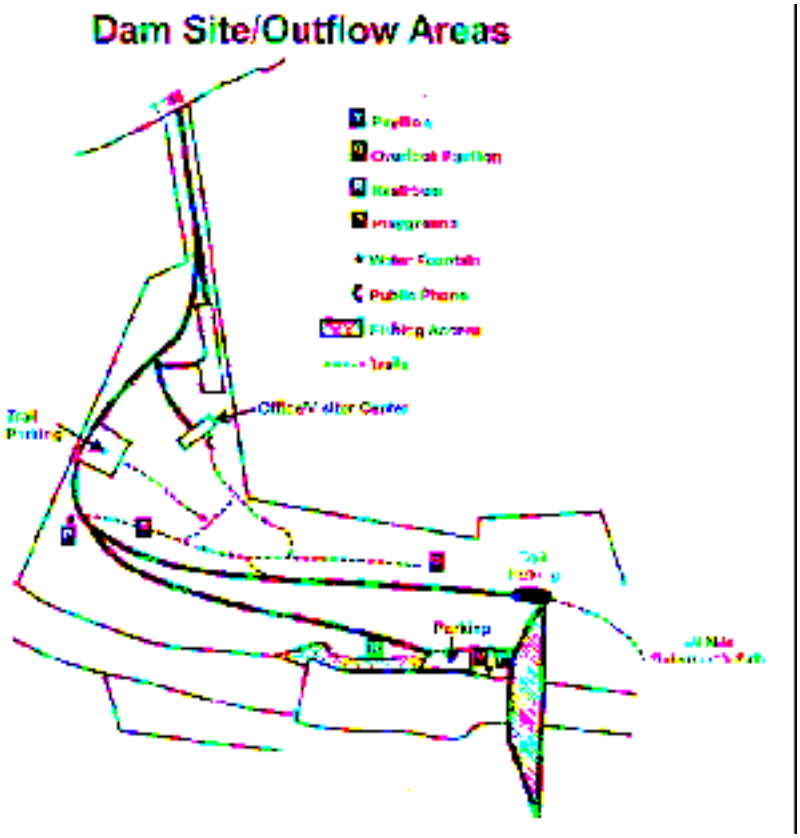

Figure 5. Outflow fishing and dam site picnic areas (source: license application).

Existing Recreation Use

Corps data indicates that approximately 65,000 people visit the Mahoning Creek Lake area, including all four public recreation sites, annually. In 2006, the Corps reported a total of approximately 86,000 trips to the lake. The most popular activities on the lake were angling and boating (48 percent of the visitors). The most popular land-based activity was hunting on Pennsylvania Game Commission land (36 percent).

A 2008 recreational use survey of the study area (filed November 5, 2008), conducted for the license application characterized types and levels of use, obtained user opinions, and investigated any short or long-term effects of the project on recreational use of this site. In the spring, 68 individuals were surveyed, and a summer survey included 73 individuals. The study area extended from 50 feet upstream of the dam to a point 1,200 feet below the dam on the right side of Mahoning Creek, including both the outflow fishing and dam site picnic areas. In total, this area supported approximately 2,600 recreation days[5] from April 14 through August 31. Angling was reported to be the most popular recreation activity at the site (61 percent of respondents). Angling at the site was more popular in the spring (76 percent) than in the summer (54 percent), due to the spring trout season. The outflow fishing area also supported sightseeing (14 percent), use of the playground (11 percent), and picnicking (8 percent). Average daily use on a spring weekday was 7 people, with weekend use much higher at 38 people. Peak spring use (Memorial Day weekend) was estimated to average 39 people per day. Daily use in the summer was higher than in the spring, with an average of 11 people visiting on the weekdays, 40 people on weekend days, and 42 people on peak weekend days (July 4thweekend).

Fall and winter recreational use at the project were not directly observed. Mahoning Hydro's final study report meeting summary, filed November 26, 2008, responds to a Corps request to extrapolate the spring and summer data for fall and winter estimates. Recreationists were asked during the surveys to estimate the number of days spent at the project during the fall and winter seasons. One hundred repeat visitors provided these estimates. Of the one hundred, only three reported spending any time at the project in the winter. Mahoning Hydro therefore assumes that winter use at the project is minimal. It then extrapolated an estimate of fall use of between 430 to 853 days.

The majority of respondents indicated that the outflow fishing area had sufficient capacity to accommodate existing use, and spot vehicle counts indicated that the

[5] A recreation day is defined as each visit by a person to the study area for recreational purposes during any portion of a 24-hour period.

demand was well within the two lots' design capacities. Twenty-eight survey responses concerning respondents' desired improvements were received. Nine responses (32.1 percent) were related to improved access (e.g., steps). An additional seven people requested improved handicap accessibility. Three responses requested a larger or improved playground. Other comments mentioned included: improved maintenance (e.g., brush clearing, painting, and trash removal), water availability at the playground and picnic area, a fishing pier, and a vending machine with soft drinks and bait.

Mahoning Hydro's license application summarizes a draft report based on the Corp Pittsburgh District's review of fishing access in the project tailwaters (conducted in 2000). This report supports the installation of a new fishing pier with handicap access off of the north bank in the stilling basin.

Environmental Effects

In a letter filed April 11, 2006, the North Central Pennsylvania Regional Planning and Development Commission commented that the proposed project is consistent with local and area-wide planning initiatives. The Corp's June 24, 2009 letter indicates the Corps' interest in investigating the option of the applicant providing programmatic support to the project's recreational facilities.

Mahoning Hydro proposes to construct and install a fixed-in-place fishing pier in the stilling basin with an access ramp located on the northern shore or the existing outflow fishing area. Mahoning Hydro has begun and will continue to consult with the Corps and Pennsylvania F&BC on this structure. The pier would be accessible to the disabled. Mahoning Hydro proposes to install steps from the pier for improved shoreline access. In addition, Mahoning Hydro proposes to install fish attraction structures in the stilling basin and an interpretive display. Mahoning Hydro does not propose to provide programmatic support to Corps recreation sites and does not propose to include any of the existing or proposed public recreation sites within the project boundary.

In its comments on the application, the Corps noted that it will require significantly more detail before approving the location and construction of a fishing pier. The Corps also noted that the application text proposes a fixed, in-place pier, but that the figure (page 62 of the license application) appears to be the standard drawing for a floating fishing pier. In addition, the Corps notes that it cannot be held responsible for any damages to the pier that may occur as a result of high volume releases from the dam.

State Representative Donna Oberlander and State Senator Don White, in their letters filed November 2 and November 11, 2009, respectively, support the project

because of the proposed installation of the accessible fishing pier, as well as other socioeconomic reasons[6].

Staff Analysis

Project construction is unlikely to affect existing Corps recreational access to the reservoir, as the Milton Loop campground and Sportsman's Area boat launch are located 5 and 2 miles upstream from the dam, respectively. Anglers and other recreationists close to the construction site and at the Mahoning Creek recreation sites would be affected by noise and the physical disturbance of land, water, and materials during construction activities. However, the construction activities would take place on the other side of the creek and stilling basin from the existing recreation areas, so access should not be impeded. The effects of construction would therefore be minor and temporary. The downstream whitewater reach would not be affected by project operation, as the water volume released to this location would not be altered from current conditions.

Recreational use surveys at the project show that the existing outflow fishing area and the dam site picnic area attract regional recreation use, supporting 2,600 recreational visits during the spring and summer seasons. Capacity, including parking, at the site appears adequate. Surveys did not indicate a need for a fishing pier, specifically. However, given that the majority (61 percent) of the recreation at the site consists of fishing, and that there were several requests related to improved access (e.g., steps) and improved handicap accessibility, the proposed accessible fishing pier would provide additional opportunities and could potentially attract additional anglers to the site.

The Corps did not provide an explanation for their interest in programmatic support of project recreation sites from Mahoning Hydro. However, it is consistent with Commission policy that recreational access to land or water at a licensed project be considered a project feature and enclosed within the project boundary. Including the proposed new fishing pier in the boundary, as well as the steps down to the shore, would ensure that this recreational access to the stilling basin is maintained during the term of the license.

A recreation plan could include a procedure for consulting with the agencies on the design of the recreation facilities, procedures for operating and maintaining the facilities, and any appropriate lighting and signage.

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[6] Ms. Oberlander and Mr. White also support the project because it would benefit the community and region as a local source of renewable clean energy that meets Pennsylvania's Tier 1 requirements; it is an opportunity for local construction employment; and it would add to the community tax base.

The proposed fish attraction structures, as well as the proposed interpretive display, would benefit anglers using the pier.

Unavoidable Adverse Effects

Recreation users at the project would experience negative effects (relating to noise and the physical disturbance of land, water, and materials) during project construction; however, the construction will occur on the other side of the creek and stilling basin from the existing recreation areas, so these disturbances would be temporary and minor.

3.3.6 Land Use and Aesthetic Resources

Affected Environment

Land Use

The proposed project lies within Armstrong County, which covers approximately 653 square miles and had a population of approximately 69,000 people in 2007. Mahoning Creek Lake is surrounded by areas of steep terrain along the Mahoning Creek and the tributaries draining into it. Lands located within and adjacent to the project boundary are mostly woodland, with some farmland. The land is used mainly for floodwater retention, agriculture, and recreation. The area surrounding the project is dominated by predominantly deciduous forest. Agricultural lands, including crops and pasture, comprise 20 percent of the land cover. Residential development is generally limited to small towns consisting of fewer than 2,000 people. The only town with a population greater than 5,000 people in the watershed is Punxsutawney, approximately 20 miles east of the Mahoning dam.

Land within the Corps' Mahoning Creek Project area is generally undeveloped with the exception of areas devoted to recreational facilities or required for purposes of operation and maintenance of the dam and reservoir. There are no privately-owned residential or commercial developments within the Corps' project boundary. The Corps-owned lands surrounding Mahoning Creek Lake therefore create a shoreline buffer around the impoundment and tailwater areas.

The proposed penstock and powerhouse would be situated on approximately 0.75 acres of land owned by the Corps. The transmission line and portions of the access road will be located on 0.26 acres of federal land and 8.16 acres of private land. The transmission line corridor is approximately 2.2-mile-long.

Aesthetics

The rugged surrounding topography and open water areas of Mahoning Creek Lake are an important aesthetic asset to the area. The landscape in the project vicinity is moderately rugged, forested terrain with relatively steep, incised beds. Deciduous trees, including maple, oak, and cherry, dominate the vegetation. Visibility of the dam and lake from public travel ways is generally obstructed due to the local topography and vegetation except those areas where local roads follow or cross the shoreline.

The area surrounding the proposed project site is characterized by steep-sided valleys and forested hillsides. Lands immediately surrounding the proposed project are forested and local topography and vegetation generally prohibit or obstruct views of the site from the surrounding areas with the exception of the outflow angling area and dam site picnic area, which are located directly across the stilling basin from the proposed project.

Environmental Effects

Project construction, operation and maintenance will be the primary activities that occur on project land. This will include operating and maintaining the powerhouse and associated facilities and routine vegetation maintenance of the transmission line corridor. Mahoning Hydro proposes to design the powerhouse to be aesthetically consistent with the surroundings. The concrete powerhouse would be constructed using rock textured forms dyed to provide coloring similar to local rock. The discharge channel would be lined with local rock and rip rap. Trees would be selectively retained in areas where they provide aesthetic screening from the viewers on the north bank weir abutment.

A 2008 aesthetics study (filed November 5, 2008), conducted for the license application, included depictions of the post-construction condition at the site, as would be viewed from the parking/viewing area at the top of the dam, and the fishing pier in the public use area. These renderings (figures 6 and 7) depict any intended tree removal and proposed building materials and design.

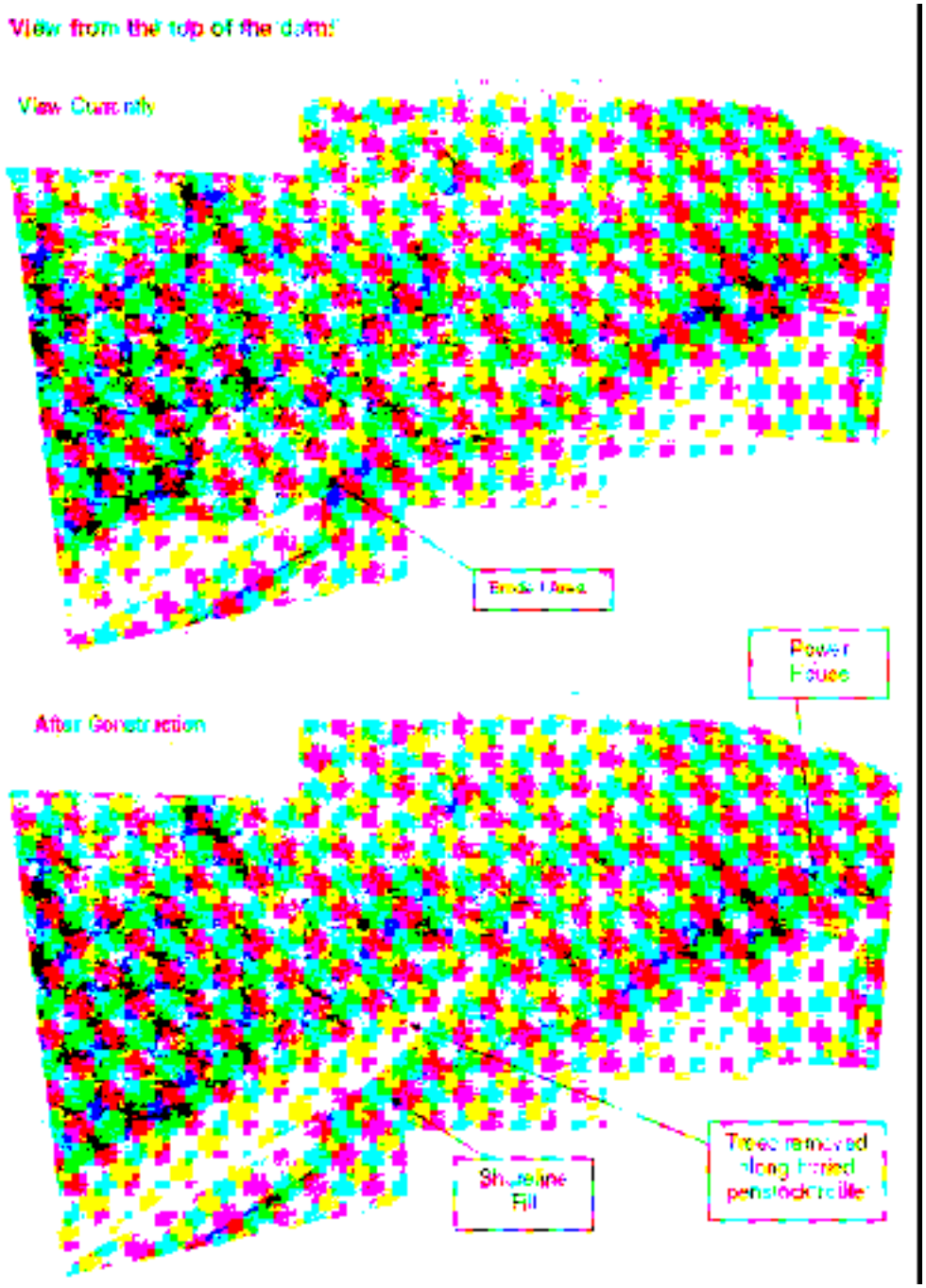

Figure 6. View of the south shoreline before and after proposed construction (source: license application).

Figure 7 View of the proposed powerhouse location before and after proposed construction (source: license application).

The Corps questions whether the 30 cfs minimum flow will ensure a continuous flow over the stilling weir. The Corps does not recommend a specific flow for the provision of veiled flow over the weir.

Staff Analysis

The proposed project would not have a significant effect on land use because the project area is small and the dam, impoundment, and service road already exist. The additional structures proposed are not significant in terms of overall land use and are consistent with the historical, existing, and intended uses of the stilling basin and area downstream of the Mahoning dam.

Under the proposed operation, water used for power generation would return to the river just downstream from the stilling basin weir. As a result, there would be a decrease in the total flow to the stilling basin and over the stilling basin weir. Concerning veiled flows, the flow duration curves show that 62 percent of the time the stilling basin would receive the proposed 30 cfs minimum flow release, leaving 38 percent of the time when the stilling basin would receive additional flow.

The proposed project would not affect visual resources on Mahoning Creek Lake. Effects to the river downstream from the dam include temporary and permanent landscape changes caused by the construction and presence of the powerhouse, construction of the penstock, and construction of the access routes, which would particularly affect recreation users at the outflow fishing and dam site picnic areas. The transmission line should not affect the landscape as it will be tied into an existing line.

If the powerhouse is designed to be aesthetically consistent with the surroundings and if disturbance of shoreline vegetation is minimized, with the site restored, then the visual affect of the powerhouse would be partially mitigated. The added structures would be a small component of the development as compared to the large concrete gravity dam. And, if, as proposed, the penstock route is reseeded it will likewise blend into the surrounding shoreline environment. With implementation of the proposed measures, the proposed project would not have a significant negative impact on scenery in the project vicinity.

3.3.7 Cultural Resources

Affected Environment

Area of Potential Effect

The Advisory Council on Historic Preservation defines an area of potential effect (APE) as the geographic area or areas in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE for the proposed Mahoning Creek Project includes: (a) lands enclosed by the project boundary; and (b) lands or properties outside the project boundary which project operations or project-related actions may cause changes in the character or use of historic properties, if any exist.

Historical Background

For the majority of the mid-seventeenth to the mid-eighteenth century, the region in an around modern-day Armstrong County was defined by increased interaction between multiple Native groups and European settlers, each seeking to secure their position in the region. Conflict and instability marked the area through the mid-eighteenth century. The Delaware established a settlement near the present community of Kittanning sometime before 1730. Following Braddock's defeat in 1755, this village served as a central location for organizing Native action against the English in this part of Pennsylvania. In response to repeated conflicts, Governor Robert Hunter Morris sent Lt. Colonel John Armstrong to lead a military party against the settlement at Kittanning. Armstrong defeated the Native contingent and destroyed the village on September 8, 1756, essentially eliminating Native resistance to settlement of the county that would eventually bear his name.

In a letter filed April 19, 2006, the Seneca Nation of Indian's noted that the proposed access road is located within 50 feet of a known ancient navigable waterway.

Historic Properties

In its letter filed April 11, 2006, the Pennsylvania Bureau for Historic Preservation (or State Historic Preservation Office, SHPO) notes that there is a high probability that prehistoric and historic archaeological resources are located in the project area. The SHPO identified one historic property, the Mahoning dam. The Corps constructed the dam in 1941 as a flood control project authorized by the Flood Control Acts of 1936 and 1938. The original design of the dam included elements that could be adapted for future hydroelectric power. In 1987, the SHPO recommended the Mahoning dam, including the stilling pool, tailrace and the weir, as eligible for listing in the National Register of Historic Places (National Register).

In 2007, a Phase I archaeological reconnaissance was completed to support Mahoning Hydro's license application. This study included a ground surface inspection of the project area along the southern bank of Mahoning Creek. The survey identified a historic foundation that the Corps identified as the former Mahoning dam construction camp headquarters. This foundation is located approximately 130 feet west of the proposed project boundary, and is considered to be a component of the Mahoning dam historic site. A literature review identified one open site and three rock shelters with multiple prehistoric archaeological components within 2 km of the project area. One historic archaeological site with an industrial component has also been found near the project area. The SHPO has not commented on the results of the survey.

A Phase I survey of two electrical transmission line alternatives was conducted in 1987 as part of a previous license application. These routes did not follow Mahoning Hydro's proposed route, but general vicinity information collected at that time may be

helpful in the current evaluation. This study identified the T. Smith Historic Archeological Site (designated 36 Je 93) and a small cemetery containing twelve headstones north of the Mahoning dam (beyond the current project's APE). Following an evaluation of alternatives and consultation with the SHPO, the transmission line was installed, but the hydroelectric project was never built.

Environmental Effects

In its 2006 letter, the SHPO states that the proposed project should have no effect on historic archaeological resources, but that if the scope of the project is amended to include additional ground-disturbing activity, the SHPO should be contacted and a Phase I Archaeological Survey may be necessary to locate all potentially significant resources. The SHPO also notes that the proposed project will have no effect on the National Register-eligible Mahoning dam. Finally, the SHPO states that should the applicant become aware that unidentified historic or archaeological properties are located at the project site, or that project activities will have an effect on these properties, the SHPO should be contacted immediately.

Mahoning Hydro proposes to implement a Historic Properties Management Plan (HPMP) to establish procedures and guidelines for the management of historic properties within the APE. In a draft HPMP, filed March 27, 2009, Mahoning Hydro provides background information, project management, preservation goals and priorities, project effects and mitigation measures (Mahoning Hydro does not propose any measures), implementation procedures (e.g. protocol in the case of an unidentified historic property), and a list of activities that do not adversely affect historic properties.

In its comments on the application, the Corps believes that there would be an effect on the Mahoning dam, but that the effect would not be adverse. The Corps also provides input on the "List of Activities that Do Not Adversely Affect Historic Properties," in the proposed HPMP. Under "Roads and Existing Disturbed Areas," Mahoning Creek includes, "any ground disturbing activities up to nominal depth of 6 inches." The Corps notes that this should be revised to state any ground disturbing activities- within previously disturbed areas- up to a nominal depth of 6 inches. This suggestion is meant to ensure that there is no confusion when undisturbed areas are impacted. Many sites in Pennsylvania, the Corps notes, are "plow zone sites," with much of the artifactual materials being recovered from within the top six inches of soil.

Staff Analysis

The removal of one of the two concrete plugs and installation of buried penstock, intake structure, construction of a powerhouse and tailrace, and refurbishment of an existing access road could affect the characteristics of the dam that make it eligible for listing on the National Register. In 1987, during a previous licensing procedure, the SHPO and the Advisory Council on Historic Preservation agreed that although the

characteristics that make the dam eligible for listing would be affected by developing the project as it was proposed, the dam would not be adversely affected relative to eligibility (FERC, 1989). Because the current proposal does not differ significantly, and includes an HPMP that includes reporting and procedures for consultation in the case that historic properties are affected, the project would not adversely affect this eligible property.

No surveys were conducted along the proposed transmission line corridor, and as Mahoning Hydro states, approximately 87,000 square feet (approximately 2 acres) of land along the transmission line would be affected by the proposal. Consistent with the SHPO's 2006 comments, such ground disturbance may require additional surveys in order to ensure that prehistoric and historic archaeological sites are not inadvertently disturbed. The draft HPMP could be amended to include a requirement that Mahoning Hydro consult with the SHPO and conduct additional surveys prior to any required ground disturbance in previously undisturbed areas. In addition, a Programmatic Agreement, executed by the SHPO and the Commission, would ensure that the HPMP is implemented during the term of the license.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the project's use of Mahoning Creek for hydropower purposes to see what effect various environmental measures would have on the project's costs and power benefits. Consistent with the Commission's approach to economic analysis, the power benefit of the project is determined by estimating the cost of obtaining the same amount of energy and capacity using the likely alternative generating resources available in the region. In keeping with Commission policy as described in Mead, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.[7]

Our estimate of the energy and capacity value was developed from the most reasonable alternative generation available. We base our estimate of the comparable cost of energy generation on the fixed cost of a combined-cycle combustion turbine plant fueled by natural gas in the Middle Atlantic region of the United States. We estimate the energy cost based on information in Energy Information Administration (EIA), Annual Energy Outlook.[8] Based on EIA information, the 2010 regional energy cost is $39.98/MWh. We estimate the existing dependable capacity of the project is 4.0 MW, and assume a capacity value of $154 per kilowatt-year. Under current 2010 conditions, the total energy and capacity cost is $70.78/MWh.

[7] 72 FERC ¶ 61,027 (1995).

[8] See http://www.eia.doe.gov/oiaf/aeo/index.html.

For any alternative, a positive net annual power benefit indicates that the project power costs are less than the current cost of alternative generation resources and a negative net annual benefit indicates that project power costs are more than the current cost of alternative generation resources. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND ECONOMIC BENEFITS OF THE PROJECT

Table 4 summarizes the assumptions and economic information we use in our analysis. This information was provided by Mahoning in its license application. We find that the values provided by Mahoning are reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs; net investment (the total investment in power plant facilities to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; licensing costs; normal operation and maintenance cost; and Commission fees. Throughout this section all dollars are 2010 unless otherwise specified.

Table 4. Assumptions for the economic analysis of the proposed project. (Source: Staff and Mahoning)

Economic parameter	Value	Sources
Period of analysis	30 years	Staff
Term of financing	20 years	Staff
Inflation and escalation	0 percent	Staff
Interest/discount rate	8.0 percent	Staff
Cost of capital	8.0 percent	Staff
Federal tax rate	34 percent	Staff
State tax	3 percent	Staff
Net investment [a]	$11,155,000	Mahoning
Annual Operation and Maintenance [b]	$412,000	Mahoning
Average annual generation (MWh)	20,000	Mahoning
Energy rate	$39.98/MWh	Staff
Capacity rate	$154/kW-yr	Staff
Energy and capacity value	$70.78/MWh	Staff

[a] Net investment includes $10,455,000 total capital cost, and $700,000 to develop the license application.

[b] Annual O&M cost includes insurance, and the Corps, Commission, and transmission fees.

4.2 COMPARISON OF ALTERNATIVES

Table 5 summarizes the annual cost, power benefits, and annual net benefits for the project.

Table 5. Summary of annual net benefits of the alternatives for the project. (Source: Staff)

Parameter	Mahoning's Proposal	Staff Alternative
Installed Capacity (MW)	6.0	6.0
Annual generation (MWh)	20,000	19,914
Annual power value	$1,415,600	$1,409,510
Annual cost	$1,701,790	$1,702,150
Annual net benefit	$-286,190	$-292,640

4.2.1 No-action Alternative

Under the no-action alternative, the project would not be constructed and no energy would be generated. There are no costs associated with this alternative, other than Mahoning Hydro's development cost for preparing the license application.

4.2.2 Power and Economic Benefits of the Proposed Alternative

The proposed alternative includes constructing and operating the project with Mahoning Hydro's proposed environmental measures, as shown in table 6. Based on the parameters in table 4 and the cost of measures proposed by Mahoning Hydro shown in table 6, we estimate that the annual cost of Mahoning Hydro's proposed project would be about $1,701,790 or $85.09/MWh. The annual power value would be about $1,415,600 or $70.78/MWh for the estimated annual generation of 20,000 MWh. The resulting annual net benefit would be about $-286,190 or $-14.31/MWh.

4.2.3 Power and Economic Benefits of the Staff-recommended Alternative

In this section, we present the annual cost of the proposed alternative with additional staff-recommended measures (i.e., staff alternative) which includes the Corps' higher bypassed reach flow releases during cold periods, plans for water quality monitoring, wetlands, and recreation, and execution of a PA that includes additional consultation and surveys, as needed, in the case of ground disturbance at previously undisturbed sites.

Under the staff-recommended alternative, the project would generate about 19,914 MWh with an annual power value of $1,409,510 or $70.78/MWh. The average annual cost of producing this power would be about $1,702,150 or $85.47/MWh. The resulting annual net benefit of the project would be about $-292,640 or $-14.69/MWh.

4.3 COST OF ENVIRONMENTAL MEASURES2

Table 6 gives the cost of each of the environmental measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 6. Cost of environmental mitigation and protection measures considered in assessing the environmental effects to operate the project. (Source: Staff and Mahoning)

Enhancement/Mitigation Measure	Recommending Entity	Capital Cost	O&M cost	Levelized Annual Cost
Geology and Soils Resources				
Develop and implement an erosion and sedimentation control plan (proposed as a "shoreline stability plan")	Mahoning Hydro, Staff	$50,000	$1,000	$4,440
Aquatic Resources				
Operate the project in a run-of-release mode while preserving a 30 cfs minimum flow into the bypassed reach	Mahoning Hydro, Staff (with following measure)	$0	$0	$96,260 [b]
Release 40 cfs minimum bypassed flow during cold periods	Corps, Staff	$0	$0	$6,090 [c]
Provide turbine draft tube aeration for enhanced DO	Mahoning Hydro, Staff	$260,000	$50,000	$52,650
Install water quality monitoring system	Mahoning Hydro, Staff	$55,000	$5,000	$7,450
Develop and implement a water quality monitoring plan	Staff	$5,000	$0	$370 [d]

Enhancement/Mitigation Measure	Recommending Entity	Capital Cost	O&M cost	Levelized Annual Cost
Install appropriately sized intake structure and trashracks with 1-inch spacing for the protection of fish	Mahoning Hydro, Staff	$175,000	$25,000	$29,720
Terrestrial Resources				
Develop and implement a wetland protection plan	Staff	$5,000	0	$370
Recreation, Land Use, and Aesthetics				
Provide a downstream fishing pier	Mahoning Hydro, Staff	$35,000	$5,000	$5,940
Develop and implement a recreation plan	Staff	$5,000	$2,000[e]	$1,690 [f]
Design the project to protect aesthetic resources	Mahoning Hydro, Staff	$25,000	$5,000	$5,190
Cultural Resources				
Develop an HPMP	Mahoning Hydro, Staff	$0	$0	$0 [g]
Prepare and implement a PA that requires consultation with the SHPO in the case of ground disturbance at previously undisturbed sites	Staff	$0	$0	$0

[a] The O&M cost to implement the erosion and sediment control plan is included in Mahoning's proposed shoreline stabilization measures.

[b] This would be the annual cost of releasing 30 cfs into the bypassed reach year-round resulting in about 1,360 MWh of lost generation. The lost generation of this measure is included in Mahoning's proposal to generate 20,000 MWh.

[c] This would be the annual cost of releasing an additional 10 cfs, a total of 40 cfs into the bypassed reach during cold periods assuming January 1 through March 31 resulting in about 86 MWh of lost generation.

[d] The O&M cost to implement the monitoring plan is included in Mahoning Hydro's proposed water quality monitoring system.

[e] The O&M cost to implement the recreation plan could vary depending on any agreement between Mahoning Hydro and the Corps.

[f] The O&M cost for the fishing pier is included in Mahoning Hydro's proposed fishing platform.

[g] The cost to develop the HPMP is included in the cost to develop the license application.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPARISON OF ALTERNATIVES

In this section we compare the development and non-developmental effects of Mahoning Hydro's proposal, Mahoning Hydro's proposal as modified by staff, and the no-action alternative (no hydro project). Table 7 summarizes the environmental effects of the different alternative.

Table 7. Comparison of alternatives for the project. (Source: Staff)

Resource	No-action Alternative	Proposed Action	Staff Alternative
Annual Generation (MWh)	No hydro generation	20,000	19,914
Geology and Soils Resources	Erosion control and protection measures that are in place (e.g., concrete stilling basin and south bank training wall) would remain in place and continue to minimize the erosion of the stream bank in the channel below the existing discharge outlet.	A shoreline stability plan would document construction management procedures and provide for armoring of the south bank, measures to reduce erosion and scouring of the tailrace and reseeding of terrestrial areas disturbed by construction.	Same as proposed, though reclassified as an "erosion and sediment control plan"
Aquatic	Modified run-of-river operation	Run-of-release operation, with	Run-of-release operation as proposed,

Resources	would protect downstream resources. Minimum downstream seasonal flows between 30 and 40 cfs would continue to protect downstream fishery.	reservation of 30 cfs to be released at the dam, would protect downstream resources.	but with an increase in winter bypassed reach flows to 40 cfs, would protect the jet ring from freezing.
	No water quality monitoring would occur.	Monitoring water quality during construction and operation would document any adverse project effects on downstream DO or temperature and allow for mitigation, if needed.	A water quality monitoring plan would form the basis for determining if and when corrective actions are required to ensure the protection of aquatic resources.
Terrestrial Resources	There are no known existing terrestrial resource measures.	Minimizing the amount of vegetation removed and measures for reseeding disturbed areas would partially mitigate for the displacement of 4 acres of habitat.	Including the proposed revegetation measures as a component of the erosion and sedimentation control plan would partially mitigate for the displacement of 4 acres of habitat. A wetland protection plan would ensure that the three project wetlands are not impacted by project construction.

Recreation Land Use, and Aesthetics	There would be continued management of existing recreation sites by the Corps.	A fishing pier would enhance fishing opportunities downstream from the dam. Minimizing the project footprint and utilizing natural colors will reduce visual effects of project facilities.	A recreation plan that includes measures for the operation and maintenance of project recreation facilities, as well as a new fishing pier, would ensure that the fishing pier is maintained for the term of the license.
Cultural Resources	No known existing resources.	An HPMP would ensure that procedures are in place in the event that future activities affect eligible sites.	Execution of a PA between the Commission and the SHPO, which would require implementation of the HPMP and additional consultation requirements with regards to previously undisturbed land, would ensure that any unevaluated properties are properly assessed before any ground disturbing activity.

5.2 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Section 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a proposed hydropower project, we consider the water quality, fish and wildlife, recreation, cultural, and other non-developmental values of the involved waterway equally with its electric energy and other developmental values. In deciding whether, and under what conditions a hydropower project should be licensed, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing the waterway.

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for relicensing the Mahoning Creek Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review and evaluation of the environmental and economic effects of no action, the proposed action, and the proposed action with staff modified measures (staff alternative), we recommend the staff alternative.

We recommend this alternative because: (1) issuing a license for the project would allow Mahoning Hydro to construct their proposed project and provide a beneficial and dependable source of electric energy; (2) the project, with an installed capacity of 6.0 MW, would eliminate the need for an equivalent amount of fossil-fuel-produced energy and capacity, which helps conserve these nonrenewable resources and limits atmospheric pollution, including greenhouse gases; and (3) the recommended environmental measures would protect water quality, fish, historic properties, and would improve public recreational access.

This section contains the basis for, and a summary of, our recommendations for licensing the project. In addition to Mahoning Hydro's proposed environmental measures, we recommend additional staff-recommended environmental measures to be included in any license issued for the project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Recommended Alternative

Erosion and Sedimentation Control Plan

Ground disturbing construction-related activities can lead to stream bank erosion and sedimentation and exposure of soils and streams to hazardous materials. Sediment from construction activities and hazardous material spills can be transported downstream and can adversely affect downstream water sources and recreational areas. Sedimentation can also clog stream channels, cover fish spawning areas, and reduce downstream water quality, and hazardous spills can contaminate stream beds, adversely affect water quality, and kill or displace aquatic organisms.

Mahoning Hydro proposes to prepare a shoreline stability plan to identify issues, limitations, and potential problems associated with riverbank stability and document

construction management procedures, such as drainage and shoreline stabilization for construction activities to prevent soil erosion. To avoid potential erosion of streambanks, particularly on the left bank immediately downstream from the excavated tailrace, the proposed plan would include measures for installing armoring. The plan would also include measures (e.g., armoring, hardening, or design considerations) for avoiding erosion and scour of the proposed excavated tailrace.

No recommendations were filed regarding erosion and sediment control measures.

Implementing the measures proposed by Mahoning Hydro to minimize erosion and sedimentation would ensure that any construction related activities do not significantly adversely affect the soil and water resources in the proposed project area.

This plan, which the Commission typically classifies as an erosion and sedimentation control plan, should include best management practices, such as: (1) a project site plan showing the location of cofferdam dams, rip rap, staked hay bales, geo-textile silt fence areas, excavated material stockpile area, and a temporary siltation catch basin; (2) designating specific sites for fuel storage and fueling vehicles; (3) disposing of all waste material properly; (4) maintaining on site sanitary facilities; and (5) reseeding disturbed vegetated areas with native plants once construction is complete. Providing such detail would help ensure erosion and sedimentation and hazardous material entering the creek is minimized during proposed project construction and operation.

We recommend that prior to project construction, Mahoning Hydro file an erosion and sedimentation control plan in consultation with the relevant resource agencies for Commission approval, which would be worth the annual cost of $4,440.

Continue Corps' operational mode

Mahoning Hydro proposes no changes to the Corps' drawdown schedule or flow release schedule. Therefore, there would be no change to Mahoning Creek flow or the impoundment lake levels. The one exception to this is the bypassed reach (stilling basin) which is discussed below.

Maintaining the same drawdown schedule and flow release schedule would protect water quality, aquatic biota, and aquatic habitat to same extent they are protected now. Therefore, we recommend this proposed mode of operation. This measure has no annual cost.

Minimum flow of 30 cfs in bypassed reach

Currently all flows released by the Corps, either through or over dam, flow through the stilling basin and over the stilling basin weir. Mahoning Hydro proposes to

operate the project in a run-of-release mode (no modifications to the quantity or timing of the Corps' releases), with a preservation of the Corp's historical minimum flow release of 30 cfs into the bypassed reach (stilling basin) for the protection of aquatic habitat. The Corps states that the minimum flow should be higher but does not provide a specific recommendation or a justification for why, except that in the winter the flow through the ring jets needs to be 35-45 cfs to prevent freezing.

The habitat in the stilling basin is suboptimal, yet adequate to support a fish community favoring warmwater species that prefer pool habitat. This situation would not change under the proposed minimum flow, which matches the 7Q10 flow for Mahoning Creek. Because of the channel shape of the stilling basin and the presence of the weir at the downstream end of the basin, there would be no change in wetted area, wetted width, or depth. Habitat for species which prefer riffle habitat will continue to be abundant and unaffected downstream of the project tailrace.

We recommend Mahoning Hydro's proposed minimum bypassed reach flow of 30 cfs for the protection of aquatic habitat in the stilling basin. This flow should be maintained year-round, except during the winter when the Corps' recommended minimum flow of 40 cfs should be provided to prevent freezing of the ring jets. The estimated annual cost of providing 30 cfs year-round is $96,260. The additional annual cost of providing 40 cfs during the winter would be $6,090.

Turbine draft tube aeration

Existing field surveys document that during most summers, the hypolimnion in the impoundment experiences low DO and modeling runs predict that project operation could result in low DO in Mahoning Creek in the absence of mitigation measures.

Mahoning Hydro proposes to install natural aeration in the draft tubes to mitigate potential low DO during certain times of the year, primarily summer and early fall. The Corps recommends oxygen injection, stating that natural aeration may result in gas supersaturation.

Turbine aeration could be one of several potential measures to address this potential impact. As discussed below, Mahoning Hydro also proposes to monitor water quality and implement a flexible operational mode to ensure that water quality in Mahoning Creek is not adversely affected by the project.

We recommend the proposed draft tube aeration at this time. However, we note that if the proposed water quality monitoring documents that this type of aeration causes gas supersaturation, it may be of limited value in addressing water quality problems, and may need to be replaced by other aeration methods, such as oxygen injection as the Corps recommends. This measure is worth the estimated annual cost of $52,650.

Water Quality Monitoring System

Mahoning Hydro proposes to install sensors in the impoundment near the penstock openings and in Mahoning Creek downstream of the project tailrace. Data would be recorded every 5 minutes and reported every 30 minutes using a computer system in the powerhouse.

The Corps agrees with the need for a monitoring system but also recommends sensors at the McCrea Furnace Road Bridge, approximately 4,000 feet below the dam.

The Mahoning Hydro proposal is adequate to determine project effects on water quality and would allow operational measures to be implemented in time to prevent water quality violations in Mahoning Creek. The additional McCrea Furnace Bridge sampling station recommended by the Corps is not necessary because any effects of the project would already be detectable at Mahoning Hydro's proposed tailrace monitoring station. The system should be designed in coordination with the Corp as part of the water quality monitoring plan discussed below. We recommend the proposed monitoring system, which has an estimated annual cost of $7,450.

Water Quality Monitoring Plan

Neither Mahoning Hydro nor any agency, including the Corps, recommended a water quality monitoring plan. However, Mahoning Hydro states that it would implement a flexible operational mode for the hydro project to maintain water quality in Mahoning Creek. The Corps agrees with the need for the applicant to remain flexible about the operation of its proposed project in order to protect water quality.

Developing a plan to monitor water quality and to implement, as necessary, with mitigation measures would avoid confusion and misunderstandings during critical periods of low DO or elevated temperature. Mahoning Hydro should develop a plan, in coordination with Corps, that describes how water quality will be monitored, what mitigation measures would be implemented, and in what situations measures would be employed. Measures could include, but not necessarily be limited to turbine aeration, oxygen injection, mixing of deep and surface water to protect Mahoning Creek temperature, reducing or curtailing generation, or the installation of a deep water penstock intake. The proposed water quality monitoring system along with implementation of an adaptive management approach to protecting water quality (i.e., flexible operational mode), would ensure that water quality in Mahoning Creek is protected. Therefore, we recommend that Mahoning Hydro develop and implement a water quality monitoring plan, which is worth the estimated annual cost of $370.

Fish Protection

With the construction and operation of the proposed project, fish would be potentially vulnerable to turbine entrainment and mortality, compared to the existing condition where any fish movement must occur via spillage over the dam To address this issue, Mahoning Hydro proposes to design the penstock intake structure with dimensions that result in an intake velocity of 1 foot per second or less. The proposed trashracks would have a clear spacing of 1 inch.

Although the Corps suggests in its comments that further mitigation for potential fish losses may be warranted, the Corps does not provide a specific recommendation.

Because of the proposed intake design, the characteristics of the impoundment fish community, hydraulic head, and turbine type, the proposed project is unlikely to have a significant adverse effect on the impoundment or Mahoning Creek fish communities. Any fish entrained at the project are likely to be abundant species with high reproductive rates. Survival of entrained fish is likely to exceed 90 percent so that the majority of entrained fish would contribute to the downstream fish community. Further, because Mahoning Hydro's recommended measures are consistent with industry-standard best management practices, we recommend that they be implemented as proposed. The estimated annual cost of fish protection measures is $29,720.

Wetland Protection Plan

Three small palustrine emergent wetlands are located within the project vicinity, totaling approximately .35 acres. Wetlands are relatively scarce within the project vicinity and provide important habitat for wildlife species. The proposed powerhouse is not located within existing wetlands, however the proposed access road refurbishment has the potential to adversely affect Wetlands B and C due to their close proximity to the access road corridor. Clearing and discharge of fill could impact the wetlands, as could interference with the natural drainage that drives the hydrology of these two wetlands. In addition, the road construction and proposed bridge (necessary to cross Camp Run to connect to Camp Run Road on the south end of the McCrea Furnace Bridge) will pass by close to Wetland A.

A wetland protection plan would ensure that these resources are not damaged during project construction. Measures could include appropriate placement or design of structures, equipment, and the access road to avoid or protect wetlands from clearing activities and from the effects of erosion and sedimentation. The benefits would be worth the annual cost of $370.

Recreation

Two Corps-operated recreation areas are located on the north shore of Mahoning Creek, directly across from the proposed project penstock/powerhouse location. The outflow fishing area provides fishing access to the stilling basin, a playground,

accessible restroom facilities, potable water, a picnic shelter and 17 picnic tables, and bank fishing access. The dam site picnic area is adjacent to the fishing area and provides a picnic area with tables and grills, a playground, potable water, walking trails, an overlook pavilion, and a visitors' center. An additional parking area serves an angler trail that leads from the parking area to the shoreline upstream from the dam.

Anglers and other recreationists close to the construction site on the lake and at the Mahoning Creek recreation sites would be affected by noise and the physical disturbance of land, water, and materials during construction activities. However, the construction activities would take place on the other side of the creek and stilling basin from the existing recreation areas, so access should not be impeded. The effects of construction would therefore be minor and temporary.

Recreational use surveys show that the existing outflow fishing area and the dam site picnic area attract regional recreation use, supporting 2,600 recreational visits during the spring and summer seasons. Capacity, including parking, at the site appears adequate.

Mahoning Hydro proposes to construct and install a fixed-in-place fishing pier in the stilling basin with an access ramp located on the northern shore or the existing outflow fishing area. The pier would be accessible to the disabled. Mahoning Hydro proposes to install steps from the pier down to the shore for improved shoreline access.

In its comments, the Corps noted that it will require significantly more detail before approving the location and construction of a fishing pier. The Corps also noted that the application text proposes a fixed, in-place pier, but that the figure (page 62 of the license application) appears to be the standard drawing for a floating fishing pier. Although no other entity commented on the recreation measures, the record shows that both Corps and Pennsylvania F&BC met with Mahoning Hydro and appear to support the proposed recreation improvements. State Representative Donna Oberlander and State Senator Don White support the project because of the proposed installation of the accessible fishing pier.

Surveys did not indicate a strong need for a fishing pier, specifically. However, given that the majority (61 percent) of the recreation at the site consists of fishing, and that there were several requests related to improved access (e.g., steps) and improved handicap accessibility, the proposed fishing pier would benefit the existing users and could potentially attract additional anglers to the site. The proposed fish attraction structures in the stilling basin, as well as the proposed interpretive display, would benefit anglers using the pier, and could be included in any recreation plan for the project.

Including the proposed new fishing pier, as well as the steps down to the shore, in the project boundary would ensure that these valuable recreational sites are maintained during the course of the license.

Because Mahoning Hydro would need to continue to consult with the Corps and Pennsylvania F&BC with regards to the design and construction of the pier, a recreation plan could include a procedure for consulting with the agencies on the design of the recreation facilities, procedures for operating and maintaining the facilities, and any appropriate lighting and signage. The proposed measures, and the development and implementation of a recreation plan, are worth the annual cost of $1,690.

Project Aesthetics

The landscape in the project vicinity is moderately rugged, forested terrain with relatively steep, incised beds. Deciduous trees, including maple, oak, and cherry, dominate the vegetation.

The proposed project would consist of a concrete powerhouse, penstock, project works, and a transmission line from the powerhouse west to an existing transmission line. Effects to the river downstream from the dam include temporary and permanent landscape changes caused by the construction and presence of the powerhouse, construction of the penstock, and construction of the access routes, which would particularly affect recreation users at the outflow fishing and dam site picnic areas.

As proposed, the penstock would be buried from the exit of the dam conduits to a point adjacent to the south weir abutment. A 150-foot section of eroded shoreline just below the south training wall would be filled with rock and soil from excavated project activities, and the disturbed ground will be graded and reseeded. Mahoning Hydro proposes to design the powerhouse to be aesthetically consistent with the surroundings. The concrete powerhouse would be constructed using rock textured forms dyed to provide coloring similar to local rock. The discharge channel will be lined with local rock and rip rap. Trees will be selectively retained in areas where they provide aesthetic screening from the viewers on the north bank weir abutment. In addition, Mahoning Hydro proposes to reseed or landscape around the powerhouse and penstock route.

No agency commented on the proposed measures to enhance the project aesthetics. The Corps noted that it questions whether the 30 cfs minimum flow from the dam will provide a continuous flow in the stilling basin and over the weir.

Constructing the powerhouse as proposed would ensure mitigate effects to visual resources in the project area; costs are included in the cost of project design and construction.

Cultural Resources and the HPMP

The Mahoning dam, as well as a nearby foundation that is associated with dam construction, are eligible for listing in the National Register. In its 2006 letter, the SHPO notes that the proposed project will have no effect on this property. The SHPO also states that the activity described in the PAD should have no effect on historic archaeological resources, but that if the scope of the project is amended to include additional ground-disturbing activity, the SHPO should be contacted and a Phase I Archaeological Survey may be necessary to locate all potentially significant resources. Finally, the SHPO states that should the applicant become aware that unidentified historic or archaeological properties are located at the project site, or that project activities will have an effect on these properties, the SHPO should be contacted immediately. The Corps notes that the proposal would affect the dam, but would not adversely affect the dam.

Mahoning Hydro's proposed HPMP would ensure that appropriate consultation occurs prior to any future activity that may affect the historic features of the project. The HPMP should be revised to clarify that any ground disturbing activity at previously undisturbed sites along road or transmission line rights-of-way should trigger consultation on the potential need for surveys. As described in section 3.3.7, Cultural Resources, staff intend to execute a Programmatic Agreement (PA) with the SHPO. The PA would require Mahoning Hydro to implement the HPMP. This plan would ensure that historic properties within the project boundary are fully identified and would establish procedures for addressing the effects of future ground-disturbing activities on cultural resources at the project, and is worth the annual cost, which is already included in the cost of preparing the application, though additional costs may vary depending on the extent of future ground-disturbing activity.

5.3 UNAVOIDABLE ADVERSE EFFECTS

Some fish entrainment mortality may occur at the project; however this long-term impact is expected to be minor, given the existing condition of the project area fishery. Upland and riparian vegetation directly within the footprint of the powerhouse, refurbished road, bridge, transmission line expansion, and along any hardened banks would be permanently displaced. However, this habitat is common in the area and displaced or disturbed habitat totals less than four acres. Recreation users, as well as wildlife at the project may experience temporarily and minor disturbance during the construction of project features.

5.4 SUMMARY OF SECTION 10(j) RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided

by the federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission finds that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency. No section 10(j) recommendations were filed in response to the ready for environmental analysis notice.

5.5 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C.§803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 5 comprehensive plans that are applicable to the project, located in Pennsylvania.[9] No inconsistencies were found.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the Mahoning Creek Project is licensed as proposed with the additional staff-recommended measures, the project would operate while providing protective measures to fish, wildlife, aesthetic, recreational, and historic resources in the project area.

Based on our independent analysis, issuance of a license for the project, as proposed with additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

[9] (1) Pennsylvania Department of Environmental Resources. 1983. Pennsylvania State Water Plan. Harrisburg, PA. 20 volumes; (2) Pennsylvania Department of Environmental Resources. 1990. Pennsylvania's Recreation Plan, 1986-1990. Harrisburg, PA.; (3) Pennsylvania Department of Environmental Resources. 1988. Pennsylvania Water Quality Assessment. Harrisburg, PA. 3 volumes. [Updated by the 20220 Pennsylvania Water Quality Assessment 305(b); (4) Pennsylvania Department of Environmental Resources. 1990. The Pennsylvania Scenic Rivers Program Scenic Rivers Inventory. Harrisburg, PA.; (5) National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington, DC.

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8.0 LIST OF PREPARERS

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Appendix A. Draft License Articles

We recommend including the following license articles for any license issued for the project:

Draft Article 001. *Administrative Annual Charges*. The licensee shall pay the United States annual charges, effective as the date of commencement of project construction, and as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of:

(1) reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 6,000 kilowatts; and

(2) recompensing the United States for the utilization of surplus water or water power from a government dam.

Draft Article 002. *Exhibit Drawings.* Within 45 days of the date of issuance this license, the licensee shall file the approved exhibit F drawings in aperture card and electronic file formats.

(a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Drawing Number (i.e., P-12555-0001 through P-12555-005) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (i.e., F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections, New York Regional Office.

(b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections, New York Regional Office. Exhibit F drawings must be segregated from other exhibits and identified as (CEII) material under 18 CFR §388.113(c). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-12555-0001, F-1, Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file
FILE TYPE – Tagged Image File Format (TIFF), CCITT Group 4
RESOLUTION – 300 dpi desired, (200 dpi min)
DRAWING SIZE FORMAT – 24" X 36" (min), 28" X 40" (max)
FILE SIZE – less than 1 MB desired

Draft Article 003. *Exhibit G Drawings.* Within 60 days of the effective date of this license, the licensee shall file, for Commission approval, revised exhibit G drawings enclosing all project features that are necessary for operation and maintenance of the project, including the fishing pier and parking area located near the existing stilling basin. The exhibit G drawings shall be filed electronically pursuant to 18 CFR sections 4.39 and 4.41.

Draft Article 004. *Headwater Benefits.* If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Draft Article 005. *Start of Construction*. The licensee shall commence construction of the project works within two years from the issuance date of the license and shall complete construction of the project within 5 years from the issuance date of the license.

Draft Article 006. *Contract Plans and Specifications*. At least 60 days prior to start of construction, the licensee shall submit one copy of its plans and specifications and supporting design document to the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer, and two copies to the Commission (one of these shall be a courtesy copy to the Director, D2SI). The submittal must also include as part of preconstruction requirements: a Quality Control and Inspection Program, Temporary Construction Emergency Action Plan, and Soil Erosion and Sediment Control Plan. The licensee may not begin construction until the D2SI – New York Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

Draft Article 007. *Facility Design and Construction.* The design and construction of those permanent and temporary facilities, including reservoir impounding cofferdams and deep excavations, that would be an integral part of, or that could affect the structural integrity or operation of the Government project shall be done

in consultation with and subject to the review and approval of the Corps' District Engineer. The Corps' review of the cofferdams will be in addition to the licensee's review and approval of the final plans and shall in no way relieve the licensee of responsibility and liability regarding satisfactory performance of the cofferdams. Within 90 days from the issuance date of the license, the licensee shall furnish the Corps and the Commission's Division of Dam Safety and Inspections – New York Regional Engineer, a schedule for submission of design documents and the plans and specifications for the project. If the schedule does not afford sufficient review and approval time, the licensee, upon request of the Corps, shall meet with the Corps and the Commission's staff to revise the schedule accordingly.

Draft Article 008. *Review of Contractor Designs*. The licensee shall review and approve the design of contractor–designed cofferdams and deep excavations, other than those approved according to Draft Article 007, prior to the start of construction and shall ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the licensee shall file with the Commission's New York Regional Engineer; and the Corps, one copy of the approved cofferdam construction drawings and specifications and a copy of the letter(s) of approval.

Draft Article 009. *Agreement with Corps*. The licensee shall within 90 days from the issuance date of the license, enter into an agreement with the Corps to coordinate its plans for access to and site activities on lands and property administered by the Corps so that the authorized purposes, including operation of the Federal facilities, are protected. In general, the agreement shall not be redundant with the Commission's requirements contained in this license, shall identify the facility, and the study and construction activities, as applicable, and terms and conditions under which studies and construction will be conducted. The agreement shall be mainly composed of reasonable arrangements for access to the Corps site to conduct studies and construction activities, such access rights to be conditioned by the Corps as may be necessary to protect the federally authorized project purposes and operations. Should the licensee and the Corps fail to reach an access agreement, the licensee shall refer the matter to the Commission for resolution.

Draft Article 010. *Periodic and Continuous Inspections by the Corps*. The construction, operation and maintenance of the project works that, in the judgment of the Corps may affect the structural integrity or operation of the Corps project shall be subject to periodic or continuous inspections by the Corps. Any construction, operation and maintenance deficiencies or difficulties detected by the Corps inspection shall be immediately reported to the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer. Upon review, the D2SI – New York Regional Engineer shall refer the matter to the licensee for appropriate action. In cases when construction, operation or maintenance practices or deficiencies may create a situation

posing imminent danger to the structural integrity and safety of the Corps project, the Corps inspector has the authority to stop construction or maintenance while awaiting the resolution of the problem. The licensee shall immediately inform the D2SI – New York Regional Engineer of the circumstances surrounding the cessation of construction, operation, or maintenance activities. The licensee shall not resume construction, operation, or maintenance activities until notified by the D2SI – New York Regional Engineer that the problem or situation has been resolved.

Draft Article 011. *Regulating (or Operating) Plan.* The licensee shall at least 60 days prior to start of construction, submit for approval an operating plan, describing (a) the designed mode of hydropower operation, (b) reservoir flow diversion and regulation requirements for operation of the Corps project during construction as established by the Corps, and (c) integration of the operation of the hydroelectric facility into the Corps' emergency action plan. In addition, the licensee, prior to start of power plant operation, shall enter into an operating memorandum of Agreement (MOA) with the Corps describing the detailed operation of the power facilities acceptable to the Corps. The MOA shall specify any restrictions needed to protect the primary purposes of the Corps project for navigation, recreation, water quality, and flood control. The Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer shall be invited to attend meetings regarding the agreement. The MOA shall be subject to revision by mutual consent of the Corps and licensee as experience is gained by actual project operation. Should the licensee and the Corps fail to reach an agreement, the matter will be referred to the Director, Office of Energy Projects for resolution. Copies of the regulating plan and signed MOA between the Corps and the licensee and any revision thereof shall be furnished to the Director, Office of Energy Projects, and the D2SI – New York Regional Engineer.

Draft Article 012. *No Claim.* The licensee shall have no claim under this license against the United States arising from the effect of any changes made in the operation or reservoir levels of the Corps project.

Draft Article 013. *Corps' Written Approval*. The licensee shall provide the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Office two copies of all correspondence between the licensee and the Corps. The D2SI – New York Regional Engineer shall not authorize construction of any project work until the Corps' written approval of construction plans and specifications, quality control and inspection program, and temporary emergency action plan have been received by the Regional Engineer.

Draft Article 014. *As–Built Drawings*. Within 90 days of completion of all construction activities authorized by this license, the licensee shall file for Commission approval, revised exhibits A, F, and G, as applicable, to describe and show those project facilities as built. A courtesy copy shall be filed with the Commission's Division of

Dam Safety and Inspections (D2SI) – New York Regional Engineer; the Director, D2SI; and the Director, Division of Hydropower Administration and Compliance.

Draft Article 015. *Project Financing Plan.* At least 90 days before starting construction, the licensee shall file for approval, with the Director, Office of Energy Projects, three copies of a project financing plan. The plan must show that the licensee has acquired the funds, or commitment for funds, necessary to construct the project in accordance with this license. The licensee shall not start any project construction or ground–disturbing activities that are inseparably associated with the project, before the project financing plan is approved.

Draft Article 016. *Erosion and Sediment Control Plan.* At least 90 days before the start of any ground-disturbing activities, the licensee shall, prepare and file for Commission approval an erosion and sediment control plan. The plan shall include, but not be limited to:

(1) a description of the measures to be used to stabilize the streambanks and control soil erosion including a site map showing the location of cofferdam dams, training walls, armoring, rip rap, staked hay bales, geo-textile silt fence areas, excavated material stockpile area, and a temporary siltation catch basin;

(2) a description of the measures to be used for storage and disposal of spoil materials and the locations of any spoil disposal areas;

(3) a description of measures proposed for maintaining on site sanitary facilities;

(4) a description of measures proposed for revegetating disturbed areas, including a description of the native plant species used, planting densities and fertilization or other requirements; and

(5) an implementation schedule.

The licensee shall prepare the plan after consultation with the Pennsylvania Department of Environmental Protection, and the U.S. Army Corps of Engineers. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the resource agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. No land-disturbing activities or land-clearing activities shall begin at the project until the licensee is notified by the Commission that the plan is approved. Upon Commission

approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 017. *Run-of-Release Operation*. The licensee shall operate the project and only use flows released by the Corps or directed to be released by the Corps within the constraints established by the Corps according to Draft Article 011.

Draft Article 018. *Minimum flow in bypassed reach.* The licensee shall operate the project such that a minimum flow of 30 cfs may be released into the bypassed reach at all times with an increase to 40 cfs during winter periods to prevent freezing of the ring jet valve.

Draft Article 019. *Water Quality Monitoring Plan*. At least 90 days before starting project construction, the licensee shall, prepare and file for Commission approval a water quality monitoring plan. The plan shall include, but not be limited to:

(1) a schedule for implementing the plan;

(2) methods for measuring and verifying DO and temperature;

(3) estimated costs for any structural or operational modifications that are needed to implement the plan;

(4) consultation with the agencies, concerning changes to the plan after the first full year of monitoring implementation;

(5) real-time reporting of the monitoring data; and

(6) specific measures proposed for mitigation in the event that any water quality parameters are found to be below state standards and project-related.

(7) procedures for modifying the plan, as necessary, to incorporate operational or structural mitigative measures which have proven effective for complying with state water quality standards.

The licensee shall prepare the plan after consultation with the Pennsylvania Department of Environmental Protection, and the U.S. Army Corps of Engineers. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the resource agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Project operation shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 020. At least 90 days before the start of any land-disturbing or land-clearing activities, the Licensee shall file with the Commission, for approval, a wetland protection plan for those wetlands located near the project construction activities.

The plan, at a minimum, shall include:

(1) details of the final design, including measures to avoid and protect the wetlands affected by construction and permanent project structures;

(2) schedules for establishing these measures and for filing recommendations for alternative wetland mitigation.

The Licensee shall prepare the plan after consultation with the Fish and Wildlife Service (FWS), the U.S. Army Corps of Engineers, and the Pennsylvania Department of Environmental Protection. The Licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Licensee is notified by the Commission that the plan is approved. Upon Commission approval, the Licensee shall implement the plan, including any changes required by the Commission.

Draft Article 021. *Recreation Plan.* Within 6 months of the date of issuance this license, the licensee shall prepare and file for Commission approval a Recreation Plan. The plan shall include, but not be limited to:

(1) as-built drawings for the existing outflow fishing area and dam picnic site;

(2) design drawings for a new fishing pier, including appropriate signage and lighting, downstream from the dam, or alternate enhancements to angler access;

(3) an explanation of ownership, operation, and management of all existing and new recreational facilities at the project during the license term;

(3) documentation of consultation with the U.S. Army Corps of Engineers, and the Pennsylvania Fish and Boat Commission with regards to the design and management of the fishing pier or alternative enhancements; and

(4) a schedule for implementation of the recreational enhancements.

The Commission reserves the right to require changes to the plan. No land-disturbing activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 022. *Programmatic Agreement and Historic Properties Management Plan.* The licensee shall implement the Programmatic Agreement Among the Federal Energy Regulatory Commission and the Pennsylvania State Historic Preservation Officer for Managing Historic Properties that may be Affected by Issuing a License to Mahoning Creek Hydroelectric Company for the Construction and Operation of the Mahoning Creek Hydroelectric Project in Armstrong County, Pennsylvania (FERC No. 12555), executed on [pending], including but not limited to the Historic Properties Management Plan (HPMP) for the project. In the event that the Programmatic Agreement is terminated, the licensee shall continue to implement the provisions of its approved HPMP. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated, the licensee shall obtain approvals from or make notifications to the Commission and the Pennsylvania State Historic Preservation Offices where the HPMP calls upon the licensee to do so.

Draft Article 023. *Use and Occupancy.* (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and

occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the licensee shall so inform the Commission in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

Document Content(s)