Federal Energy Regulatory Commission

Office of
Energy Projects

September 2019

PennEast Pipeline Company, LLC **Docket No. CP19-78-000**

PennEast Pipeline Project Amendment

Environmental Assessment

Cooperating Agencies:

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 2
PennEast Pipeline Company, LLC
Docket No. CP19-78-000

TO THE INTERESTED PARTIES:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the PennEast Pipeline Project Amendment (Amendment Project), proposed by PennEast Pipeline Company, LLC (PennEast) in the above referenced docket. PennEast proposes to amend their certificate of public convenience and necessity for the previously approved PennEast Pipeline Project (Docket No. CP15-558-000) that was issued by the Commission on January 19, 2018. The Amendment Project would include four modifications to adjust certain aspects of the design, alignment, workspace, and construction methods for the PennEast Pipeline Project in Luzerne, Carbon, Monroe, and Northampton Counties, Pennsylvania.

The EA assesses the potential environmental effects of the construction and operation of the Amendment Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the Amendment Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and U.S. Department of Agriculture – Natural Resources Conservation Service participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis.

The Amendment Project would consist of the following four proposed modifications to the previously approved PennEast Pipeline Project, all in Pennsylvania:

- **Saylor Avenue Realignment** [Plains Township (Twp.), Luzerne County] - a 0.4-mile-long pipeline realignment between milepost (MP) 8.5R3 and MP 8.9R3 to address construction feasibility and land use impacts;
- **Interstate 81 Workspace Adjustment** (Plains Twp., Luzerne County) – a revised horizontal directional drill (HDD) design and workspace adjustment between MP 10.0R2 and 10.4R2 due to historic mines;

- **Appalachian Trail PPL Electric Utilities Crossing Realignment** (Lower Towamensing Twp., Carbon County, Eldred Twp., Monroe County, and Moore Twp., Northampton County) - a 5.5-mile-long pipeline re-route from MP 48.6R2 to MP 53.6R3 to collocate the crossing of the Appalachian National Scenic Trail along an existing utility corridor, relocation of the Blue Mountain Interconnect, and addition of a 0.5-mile-long, 4-inch-diameter Blue Mountain Lateral; and
- **Freemansburg Avenue Realignment** (Bethlehem Twp., Northampton County) - a 0.6-mile-long pipeline realignment between MP 69.7R3 and MP 70.8R3 and redesign of construction method from HDD to open cut to avoid karst topography.

The Commission mailed a copy of the *Notice of Availability* to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the Amendment Project area. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the Environmental Documents page (https://www.ferc.gov/industries/gas/enviro/eis.asp). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (https://www.ferc.gov/docs-filing/elibrary.asp), click on General Search, and enter the docket number in the "Docket Number" field, excluding the last three digits (i.e. CP19-78). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they would be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **October 21, 2019.**

For your convenience, there are three methods you can use to submit your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

(1) You can file your comments electronically using the eComment feature on the Commission's website (www.ferc.gov) under the link to Documents and Filings. This is an easy method for submitting brief, text-only comments on a project;

(2) You can also file your comments electronically using the eFiling feature on the Commission's website (www.ferc.gov) under the link to Documents and Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing;" or

(3) You can file a paper copy of your comments by mailing them to the following address. Be sure to reference the project docket number (CP19-78-000) with your submission: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426 NE, Room 1A, Washington, DC 20426.

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214). Motions to intervene are more fully described at http://www.ferc.gov/resources/guides/how-to/intervene.asp. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. The Commission may grant affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the Amendment Project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription, which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

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Technical Abbreviations and Acronyms

ACHP	Advisory Council on Historic Preservation
Amendment Project	Four proposed pipeline modifications to the previously authorized PennEast Pipeline Project
ANST	Appalachian National Scenic Trail
APE	Area of Potential Effect
AIMP	agricultural impact mitigation plan
AQCR	Air Quality Control Regions
ATC	Appalachian Trail Conservancy
ATW	approved trout waters
ATWS	additional temporary workspace
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BWA	Bethlehem Water Authority
CAA	Clean Air Act
Certificate	Certificate of Public Convenience and Necessity
Certificate Order	Certificate Order issued on January 19, 2018 for the PennEast Pipeline Project in Docket No. CP15-558-000
Certificated Project	PennEast Pipeline Project previously approved in Docket No. CP15-558-000
Certificated Route	Pipeline route authorized for the Certificated Project in Docket No. CP15-558-000
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
COE	U.S. Army Corps of Engineers
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
dBA	A-weighted decibels
DO	dissolved oxygen
DRBC	Delaware River Basin Commission
EA	environmental assessment
EDR	Environmental Data Resources, Inc.
EI	Environmental Inspector
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
E&SCP	Erosion and Sediment Control Plan
EV	exceptional value
F	Fahrenheit
FDCP	Fugitive Dust Control Plan

FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g	gravity
GHG	greenhouse gases
GWP	global warming potential
HAPs	hazardous air pollutants
HCA	high consequence area
HDD	horizontal directional drill
HQ	high quality
HUC	Hydrologic Unit Code
IBA	Important Bird Area
L_{dn}	day-night equivalent sound level
L_{eq}	equivalent sound level
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MLVs	mainline valves
MOU	memorandum of understanding
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed PennEast Pipeline Project Amendment, and Request for Comments on Environmental Issues*
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCC	Northeast Regional Climate Center
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive areas
NSR	New Source Review
O_3	ozone
OEP	Office of Energy Projects
Order	Certificate of Public Convenience and Necessity
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PEM	palustrine emergent
PennDOT	Pennsylvania Department of Transportation

PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested wetlands
PGA	peak ground acceleration
PGC	Pennsylvania Game Commission
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	*Upland Erosion Control, Revegetation, and Maintenance Plan*
Procedures	*Wetland and Waterbody Construction and Mitigation Procedures*
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
$PM_{2.5}$	particulate matter sized 2.5 microns or smaller
PM_{10}	particulate matter sized 10 microns or smaller
PSS	palustrine scrub-shrub wetlands
PUB	palustrine unconsolidated bottom wetlands
Revised Pennsylvania Route	The Revised Pennsylvania Route refers to the Certificated Route inclusive of the modifications from Amendment Project.
SFHA	Special Flood Hazard Area
SGL	Pennsylvania State Game Lands
SHPO	State Historic Preservation Office
SIPs	state implementation plans
SO_2	sulfur dioxide
SPCC Plan	*Spill Prevention, Containment, and Countermeasures Plan*
SSA	sole source aquifers
T&E	threatened and endangered
TMDL	Total Maximum Daily Load
tpy	tons per year
TSF	trout stocked fisheries
UDP	*Unanticipated Discovery Plan*
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
VdB	vibration decibels
VOC	volatile organic compound
WHPA	Wellhead Protection Area
WTW	wilderness trout streams
WWF	warm-water fisheries

SECTION A – PROPOSED ACTION

1.0 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this environmental assessment (EA) to assess the potential environmental impacts of the construction and operation of four proposed pipeline modifications (Amendment Project) to the previously authorized PennEast Pipeline Project (Docket No. CP15-558-000) in Luzerne, Carbon, Monroe, and Northampton Counties, Pennsylvania.[1] PennEast Pipeline Company, LLC (PennEast) requests a Certificate of Public Convenience and Necessity (Certificate or Order) to incorporate four modifications to the previously approved PennEast Pipeline Project (Certificated Project) in the Certificate Order issued on January 19, 2018 (Certificate Order). The location and a general overview of the proposed facilities are provided on figure A.1-1.

The FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the Natural Gas Act (NGA), and is the lead federal agency for preparation of the EA. We[2] prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations [CFR] Parts 1500-1508 [40 CFR 1500-1508]) and the Commission's implementing regulations under 18 CFR 380.

On February 1, 2019, PennEast, filed an Amendment Application with the Commission in Docket No. CP19-78-000 under Section 7(c) of the NGA and Part 157 of the Commission's regulations. The Amendment Application proposes four modifications to the pipeline route authorized for the Certificated Project in Docket No. CP15-558-000 (Certificated Route). The proposed modifications, referred to as the Amendment Project, would include pipeline realignments and adjustments in Luzerne, Carbon, Monroe, and Northampton Counties, Pennsylvania. Among other route changes, PennEast proposes a realignment of the pipeline route at the crossing of the Appalachian National Scenic Trail (ANST) that would be collocated with an existing cleared right-of-way. This realignment would also include a pipeline lateral and an aboveground interconnect. The other modifications would include two minor route realignments and one workspace adjustment. Except for the realignment of the ANST crossing, all other modifications would be within 0.25 mile of the Certificated Route.

2.0 PURPOSE AND NEED

PennEast states in its application that the purpose of the Amendment Project would be to improve construction feasibility, address agency concerns, and minimize the potential for environmental impacts from those previously approved in the Certificated Project.

Under Section 7(c) of the NGA, the Commission considers all factors bearing on the public interest as part of its decision to authorize natural gas transportation facilities, and if so, grants a Certificate to construct and operate the facilities. The Commission bases its decision on financing, rates, market demand, gas supply, environmental impact, and other issues concerning a proposed project.

[1] The PennEast Pipeline Project includes about 116-miles of 36-inch-diameter natural gas pipeline from Luzerne County, Pennsylvania, to Mercer County, New Jersey, along with three laterals extending off the mainline, a compressor station, and appurtenant above ground facilities, designed to provide up to 1,107,000 dekatherms per day of firm natural gas transportation service to markets in New Jersey, New York, Pennsylvania, and surrounding states.

[2] The pronouns "we," "us," and "our" refers to environmental and engineering staff of the Office of Energy Projects.

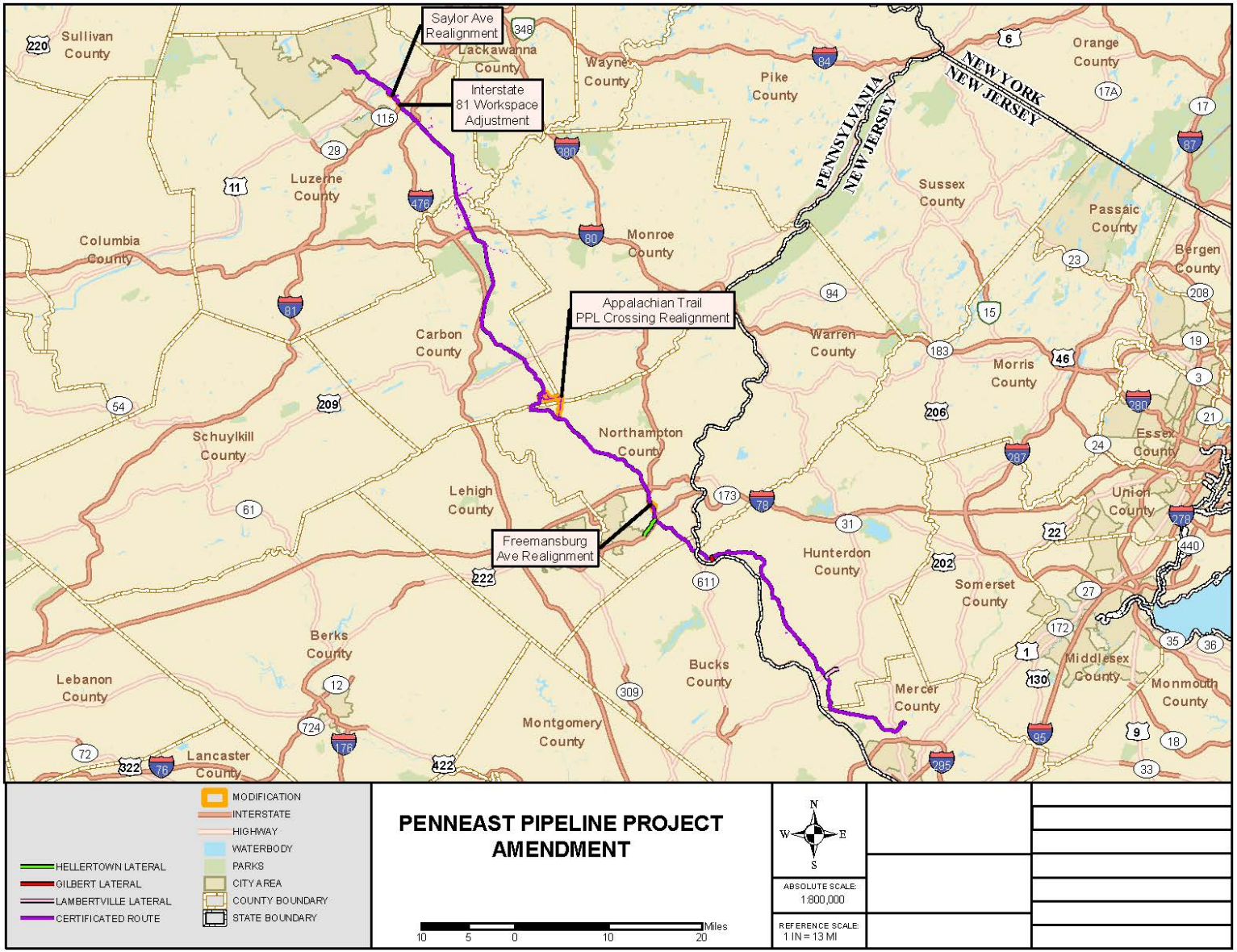

Figure A.1-1 Location and Overview of Proposed Facilities

3.0 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

Our principal objectives in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that would result from implementation of the proposed action;
- describe and evaluate reasonable alternatives to the proposed actions that would avoid or minimize adverse effects on the environment;
- identify and recommend specific mitigation measures, as necessary, to minimize the environmental impacts; and
- facilitate public involvement in identifying the significant environmental impacts.

The topics addressed in this EA include: geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; special status species; land use, recreation, special interest areas, and visual resources; socioeconomics (including transportation and traffic); cultural resources; air quality and noise; reliability and safety; and cumulative impacts. The EA describes the affected environment as it currently exists, discusses the environmental consequences of the Amendment Project, and compares the Amendment Project's potential impact with that of various alternatives. The EA also presents our recommended mitigation measures.

The EA will be used by the Commission in its decision-making process to determine whether to authorize PennEast's proposal. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Amendment Project is in the public convenience and necessity.

4.0 COOPERATING AGENCIES

The U.S. Army Corps of Engineers (COE), U.S. Environmental Protection Agency (EPA), and U.S. Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS) participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to environmental impacts involved with a proposal. The roles of the COE, EPA, and NRCS in the Amendment Project review process are described below. The EA provides a basis for coordinated federal decision making in a single document, avoiding duplication among federal agencies (or state agencies with federal delegation authority) in the NEPA environmental review process. In addition to the lead and cooperating agencies, other federal, state, and local agencies may use this EA in approving or issuing permits for all or part of the Amendment Project. Federal, state, and local permits, approvals, and consultations for the Amendment Project are discussed in section A.10.0.

4.1 U.S. Army Corps of Engineers

The COE has jurisdictional authority pursuant to Section 404 of the Clean Water Act (CWA) (33 United States Code [USC] 1344), which governs the discharge of dredged or fill material into waters of the U.S. and Section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Construction of the Amendment Project would impact waters of the U.S. and require amendments to the individual permits filed to the Baltimore and Philadelphia Districts. Therefore, due to Amendment Project's impacts on waters of the U.S., the COE is participating as a cooperating agency in the development of this EA.

4.2 U.S. Environmental Protection Agency

The EPA has delegated water quality certification, under Section 401 of the CWA, to the jurisdiction of individual state agencies. The EPA also oversees the issuance of a National Pollutant Discharge Elimination System (NPDES) permit by the state agency, under Section 402 of the CWA, for point-source discharge into waterbodies. In addition to its authority under the CWA, the EPA has jurisdictional authority under the Clean Air Act of 1970 (CAA) to control air pollution by developing and enforcing rules and regulations for all entities that emit toxic substances into the air. Under this authority, the EPA has developed regulations for major sources of air pollution and has delegated the authority to implement these regulations to state and local agencies. State and local agencies also develop and implement their own regulations for nonmajor sources of air pollutants.

4.3 U.S. Department of Agriculture – Natural Resources Conservation Service

The NRCS is charged with helping America's farmers, ranchers, and forest landowners conserve the nation's soil, water, air and other natural resources. Though not a permitting agency, the NRCS will ensure that the impact of the proposed Amendment Project on NRCS acquired easement holdings is fully and adequately considered.

5.0 PUBLIC REVIEW AND COMMENT

On March 15, 2019, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed PennEast Pipeline Project Amendment, and Request for Comments on Environmental Issues* (NOI). The NOI was published in the Federal Register and mailed to 488 entities, including federal, state, and local government, representatives and agencies; elected officials; Native American tribes; environmental and public interest groups, newspapers and libraries in the Amendment Project area; and affected landowners and interested parties.[3] Comments received during the scoping process are part of the public record for the Amendment Project and are available for viewing on the FERC Internet website (www.ferc.gov).[4] Table A.5-1 summarizes the environmental issues identified during the scoping process. Substantive environmental issues raised by commenters are addressed in the applicable sections of the EA. Comments were received from the public and other interested parties, such as: Delaware Riverkeeper Network, Frenchtown Environmental Commission, Northampton County Farmland Preservation, Williams Township Board of Supervisors, and, Appalachian Mountain Club. Additional agencies that commented on the NOI included the National Park Service (NPS), Pennsylvania Department of Conservation and Natural Resources (PADCNR), and the Delaware Nation Historic Preservation Department.

We received 319 comment letters on Docket No. CP19-78-000, which includes 86 letters from Pennsylvania residents, 163 letters from New Jersey residents, and 70 letters from residents in Colorado, Delaware, West Virginia, and other states. Since the Amendment Project is specific to the four modifications in Pennsylvania, the EA addresses all comments relative to this scope. In addition, we acknowledge the receipt of several comment letters regarding Docket No. CP15-558-000, which are not addressed in the EA since the areas discussed are outside the scope of the four modifications in the Amendment Project.

In addition, FERC staff acknowledges that on March 25, 2019 and April 30, 2019, PennEast filed responses to the agencies' comments.

[3] On March 22, 2019, the NOI was published in 84 FR10811.

[4] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., CP19-78). Select an appropriate date range.

Table A.5-1

Issues Identified During the Scoping Period

Issue	Comments	EA Section(s) Where Comments are Addressed
Alternatives	Recommend the EA describe the methodology and criteria used for determining project siting; rationale used to determine what installation methods would be used where; how each alternative was developed, how it addresses each project objective, and how it would be implemented.	C
Water Use and Quality	Effects on water quality and supply during project construction and operation, including impacts to private wells and water tables.	B.3.0
Surface Waters	Effects on surface waters during pipeline construction and operation.	B.3.2
Wetlands	Effects on wetlands during pipeline construction; effects on loss of wetlands; effects on "Exceptional Value" wetlands.	B.3.3
Vegetation	Effects on vegetation during construction and operation of the pipeline; describe methodology and criteria used to determine what vegetation would be removed or disturbed; effects of fragmentation of forests and clear cutting.	B.4.1
Fish and Wildlife	Effects on wildlife during pipeline construction; loss of habitat; effects on the spread of invasive species.	B.4.2
Threatened, Endangered, and Special-Status Species	Effects on threatened and endangered species and their habitats.	B.4.4
Land Use, Recreation, and Visual Resources	Effects on land use plans; effects on private septic systems.	B.6.0
Floodplains	Effects of construction on floodplains.	B.1.2.2
Socioeconomics	Effects of project construction and operation on quality of life for nearby residents; effects on nearby property values and businesses.	B.7.0
Cultural Resources	Effects on cultural and historic resources during construction and operation.	B.5.0
Air Quality and Noise	Air pollution during construction and operation; air pollution and noise impacts on nearby residents.	B.8.1
Soils	Effects on compaction of soils and soil disturbance during construction.	B.2.0
Geology	Effects on karst topography and existing mine shafts.	B.1.0

6.0 PROPOSED FACILITIES

The Amendment Project would involve the modifications of four locations previously approved under Docket No. CP15-558-000, and the Blue Mountain Lateral and Interconnect to meet the purpose and need of the Amendment Project. The modifications are described in the sections below.

6.1 Pipeline Facilities

The PennEast pipeline would be designed for a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig) and a capacity of approximately 1.1 million dekatherms per day. Facilities included in the Amendment Project would be located within Luzerne, Carbon, Monroe, and Northampton Counties, Pennsylvania and are summarized below in table A.6.1-1 and depicted in appendix A.

Table A.6.1-1

Summary of the Facilities Included in the Amendment Project.

Facility	County	Length (miles)	Diameter (inches)	Location (milepost) [a]	Description	Landowner Status
Saylor Ave Realignment						
Pipeline	Luzerne	0.4	36	8.5R3 – 8.9R3	Realignment and workspace change to avoid coal slag area and depression	3 landowners, all previously affected
Interstate 81 Workspace Adjustment						
Pipeline	Luzerne	N/A	36	10.0R2 – 10.4R2	Temporary workspace adjustment to accommodate shallower and shorter Horizontal Directional Drill (HDD)	4 Landowners, 2 new and 2 previously affected
Appalachian Trail PPL Crossing Realignment						
Pipeline	Carbon, Monroe, Northampton	5.5	36	48.6R2 – 53.6R3	Realignment to satisfy agency comments regarding Appalachian National Scenic Trail (ANST) crossing	25 landowners, 23 new and 2 previously affected
Blue Mountain Lateral	Carbon	0.5	4	49.7R3	Lateral to provide connection to relocated Blue Mountain Interconnect	One landowner previously affected
Blue Mountain Interconnect	Carbon	N/A	N/A	N/A	Relocation resulting from realignment of the ANST crossing	One landowner, newly affected
Freemansburg Ave Realignment						
Pipeline	Northampton	0.6	36	69.7R3 – 70.8	Removal of HDD due to karst terrain and realignment and workspace change to avoid future developments	5 landowners, all previously affected

N/A – not applicable

[a] Route changes after PennEast's Certificate Application under CP15-558, are denoted with an "R" and indicate a milepost location. Mileposts with an "R2" indicate route changes implemented in PennEast's September 2016 filing and included in the Final Environmental Impact Statement under CP15-558-000. Mileposts with an "R3" indicate modifications resulting from PennEast's amendment filing under CP19-78-000. Mileposts not containing an "R" indicate the original route as filed by PennEast under CP15-558-000.

6.1.1 Saylor Ave Realignment

The Saylor Ave Realignment would consist of a 0.4-mile shift in the pipeline route to address construction feasibility. This modification would be between mileposts (MPs) 8.5R3 and 8.9R3 in Plains Township, Luzerne County, Pennsylvania. The shift would avoid an area built up from coal slag or mine tailings as well as areas within a depression that would make construction difficult. This modification is also proposed to avoid impacts on minerals, avoid monitoring wells, issues with quarry asphalt operations, and minimize impacts on a proposed subdivision/residential development. The Saylor Ave Realignment would require 4.7 acres of workspace, which is an approximate 1.1 acre decrease in workspace compared to the Certificated Project route in this location.

6.1.2 Interstate 81 Workspace Adjustment

The Interstate 81 Workspace Adjustment would be located between MPs 10.0R2 and 10.4R2 in Plains Township, Luzerne County, Pennsylvania. This modification would consist of the addition of 2.8 acres of workspace, a temporary access road that would follow an existing powerline right-of-way, and additional temporary workspace (ATWS) for pipe pullback. Historic mines identified during geotechnical investigations resulted in the need for a shorter and shallower horizontal directional drill (HDD) across

State Route 315/Interstate 81. As a result, the drill pad would be relocated to accommodate the shortened drill. The Interstate 81 Workspace Adjustment would result in an increase of approximately 1.7 acres of workspace compared to the Certificated Project route in this location.

6.1.3 Appalachian Trail PPL Crossing Realignment

This modification would be about 5.5 miles in length from MPs 48.6R2 to 53.6R3 in Lower Towamensing Township, Carbon County, Eldred Township, Monroe County, and Moore Township, Northampton County, Pennsylvania. The Appalachian Trail PPL[5] Crossing Realignment is proposed to address concerns from the Bethlehem Water Authority (BWA) regarding separation from their infrastructure and comments from the Pennsylvania Game Commission (PGC) and NPS regarding the ANST crossing. PennEast states in the application and responses to subsequent Environmental Information Requests that the Appalachian Trail PPL Crossing Realignment would not cross NPS lands.[6] PennEast developed the Appalachian Trail PPL Crossing Realignment based on discussions with the Appalachian Trail Conservancy (ATC), PGC, and NPS about various crossing methodologies, and determined that based on the terrain and geology, and in order to minimize workspace use near the ANST viewshed, it would utilize an open-cut crossing adjacent and partially within an existing cleared right-of-way. NPS filed a letter on April 15, 2019 stating that NPS is supportive of consideration and analysis of the Amendment Project route that would cross the ANST.[7] The Appalachian Trail PPL Crossing Realignment would utilize standard cross-country construction methods (open cut) and be collocated with two existing high-voltage electric transmission line right-of-way for 60 percent of its length. This realignment would minimize greenfield disturbance and reduce the overall pipeline length while increasing separation from the existing BWA infrastructure. Where the pipeline would cross the ANST on land owned by the PGC, the right-of-way would be collocated with an approximately 100-foot wide high voltage PPL power line right-of-way. PennEast would maximize use of this existing right-of-way to minimize the amount of clearing that would be required to construct the pipeline in this location, and to reduce visual impacts. The temporary construction workspace would overlap the existing electric transmission right-of-way by 70-feet at the crossing of the ANST. PennEast's permanent right-of-way across the ANST would be 30 feet wide, approximately half of which would overlap with the existing right-of-way. Overall, the Appalachian Trail PPL Realignment would result in a decrease of 17.8 acres of workspace compared to the Certificated Project route.

PennEast indicated that it does not require any additional authorizations for the Amendment Project to cross the ANST and acknowledges that construction across the ANST would not occur until all required permits and approvals have been received.[8] The Appalachian Trail PPL Crossing Realignment would affect 25 landowners, one of which is the PGC and the remaining 24 are residents, businesses, or other utilities. The crossing location and plan were approved by the PGC who owns the land where the ANST is crossed.[9] The Appalachian Trail PPL Crossing Realignment would require 81.0 acres of workspace as well as use of six existing access roads, including one on NPS-owned property which requires a Special Use Permit by NPS. Four access roads would no longer be needed as a result of this modification. A detailed crossing plan for the ANST is included in appendix B and further described in section B.6.

6.1.3.1 Blue Mountain Lateral and Interconnect

As a result of the Appalachian Trail PPL Crossing Realignment, the location of the Blue Mountain Interconnect on the Certificated Route would be relocated to the east side of Blue Mountain Resort's ski slopes. The Blue Mountain Interconnect would consist of a meter station within a one-acre site within the

[5] PPL is an abbreviation for PPL Electric Utilities.
[6] Accession number 20190328-5307.
[7] Accession number 20190415-5024.
[8] Accession number 20190520-5076.
[9] Available in Appendix E of Amendment Application; Accession Number 20190201-5212

ski resort property. In order to connect the pipeline to the Blue Mountain Interconnect, PennEast would construct a 0.5 mile, 4-inch-diameter lateral (Blue Mountain Lateral) with a side valve consisting of 30 feet of aboveground 4-inch-diameter pipe, flanges, and valves in a 150 square foot area within the permanent right-of-way of the mainline pipeline. The Blue Mountain Lateral would be 100 percent collocated with an existing pipeline right-of-way and located at approximate MP 49.7R3 and a new access road.

6.1.4 Freemansburg Ave Realignment

Geotechnical investigations identified karst features within the Lowes's parking lot that would preclude the use of HDD in this area. Therefore, PennEast proposes the use of open-cut technology to avoid potential construction issues that could occur from use of HDD. PennEast would utilize a 60-foot-wide right-of-way to construct the pipeline in the Lowe's parking lot. In addition, St. Lukes's Hospital requested a shift in the alignment to accommodate future development on their property. As a result, PennEast proposes a 0.6-mile realignment between MPs 69.7R3 and 70.8 in Bethlehem Township, Northampton County, Pennsylvania that would require 17.8 acres of workspace. The realignment would result in a decrease of approximately 50 acres of workspace compared to the Certificated Project route in this location.

7.0 NON-JURISDICTIONAL FACILITIES

As part of its decision to approve facilities under Commission jurisdiction, the Commission considers all factors bearing on the public interest. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of FERC. These "non-jurisdictional" facilities may be integral to the needs of a project (e.g., a new or expanded power plant at the end of a pipeline that is not under the jurisdiction of FERC) or may be merely associated as minor, non-integral components of the jurisdictional facilities that would be constructed and operated as part of a project.

The Blue Mountain Interconnect meter station would require a powerline and telecommunications cable. These non-jurisdictional facilities would be installed along the proposed access road within the proposed workspace. Therefore, the impacts are accounted for in our consideration of the Amendment Project impacts as described in section B of this EA. PennEast would coordinate with PPL regarding these services.

8.0 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

The Amendment Project facilities would be designed, constructed, tested, operated, and maintained in the same manner as approved for the Certificated Project. PennEast would follow U.S. Department of Transportation (USDOT) regulations at 49 CFR 192, Transportation of Natural or Other Gas by Pipeline: Minimum Federal Safety Standards. These regulations specify material selection, design criteria, corrosion protection, and qualifications for welders and operation personnel. These regulations ensure adequate protection for the public and prevent natural gas facility accidents and failures. Additionally, PennEast would comply with the Commission's regulations at 18 CFR 380.15 regarding the siting and maintenance of pipeline rights-of-way.

PennEast would not begin construction of the Amendment Project until the receipt of all necessary approvals and authorizations. PennEast anticipates commencing construction of CP15-558-000 and CP19-78-000 in 2020. General construction of the pipeline is planned to commence in the spring, summer, and fall seasons of 2020 with an anticipated in-service date of November 2020. PennEast adopted FERC staff's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures). PennEast would also implement its *Spill Prevention, Containment, and Countermeasures Plan* (SPCC Plan) and Project-specific *Erosion and Sediment Control Plan* (E&SCP) to help ensure a favorable environment for the successful re-establishment

of vegetation and proper handling of lubricants, fuel, or other potentially toxic materials and prevention of spills, respectively. PennEast would also revegetate temporarily disturbed areas in accordance with the FERC Plan and Procedures.

As stated in the PennEast final environmental impact statement (FEIS) (Docket No. CP15-558-000), typical construction drawings would be available to guide construction crews to the approved methods to employ at appropriate locations. Construction crews would be familiar with the plans and assessing actual conditions before employing the guidelines.

For purposes of quality assurance and compliance with mitigation measures, other applicable regulatory requirements, and certain specifications for the Amendment Project, the Amendment Project would be represented on site by a Chief Inspector. There would be one or more Craft Inspectors and one or more Environmental Inspectors (EI) assisting the Chief Inspector. To ensure that the environmental conditions associated with other permits or authorizations are satisfied, the EI's duties would be fully consistent with those contained in paragraph II.B of the Plan. The EI(s) would have authority to stop work or require other corrective actions to achieve environmental compliance. In addition to monitoring compliance, the EI's duties would include training personnel about environmental requirements and reporting compliance status to the contractors, project management, FERC, and other agencies, as required.

FERC staff would conduct field and engineering inspections during construction. Other federal and state agencies may also conduct oversight of inspection to the extent determined necessary by the individual agency. After construction, the FERC staff would continue to conduct oversight inspection and monitoring during operation to ensure successful restoration.

The sections below describe the general procedures proposed by PennEast for construction and operation activities including restoration and maintenance following the completion of construction.

8.1 General Construction Procedures

As stated for the Certificated Project, in general, PennEast would use conventional construction techniques for buried pipelines and would follow our Plan and Procedures. Construction specifications would also require adherence to the *Stormwater Pollution Prevention Plan* for construction stormwater discharges, SPCC Plan, PennEast's E&SCP, best management practices (BMPs), and plans and procedures for unique construction techniques (e.g., HDD). General construction procedures for routine pipeline construction include:

- Right-of-Way Survey – PennEast would contact the Pennsylvania One Call System to verify and mark all utilities where any ground disturbance would occur. Prior to construction, PennEast would survey and stake the route centerlines, foreign pipeline and utility crossings, and workspace limits, along with wetland boundaries and other environmentally sensitive areas. Typically, PennEast would stake the centerline in 200-foot intervals and at points of inflection (PIs or pipeline bends).
- Clearing and Grading – The pipeline right-of-way and the temporary construction workspace would be cleared of vegetation by mechanical means or hand cutting. Following clearing, the entire width of the construction right-of-way, including the temporary construction workspace may be rough graded, as necessary. Graded topsoil would be segregated in accordance with our Plan and Procedures.
- Trench Excavation – Typically, the trench would be excavated to a depth sufficient to provide 3 feet of soil cover over the top of the pipe after backfilling. In areas of bedrock, a minimum of 18 inches of cover would be provided in Class I Areas and 24 inches in Class II and III Areas, in accordance with USDOT requirements. PennEast would provide a minimum 4 feet

of cover in active agricultural areas. Additional cover would also be provided at road, railroad, and waterbody crossings. At least 12 inches of clearance would be maintained when crossing foreign utility lines. Excavated soil would be stockpiled along the right-of-way away from construction traffic and the pipe assembly area (the "spoil side").

- Piping Techniques – Pipe would be delivered to the cleared and graded right-of-way where it would be strung adjacent to the trench. Bends in the pipe may be needed for direction changes, as well as natural grade changes. Prior to welding, select joints would be bent in the field by track-mounted hydraulic bending machines. Following stringing and bending, the pipe would be placed on supports to weld segments of pipe together. The pipe would arrive on site with a protective coating with the ends uncoated where they would be welded together. Once welded, these areas are coated by a coating crew. The pipe would then be inspected for defects in the coating and welds and repaired as needed before installation in the trench.
- Lowering-In – The trench would be dewatered, if needed, to perform an inspection of the trench and cleaned of debris. In rocky areas, sandbags or support pillows may be placed on the bottom of the trench to protect the pipe. PennEast would lower the pipe into the trench and install trench breakers as required before backfilling at specified intervals to prevent water movement along the pipeline. In areas of saturated soil, set-on concrete weights, pipe sacks, soil anchors, and/or concrete coating may be used to keep the pipe from rising.
- Backfilling – The trench would be backfilled with the previously excavated material. Clean fill or protective coating would be placed around the pipe prior to backfilling if the excavated material contains large rocks or other material that could damage the pipe or its coating. Where topsoil is required to be stored separately from subsoil, the subsoil would be backfilled first, followed by replacement of the topsoil. Topsoil would not be used to pad the pipe. In upland areas, a soil mound would be left over the trench to allow for soil settlement, unless otherwise requested by the landowner.
- Cleaning and Hydrostatic Testing – The pipe would be internally cleaned with "pigs." The pipe would then be hydrostatically tested to ensure there are no leaks and to provide the necessary safety margin for high-pressure operation. Once in-place, the pipeline would be filled with water and pressurized. Pressure would be maintained throughout the test. PennEast stated that it does not anticipate that any chemical agents would be added to the test water. PennEast submitted an application for a Water Withdrawal and Discharge Permit to the Delaware River Basin Commission (DRBC).

After the completion of a satisfactory test, the water would be discharged in accordance with state permit requirements and additional "drying" pig runs would be made, as necessary, to remove any residual water from the pipeline.

- Restoration and Revegetation – All work areas would be graded to match pre-construction contours. Erosion control methods would be implemented and could include contouring, permanent slope breakers, mulch, and re-seeding or sodding with soil-holding grasses. PennEast would restore fences, gates, driveways, and roadways affected by construction to original or better condition. Upland locations, excluding actively cultivated cropland, would be revegetated with seed, fertilizer, and soil additive recommendations based on landowner, U.S. Fish and Wildlife Service (FWS), and/or the local soil conservation authority requirements/recommendations.

Markers showing the location of the pipeline would be installed in accordance with 49 CFR 192. The markers would identify PennEast as the operator and list telephone numbers for emergencies and inquiries. PennEast would place markers at regular intervals along the rights-of-way and adjacent to road crossings.

8.2 Specialized Construction Procedures

As stated for the Certificated Project, wetland and waterbody crossings would be conducted in accordance with required state and federal permits and our Procedures. Operation of construction equipment in wetlands would be limited to that needed to clear the right-of-way, dig the trench, fabricate the pipe, backfill the trench, and restore the right-of-way. In unsaturated wetlands, topsoil over the pipe trench would be segregated from subsoils. In accordance with our Procedures, fuel would not be stored within 100 feet of wetlands or waterbodies. Wetlands and waterbodies would generally be crossed using the conventional excavator-type equipment and dry-crossing techniques, or by HDD. Road and utility crossings would be accomplished using open-cut, bore, or HDD crossing methods, depending upon site-specific conditions and state and local statutes.

Pipeline construction across waterbodies would be performed in accordance with state and federal permit conditions and PennEast's adherence to its SPCC Plan, E&SCP, BMPs, and our Plan and Procedures for unique construction techniques. PennEast has proposed to cross flowing waterbodies using a dry-ditch crossing method. A dry-ditch crossing involves installation of a flume pipe(s) and/or dam-and-pump system prior to trenching to divert the stream flow over the construction area and allow trenching of the stream crossing in drier conditions isolated from the stream flow. Spoil removed during trenching would be stored away from the water's edge and protected by sediment containment structures. Where these methods are employed, ATWS areas would be required for assembly of the pipe strings and for the spoil storage areas.

A conventional open-cut crossing method (i.e., bed and bank disturbance with no stream flow bypass equipment installed) would be used when minor waterbodies with no discernible flow at the time of construction are encountered. PennEast would complete construction activities within 24 hours at minor conventional trench stream crossings (those less than 10 feet wide) and within 48 hours at intermediate conventional trench crossings (those from 10 to 100 feet wide).

HDD is a method that allows for trenchless construction across an area. A small diameter pilot hole is drilled along the desired pipeline path using electromagnetic sensors to guide the drill bit. The hole is then enlarged using reaming tools until the desired diameter is achieved. Bentonite clay and water are continuously pumped into the hole to remove cuttings and maintain the integrity of the hole. Once the desired diameter is achieved, a pre-fabricated section of pipe is then pulled through the drill hole. PennEast stated that it would follow the same construction techniques as the ones used in the Certificate Order. For example, in areas where right-of-way width would be reduced because of constraints adjacent to the right-of-way, PennEast would implement stove pipe construction. This requires the contractor to construct one length of pipe (usually 40 feet) at a time. Drag section construction would be used in areas where there is insufficient space to assemble the pipe in-place. With this technique, the trench would be excavated, the prefabricated section of pipe (drag section) installed, and the trench backfilled all in one day.

The conventional bore method is similar to HDD in that the pipeline is installed beneath a feature without surface disturbance to the feature during crossing. The bore method differs in that the path of the pipeline across the feature is straight rather than curved. Bores are frequently used at paved road and railroad crossings and are not a common crossing method for waterbodies primarily because of the difficulty in managing groundwater during the installation. Boring requires excavation of pits on each side of the feature. During a standard boring operation, spoil from the bore would be carried into the pit as the crossing is being completed and then removed by track hoes to provide room for the pipe to be welded and eventually pulled through the borehole. The operator for the boring machine, welders, and several laborers would work in the bore pit. Trench boxes or sheet piling may be used to support the pit walls and help control groundwater inflows.

Rock removal would be accomplished through conventional backhoe excavation, ripping with a bulldozer, pneumatic hammering, or blasting. The technique utilized would be dependent on the hardness of the bedrock, fracture susceptibility, volume, and location. PennEast would perform all blasting according to federal and state safety standards and in accordance with their Blasting Plan to be implemented by the blasting contractor. Excess rock would be hauled off-site to an approved quarry for disposal.

Rugged topography, such as steep, vertical slopes and steep side slopes (i.e., slopes running parallel to the Amendment Project), is present in numerous areas along the Amendment Project route. PennEast may employ a technique called "winching" that involves placing heavy equipment at the top of the slope to serve as an anchor point, and then connecting one or more additional pieces of equipment together with a cable. This provides stability and safety to the equipment operators as work proceeds up and down the steep slope.

Another construction method used in areas with steep side slopes is called the "two-tone" cut and fill method. Typically, the up-slope side of the construction right-of-way would be cut during grading, and the soil excavated from the cut then used to fill the down-slope edge of the construction right-of-way to provide a safe and level working surface for heavy equipment. Pipeline construction then occurs on the level surface as it would in typical construction. Then, during restoration, the spoil material would be placed back into the cut and compacted to match the original topography and contours. PennEast would require extra workspace in these areas for storage of excavated material from the temporary cut and fill areas, as well as for temporary storage of material such as trench spoil, excess rock, and felled timber.

Permanent trench breakers would be installed in the trench surrounding the pipeline in areas of steep slopes with high erosion potential and to prevent the high velocity channeling of water along the trench line. Methods such as sediment barriers, waterbars, or mulching and crimping may be used as necessary to control erosion until vegetation can be reestablished. The exact location of trench breakers and use of other erosion control methods would be determined during construction in accordance with the plans listed in sections B.8.0 and B.8.1. Also, in accordance with those plans, erosion controls would be monitored and repaired as necessary throughout construction, as well as during right-of-way restoration until revegetation is determined to be successful.

8.3 Operation and Maintenance

The Amendment Project facilities would be operated and maintained in the same manner as approved for the Certificated Project. Maintenance activities would include regularly scheduled gas leak surveys and measures necessary to repair any potential leaks. All fence posts, signs, markers, and decals would be painted or replaced to ensure visibility from the air or ground. The right-of-way would be patrolled on a routine basis and all valves would be periodically inspected and maintained. The right-of-way would be patrolled by air on a periodic basis to provide information on potential problems that may affect the safety and operation of the pipeline such as possible leaks, exposed pipe, erosion, construction activities, population density, or possible encroachment. Other maintenance functions would include the following:

- periodic seasonal mowing of the permanent easement in accordance with the vegetative maintenance restrictions outlined in our Plan and Procedures;
- terrace repair, backfill replacement; and
- periodic inspection of water crossings.

PennEast would conduct routine vegetation mowing or clearing in accordance with the timing restrictions in our Plan. As stated in PennEast's E&SCP, a 30-foot-wide cleared area in the 50-foot-wide permanent right-of-way, in non-wetland resource areas, would be maintained over the centerline of the

pipeline. In wetland areas, trees and shrubs located within 15 feet of the pipeline that could compromise the integrity of the pipeline would be cut and removed. The mowing or clearing would be conducted no more frequently than once every three years. A permanent 10-foot-wide cleared corridor would be maintained, as needed, in both wetland and upland areas over the center of the pipeline to facilitate corrosion and leak surveys in accordance with our Plan and Procedures. As stated in PennEast's E&SCP, no herbicides or pesticides would be used for clearing or vegetation maintenance within the maintained permanent right-of-way. If required for vegetation maintenance, its use must comply with our regulations in 18 CFR 380.15 which requires authorization by the landowner or land management agency. Cathodic protection systems would be installed at various points along the pipeline to prevent corrosion by applying a low voltage current to offset natural soil and groundwater corrosion potential.

9.0 LAND REQUIREMENTS

PennEast would create a 100-foot-wide construction right-of-way in upland areas and a 75-foot-wide right-of-way in wetlands. For wetlands and waterbody crossings, residential areas, or other areas where specialized construction techniques would be employed, PennEast would require extra workspaces outside the typical construction right-of-way where additional excavation, soil storage requirements, steep slope construction, bedrock, or equipment management and staging would make it impracticable and unsafe to carry out all construction operations within the 100-foot-wide construction corridor. In agricultural areas where full topsoil segregation of 12 inches would be required, PennEast would utilize a 125-foot-wide right-of-way to accommodate excess spoil. Following construction, PennEast would retain a 50-foot-wide permanent easement for operation and maintenance of the pipeline, and all temporary workspace would be returned to pre-existing conditions.

Construction of the Amendment Project would impact a total of about 63.8 acres of land. Following construction, about 42.4 acres would be affected by the 50-foot-wide permanent easement for the pipeline. Of the 42.4 acres, about 23.3 acres would be maintained during operation. Table A.9-1 lists workspace, easement, and right-of-way land requirements for the Amendment Project.

The Amendment Project would impact approximately 48 tracts or parcels (37 landowners). Of these, 35 tracts were previously affected by the Certificated Project. Six landowners affected by the Amendment Project have denied survey access on their properties, all of which are also affected by the Certificated Route. There would be 25 landowners involved in the Appalachian Trail PPL Crossing Realignment across Carbon, Monroe, and Northampton Counties, Pennsylvania. Construction of the Appalachian Trail PPL Crossing Realignment would require the use of six access roads and the Interstate 81 Workspace Adjustment would require a single access road. All access roads are existing roads and no additional impacts outside of minor grading and vegetation trimming are anticipated by PennEast.

Table A.9-1

Summary of the Amendment Project Land Requirements

Facility	Temporary Construction Workspace (acres)[b]	ATWS (acres)	50-foot-wide Permanent Operation Easement (acres)	30-foot-wide Maintained Right-of-Way (acres)
Saylor Ave Realignment				
Pipeline	1.9	0.2	2.6	1.5
Interstate 81 Workspace Adjustment				
Pipeline	1.0	1.8	0.0	0.0
Appalachian Trail PPL Crossing Realignment				
Pipeline	26.6	12.7	29.3	17.8
Blue Mountain Lateral	2.6	0.0	3.0	1.8
Blue Mountain Interconnect[a]	0.0	2.3	4.5	0.0
Freemansburg Ave Realignment				
Pipeline	3.6	11.1	3.0	2.2
TOTAL	**35.7**	**28.1**	**42.4**	**23.3**

[a] Includes impacts associated with the Blue Mountain Side Valve
[b] Does not include impacts associated with operation

10.0 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table A.10-1 lists the federal and major state regulatory agencies that PennEast identified as having permit approval authority or consultation requirements and the status of that review for portions of the Amendment Project. PennEast would be responsible for obtaining all necessary permits, licenses, and approvals required for the Amendment Project, regardless of whether or not they are listed in table A.10-1.

Table A.10-1

Permits, Approvals, and Consultations for the Amendment Project

Agency and Agency Contact	Permit/Approval/Consultation	Actual or Anticipated Submittal	Actual/Anticipated Issuance
FERC	Authorization pursuant to Section 7(c) of the Natural Gas Act	February 1, 2019	Pending
FWS	Section 7 Endangered Species Act Consultation/Clearance	Updated route materials sent 2015-2018	July 29, 2019
COE	Clean Water Act Section 404 Permit, Rivers and Harbors Act Section 10	Amendment submitted December 21, 2018; Comments received July 2, 2019; Response pending	Pending
NPS	Special Use Permit for access road	February 4, 2019	Pending
PGC	License for Right-of-Way for SGL 168	September 17, 2018	December 5, 2018
Pennsylvania State Historic Preservation Office	Section 106 National Historic Preservation Act Consultation, Clearance	Reports submitted 2015 through 2019; Final Report recommendations submitted May 2019	August 15, 2019 the ACHP issued an adverse effect on historic properties finding.

SECTION B – ENVIRONMENTAL ANALYSIS

In the following sections, we address the affected environment, direct and indirect construction and operational impacts, and proposed mitigation to minimize or avoid impacts for each resource.

PennEast, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluated PennEast's proposed mitigation measures to determine whether additional measures would be necessary to reduce impacts. Where we identify the need for additional mitigation, the measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to any authorization that the Commission may issue to PennEast. Conclusions in this EA are based on our analysis of the environmental impact of Amendment Project construction and operation as described in section A of this document, including implementation of the mitigation measures included in PennEast's applications and supplemental filings to FERC.

1.0 GEOLOGY

Published information regarding geological conditions for the Amendment Project was obtained from the U.S. Geological Survey (USGS) the PADCNR, as well as site specific geotechnical reports.

Bedrock geology of the Amendment Project area is dominated by sedimentary rocks with limited amounts of metamorphic and igneous rock. Bedrock beneath the Saylor Ave Realignment and Interstate 81 Workspace consists of gray, fine- to coarse grained sandstone, siltstone, shale, conglomerate, and anthracite coal in repetitive sequences. The Appalachian Trail PPL Crossing Realignment is underlain by a series of gray sandstones and greywackes interbedded with red to purple siltstone and mudstone. The bedrock beneath the Freemansburg Ave Realignment is a dark-gray, thick-bedded dolomite and impure limestone; containing chert stringers and nodules.

The effect to bedrock geology would be minor. The primary effects would be associated with areas of shallow bedrock where rock would need to be removed by ripping, hammering, or blasting during the construction of pipeline facilities, which in most cases would be limited to the pipeline trench and within 8-10 feet of the surface.

PennEast evaluated the potential for blasting within the Amendment Project area and determined that blasting would only be likely along approximately 1 mile of the Appalachian Trail PPL Crossing Realignment. No residences or businesses would be located within 200 feet of areas where blasting may be required. The closest residence to blasting would be 217 feet from the centerline. To minimize impacts on the ANST, PennEast would not blast within 500 feet of the ANST; instead alternative rock removal techniques would be used within 500 feet. Blasting would be performed according to federal and state safety standards and in accordance with PennEast's Blasting Plan prepared for the Certificated Project to be implemented by a certified blasting contractor.

The surficial geology in the recently glaciated portions of the Amendment Project area in the areas of the Saylor Ave Realignment and the Interstate 81 Workspace Adjustment is comprised mainly of glacial till with intermittent associated glacial deposits of stratified drift and deposits. In the area around the Interstate 81 Workspace Adjustment much of the crossing area has been disturbed by historic coal mining and road construction backfill material up to 50 feet thick (Mott-MacDonald, 2018a).

In other areas of the Amendment Project the surficial geology consists of a variety of locally derived deposits from in situ (saprolite), fluvial, and mass-wasting processes. Hillsides in the area of the Appalachian Trail PPL Crossing Realignment typically have a thicker mantle of colluvium deposits towards the base of the

slope with the ridges and slopes having exposed bedrock outcrops. These colluvium deposits are derived from the local bedrock.

The surficial geology of the Freemansburg Ave Realignment is underlain by carbonaceous saprolites of interbedded clay, sands, and gravel approximately 25 feet thick (Mott-MacDonald, 2018b). The USGS also reports Pre-Illinoian lag and outwash deposits in the area.

The overall effect of the Amendment Project on surface geology would be minor. The effects would mostly be limited to construction activities and would include temporary disturbance to surficial deposits within the right-of-way resulting from grading and trenching. PennEast would minimize the impacts on surface geology by returning the native material back into the construction trench and returning contours to preconstruction conditions to the maximum extent practicable immediately after construction. At the aboveground facilities, where grading and filling may be required to create a safe and stable land surface to support the facility and allow for stormwater drainage, this may not be possible. However, these impacts would be minor and would not change overall geologic conditions.

PennEast consulted with paleontological specialists for the counties crossed by the Amendment Project, and no known paleontological sites were identified within 0.5 mile of the Amendment Project. Although significant geological features occur within the East Stroudsburg quadrangle in Monroe County, the geologic features are greater than 10 miles from the Amendment Project. In order to protect any unidentified paleontological resources, PennEast would prepare an Unanticipated Discovery Plan of Paleontological Resources in accordance with Environmental Condition 20 of the Certificate Order for the Certificated Project, including coordination with specified agencies and individuals. This plan would also address any unanticipated discovery encountered during construction of the Amendment Project.

1.1 Mineral Resources

Information regarding mining activities and locations was obtained from the Pennsylvania Department of Environment Protection (PADEP) Office of Active and Abandoned Mine Operations and USGS Mineral Resources Online Spatial Data. Mineral resources in the Amendment Project area include crushed stone, cement, tripoli, lime, and sand and gravel production. Implementation of the proposed modifications would not result in a change to mineral resources previously reported for the Certificated Project.

There are no new active or abandoned mines and quarries within 0.25 mile of the Amendment Project that have not been previously identified under the Certificated Project. Table B.1.1-1 lists active, abandoned, or planned mines and quarries that are crossed or within 0.25 mile from the four proposed modifications, including the distance and direction from the proposed workspace for each modification.

Subsidence associated with underground mining can be either a planned or an unplanned activity. In general, surface subsidence is usually an unplanned event for underground mining operations. Where the available information indicates that mines are likely to exist below the pipeline alignment, PennEast would drill borings for confirmation and to determine the length of the pipeline section that would be affected. PennEast would implement design measures as needed to minimize the risk of subsidence due to underground mines in accordance with USDOT standards as discussed in the Mine Subsidence Mitigation Plan. Measures would include visual checks by operation staff at a frequency of four times per year in areas where historic mining has been documented.

Table B.1.1-1

Abandoned and Reclaimed Mine Features and Quarries within 0.25 Miles of the Amendment Project Area

Modification	Name	Type	Status	Nearest MP [a, b]	Distance from Centerline (ft)	Distance from Workspace (ft)
Saylor Ave Realignment [c]						
	Mine 2165-14	Entry Point/ Opening	Reclamation Complete	8.5R3	1,142	1,114
	Poppel Quarry	Quarry	Active	8.8R3	0	0
Interstate 81 Workspace Adjustment [c]						
	Wilkes Barre Materials Quarry	Quarry	Active	10R2	0	0
Appalachian Trail PPL Crossing Realignment						
None	-	-	-	-	-	-
Freemansburg Ave Realignment						
None	-	-	-	-	-	-

Source: http://www.pasda.psu.edu/ (Abandoned Mine Land Inventory Points) & http://www.state.nj.us/dep/njgs/geodata/dgs03-2.htm
Note: The PASDA data set portrays the approximate location of Abandoned Mine Land Problem Areas containing public health, safety, and public welfare problems created by past coal mining.
Note: Detailed review and investigation of historic mine hazards is presented within the GeoHazard report. 353754-MM-E-E018
[a] Route changes after the FERC Certificate Application under CP15-558, are denoted with an "R". MPs with "R3" indicate route changes after the Certificate Order. MPs without an "R" indicate that the route has not changed since the Certificate Application under CP15-558.
[b] Nearest MP indicates the point along the pipeline nearest to the mine feature rounded to the nearest tenth of a mile.
[c] Amendment Project is located on the Poppel and Wilkes Barre Materials quarry properties, outside of any active mining portions of the properties.

PennEast held meetings and exchanges with the PADEP Bureau of Abandoned Mine Land Reclamation to discuss subsidence issues. In general, the results of these talks indicate the mitigation and remediation measures presented in previous environmental reports and submittals, including as analyzed for the Certificated Project, to reduce the risks associated with underground mines would be adequate for the modifications of the proposed Amendment Project.

There are no mapped locations of oil and gas wells within 0.25 mile of the Amendment Project.

Following construction of the Amendment Project, gas well drilling in the permanent right-of-way would be prohibited. If future gas well development was to be conducted in Luzerne or Carbon Counties, Pennsylvania in the proximity of the pipeline, or if access to these well sites would require crossing the pipeline, PennEast would ensure that proper construction techniques were followed to protect the integrity of the pipeline. Therefore, it is not expected that the Amendment Project would negatively impact future development of gas wells in the area.

1.2 Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically include seismicity (e.g., earthquakes, surface faults, soil liquefaction), landslides, flash flooding, and ground subsidence. Conditions necessary for the development of other geologic hazards, including avalanches and volcanism, are not present in the Amendment Project area. Areas underlain by karst deposits would be extensively evaluated to ensure that the Amendment Project would be constructed using BMPs for work conducted in karst terrain and engineered to account for conditions largely related to ground subsidence.

The Ramapo Fault is part of a system of northeast-striking faults in southern New York and New Jersey that connect to the Border Fault system of eastern Pennsylvania. This regional fault system was active during the early to mid-Mesozoic Era, approximately 200 million years ago. The fault system is a

remnant of an active extensional tectonic boundary (half-graben) that once existed in the area, and now constitutes the western boundary of the Newark Basin. The USGS has extensively studied the Ramapo Fault system and the level of seismicity in the region. The USGS's review of data for evidence of Quaternary Period fault activity (i.e., within the last 1.8 million years) encompassing the eastern United States indicates that there is no clear association between the fault and small earthquakes that occur in the region. However, earthquakes that do occur in the Amendment Project area are largely due to trailing edge tectonics and residual stress released from past orogenic (mountain-building) events.

Seismic risk can be quantified by the motions experienced by the ground surface or structures during a given earthquake, expressed in terms of gravity (g). According to the USGS a peak ground acceleration (PGA) of 10 percent of gravity is generally considered the minimum threshold for damage to older structures or structures not made to resist earthquakes. The PGA for the pipeline route with a 10 percent incidence per 50 years (recurrence interval of 1:475 years) ranges from 3 to 5 percent g. Based on USGS information, seismic hazard is low. Based on the low seismic risk and occurrence assigned to the Amendment Project area, and the lack of recent (Holocene-age) faulting, we find the risk of damage to pipeline facilities by earthquakes to be low. The modifications do not change the seismic hazard evaluation that was previously conducted for the Certificated Project.

Soil liquefaction can result in surface settlement in areas where the ground surface is flat, and soil flow or slope instability in areas where the landscape is sloped. PennEast performed a soil boring program to evaluate liquefaction at twelve random locations along the alignment and determined a low risk for liquefaction. Soil conditions necessary for liquefaction may occur at other locations along the alignment. However, due to the low potential for strong and prolonged ground-shaking associated with a seismic event, we find the potential for soil liquefaction to be low.

Landslides involve the down-slope movement of earth materials under force of gravity due to natural or man-made causes. In Pennsylvania, portions of the Amendment Project would be susceptible to landslides. The Saylor Ave Realignment (MPs 8.5R3-8.9R3), and Interstate 81 Workspace Adjustment (MPs 10.0R2-10.4R2) in Luzerne County and between MPs 48.6R2-53.6R3 in Carbon, Monroe, and Northampton Counties along the Appalachian Trail PPL Crossing Realignment (MP 51.3R3 and MP 52.2R3) have a relatively high susceptibility to landslides with moderate incidence according to the USGS Landslide Potential maps and supplemented with additional desktop and onsite evaluation. The risks and conclusions that were presented for the Certificated Project remain unchanged. Further, Environmental Condition 15 of the Certificate Order would also be applicable to the Amendment Project, which requires PennEast to file a completed Geohazard Risk Evaluation Report and pipeline design geotechnical report, prior to construction for our review and approval. The reports must include a final landslide hazard inventory, mitigation for potential soil stability or landslide hazards, and post-construction monitoring plan.

Subsidence is the local downward movement of surface material with little or no horizontal movement. Subsidence is a potential geologic hazard in areas where karst terrain occurs and where underground mining has taken place.

In karst terrain, karst features, such as sinkholes, caves, and caverns, can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolomite). These features could present a hazard to the pipeline due to cave or sinkhole collapse. Karst features can provide a direct connection to groundwater, allowing the potential for pipeline construction to impact groundwater from increased turbidity due to runoff of sediment into karst features or contaminate groundwater resources by inadvertent spills of fuel or other hazardous materials from construction equipment. Karst areas are also associated with seeps and springs, which could experience temporary changes in flow characteristics from construction of the pipeline. Seeps and springs along steep slopes could likewise contribute to and be the cause of landslides or other earth movements.

The USGS Mineral Resources On-Line Spatial Database was used to report the potential presence or absence of sinkholes in areas crossed by the Amendment Project. The Freemansburg Ave Realignment would be located within the Allentown geological formation and is the only portion of the proposed Amendment Project known to contain any karst features within 0.25 mile.

PennEast has performed a karst investigation in the area of the Freemansburg Ave Realignment which consisted of surface geophysical surveys and geotechnical borings. The conclusions of this study confirmed the presence of karst conditions in the subsurface which would impact the feasibility of successfully completing an HDD. The pinnacled rock head and underground voids in the vicinity of this crossing could lead to challenges in maintaining HDD profile and grade and would elevate the risk of an inadvertent return and HDD failure. As such, PennEast made the decision to change from HDD construction to an open cut construction method. Construction considerations for open trenching through karst areas are covered within the Revised Karst Mitigation Plan, and the Preliminary HDD Drilling Plan for Karst Terrain that was accepted in the Certificated Project.

PennEast continues to update the Karst Mitigation Plan for the Certificated Project to include current information regarding ongoing field surveys, geophysical surveys, and geotechnical borings conducted to support identification and mapping of karst features along the Amendment Project alignment. The Karst Mitigation Plan prepared for the Certificated Project, and the related Environmental Condition 16 of the Certificate Order, requiring a final Karst Mitigation Plan, would apply to the proposed modifications addressed in this EA.

Flash flooding has the potential to occur in streams within the Amendment Project area, particularly in areas of higher relief and narrower stream valleys as happens periodically in Luzerne and Carbon Counties. Flooding can be caused by significant storm events and seasonal variations in precipitation.

Construction of the Amendment Project within 100-year floodplains would not result in the loss of floodplain storage as the pipelines would be installed below the ground surface and would not displace flow waters. No permanent aboveground facilities would be located within 100-year floodplains as reported by PennEast.

Through PennEast's implementation of measures to mitigate impacts in floodplains and at stream crossings outlined in its E&SCP, impacts on the Amendment Project facilities from flash flooding are not expected.

The Interstate 81 Workspace Adjustment resulted from additional geotechnical studies that provided information on the historical mining that has occurred near the proposed drill. For the Amendment Project, PennEast proposes to use a shallower HDD design profile than was approved for the Certificated Project in order to reduce the risk of potentially encountering mining voids. The HDD profile would be at an elevation approximately 30 feet higher than the elevation of the Ross Coal seams and primary mine collapse zone, as characterized in the detailed geotechnical investigations and historic mine records, and with sufficient cover between the HDD profile and ground surface. The primary risk during construction involves loss of drilling fluids within stress induced joints or fractures within the bedrock materials overlying the coal seams. To aid in minimize the drilling fluid pressures necessary to complete the HDD installation, the proposed HDD for the Amendment Project has been designed with the HDD drill rig (drill entry) location on the lower elevation side of the crossing. We have reviewed the HDD profile drawing for this modification and find it acceptable.

Overall, impacts on geologic resources resulting from the installation of the Amendment Project would be minor and not significant. With the implementation of BMPs and our Plan and Procedures,

impacts on geological resources would be adequately minimized during construction and operation of the Amendment Project.

2.0 SOILS

Construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration within Amendment Project workspaces have the potential to cause adverse soil impacts such as erosion, compaction, rutting, and mixing of topsoil and subsoil layers. These impacts could in turn lead to disruption or alteration of natural soil characteristics such as water infiltration and storage, surface and subsurface drainage patterns, and nutrient fertility in a manner that reduces soil productivity and its ability to support a stabilizing vegetative cover. Certain soils have characteristics that contribute to difficult construction conditions or are especially susceptible to adverse impacts. Other construction impacts such as spills of construction equipment fuels, oils and lubricants could result in contamination of soils.

PennEast used the NRCS Soil Survey Geographic Database (SSURGO Database) to compile soils information for the Amendment Project. Specific soil attributes were selected based on the attributes' potential to cause construction limitations or potential hazards. None of the soils occurring within the proposed Amendment Project area indicate that significant construction limitations or hazards are likely to occur.

Soil limitations have been addressed in PennEast's E&SCP, which requires testing of subsoils for compaction prior to topsoil replacement.[10] The E&SCP is currently under review by the PADEP and the Luzerne, Carbon, Monroe, Northampton, and Bucks County Conservation Districts.

We received a comment from the NRCS[11] that parcels of NRCS easement would be crossed by the Amendment Project. PennEast stated in a data response[12] that the modifications described within the Amendment Application would not cross any NRCS parcels.

PennEast's E&SCP is consistent with FERC's Plan and Procedures and 25 PA Code §102 requirements, and in accordance with Environmental Condition 27 of the Certificate Order, PennEast would file a revised E&SCP with the FERC for review and written approval prior to construction. The methods in the E&SCP that would be used to minimize impacts on soils during construction include, but are not limited to:

- minimizing the area and duration of soil exposure;
- installing and maintaining erosion and sediment control devices to reduce the velocity of and control runoff;
- installing and maintaining erosion and sediment control devices to reduce the velocity of and control runoff;
- segregating and stockpiling topsoil on cultivated lands;
- reestablishing vegetation following final grading; and
- inspecting the right-of-way and maintaining erosion and sediment controls, as necessary, until final stabilization is achieved.

[10] Accession number 20190812-5143.
[11] Comment filed April 8, 2019 (accession number 20190408-5078).
[12] Response filed on August 12, 2019 (accession number 20190812-5143).

The acreages of physical and interpretive characteristics of the forty-nine soil map units within the pipeline portions of the modification areas are provided in table B.2-1. The potential impacts and mitigation are discussed below.

2.1 Prime Farmlands

The NRCS defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. Unique farmland is land, other than prime farmland, that is used for production of specific high-value food and fiber crops. Soils that do not meet all of the requirements to be considered prime or unique farmland may be considered farmland of statewide or local importance if soils are capable of producing a high yield of crops when treated or managed according to accepted farming methods.

The Amendment Project would impact approximately 41.5 acres of prime farmlands, the majority of which would be within the same construction workspace associated with the Certificated Project. As required by the Plan and Procedures, PennEast would work with landowners to ensure that proper restoration of impacted agricultural area occurs, including topsoil segregation, stone removal, soil de-compaction and compliance with re-seeding specifications. In addition, PennEast would implement its Agricultural Impact Mitigation Plan (AIMP) to reduce impacts in agricultural areas. PennEast also would work with the landowners to arrange for proper fencing of the work areas, locations for livestock to cross the right-of-way, and if necessary, alternate grazing areas for livestock. PennEast would have EIs and land representatives on site during construction to provide oversight in meeting any special conditions.

Approximately 0.4 acre of farmland of statewide importance would be permanently impacted by the construction and operation of the Blue Mountain Interconnect, located on a forested portion of the Blue Mountain Resort property adjacent to an existing road. It is unlikely that this small area of farmland of statewide importance would be used for agriculture based on the existing and foreseeable future use of the property.

The Amendment Project would not result in any changes to mitigation measures that were approved in the Certificate Order or the analyses and conclusions presented for the Certificated Project.

2.2 Hydric Soils and Compaction Potential

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part, or the rooting zone. Hydric soils are poorly to very poorly drained soils that are saturated or inundated long enough during the growing season to favor the growth of hydrophytic vegetation. These soils are generally associated with wetland areas. Hydric soils that contain a large organic component can be susceptible to both wind and water erosion when disturbed or stored in spoil piles.

Compaction-prone soils include those that have a clay loam or finer USDA texture classification and have a drainage class of somewhat poorly drained to very poorly drained. Soil characteristics that affect soil compaction include soil texture, soil moisture, grain size distribution, and porosity. Soil compaction has a restrictive action on water penetration, root development, and the rate of diffusion of oxygen into soils. Compaction has the effect of reducing yields of most agricultural crops and can inhibit revegetation. If construction activities, particularly the operation of heavy equipment, occur when soils are saturated, soil compaction and rutting could occur. PennEast would minimize rutting, and compaction by paying particular attention to areas identified as having hydric soils that are vulnerable to these types of impacts and to areas that are saturated due to recent rainfall.

Table B.2-1

Acres of Soil Characteristics Affected by the Proposed Amendment Project

Modification	Prime Farmlands [a]	Compaction Potential [b]	Water Erosion Potential [c]	Wind Erosion Potential [d]	Revegetation Potential [e]	Hydric Soils [f]	Poor Drainage Potential [g]
Appalachian Trail PPL Crossing Realignment - PennEast Mainline Pipeline							
Pipeline (includes ATWS)	16.12	1.95	25.61	0.00	43.11	1.24	1.95
Aboveground Facilities	0.00	0.00	0.34	0.00	0.34	0.00	0.00
Access Roads	0.37	0.16	4.28	0.00	5.27	0.16	0.16
Pipeyards	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	5.44	0.00	0.36	0.00	5.80	0.00	0.00
Appalachian Trail PPL Crossing Realignment - Blue Mountain Interconnect							
Pipeline (includes ATWS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aboveground Facilities	0.39	0.00	1.10	0.00	1.49	0.00	0.00
Access Roads	3.05	0.00	0.49	0.00	3.12	0.00	0.00
Pipeyards	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	1.78	0.00	0.00	0.00	1.78	0.00	0.00
Appalachian Trail PPL Crossing Realignment - Blue Mountain Lateral							
Pipeline (includes ATWS)	0.00	0.00	5.59	0.00	5.59	0.00	0.00
Aboveground Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access Roads	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipeyards	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Freemansburg Ave Realignment							
Pipeline (includes ATWS)	13.47	0.00	0.74	0.00	3.08	0.00	0.00
Aboveground Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access Roads	0.03	0.00	0.00	0.00	0.39	0.00	0.00
Pipeyards	0.03	0.00	0.00	0.00	0.02	0.00	0.00
Staging Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interstate 81 Workspace Adjustment							
Pipeline (includes ATWS)	0.34	0.00	0.41	0.00	2.17	0.00	0.00

Table B.2-1

Acres of Soil Characteristics Affected by the Proposed Amendment Project

Modification	Prime Farmlands [a]	Compaction Potential [b]	Water Erosion Potential [c]	Wind Erosion Potential [d]	Revegetation Potential [e]	Hydric Soils [f]	Poor Drainage Potential [g]
Aboveground Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access Roads	0.03	0.00	0.00	0.00	0.10	0.00	0.00
Pipeyards	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saylor Ave Realignment							
Pipeline (includes ATWS)	0.43	0.00	0.54	0.00	4.66	0.00	0.38
Aboveground Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access Roads	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipeyards	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total [h]	41.48	2.10	39.46	0.00	76.94	1.40	2.49

Notes:
[a] Includes acreage of soils designated as Prime Farmland and Farmlands of Statewide Importance.
[b] Includes acreage of soils with High Compaction Potential.
[c] Includes acreage of soils with Severe and Very Severe Water Erosion Potential.
[d] Includes acreage of soils within Wind Erodibility Groups 1 or 2 - High Wind Erosion Potential.
[e] Includes acreage of soils with Poor Revegetation Potential.
[f] Includes acreage of soils with All Hydric (Hydric) Soils.
[g] Includes acreage of soils with Poorly Drained, Somewhat Poorly Drained, and Very Poorly Drained Drainage Potential.
[h] The totals shown on this table may not equal the sum of addends due to rounding.

Approximately 1.4 acres of hydric soils and 2.1 acres of compaction prone soil are within the construction workspace of the proposed Amendment Project. One acre of these soils lay within the 1.0 acre of wetlands that would be disturbed by the Amendment Project. Several wetland soil impacts mitigation measures would be contained within the E&SCP that would reduce impacts to hydric soils. These measures include topsoil segregation in wetlands, using timber mats to minimize rutting and compaction in saturated wetlands, minimizing grading within wetlands, and using low-ground pressure equipment. Compaction of hydric and compaction prone soils existing outside the wetlands would be mitigated by implementing compaction testing and remediation BMPs included in the E&SCP. PennEast would test topsoil and subsoils for compaction at regular intervals in agricultural areas disturbed by construction. Severely compacted agricultural areas would be plowed with a paraplow or other deep tillage implement.

There would be a potential for increased runoff of stormwater as a result of compacted soils. To facilitate stormwater drainage, PennEast would install a system of drainage features to convey stormwater measures that would be implemented to minimize impacts on soils from stormwater runoff include use of silt fence, hay bale dikes, rock check dams, filter bags for dewatering activities, vegetated filter strips, and diffuser devices. The permanent compaction of soils beneath aboveground facilities and access roads would have permanent hydrological impacts on the area, but impacts would be highly localized and minor.

There would be a potential for increased runoff of stormwater as a result of compacted soils. To facilitate stormwater drainage, PennEast would install a system of drainage features, only in upland areas, to convey stormwater measures that would be implemented to minimize impacts on soils from stormwater runoff include use of silt fence, hay bale dikes, rock check dams, filter bags for dewatering activities, vegetated filter strips, and diffuser devices. The permanent compaction of soils beneath aboveground facilities and access roads would have permanent hydrological impacts on the area, but impacts would be highly localized and minor.

In addition, the permanent compaction of soils beneath aboveground facilities and access roads would have permanent hydrological impacts on the area, but impacts would be highly localized and minor. The Amendment Project would not result in any changes to the mitigation measures that were approved in the Certificate Order or the analyses and conclusions presented for the Certificated Project.

2.3 Erosion and Revegetation

Wind erosion is common in regions of low rainfall and is increased by removing or reducing the vegetative cover. Water erosion is the dislocation of soil particles by falling water and their subsequent movement by flowing water. Water erosion is influenced by ground cover and slope gradient.

PennEast would limit the extents and duration of earth disturbance to the extent feasible and practical to construct the Amendment Project. PennEast would employ the use of appropriate erosion control measures, as described in the E&SCP to minimize potential impacts due to water erosion. EIs would inspect construction activities for compliance with the requirements of the E&SCP and would be responsible for identifying, documenting, and overseeing corrective actions. Temporary erosion control measures would be inspected on at least a daily basis in areas of active construction and equipment operation, on a weekly basis in areas of no construction or equipment operation, and within 24 hours of each 0.5-inch rainfall event. Erosion control devices would remain in place until site stabilization is achieved. The proposed Amendment Project would not result in any changes to the previous analyses, conclusions, and mitigation measures for the Certificated Project.

Construction would require the removal of surface vegetation from workspaces. Upon completion of construction, the temporarily disturbed areas would be revegetated. Table B.2.1-1 shows that poor revegetation potential of the soils is a concern in some areas along the modifications.

Restoration of temporarily disturbed areas where soils have poor revegetation potential would be in accordance with BMPs included in the E&SCP. Topsoil segregation in agricultural, residential, and wetland areas would aid in restoration, reducing surface compaction and wetland seed banks. As described in sections B.2.1 and B.2.2 above, PennEast would also mitigate compaction impacts in agricultural areas through testing and tilling or paraplowing. Soils would be amended with fertilizer and pH modifiers, as appropriate, in residential and agricultural areas. The seedbed would be prepared to a depth of three to four inches to provide a firm seedbed. Seed mixes would be applied using an acceptable method as outlined in the E&SCP (seed drill equipped with a culitpacker, broadcast or hydroseeding). Mulch would be applied to the seeded areas in accordance with the E&SCP.

PennEast proposes to use several seed mixes for reseeding areas temporarily disturbed by the Amendment Project. Seed mixes would follow the PADEP's Erosion and Sediment Pollution Control Program Manual, Technical Guidance Number 363-2134-008 (March 2012) unless otherwise requested by the landowner. In consultation with the USACE and PADEP, PennEast proposes to use wetland and riparian conservation seed mixes in wetland and riparian areas. Tree and shrub plantings are also proposed in forested and shrub wetlands and in forested riparian areas along streams. The PGC requested specific seed mixes for restoration of Pennsylvania State Game Land (SGL) 168, which would be crossed by the Appalachian Trail PPL Crossing Realignment. PennEast has included the PGC-recommended seed mixes, shrub, and tree plantings, and monitoring in a site-specific restoration plan for SGL 168. The PGC approved the plan in February 2018 and included implementation of the approved plan as a condition of the license agreement.

PennEast would monitor the success of restoration upon completion of construction and restoration activities for a minimum of two years as required by FERC's Plan and Procedures. Restoration in upland areas would be considered successful once a uniform vegetation cover of 70 percent is achieved. PennEast would also implement a Post-Construction Wetland and Watercourse Monitoring Plan to monitor revegetation progress at wetland and waterbody crossings for two years following construction. Annual reports would be submitted to the USACE and PADEP. PennEast would also adhere to its Compensatory Wetland Mitigation Plan (Pennsylvania) for impacts on wetland resources. Within 3 years after construction, PennEast would submit a post-construction wetland monitoring report to the FERC. If any areas fail to meet the success criteria, PennEast would submit a remedial revegetation plan for agency review. Monitoring and reporting would continue until revegetation is successful.

The proposed Amendment Project would not result in any changes to mitigation measures that were approved in PennEast's Certificate Order or the previous analyses and conclusions presented for the Certificated Project.

2.4 Soil Contamination

Soil contamination in the area of the Amendment Project could result from at least two sources: new spills of hazardous material or fuel during construction, and/or those occurring before construction in pre-existing contaminated areas that are encountered during construction. Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of such contamination are typically minor because of the low frequency and volumes of spills and leaks. PennEast has developed an SPCC Plan that specifies cleanup procedures to minimize the potential for soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents that we have reviewed and find acceptable. PennEast and its contractors would use the SPCC Plan to minimize accidental spills of materials that could contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained, cleaned up, and disposed of as quickly as possible and in an appropriate manner.

In the event that contamination is encountered during construction, PennEast would implement the protocols in its Unanticipated Discovery of Contamination Plan prepared for the Certificated Project. If contaminated soils are encountered during construction, all personnel would stop work, leave the contaminated area, and notify the chief inspector on-site. Additional notifications would then be made, including outside agencies if required. PennEast would transport excavated soil to designated soil staging areas, characterize the soils for waste disposal, and ensure that all soils are managed in accordance with state and federal regulations. We have reviewed the Unanticipated Discovery of Contamination Plan and find it acceptable, with the exception of the identification of responsible personnel. Environmental Condition 24 of the Certificate Order would address this concern and would also apply to the proposed modifications addressed in this EA.

The Amendment Project would not result in changes to the mitigation measures approved in the Certificate Order or previous analyses and conclusions presented for the Certificated Project.

2.5 Winter Construction

PennEast stated that if construction were to occur in the winter, a Winter Construction Plan would be provided. As required by the FERC Plan, the Winter Construction Plan would include winter construction procedures (e.g., snow handling and removal, access road construction and maintenance, soil handling under saturated or frozen conditions, topsoil stripping); stabilization and monitoring procedures if ground conditions will delay restoration until the following spring (e.g., mulching and erosion controls, inspection and reporting, stormwater control during spring thaw conditions); and final restoration procedures (e.g., subsidence and compaction repair, topsoil replacement, seeding).

3.0 WATER RESOURCES AND WETLANDS

3.1 Groundwater

Groundwater is surface water that seeps down to collect or flow beneath the Earth's surface, filling the porous spaces in soil, sediment, and rock and becoming the source for aquifers, wells, and springs. Groundwater is a significant source of drinking water in selected areas of Pennsylvania – 56 percent of the public and private domestic water use comes from groundwater sources. Groundwater is withdrawn for domestic use as well as mining, industrial, and agricultural purposes (PADCNR 2015c). Groundwater flow generally reflects surface topography. Although depth to groundwater is variable along the Amendment Project, groundwater is often found near the ground surface, and the Amendment Project may encounter groundwater during construction activities in areas close to surface waterbodies or wetlands. PennEast conducted a boring program to identify areas of potential liquefaction due to earthquakes and found, in general, that the water table is reached at ten-to-twenty feet below the ground surface.

Bedrock aquifers, principal aquifers, surficial aquifers, sole-source aquifers, wellhead and aquifer protection areas, wells, seeps, springs, and contaminated groundwater that occur within the Amendment Project area are presented below.

3.1.1 Bedrock Aquifers

Bedrock aquifers are composed of unbroken solid rock such as limestone, dolomite, sandstone, siltstone, shale, or crystalline rock. Bedrock aquifers, as well as unconsolidated alluvium and glacial sand and gravel aquifers, are found in the overall Amendment Project area. These bedrock aquifers include 40 geologic formations and occur within three of the physiographic provinces in Pennsylvania – the Appalachian Plateaus Province, the Ridge and Valley Province, and the New England Province (PADCNR 2000). The Appalachian Plateaus Province consists of bedrock of various types, mainly sandstones and siltstones (PADCNR 2000). The Ridge and Valley Province consists primarily of sandstone, siltstone,

shale and carbonate rocks (PADCNR 2000). The New England Province is made up of largely granitic gneiss, granodiorite, and quartzite. These rocks are very resistant to weathering and remain highly stable and not prone to erosion.

3.1.2 Principal Aquifers

Principal aquifers are regional aquifers with potential to be used as a source of potable water. The four modifications cross four principal aquifers, as defined by the USGS (2003), focused on bedrock type. These include the Valley and Ridge Aquifers, New York and New England Aquifers, Valley and Ridge carbonate rock aquifers, and Piedmont and Blue Ridge carbonate-rock aquifers (Trapp and Horn 1997).

3.1.3 Surficial Aquifers

Surficial aquifers occur at or near the land surface and occur in the unconsolidated overburden above the bedrock. These types of aquifers can interact with surface waters by either discharging or recharging water to the surface water depending on the hydraulic to the gradient. The Amendment Project would cross two major types of surficial aquifers – those that are the result of till and glacial lake deposits, and those that are sand and gravel aquifers at or near the land surface and alluvium deposits along streams and rivers. Existing data on the presence of surficial aquifers is not available for all portions of the Amendment Project.

3.1.4 Sole Source Aquifers

Sole source aquifers (SSA) are designated by the EPA and defined as aquifers that supply at least 50 percent of the drinking water consumed by the communities overlying the aquifer. These areas are designated as critical resources, as the communities that use them have no alternative drinking water source(s) which could physically, legally, and economically supply potable water to those who depend upon the aquifer. Federally funded projects within SSAs are subject to review by the EPA under the *Safe Drinking Water Act* (EPA 2015). Based on a review of the EPA-designated SSA mapping, the Amendment Project does not cross any SSAs (EPA 2018).

3.1.5 Wellhead and Aquifer Protection Areas

A Wellhead Protection Area (WHPA) is defined by the EPA as the surface and subsurface area surrounding a well or wellfield supplying a public water system, through which contaminants are reasonably likely to move toward and reach a drinking water well or wellfield. WHPAs are delineated by zones based on distance from the wellhead in Pennsylvania (Pennsylvania Code 1994). The identification of WHPAs allows potential pollution sources to be managed in relation to their location within the WHPA. Within Pennsylvania, WHPA data is not publicly available. However, based on a review of PADCNR data, no known WHPAs are located within 5 miles of the Amendment Project (PADCNR 2015d).

3.1.6 Wells, Springs, and Seeps

Through publicly available datasets, discussions with landowners, civil surveys, and consultations with public water suppliers, PennEast continues to identify the locations of water wells and springs within 150 feet (500 feet in areas characterized by karst terrain) of any construction workspace for the Amendment Project. As of March 2019, PennEast had identified six wells within 150 feet (500 feet in karst areas) of the proposed Amendment Project – one well identified for the Saylor Ave Realignment, and five wells identified for the Appalachian Trail PPL Crossing Realignment. PennEast continues to identify well locations, and this outstanding information is addressed by Environmental Condition 21 of the Certificate Order that would also apply to the Amendment Project.

PennEast has prepared a draft Well Monitoring Plan to outline the specific monitoring and mitigation measures that would be implemented to protect any identified groundwater sources, should

public or private water supply wells or springs be found during field investigations. This plan details special protocols required for karst-prone terrain, well and spring yield testing procedures, water quality testing procedures, and impacted well and spring procedures. PennEast will perform monitoring for well yield and water quality before and after construction. We find PennEast's draft Well Monitoring Plan acceptable; and submittal of a final Well Monitoring Plan is required by Environmental Condition 23 of the Certificate Order that would also apply to the Amendment Project.

If a groundwater seep would be affected by construction, PennEast would document the hydrologic characteristics of the seep prior to installation of the pipeline, including identification of the source or cause of the seep. If possible, the seep would be temporarily redirected around the construction area. Restoration of the seep would include restoration of the pre-construction topography, and a determination whether a perching layer would need to be restored. During future field surveys completed by PennEast, additional seep and spring locations would be recorded and documented as they are encountered.

3.1.7 Contaminated Groundwater

Based on a search of the PADEP's Land Recycling Cleanup Locations program (PADEP 2015) and by commissioning a review of public data by Environmental Data Resources, Inc. (EDR) (EDR 2015), PennEast did not identify any areas of potential groundwater contamination within the Amendment Project area. Additionally, based on the geology and hydrogeology in these areas, it is expected that the pipeline would be located above the water table and, therefore, not encounter potential groundwater contamination. All known areas of contaminated drinking water are located at a distance greater than 0.25 mile from the Amendment Project. If contaminated soils are found during construction, PennEast would implement its Unanticipated Discovery of Contamination Plan developed in accordance with applicable federal and state regulations that outlines measures PennEast would follow to mitigate the affected area. PennEast would prohibit the refueling or storage of hazardous materials from occurring within a 200-foot radius of private wells, and 400-foot radius of community and municipal wells.

3.1.8 General Impacts and Mitigation for Groundwater Resources

The proposed Amendment Project would not significantly impact groundwater quality or quantity during construction or operation. In most cases, the Amendment Project installation would involve the excavation of a trench between about 7 and 10 feet deep to allow burial of the pipeline with 3-to-4 feet of cover. This depth is confined to surficial aquifers near the ground surface and would not significantly impact deeper bedrock aquifers crossed by the Amendment Project. It is also not expected to significantly affect groundwater discharge or recharge patterns in the deeper aquifers being recharged by precipitation in these areas. Minor temporary impacts on groundwater may include changes in percolation rates from clearing of vegetation, dewatering of the trench and bore pits, soil mixing and compaction prior to restoration, and blasting. Clearing vegetation from within the construction right-of-way would remove this natural filter layer, and localized runoff may be enhanced in the disturbed areas of the right-of-way during construction activities. The reduction in infiltration rates along the right-of-way and increase in surface runoff during storm events could result in increases in localized soil erosion and sedimentation. PennEast would implement its E&SCP and our Plan and Procedures to minimize erosion potential of soils in the right-of-way, minimize the mobilization of soils on steep slopes via storm water runoff, and minimize sedimentation in waterbodies crossed by the right-of-way.

The shallow depths of overburden disturbance for pipeline burial would be above the groundwater table in most of the aquifers identified and would not impact groundwater discharge or recharge patterns in the deeper aquifers being recharged by precipitation in these areas. Therefore, no effect on recharge of any SSA would be expected to occur. PennEast would implement its SPCC Plan to prevent or respond to any spill or releases of oil or fuel during construction. In the event of a natural gas leak, the gas would discharge to the atmosphere and not directly impact underlying groundwater.

Trenching activity for pipeline installation would result in disturbance and redistribution of surface soils and shallow subsurface soils. This disturbance, however, would be temporary and limited to the construction right-of-way and workspace. The accumulation of water in low lying areas of the open trench, which may require dewatering of the trench, could also affect immediate surficial groundwater flow patterns. Any impacts from water accumulation in the open trench and trench dewatering, including changes in the volume or rate of groundwater infiltration across the trench area, would be short-term and limited to the period of construction. PennEast would use special dewatering methods as appropriate and would install trench breakers, where appropriate, to control water flow along the trenchline. Use of seed and mulch material would be used to stabilize soils post-construction, and implementation of the E&SCP would allow for establishment of a vegetative groundcover and percolation of precipitation into the shallow groundwater.

In areas where blasting or rock hammering may be needed to excavate the trench to proper depth, fracturing of the bedrock may result in shallow groundwater infiltration. Blast charges would be limited to that needed to fracture rock to the required trench depth; therefore, fracturing of bedrock would be limited to within several feet of the pipeline trench. All blasting would be performed in a manner consistent with the guidance in PennEast's Blasting Plan.

As discussed in section B.1, PennEast has performed an investigation in the Amendment Project area consisting of geophysical surveys and boreholes – the conclusions of this study confirmed the presence of karst conditions. PennEast's Revised Karst Mitigation Plan increased evaluation range from 150 feet to 500 feet for wells and springs within areas of karst terrain. PennEast's Well Monitoring Plan includes separate sections for karst terrain well and spring monitoring. The Revised Karst Mitigation Plan also includes a discussion on the use of BMPs in karst terrain during construction for the protection of groundwater resources.

3.1.9 Conclusion

No long-term or significant impacts on groundwater are anticipated from construction and operation of the Amendment Project, because disturbances would be temporary, erosion controls would be implemented, natural ground contours would be restored, and the right-of-way would be revegetated. Implementation of PennEast's E&SCP, as well as our recommendations, would limit impacts on groundwater resources.

3.2 Surface Water

Surface water resources in the Amendment Project area include rivers, streams, associated tributaries, lakes, ponds, and stormwater catchment basins. Surface water resources crossed by the Amendment Project were identified through field surveys and information from the National Hydrography Dataset (NHD), PADCNR, NRCS county soils surveys, watershed data from the USGS, and aerial photography. PennEast has refined the Amendment Project workspaces to avoid and minimize impacts to waterbodies, associated floodways, and riparian areas, where practicable. The pipeline would be located within two major rivers basins and would cross three watersheds – these are summarized in table B.3.2-1.

Table B.3.2-1

Summary of Major River Basins and Watersheds Crossed by the Amendment Project

Facility	Major River Basin	Watershed
Saylor Ave Realignment	Upper Susquehanna River	Upper Susquehanna River
Interstate 81 Workspace Adjustment	Upper Susquehanna River	Upper Susquehanna River
Appalachian Trail PPL Crossing Realignment	Upper Delaware River	Aquashicola Creek Lower Lehigh River
Freemansburg Ave Realignment	Upper Delaware River	Lower Lehigh River

3.2.1 Existing Surface Water Resources

The hydrologic regimes for surface waters crossed by the Amendment Project are classified into one of three categories: perennial, intermittent, and ephemeral. Waterbodies crossed by the Amendment Project are listed in table B.3.2-2. For the 20 surface water resource crossings identified (one resource would be crossed twice), 40 percent of the crossings are classified as perennial; with 45 percent classified as intermittent, and 15 percent classified as ephemeral.

Table B.3.2-2

Summary of Waterbodies Crossed by the Amendment Project

Facility	Perennial Waterbody Crossing	Intermittent Waterbody Crossing	Ephemeral Waterbody Crossing [a]	Total
Saylor Ave Realignment	0	0	0	0
Interstate 81 Workspace Adjustment	0	1	0	1
Appalachian Trail PPL Crossing Realignment	8	8	1	17
Freemansburg Ave Realignment	0	0	2	2
Amendment Project Total	**8**	**9**	**3**	**20**

Notes:
[a] Ditches are included as ephemeral waterbody crossings.

A list of waterbodies crossed by the Amendment Project are identified in table C-1 in appendix C. Information is based on field surveys completed and data collected by PennEast.

The Amendment Project would cross a total of approximately 138 feet within waterbodies. The FERC Procedures define waterbody crossings by size (width) as minor, intermediate, or major.[13] Eighteen (90 percent) of the proposed waterbody crossings would be classified as minor, and 2 (10 percent) would be classified as intermediate. There would be no major waterbodies crossed by the Amendment Project. Potentially sensitive waterbodies are described below.

The Amendment Project would not cross any reach of waters listed in the NRI database (NPS 2015) or any water course reach included in the National Wild and Scenic River System. Based on publicly

[13] FERC classifies waterbodies as any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes: "minor waterbody" (Minor) includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing; "intermediate waterbody" (Intermediate) includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and "major waterbody" (Major) includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing. PennEast determined FERC Classifications for NHD waterbodies by measuring the distance of the waterbody at the crossing point using aerial photographs. If the stream was not visible on the aerial photograph the stream was designated as minor, with a crossing distance of "<10" feet. Classification may change based on conditions at time of construction.

available GIS data (PADCNR 2015d), PennEast did not identify any groundwater or surface waters upstream of potable water intakes.

3.2.1.1 State-Designated High-Quality and Exceptional Value Waters

PennEast has conducted surveys of the Amendment Project area and interpreted crossing data from existing databases maintained by the Pennsylvania Fish and Boat Commission (PFBC) in order to determine the list of waterbodies that would be crossed, the details regarding the potential crossing, and information regarding the aquatic habitats and aquatic biological resources that could potentially occur in the Amendment Project area. USGS 7.5-minute series topographic maps were also used to identify waterbody names, tributaries, and general flow regimes.

The Amendment Project would cross multiple waterbodies that fall under various state classifications in Pennsylvania. Aquatic habitats are classified based on Pennsylvania surface water quality regulations. These water quality regulations have established systems for classifying waterbodies with the intent of protecting and maintaining their ecological communities. Table B.3.2-3 summarizes Pennsylvania Fisheries Resource Classifications.

The PFBC and PADEP classifies fisheries as warm-water fisheries (WWF), CWF, MF, and trout stocked fisheries (TSF) (Pennsylvania Code Title 25, Chapter 93) (Pennsylvania 2015). Within these classifications, waterbodies are also designated as an exceptional value (EV) or HQ resource waters. The PFBC also defines waterbodies based on their ability to support the propagation of wild or stocked trout.

HQ or EV waters are designated as having high quality aquatic habitats and water resources that support ecologically unique or recreational important fisheries. In order for a surface water to be classified as HQ, the waterbody must meet water quality or biological parameters outlined in Pennsylvania Code Title 25 Chapter 93b. In order to qualify as an EV waterbody, the surface water must meet the criteria for a HQ waterbody and at least one of the following:

- is located in a national wildlife refuge or a state game propagation and protection area;
- is located in a designated state park natural area or state forest natural area, national natural landmark, federal or state wild river, federal wilderness area, or national recreation area;
- is a surface water of exceptional recreational significance;
- is a surface water of exceptional ecological significance;
- is a surface water scoring at least 92 percent in the appropriate biological assessments; or
- is designated as a wilderness trout stream.

HQ or EV waters include CWF that support or maintain naturally reproducing trout populations or provide suitable habitat to support trout species. In Pennsylvania, trout water classifications include approved trout waters (ATW) that are stocked with trout, stream sections that support natural reproduction of trout, and wilderness trout streams (WTW). Class A wild trout streams and stream sections that support natural reproduction of trout are defined as streams that support a population of naturally produced trout of sufficient size and abundance to support a long-term fishery. Table C-1 in appendix C provides PFBC fishery classifications for individual waterbody crossings in Pennsylvania by MP as well as the proposed crossing method. HQ waters and waters with trout classifications that would be crossed by the Amendment Project are summarized in table B.3.2-4.

Table B.3.2-3

Summary of Pennsylvania Fisheries Resource Classifications

Designation [a]	Designating Agency	Description
Cold-Water Fisheries (CWF)	PADEP	Includes the maintenance and/or propagation of fish species, including the family *Salmonidae,* and additional flora and fauna that are indigenous to a cold-water habitat.
Migratory Fisheries (MF)	PADEP	Includes the passage, maintenance, and propagation of anadromous and catadromous fishes and other fishes that move to or from flowing waters to complete their life cycle in other waters.
Trout-Stocked Fisheries (TSF)	PADEP	The maintenance of stocked trout from February 15 to July 31, and maintenance and propagation of fish species and additional flora and fauna that are indigenous to a warm water habitat.
High Quality (HQ)	PADEP	A surface water that meets one or more of the conditions for: (1) Chemistry - The water has long-term water quality, based on at least 1 year of data which exceeds levels necessary to support the propagation of fish, shellfish and wildlife and recreation in and on the water and/or (2) Biology - The surface water supports a high quality aquatic community based upon information gathered using peer-reviewed biological assessment procedures that consider physical habitat, benthic macroinvertebrates or fishes based on Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish, The surface water is compared to a reference stream or watershed, and an integrated benthic macroinvertebrate score of at least 83% shall be attained by the referenced stream or watershed. - The surface water supports a high-quality aquatic community based upon information gathered using other widely accepted and published peer-reviewed biological assessment procedures that the Department may approve to determine the condition of the aquatic community of a surface water. Or - The surface water has been designated a Class A wild trout stream by PFBC.
Wild Trout Waters (WTW)	PFBC	Streams where trout have resulted from natural reproduction and the habitat supports wild trout. Specifically excludes trout stocked as fingerlings or adults and trout that escape from a hatchery. Tributaries to wild trout streams are classified as wild trout streams for their function as habitat for segments of wild trout populations, including nurseries and refuges, and in sustaining water quality necessary for wild trout.

Notes:
[a] Designations and descriptions based on current legal code. Other agency-specific classifications may apply to waterbodies crossed by the Amendment Project.
Source: PADEP Streams Chapter 93 Existing Use, dated 7/2017 and PADEP Streams Chapter 93 Designated Use, dated 2/2017; PFBC Stream Sections that Support Wild Trout Production, dated 8/2018 and PFBC Class A Wild Trout Streams, dated 8/2018; PASDA Stocked Trout Waters (Flowing Waters), dated 2/2018 and PASDA Trout Stocked Streams, dated 2018

Table B.3.2-4

Summary of Pennsylvania-Classified Designated Waterbodies Crossed by the Amendment Project

Facility	Pennsylvania Code Designation [a]	PFBC Fishery Designations [b]		
	HQ/EV	ATW	WTW	WWCW
Saylor Ave Realignment	0	0	0	0
Interstate 81 Workspace Adjustment	0	0	1	1
Appalachian Trail PPL Crossing Realignment	11	3	17	17
Freemansburg Ave Realignment	0	0	0	2

Notes:
[a] An individual stream crossing could have more than one designation. Pennsylvania-classified designated waterbodies include High Quality and Exceptional Value Waters, and Waters with Trout Designations.
[b] Wild Trout Waters, Natural Reproduction, January 2015 (PFBC 2015a), Wild Trout Waters (PFBC 2015b), Class A Waters, December 2013 (PFBC 2015c).
Wild Trout Waters include:
–Class A Wild Trout Streams: Streams that support a population of naturally produced trout of sufficient size and abundance to support a long-term and rewarding sport fishery.
–Wilderness Trout Streams: Wilderness trout stream management is based upon the provision of a wild trout fishing experience in a remote, natural, and unspoiled environment where man's disruptive activities are minimized.
–Wild Trout Streams: Stream sections supporting naturally reproducing populations of trout. A wild trout stream section is a biological designation that does not determine how it is managed; therefore, these streams may also be stocked with hatchery trout by the PFBC.
Key:
ATW = Approved Trout Waters (stocked with trout); EV = Exceptional Value; HQ = High Quality; PFBC = Pennsylvania Fish and Boat Commission; WTW = Wild Trout Waters/Streams; WWCW = Warm-Water/Cool-Water Fisheries
Source: PA Code, 2015; PFBC, 2015a-f; NHD, 2015.
Data is based on field delineated waterbodies and mapped waterbodies from NHD mapped features.

We believe that construction following the measures included in our Procedures would adequately minimize impacts on Pennsylvania state-designated waters, including HQ streams. However, in response to comments, PennEast identified several special construction procedures that would be implemented to minimize impacts on state-designated waters including dry-crossing with reduced workspace, trenchless, and trenchless with a travel lane for construction equipment crossing of the waterbody. In general, PennEast would minimize impacts on state-designated waterbodies and associated riparian zones by locating temporary workspace in actively disturbed areas. Where the riparian zone could not be avoided entirely, PennEast would reduce the workspace to 75 feet in width and relocated ATWS to upslope or into actively disturbed areas, to the extent practicable. For dry-crossings, the workspace through the waterbody would be reduced to 60 feet in width and the workspace outside the waterbody would have a total width of 75 feet on both sides of the waterbody until actively disturbed areas are encountered.

3.2.1.2 Impaired Surface Waters and Waterbodies with Contaminated Sediments

Section 303(d) of the federal CWA mandates that states must prepare a list of all waters that do not meet the water quality criteria for their designated uses. These include the identification of the specific pollutant or water quality impairment (i.e., biological, chemical, or physical) not being attained and for develop a Total Maximum Daily Load (TMDL) for each criterion. A TMDL establishes the maximum allowable discharge into a waterbody to better control the identified pollutants. The summary of the integrated reports prepared for Pennsylvania and associated fish consumption advisories were searched, and no impaired surface waters or waterbodies with contaminated sediments would be crossed by the Amendment Project.[14]

[14] This is the search of the list provided under Section 303 of the CWA. A waterbody can be listed for a variety of pollutants and that would then be identified and a TMDL established. This search is not for particular pollutants but actually streams that have been identified.

3.2.1.3 Flood Hazard Zones

FEMA identifies an area subject to flooding and high-volume flows, located within the 100-year floodplain, as a Special Flood Hazard Area (SFHA). The Saylor Ave Realignment and Interstate 81 Workspace Adjustment would not cross any SFHAs. The Appalachian Trail PPL Crossing Realignment would cross 0.1 mile of SFHA. In addition, the Blue Mountain Interconnect access road is an existing access road that crosses a FEMA SFHA; however, PennEast does not propose any road improvements within the flood zone. The Freemansburg Ave Realignment would cross 0.01 mile of SFHA. No aboveground facilities would be located within a FEMA SFHA. No tidally influenced waterbodies are located within the Amendment Project area.

3.2.2 Waterbody Construction Procedures

PennEast proposed to cross waterbodies using a variety of special construction methods. The proposed method for each waterbody is shown in table C-1 in appendix C. Additional construction details regarding dry-crossing methods, the HDD method, hydrostatic test water withdrawal and discharge, blasting, floodplain crossings, hazardous material spill protocols, and extra workspace within 50 feet of waterbodies are provided below.

3.2.2.1 Dry-Crossing Methods

Dry-crossing methods (flume or dam-and-pump) that divert water flow during pipe installation would be used at specific small waterbodies with perceptible flow. A flume crossing directs the flow of water through one or more flume pipes placed over the area to be excavated. After the flume pipes are placed in the stream, sand or pea gravel bags would be placed upstream and downstream of the crossing location. The bags would serve to temporarily dam the stream and divert stream flow through the flume pipes. Trenching then occurs with backhoes located on both banks that excavate under the flume pipes without reducing downstream water flow. Concrete coating or set-on weights would be utilized, as necessary, to keep the pipeline from floating to the surface. After pipe installation, backfill of the trench, and restoration of the stream banks, the flume pipes would be removed.

The dam-and-pump method involves installing temporary dams upstream and downstream of the waterbody with sand or pea gravel bags. Following dam installation, PennEast would use appropriately sized pumps with hoses to transport the stream flow around the construction work area and trench. The area between the dams would be dewatered prior to trenching. Energy dissipating devices, such as steel plates, would be installed at the pump discharge point to minimize erosion and streambed scour. Trench excavation and pipe installation would then commence through the dewatered portion of the waterbody. After pipeline installation, backfill of the trench, and restoration of the stream banks, the temporary dams would be removed, and flow across the construction work area would be restored.

Stockpiling and segregation of soils would be done using methods consistent with PennEast's E&SCP to allow for reuse of the material for burial of the pipeline and stabilization of the streambed.

3.2.2.2 Horizontal Directional Drilling

Factors in HDD design include the availability of a straight and relatively low relief laydown area for the pullback pipe section, the availability of large work areas at the HDD entry and exit points, surrounding terrain, land use, and operation concerns. Based on information from PennEast, our review of Amendment Project mapping, and information we obtained during visits to the Amendment Project area, we conclude for the Saylor Ave Realignment, Interstate 81 Workspace Adjustment, and Appalachian Trail PPL Crossing Realignment that the use of the HDD method for the waterbodies crossed by the Amendment Project would be either technically infeasible, impractical, or would not result in a clear environmental advantage to the proposed dry-crossing methods. For the Freemansburg Ave Realignment, based on a

landowner request to avoid potential future development, adjustments to the previously proposed Lehigh River HDD crossing require a slight shift in the Lehigh River HDD entry and exit points and decrease the depth of the drilled crossing but would not affect the alignment of the Lehigh River HDD crossing. Except for this previously proposed Lehigh River HDD crossing, PennEast does not intend to utilize the HDD method for any of the waterbodies crossed by the proposed Amendment Project.

3.2.2.3 Conventional Bore

The conventional bore method is similar to HDD in that the pipeline is installed beneath a feature without surface disturbance to the feature during crossing. The bore method differs in that the path of the pipeline across the feature is straight rather than curved. Bores are frequently used at paved road and railroad crossings and are not a common crossing method for waterbodies primarily because of the difficulty in managing groundwater during the installation. Boring requires excavation of pits on each side of the feature. During a standard boring operation, spoil from the bore would be carried into the pit as the crossing is being completed and then removed by track hoes to provide room for the pipe to be welded and eventually pulled through the borehole. The operator for the boring machine, welders, and several laborers would work in the bore pit. Trench boxes or sheet piling may be used to support the pit walls and help control groundwater inflows.

3.2.2.4 Hydrostatic Test Water

Hydrostatic testing would be completed on all pipeline segments prior to placing the pipeline into service. Water from surface water sources or municipal sources would be used to conduct the hydrostatic testing. Withdrawal and discharge of hydrostatic test waters would be regulated through state-issued and DRBC water withdrawal permits, as required; as well as NPDES discharge permits, as administered by Pennsylvania and the DRBC, as applicable. Discharges of hydrostatic test water would also be regulated by state NPDES permit, and the classification of the receiving waters (as applicable) would be identified as part of the permitting process. In February 2016, PennEast submitted a permit application for a Water Withdrawal and Discharge Permit to the DRBC. PennEast has provided supplemental information and has coordinated with the DRBC since the application was submitted. PennEast will also obtain NPDES discharge general permits from the PADEP to discharge hydrostatic test water at approved locations. Depending on the quality of the hydrostatic test water, alternative water management methods may be required and utilized.

Based on Amendment Project design, three previously sited discharge locations included in PennEast's February 2016 DRBC application would no longer be utilized at MPs 51.3R2, 53.8, or 54.1, as they are within the limits of disturbance for the Certificated Route. PennEast would mitigate these discharge locations through the use of water storage tanks – hauling the water offsite to an approved disposal facility in lieu of open discharging into dewatering structures. Since no withdrawal locations were affected – only discharge locations – the volumes accounted for in the withdrawal permit have not changed.

As previously stated, water from surface water sources or municipal sources would be used to conduct the hydrostatic testing. No chemicals (i.e., biocide or corrosion inhibiting agents) would be added to hydrostatic test waters to be discharged. PennEast would adhere to all permits to ensure that the hydrostatic test water contains no chemicals. To minimize the entrainment of organisms from surface waterbodies during water withdrawal, mesh screened intake hoses would be used. Adequate flow rates downstream from the withdrawal would be maintained to protect aquatic life, provide for waterbody designated uses, and provide for downstream withdrawals of water by existing users. During exceptional dry periods when low flow conditions may be encountered, the volume to be withdrawn would be assessed relative to the hydrological needs of the waterbody to determine if an alternative water source (i.e., municipal supply) should be used. State-designated EV or C-1 waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies would

not be used as hydrostatic test water withdrawal sources, unless the appropriate federal, state, and/or local permitting agencies have granted written permission. Hydrostatic test manifolds on discharges would be used to dissipate energy flow in aquatic waterbodies to minimize scouring in the receiving waterbody. Water would be prevented from discharging into state-designated EV waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless otherwise approved by federal, state, and/or local permitting entities.

PennEast has not yet finalized its hydrostatic test water sources, withdrawal and discharge volumes, and MP locations for withdrawal and discharge sites. This outstanding information is addressed by Environmental Condition 28 of the Certificate Order that would also apply to the Amendment Project.

3.2.2.5 Blasting

The potential for blasting was evaluated for the Amendment Project, and it was determined that blasting may be necessary along approximately 1.0 mile of the Appalachian Trail PPL Crossing Realignment, between MP 51.1R3 and MP 52.1R3. PennEast would not blast within 500 feet of the ANST, and one of the following alternative rock removal techniques would be used within 500 feet of the ANST:

- conventional excavation with a backhoe;
- ripping with a bulldozer, followed by excavation with a backhoe; and
- pneumatic hammering, followed by excavation with a backhoe.

If blasting in waterbodies would be required, there is a potential for permanent alterations of stream channels. PennEast proposes to develop site-specific blasting plans for each waterbody crossing where blasting would be necessary. All blasting would be performed according to federal and state safety standards and in accordance with PennEast's Blasting Plan to be implemented by a certified blasting contractor. PennEast would obtain blasting permits from appropriate agencies and would conduct any required in-stream work during the appropriate timing window for WWF and CWF.

The EPA requested that site-specific blasting plans for waterbody crossings be provided and made available to the public. However, PennEast would not be able to determine whether blasting is required until additional geophysical and geotechnical evaluations are completed, and construction commences. PennEast stated in the application that it would develop site-specific blasting plans for each waterbody crossing where blasting is determined to be necessary, and this information would be filed in the public record.

3.2.2.6 Hazardous Materials Spills

During construction, refueling and maintenance operations of heavy equipment would require the use of fuel, lubricants, coolant, welding materials, and hydraulic fluids. Accidental spills and leaks of hazardous materials associated with equipment trailers, the refueling or maintenance of vehicles, and the storage of fuel, oil, and other fluids can have immediate effects on aquatic resources and could contaminate waterbodies downstream of the release point. PennEast would implement its SPCC Plan to ensure that spill prevention and response protocols are followed to both minimize risk of environmental release and effects in the use of these materials.

3.2.2.7 Extra Workspace Within 50 Feet of Waterbodies

Our Procedures require that ATWS be at least 50 feet away from wetland boundaries and waterbodies, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. Table B.3.2-5 identifies wetland and waterbody crossings that require site-specific justification for ATWS within 50 feet of wetlands and waterbodies. PennEast has identified six wetlands and four

waterbodies where ATWS would be required within 50 feet. Based on our review, we have determined that PennEast has provided adequate justification for the requested ATWSs.

Table B.3.2-5

Wetland and Waterbody Crossings Requiring Site-Specific Justification for ATWS

Name	MP	ATWS	Distance from Resource (feet)	Justification
Wetlands				
Appalachian Trail PPL Crossing Realignment				
041117_GM_1001_PSS	49.3R3	ATWS-1954	32.6	Required to support Aquashicola Creek bore. [a]
041117_GM_1001_PFO	49.3R3	ATWS-1955	1.0	Required to support Aquashicola Creek bore. [a]
041117_GM_1001_PEM	49.3R3	ATWS-1955	49.7	Required to support Aquashicola Creek bore. [a]
052918_WA_003_PFO	52.6R3	ATWS-1960.1	23.1	Required to store stockpile for wetlands to the north and for boring with a travel lane. [b]
052918_WA_008_PUB	52.6R3	ATWS-1960.2	50.0	Required to store stockpile for wetlands to the north and for boring with a travel lane. [b]
080917_WA_001_PEM	53.3R3	ATWS-1963	31.3	Required to support stream crossing and for topsoil segregation in farm field. [c]
Waterbodies				
Appalachian Trail PPL Crossing Realignment				
041217_GM_1001_P_IN	49.3R3	ATWS-1955	38.6	Required to support Aquashicola Creek bore. a
041117_GM_1001_E_MI	49.4R3	ATWS-1956	34.2	Required to support Aquashicola Creek bore. a
052218_WA_1000_E_MI	49R3	ATWS-1950	39.5	Required to support Lower Smith Gap Road bore and hydrotest activities. [d]
Freemansburg Ave Realignment				
010615_JC_1000_E_MI	70.9R3	ATWS-0572	48.7	On the St. Luke's Hospital parcel, ATWS for HDD and pullback of the crossing; for spoil storage; and to bury pipeline at depth to accommodate St. Luke's future development.

Notes:
[a] The ATWS- 1954/1955/1956 workspace was location within 50 feet of Aquashicola Creek and associated wetland complexes to be able to design a suitable, low-risk bored crossing of the feature and identified bog turtle habitat.
[b] The ATWS 1960.1/1960.2 area is considerably wet and workspaces are required to store stockpile for wetlands to the north and for boring was a travel lane, feature 052918_WA_008_PUB. Workspaces are located within existing PP&L easement.
[c] The ATWS 1963 workspace is for workspace to cross the stream and for topsoil segregation in the farm field.
[d] The ATWS 1950 workspace is required for the bore of Lower Smith Gap Road. This location is also a spread break. It will contain frac-tanks with hydrotest water for testing of the pipeline segment.

3.2.3 General Impacts and Mitigation for Surface Water Resources

The Amendment Project would be constructed in compliance with all applicable federal, state, and local regulations and guidelines, specifications, and project-specific permit conditions. Although PennEast designed the Amendment Project routes to avoid and minimize effects on waterbodies to the greatest extent practicable, pipeline construction activities that could potentially affect surface waters include clearing and grading of streambanks, in-stream trenching and backfilling, blasting, trench dewatering, inadvertent returns from HDD operations, and potential spills or leaks of hazardous materials. Potential effects on surface waters may include:

- modification of aquatic habitat;
- increased runoff and the rate of in-stream sediment loading;
- turbidity;

- decreased dissolved oxygen (DO) concentrations;
- releases of chemical and nutrient pollutants from sediments;
- thermal effects;
- modification of riparian areas; and
- introduction of chemical contaminants such as fuel and lubricants.

In-stream construction activities, especially trenching and backfilling of the trench, would temporarily increase the amount of sediments mobilized downstream. The extent of the impact would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and downstream extent of sediment migration. In-stream construction could also result in the alteration of stream contours. Changes in the stream bottom contours could alter stream dynamics and increase downstream erosion or deposition. Turbidity resulting from resuspension of sediments from in-stream construction and erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production. In-stream disturbance could also introduce chemical and nutrient pollutants from sediments. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, potentially resulting in a decrease of DO concentrations in the affected area. Lower DO concentrations could cause temporary displacement of motile organisms, such as fish, and may kill non-motile organisms within the affected area. As previously stated, for the smaller waterbodies with perceptible flow at the time of construction, flume or dam-and-pump crossings would be the primary crossing method used. These methods create a temporary diversion of stream flow through the use of a cofferdam or pump methods and allow construction to occur under dry conditions across the natural streambed. In-stream work would result in short-term increase of suspended sediments in the stream channel with the restoration of flow across the restored work area; however, these increases would be short-term in nature. The use of dry-crossing methods, as opposed to wet-crossing methods, would minimize in-water disturbance within the stream basin during excavation, installation, and backfilling activities to the greatest extent practicable.

The clearing and grading of streambanks would reduce riparian vegetation and expose soil to erosional forces. The use of heavy equipment for construction could cause compaction of near surface soils, an effect that could result in increased runoff into surface waters in the immediate vicinity of the construction right-of-way. Increased surface runoff could transport sediment from uplands into surface waters, resulting in increased turbidity levels and increased sedimentation rates in the receiving waterbody. Disturbances to stream channels and streambanks could also increase the likelihood of scour after construction. The adherence to our Procedures and PennEast's E&SCP would minimize the potential for these impacts.

Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters could create a potential for contamination. If a spill were to occur, immediate downstream users of the water could experience degradation in water quality. Acute and chronic toxic effects on aquatic organisms could also result from such a spill. Adherence to our Procedures and PennEast's SPCC Plan would minimize the potential for impacts on waterbodies from the release fuel, oil, or other hazardous materials.

Blasting may be required along approximately 1.0 mile of the Appalachian Trail PPL Crossing Realignment within waterbodies. In-stream blasting has the potential to injure or kill aquatic organisms, displace organisms during the blast-hole drilling operations, and temporarily increase stream turbidity. Chemical by-products from blasting materials could also be released and potentially contaminate the water. If blasting is required, all blasting activity would be performed according to federal and state safety standards and in accordance with PennEast's Blasting Plan to be implemented by a certified blasting contractor. PennEast would make every attempt to utilize non-blasting bedrock removal techniques whenever possible.

Crossings employing HDD or conventional bore technologies would not be expected to impact TSS/total dissolved solids or turbidity levels in the open channel of waterbody and wetland areas. However, breakthrough of HDD drilling muds into the waterbody during drilling could also result in siltation or exceedance of water quality standards for TSS or turbidity. PennEast's E&SCP, SPCC Plan, HDD Inadvertent Returns and Contingency Plan, and HDD construction BMPs would be followed during HDD and conventional bore installation activities to minimize potential breakthrough events during HDD operations. PennEast's HDD Inadvertent Returns and Contingency Plan details the protocols for minimizing the potential for an inadvertent return associated with HDD activities; providing for the timely detection of inadvertent returns; protecting the environmentally sensitive riverbed and associated riparian vegetation; ensuring an organized, timely, and "minimum-impact" response in the event of an inadvertent return and release of drilling mud; and ensuring that all notifications are made immediately to the appropriate project personnel. We have reviewed PennEast's HDD Inadvertent Returns and Contingency Plan[15] and find it acceptable. Environmental Condition 19 of the Certificate Order would also apply to the Amendment Project, which requires PennEast to file final design plans of each HDD crossing, results for all geotechnical borings, and an HDD feasibility assessment for our review and approval.

HDD-related BMPs to be implemented by PennEast would include, but are not limited to, the following:

- ensure that all workers are properly trained and familiar with the necessary procedures for response to an inadvertent return, prior to commencement of drilling operations;
- all equipment and vehicles would be checked and maintained daily to prevent leaks of hazardous materials;
- spill kits and spill containment materials would be available on-site at all times. A vacuum truck would be readily available within 30 minutes of the site during all drilling operations. Containment materials (straw, silt fencing, sand bags, spill kits, etc.) would be staged on-site at location where they are readily available and easily mobilized for immediate use in the event of an inadvertent return;
- equipment required to contain and clean-up an inadvertent return would either be available at the work site or readily available at an offsite location within 30 minutes of the bore site;
- if equipment is required to be operated near a riverbed, absorbent pads and plastic sheeting for placement beneath motorized equipment would be used to protect the riverbed from engine fluids;
- avoid storage of hazardous materials, chemicals, fuels, or lubricating oils within 100 feet of any wetland, waterbody, or within any designated municipal watershed area where feasible. If the 100-foot setback cannot be met, this activity would be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC Plan;
- crew members would receive training in the provisions of applicable plans, equipment maintenance and site-specific permit and monitoring requirements; inspection procedures for release prevention and containment equipment and materials; contractor/crew obligation to immediately stop the drilling operation upon first evidence of the occurrence of an inadvertent return and to immediately report any release; operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and protocols for communication with agency representatives who might be on-site during the clean-up effort;
- drilling fluid pressures would be closely monitored. Pressure observations would be compared to estimates of the required drilling fluid and allowable formation pressures. Actions would be

[15] Available in the FERC eLibrary, the Commission's on-line records information system, docket number CP15-558-000, accession number 20160516-5382 (Attachment 2-10).

taken to lower the required drilling fluid pressure where pressures differ greatly with expectations;

- an environmental inspector would be onsite monitoring the drill for inadvertent releases and ensuring proper erosion and sediment BMPs are in place and working;
- exit and entry pits would be enclosed by silt fences and straw. If necessary, barriers (straw bales or sedimentation fences) between the bore site and the edge of the water source would be constructed prior to drilling to prevent released bentonite material from reaching the water; and
- water containing mud, silt, bentonite, or other pollutants from equipment washing or other activities would not be allowed to enter a lake, flowing stream or any other water source. The bentonite used in the drilling process would be either disposed of at an approved disposal facility or recycled in an approved manner. Other construction materials and wastes shall be recycled or disposed of as appropriate.

Minor impacts on water resources would include the reduction of shading along riparian areas through the conversion of forested riparian and wetland areas to herbaceous or emergent wetland areas. This reduction in shading would be limited to isolated areas of stream or tributary crossings and would allow for increased light penetration to the stream channel. This could lead to greater light penetration and increased temperatures in the water column during warmer seasons (i.e., late spring and summer) at these isolated locations. Increased light penetration may also enhance aquatic vegetation growth in the channels where the crossing occurred following construction. These impacts would largely be limited to smaller streams and tributaries crossed where pre-construction canopy coverage fully encloses the channel. The small area of channel affected would not present a significant impact on overall aquatic system. Larger tributaries and rivers would not be as affected by this reduction in canopy cover as most of the channels would already have open channels at the crossing location. Crossings using HDD or boring technologies for pipeline installation would have reduced impacts from changes in riparian cover.

Several comments were made regarding changes in water temperature and stormwater runoff. Final restoration of waterbody crossings would maintain riparian buffers and canopy cover over surface waters to the extent practicable, maintain existing hydrology, and encourage natural thermal buffering. Per our Procedures, PennEast would limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high-water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. Direct discharges of stormwater runoff to surface waters would be minimized by thorough establishment of vegetative cover and implementation of PennEast's E&SCP. Utilization of BMPs in the E&SCP to encourage soil infiltration and promote groundwater recharge of stormwater runoff would act to prevent direct discharge to the waterbody being crossed.

3.2.4 Conclusions

Impacts on waterbodies during construction would be short-term and not significant. Following pipeline installation and restoration of waterbodies and the adjacent construction workspace, in accordance with the construction, restoration, and mitigation measures described above, minimal long-term effects on surface waters are anticipated as a result of construction and operation of the Amendment Project. No designated water uses would be permanently affected because the pipeline would be buried beneath the bed of the waterbodies, erosion controls would be implemented during construction, and streambanks and streambed contours would be restored as close as possible to preconstruction conditions.

Operation of the Amendment Project would not impact surface water, unless maintenance activities involving pipe excavation and repair in or near streams are required. If this should occur, PennEast would

employ protective measures similar to those proposed for construction of the Amendment Project. Consequently, we conclude that any maintenance-related effects would be short term.

3.3 Wetlands

Wetlands can be defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of wetland vegetation adapted for life in saturated soil conditions (COE 1987). The COE enforces the federal CWA, Section 404 (33 U.S.C. 1344) which regulates waters of the United States, including jurisdictional wetlands within the Commonwealth of Pennsylvania.

In the Amendment Project area, wetlands are regulated at both federal (COE) and state (PADEP) levels. Under Section 404 of the CWA, the COE is authorized to issue permits for activities that would result in the discharge of dredge or fill material into waters of the United States, including wetlands. Under Section 401 of the CWA, states are required to certify that proposed dredging or filling of waters of the United States meets state water quality standards. On February 7, 2017, PADEP granted a state water quality certification for the Certificated Project under CWA Section 401. The revised route and modifications for this Amendment Project would not require a revised 401 Water Quality Certification. PennEast would comply with the criteria and conditions of the certification including applicable state permits pursuant to Pennsylvania regulations.

3.3.1 Existing Wetland Resources

PennEast identified wetlands crossed by the Amendment Project using site-specific field delineation results. Field surveys were conducted within the Amendment Project area between September 2014 and July 2018. PennEast conducted wetland surveys on 100 percent of the Amendment Project, including workspace for each route. Wetland boundaries were delineated using the methods described in the 1987 Corps of Engineers Wetlands Delineation Manual (COE 1987) and the applicable Regional Supplement. The vast majority of the field delineations were then field verified by the COE for accuracy. Any changes identified by the COE were incorporated into the final delineation of waters and wetlands.

In addition to the classifications used in this EA (Cowardin 1979) the PADEP classifies wetlands as either EV or other. EV wetlands in Pennsylvania are given special protection by the PADEP under Pennsylvania Code Title 25 and include those wetlands that:

- serve as habitat for threatened and endangered (T&E) species (or are hydrologically connected to or within 0.5 mile of such wetlands);
- are adjacent to a wild trout stream or EV water;
- are along a designated drinking water supply; and
- are within natural or wild areas (e.g., federal and state lands).

Wetlands not classified as EV were classified "other" wetlands. Only the Appalachian Trail PPL Crossing Realignment crosses wetlands – these wetlands were classified as being palustrine emergent wetlands (PEM), palustrine scrub-shrub wetlands (PSS), and palustrine forested wetlands (PFO). No palustrine unconsolidated bottom wetlands (PUB) or vernal pools would be crossed by the Amendment Project.

Field surveys identified 27 wetlands – all within the Appalachian Trail PPL Crossing Realignment. Nineteen of the wetlands would be crossed during construction, and eight of the wetlands are within the Amendment Project workspace but would not be crossed. The Amendment Project would impact about 1.0 acre of wetlands during construction. Table C-2 in appendix C identifies all wetland crossings by MP.

As required by Environmental Condition 30 of the Certificate Order, PennEast would file with the Secretary a complete wetland delineation report that would include the Amendment Project areas, that includes all wetlands delineated in accordance with the COE and the applicable state agency requirements.

3.3.2 Wetland Types

PennEast classified wetlands based on the Cowardin system that categorizes wetlands based on systems (e.g., palustrine) and classes (e.g., emergent, scrub-shrub, and forested). PennEast also classified wetlands meeting EV criteria (Pennsylvania Code § 105.17). The primary wetland types that were delineated in the proposed Amendment Project area are discussed below.

3.3.2.1 Palustrine Emergent Wetlands

PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et. al. 1979). PEM wetlands include areas commonly referred to as marshes, wet meadows, and beaver flowage communities. The PEM wetland type exists on its own as well as in conjunction with other wetland types, creating a more heterogeneous wetland system. PEM wetlands are often associated with utility rights-of-way, abandoned agricultural areas, and open waterbodies.

3.3.2.2 Palustrine Scrub-Shrub Wetlands

PSS wetland cover type includes areas that are dominated by saplings and shrubs that typically form a low and compact structure less than 20 feet tall (Cowardin et. al. 1979). The structure and composition of the vegetation within this cover type may be influenced by the water regime and, where located within existing rights-of-way, by utility maintenance practices. Most of these communities are seasonally flooded and often saturated to the surface. Many PSS wetlands are associated with emergent wetlands as part of large complexes. These PSS wetlands are also the dominant along existing electric transmission rights-of-way.

3.3.2.3 Palustrine Forested Wetlands

PFO wetlands are broad-leaved deciduous wetlands, found in association with streams and seeps or as isolated depressions. These wetlands typically occur in areas where the topography is low and flat or along waterbodies. PFO wetland cover types are dominated by trees and shrubs that have developed a tolerance to a seasonal high-water table. In order to be characterized as forested, a wetland must be dominated by trees and shrubs that are at least six meters tall (Cowardin et. al. 1979). PFO wetlands typically have a mature tree canopy which, depending upon the species and density, can have a broad range of understory and groundcover community components.

3.3.2.4 Vernal Pools

Vernal pools are unique, seasonal wetland habitats, and are typically small, shallow ephemeral waterbodies with no permanent inlet or outlet. These pools are filled seasonally each spring by rain, snow melt, or groundwater, and then become dry for a period of time during the summer. Based on field surveys conducted within the Amendment Project area between September 2014 and July 2018, vernal pools were identified in the survey corridor, but not within the proposed Amendment Project's disturbance footprint.

3.3.3 Wetland Impacts and Mitigation

Wetland impacts were calculated for the four proposed modifications discussed in this EA, which includes ATWS, access roads, a construction right-of-way of 75 feet in width, and a 30-foot-wide vegetation maintenance corridor within the operational/permanent right-of-way. There would be no permanent fill or loss of wetland area as a result of construction and operation of the Amendment Project. After construction, all wetlands would be allowed to return to pre-construction conditions, and contours

would be restored. However, 0.2 acre of PFO would be altered to PSS and PEM wetlands and 0.01 acre of PSS wetlands would be altered to PSS and PEM wetlands within the operational right-of-way. Construction would affect about 1.0 acre of wetlands, and operation would affect about 0.4 acre of wetlands (table B.3.3-1).

PennEast proposes to cross 16 wetlands using open trench construction methods. PennEast would minimize the amount of time that topsoil is segregated, and the trench is open to the extent possible. PennEast would use timber mats and would assemble the pipeline in upland locations to minimize wetland disturbance. Where trench dewatering would be necessary, water would be discharged through an energy-dissipation structure, such as a filter bag, into a well-vegetated upland area to minimize erosion associated with discharge. PennEast would use "push-pull" and/or "float" techniques for crossing wetlands when conditions permit, which is typically when the water table is near the surface and adequate workspace is available on either side of the wetland crossing. Installation and maintenance of erosion and sediment controls would be applied per PennEast's E&SCP and in accordance with our Procedures.

Table B.3.3-1

Summary of Wetland Classifications Affected by Construction and Operation of the Amendment Project

Cowardin Classification	Length Crossed (feet)	Wetland Area Affected During Construction (acre) [a]	Wetland Area Affected During Operation (acre) [a] [c]
Saylor Avenue Realignment			
(None)	**0**	**0.0**	**0.0**
Interstate 81 Workspace Adjustment			
(None)	**0**	**0.0**	**0.0**
Appalachian Trail PPL Crossing Realignment – PennEast Mainline			
PEM	457	0.6	0.2
PSS	132	<0.1	<0.1
PFO	635	0.4	0.2
Appalachian Trail PPL Crossing Realignment – Blue Mountain Lateral	**Appalachian Trail PPL Crossing Realignment – Blue Mountain Lateral**		
(None)	**0**	**0.0**	**0.0**
Appalachian Trail PPL Crossing Realignment – Blue Mountain Interconnect			
(None)	**0**	**0.0**	**0.0**
Freemansburg Avenue Realignment			
(None)	0	0.0	0.0
Total	1,224	1.0	0.4

Notes:
[a] Area affected during construction is the total area of impact during construction; and area affected during operation is the area within the operational right-of-way.
[b] Access roads are included in mainline pipeline construction and operation acreage.
[c] A 30-foot-wide permanent right-of-way would be maintained across wetlands.
Key:
PEM = Palustrine Emergent
PFO = Palustrine Forested
PSS = Palustrine Scrub-Shrub

Three of the proposed wetland crossings would be conducted using conventional bore methods (see table C-2 in appendix C). Use of the conventional bore crossing method would eliminate the need for mechanical clearing and grading, trenching, and the operation of heavy construction equipment within the wetland. Activities between the bore entry and exit points would be limited to foot traffic.

Construction in the wetlands would be conducted in accordance with the wetland construction and mitigation measures identified in PennEast's E&SCP and in accordance with our Plan and Procedures, except in circumstances where PennEast would request site-specific ATWS to facilitate safe construction conditions. Our Procedures require that ATWS be at least 50 feet away from wetland boundaries and waterbodies, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. Table B.3.2-5 identifies wetland and waterbodies crossings that require site-specific justification for ATWS within 50 feet of wetlands and waterbodies. Based on our review, we have determined that PennEast has provided adequate justification for the requested ATWSs.

Additionally, PennEast would comply with any permit conditions and mitigation requirements in the CWA Section 404 permits and Section 401 certifications. On February 7, 2017, PADEP granted a state water quality certification for the Amendment Project under CWA Section 401. PennEast would comply with the criteria and conditions of the certification including applicable state permits pursuant to Pennsylvania regulations.

The primary impact of pipeline construction and right-of-way maintenance activities on wetlands would be the temporary alteration of emergent wetland vegetation and the permanent conversion of forested wetlands to scrub-shrub and herbaceous emergent wetlands. In PEM emergent wetlands, the impact of construction would be relatively brief because the emergent vegetation would regenerate quickly, typically within one to three years. In forested wetlands, PennEast would selectively cut trees within a permanent 30-foot-wide corridor centered over the pipeline – this would prevent tree roots from compromising the integrity of the pipeline coating. Across all wetlands, PennEast would maintain a 10-foot-wide corridor centered over the pipeline in an herbaceous state to facilitate periodic corrosion and leak surveys.

Other effects on wetlands could include temporary changes in hydrology and water quality during construction. Temporary removal of wetland vegetation during construction could alter the capacity of wetlands to function as habitat and flood and erosion control buffers. Mixing topsoil with subsoil could alter nutrient availability and soil chemistry, thereby inhibiting recruitment of native wetland vegetation. Heavy equipment operating during construction could result in soil compaction or rutting that would alter natural hydrologic and soil conditions, potentially inhibiting germination of native seeds and the ability of plants to establish healthy root systems. Additionally, discharges from stormwater, dewatering structures, or hydrostatic testing could transport sediments and pollutants into wetlands, affecting water quality.

The majority of the effects on wetlands from construction of the pipelines would be temporary and short-term because PennEast would restore all wetlands to preconstruction contours and hydrology. PennEast would mitigate for unavoidable wetland impacts by implementing the procedures specified in its E&SCP and by complying with the conditions of its pending Section 404 permit. Specific wetlands-related measures that PennEast would implement to minimize and mitigate possible wetland impacts such as those described above, include, but are not limited to, the following:

- limit construction activity and ground disturbance in wetland areas to a construction right-of-way width of 75 feet or as shown on the construction drawings. With written approval from the FERC for site-specific conditions, construction right-of-way width within the boundaries of federally delineated wetlands may be expanded beyond 75 feet;
- clearly mark wetland boundaries and buffers in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete;
- cut vegetation just above ground level and grind stumps to ground level, leaving existing root systems in place. Immediately remove all cut trees and branches from the wetland and stockpile in an upland area on right-of-way for disposal;

- locate ATWS at least 50 feet from wetland boundaries except where site-specific conditions warrant otherwise, and FERC approval has been obtained;
- do not cut trees outside of the construction right-of-way to obtain timber for riprap or equipment mats;
- segregate the top 12 inches of topsoil within the ditchline, except in areas where standing water is present, or soils are saturated;
- decompact wetland soils as may be required;
- revegetate the upland portions of the right-of-way with annual ryegrass at 40 pounds/acre pure live seed or with the recommended wetland seed mix identified in PennEast's E&SCP for wetland areas within the right-of-way, unless standing water is present. Scrub-shrub and forested areas should be planted and/or seeded with appropriate plants to facilitate the regeneration of that wetland type originally present before construction for those areas that are not part of the maintained operational right-of-way. Do not use mulch, lime or fertilizer in wetland areas unless required in writing by the appropriate federal or state agency; and
- avoid storage of hazardous materials, chemicals, fuels, or lubricating oils within 100 feet of any wetland, waterbody, or within any designated municipal watershed area where feasible. If the 100-foot setback cannot be met, this activity would be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC Plan.

Following construction, disturbed areas would be restored to pre-construction soil and hydrology conditions and vegetation. PennEast would use only plant species that are native to the local area for revegetation of the Amendment Project area to facilitate the regeneration of the wetland type originally present before construction. In PEM wetlands, the herbaceous vegetation would regenerate quickly (within one to three years). Following revegetation, the permanent impact on emergent vegetation in the maintained right-of-way would be minimal because these areas consist of and would remain as open and herbaceous communities. To facilitate periodic corrosion and leak surveys, a 10-foot-wide corridor centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot-wide corridor in an herbaceous state. The duration of the impact on PSS and PFO wetlands would be longer. Woody vegetation may take several years to regenerate, and the re-establishment of large woody vegetation would be precluded on a portion of the permanent right-of-way by routine vegetation maintenance activities during pipeline operation. This would permanently convert previously PFO wetland areas within the maintained right-of-way to non-forested wetlands and PSS wetland areas to PEM wetlands.

During project operation, routine maintenance of the right-of-way would be required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols. PennEast would minimize wetland impacts during operation by implementing the measures contained in its E&SCP.

In accordance with its E&SCP, PennEast would conduct post-construction monitoring. PennEast would conduct follow-up inspections of all disturbed areas as necessary to determine the success of revegetation and address landowner concerns. At a minimum, in accordance with FERC Procedures, PennEast would conduct inspections after the first and second growing seasons. PennEast would monitor and record the success of wetland revegetation annually until wetland revegetation is successful as provided in appropriate federal and state permits. For any wetland where vegetation is not successful at the end of three years after construction, PennEast would develop and implement (in consultation with a professional wetland ecologist and at the approval of PADEP and the COE) a plan to actively revegetate the wetland with native wetland herbaceous and woody plant species.

PennEast would provide offsite compensatory mitigation in accordance with agency-approved compensatory wetland mitigation plans. Compensatory mitigation would provide wetland functions and

values equivalent to those lost as a result of construction and operation of the Amendment Project. PennEast has developed a preliminary Compensatory Wetland Mitigation Plan for permanent wetland impacts (WHM Group 2015), which would offset functional changes associated with the conversion of PFO and PSS wetlands to PEM wetlands within the 30-foot-wide right-of-way that PennEast would maintain during operations. The three proposed mitigation sites in Pennsylvania would be constructed in the Upper Central Susquehanna and the Central Delaware River sub-basins. PennEast submitted a proposed compensatory mitigation plan to the PADEP and COE with the joint permit applications on February 5, 2016. Per comments from the COE, PennEast would be required to monitor restored areas to comply with COE and state permits.

As mitigation design progresses, further coordination with the COE and PADEP would be required to incorporate site-specific design features and/or modifications, as applicable. In addition, the EPA indicated it would like to be involved in the consultation. Environmental Condition 32 of the Certificate Order, requiring that PennEast file a project-specific Wetland Restoration Plan, would also apply to the Amendment Project.

3.3.4 Conclusions

While minor adverse and long-term effects on wetlands would occur, with adherence to PennEast's E&SCP and FERC Procedures, we conclude that construction and operation of the Amendment Project would result in minor effects on wetlands that would be appropriately mitigated and reduced to less than significant levels. In addition, impacts on wetlands would be further mitigated through PennEast's implementation of an agency-approved mitigation plan.

4.0 VEGETATION, WILDLIFE, AND THREATENED AND ENDANGERED SPECIES

4.1 Vegetation

The Amendment Project area lies within the "Appalachian Highlands" land form and the "Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow" ecosystem province (Bailey 1998). The "Central Appalachian Broadleaf Forest" ecosystem province is described as a temperate area, with distinct summer and winter seasons. Precipitation averages in this ecosystem are the highest in the eastern United States. Typical vegetation in these provinces are characterized by a closed canopy of deciduous, xerophytic tree species (mainly oaks), although many mesophytic species occur on lower slopes and in mountain valleys; broadleaf forests change to coniferous or shrub lands at higher elevations (Bailey 1998).

The vegetation/cover types that would be crossed by the Amendment Project include agricultural lands, commercial/industrial areas, forest/woodlands, open lands (e.g., non-forested uplands, old fields, pasture and grasslands), and waterbodies. For the purpose of this EA section, wetlands are included within the open land and forest/woodland category based upon the presence of herbaceous (classified as open land) or forested (classified as forest/woodland) wetland types. The following describes the general vegetation types along the Amendment Project:

- *Agricultural Land*: These areas are predominately cultivated cropland or pastures. Some orchards, along with hay fields, corn (*Zea mays*) fields, and pastures also occur.
- *Industrial/Commercial Land*: This cover type includes developed lands, such as residential and commercial areas inclusive of landscaped areas. Vegetation found in these areas include urban lawns, as well as both native and non-native species of ornamental trees and shrubs. Roadway medians, embankments, and commercial parking lots within this area can include non-managed vegetation such as crown vetch (*Coronilla varia*).

- *Forest/Woodland*: Forests typically have dense and extensive tree cover (i.e., dense canopy areas), while woodlands typically have smaller trees that are short-boled relative to their crown depth (forming open canopies; Helms 1998). This vegetation type includes forested/woodland wetlands and upland forest/woodlands. The predominant forest/woodland community crossed by the Amendment Project is deciduous-broadleaf forest. Coniferous forests and mixed deciduous-broadleaf/coniferous forests are also present along the Amendment Project.
- *Open Land*: These areas are non-forested, non-agricultural lands, including herbaceous and scrub-shrub wetlands (i.e., PEM and PSS wetland types as defined by Cowardin; see section B.3.3), and areas containing utility line rights-of-way. The plant species found within non-wetland lands are typically weedy or contain early successional species.

Table B.6.1-1 lists the acres of various vegetation/cover types that would be affected by construction and operation of the Amendment Project. About 106 acres would be affected during the construction of the Amendment Project (consisting of about 50 acres of forested/woodland areas and 56 acres of non-forested/woodland areas). About 28 acres of this area would also be permanently affected during operation of the Amendment Project (i.e., these areas would be encompassed by the permanent right-of-way or permanent Amendment Project features); of this, about 16 acres of permanent operational impacts would occur to forested/woodland areas and 12 acres to non-forested/woodland areas. The majority of the impacts on forested/woodland areas would result from the portion of the Amendment Project related to the Saylor Ave Realignment and the Appalachian Trail PPL Crossing Realignment. The Interstate 81 Workspace Adjustment would primarily impact commercial/industrial areas; while the Freemansburg Ave Realignment would primarily impact agricultural areas.

Vegetative communities of special concern in the Amendment Project area include upland forested/woodland habitats and wetlands. Refer to table B.4.1-1 for impacts from the modifications on forested habitats. Wetland habitats are discussed in detail in section B.3.3.

Construction areas would be cleared of vegetation in order to provide a safe working area. The limits of clearing would be identified and flagged in the field prior to the start of clearing activities, and PennEast would install erosion control measures following the initial disturbance of the soil as described in its E&SCP. The cleared width within the construction right-of-way and ATWSs would be kept to the minimum required to safely construct the pipeline (see section A.8). Areas temporarily disturbed during construction would be reseeded (in accordance with FERC's Plan and Procedures as well as any recommendations made by the local soil conservation district or land managing agency) and allowed to revegetate to preconstruction cover types. The seed mixes used for revegetation would be determined based on recommendations made by the local soil conservation district or land managing agency, would include plant species that are important for pollinators, and would create habitat for native and domestic pollinators (the revegetation potential of affected areas and the revegetation success criteria is further discussed in section B.2).

Construction in forest lands would remove mature trees from the construction right-of-way. In addition, portions of the forest canopy that overhang work areas may be trimmed as needed. Felled trees would be cut into lengths, chipped on the right-of-way, or removed to an approved site. In temporary construction work areas, tree stumps and rootstock would be left in place wherever possible to facilitate natural revegetation.

Table B.4.1-1

Forested Habitat Impacts for the Amendment Project (acres)

Modification	Deciduous Broadleaf Forest/Woodland - Upland		Coniferous Forest/Woodland - Upland		Mixed Forest/Woodland - Upland		Palustrine Forest - Wetland		Total [a]	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Saylor Ave Realignment										
PennEast Mainline	3.1	1.1	0	0	0.2	0.1	0	0	3.3	1.2
Interstate 81 Workspace Adjustment										
PennEast Mainline	0	0	0	0	0.1	0	0	0	0.1	0
Appalachian Trail PPL Crossing Realignment										
PennEast Mainline	31.7	9.9	3.1	1.4	2.3	0.7	0.6	0.2	37.7	12.2
Blue Mountain Lateral	0.3	0.1	3.8	1.2	1.6	0.5	0	0	5.7	1.8
Blue Mountain Interconnect [b]	0.8	0.3	0.5	0.3	0.1	0	0	0	1.4	0.6
Freemansburg Ave Realignment										
PennEast Mainline	1.4	0.3	0	0	0	0	0	0	1.4	0.3
Total	37.3	11.7	7.4	2.9	4.3	1.3	0.6	0.2	49.6	16.1

Notes:
[a] The totals shown in this table may not equal the sum of addends due to rounding.
[b] Operational impacts were calculated using the 30-foot maintained right-of-way for all Modifications except for the Blue Mountain Interconnect, which has permanent aboveground impacts not included in the 30-foot corridor. Operational impacts are a subset of total workspace and are not additive.
Data Source: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) Cropland Data Layer (USDA-NASS, 2014) and 2013 aerial photographs. Adjustments were made to the 2014 USDA-NASS Cropland Data Layer based on manual review of high-resolution 2013 aerial photography and information gathered during field surveys conducted 2014 through 2018.

Impacts are expected to be short-term in non-forested/woodland areas that are allowed to restore to preconstruction conditions, as it is expected that these non-forested/woodland areas would be successfully restored within 3 years following construction (with implementation of PennEast's E&SCP and FERC's Plan and Procedures). However, all impacts on forested/woodland habitats would be considered long-term because of the time required to restore woody vegetation to preconstruction conditions (i.e., more than 30 years, and possibly hundreds of years for some forested/woodland areas).

During operation, routine maintenance of the right-of-way would occur to allow continued access for routine pipeline patrols, and to maintain access in the event of emergency repairs as well as to maintain visibility during aerial patrols. In upland areas, maintenance of the right-of-way would involve clearing a 30-foot-wide corridor of woody vegetation every three years. To facilitate periodic corrosion surveys, a 10-foot-wide strip centered on the pipeline would be mowed annually to maintain herbaceous growth.

Impacts on forest habitat could include fragmentation and edge effects. The loss of forest habitat and resulting edge effects could decrease the quality of habitat for forest dependent species, including alteration of habitat resulting from increased light levels and a subsequent loss of soil moisture as a result of the new forest edge. To minimize the fragmentation of large contiguous stands of forest and the associated edge effects, the Amendment Project route was sited to avoid areas containing large, interior forested stands where possible. When forests could not be avoided, proposed routing through a forest was accomplished by locating the pipeline as far from the forest's interior portion as practicable to maximize preservation of interior forest habitat. During initial planning of the pipeline's route, PennEast attempted to choose the shortest crossing length practical through large contiguous forest stands while taking into account other environmental and engineering constraints (see section 2 of the FEIS; FERC 2017a).

The term "invasive plant species" typically refers to plants that are non-native and are capable of aggressive growth, thereby displacing native species. Executive Order 13751 identifies invasive plant species as a threat to human, animal, and plant health; and indicates that introduction, establishment, and spread of these species can create the potential for serious public health impacts. The Amendment Project has the potential (through the disturbance of habitats and soils) to spread existing invasive plant species as well as create conditions that promote the establishment of new infestations. PennEast would work with the appropriate regulatory agencies (e.g., PADEP, PADCNR) as part of the permitting process to minimize the potential for invasive or noxious plant species would spread during construction or operation of the Amendment Project. In order to minimize the risk of invasive plants spreading within the rights-of-way and to control existing invasive populations that might prevent successful revegetation, Environmental Condition 33 of the Certificate Order requires PennEast to file an Invasive Species Management Plan; this requirement would also apply to and address the Amendment Project areas.

Based on the amounts and types of vegetation impacted along the pipeline, and the measures that would be implemented to minimize adverse effects, we have determined that construction and operation of the Amendment Project would not significantly affect vegetation.

4.2 Wildlife

4.2.1 Terrestrial Resources

A wide variety of wildlife species are likely to occur in each of the vegetation/cover types (i.e., wildlife habitats) crossed by the Amendment Project. The following provides a general list of common species that are expected to occur in these areas.

- *Agricultural Land*: This cover type is often inhabited by species considered to be generalists in nature. Agricultural lands throughout the Amendment Project area are often interspersed with upland forest and wetland habitat, further increasing the habitat value of these lands to

wildlife. Bird species that are commonly found using agricultural lands include eastern wild turkey (*Meleagris gallopavo silvestris*), American kestrel (*Falco sparverius*), eastern meadowlark (*Sturnella magna*) and mourning dove (*Zenaida macroura*). Mammal species that are commonly found using these lands include woodchuck (*Marmota monax*), striped skunk (*Mephitis mephitis*), meadow vole (*Microtus pennyslvanicus*) and white-footed mouse (*Peromyscus leucopus*), white-tailed deer (*Odocoileus verginianus*), and red fox (*Vulpes vulpes*). White-tailed deer often use agricultural land for feeding and resting, while red fox may use these lands for feeding on prey species (e.g., small mammals and birds).

- *Industrial/Commercial Land*: These cover types are, by nature, influenced by human impacts (e.g., contain paved and landscaped areas), and wildlife species that generally occur within these cover types are adapted to the presence of humans. Within the Amendment Project area, developed lands primarily consist of roadways and industrial/commercial lots. These areas typically provide little wildlife habitat, and mostly support opportunistic species including gray squirrel (*Sciurus carolinensis*), American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), and opossum (*Didelphis virginiana*) (Collins 1981; PGC 2013).
- *Forest/Woodland*: These forested/woodland habitats provide a variety of microhabitats, including the overstory tree canopy, the understory or shrub layer, as well as the ground cover and leaf litter found on the forest floor. Common mammals found in this cover type include white-tailed deer, raccoon (*Procyon lotor*), gray squirrel, white-footed mouse, eastern chipmunk (*Tamias striatus*), and short-tail shrew (*Blarina brevicauda*). Bird species commonly found include red-tailed hawk (*Buteo jamaicensis*), rose-breasted grosbeak (*Pheucticus ludovicianus*), pileated woodpecker (*Dryocopus pileatus*), and red-eyed vireo (*Vireo olivaceous*). Bird species that inhabit the understory include blue jay (*Cyanocitta cristata*), northern cardinal (*Cardinalis cardinalis*), white-breasted nuthatch (*Sitta carolinensis*), and black-capped chickadee (*Poecile atricapillus*). A variety of species groups will inhabit the forest floor including invertebrates, mammals, reptiles, and amphibians. Mammal species found on the forest floor can include white-footed mouse, eastern chipmunk, and short-tail shrew, while the reptile and amphibian species can include eastern box turtle (*Terrapene carolina*), red-backed salamander (*Plethodon cinereus*), Northern copperhead (*Agkistrodon contortrix mokasen*), and American toad (*Bufo americanus*) (Collins 1981; PGC 2013).
- *Open Land*: This cover type supports many herbaceous species and low-growing woody vegetation that can serve as protection or food sources for wildlife species. Open lands are classified as being non-forested lands, uncultivated grassland, emergent wetlands, scrub-shrub areas, and maintained utility right-of-way. It is typical for small to medium-sized mammals and birds to inhabit uncultivated areas. Open and grassy areas could also serve as habitat for reptile and amphibian species. Wildlife species often present in emergent wetlands include amphibians such as green frog (*Rana clamitans*) and bullfrog (*Rana catesbeiana*); reptiles such as northern water snake (*Nerodia sipedon*); and birds such as redwing blackbird (*Agelaius phoenicus*), common yellowthroat (*Geothlypis trichas*), and Canada goose (*Branta canadensis*). Wildlife species often present in scrub-shrub wetlands include northern black racer (*Coluber constrictor*), Carolina wren (*Thryothorus ludovicianus*), and raccoon (Collins 1981; PGC 2013).

In addition to the general habitat types discussed above, the portion of the Amendment Project related to the Appalachian Trail PPL Crossing Realignment would impact sensitive wildlife habitats such as SGL and Important Bird Areas (IBAs). This includes the SGL 168 and the Kittatinny Ridge IBA. The Amendment Project would cross about 7,950 feet of the SGL 168, impacting about 18.4 acres during construction and 5.5 acres during operation. About 50,440 feet of the Kittatinny Ridge IBA would be

crossed by the Amendment Project, impacting about 70.2 acres during construction and 36.6 acers during operation.

The impact on terrestrial wildlife species and their habitats would vary depending on the timing of construction, types of construction techniques used, the habitat and life-history requirements of each species affected, and the type and extent of habitats that would be impacted. Direct impacts on wildlife during construction could include the displacement of wildlife from the Amendment Project area, as well as direct mortality of some individuals. Individuals of some wildlife species may be directly affected by construction of the Amendment Project if they are killed by vehicles or construction equipment traveling to, from, or within the construction sites. Species most susceptible to vehicle-related mortality include those that are inconspicuous (e.g., salamanders, frogs, snakes, small mammals), those with limited mobility (e.g., amphibians, as well as young individuals of any taxa), burrowing species (e.g., mice and voles, weasels, frogs and toads, snakes, subterranean mollusks, and burrowing avian species), and wildlife with behavioral activity patterns that can make them vulnerable to vehicular collisions (e.g., deer are more active at dusk and dawn when light levels are low and collisions are more likely to occur, and some wildlife scavenge roadside carrion making them more susceptible to collisions with vehicles [Leedy 1975; Bennett 1991; Forman and Alexander 1998; Trombulak and Frissel 2000]).

Some species are likely to be displaced from habitats that are cleared of vegetation as well as from areas adjacent to construction sites due to construction noise and visual disturbances. Displacement from adjacent habitats would most likely be a temporary effect during construction of the Amendment Project, and it is expected that most wildlife would return to the area after restoration of the right-of-way is complete. However, if adjacent habitats are at carrying capacity for the species, displaced individuals could be adversely affected due to increased competition for resources, increased susceptibility to predation, or disease that may be facilitated by over-crowding. This may decrease individuals' reproductive success by increasing nest abandonment or interfering with breeding behaviors and success. These impacts may negatively affect population growth through diminished rates of survivorship and fecundity.

During pipeline operation, impacts on wildlife populations could result through direct mortality or through habitat alteration (e.g., cleared and maintained habitats). Direct mortality of species could occur during right-of way maintenance operations (e.g., individuals being struck by vehicles or killed during maintenance mowing of the right-of-way). Long-term habitat impacts could result from a permanent shift in vegetation structure, primarily where trees would be prevented from occupying the permanent pipeline right-of-way during operation of the Amendment Project. Creation of a permanent pipeline right-of-way would permanently convert forested habitats to early seral[16] vegetation stages. The trees removed by clearing would be replaced by herbaceous species, shrubs, and small trees, which may provide seeds and foliage as food for terrestrial mammals and birds, as well as habitat for ground-nesting birds and mammals. Where preconstruction conditions were similar (e.g., where the permanent right-of-way crossed through an area that was originally an open or agricultural habitat), the effects of the permanent right-of-way would be minimal. Where the construction impacts change species composition or habitat structure to a substantial degree (e.g., in previously forested habitats), wildlife that are closely associated with the original conditions of the area may respond by shifting activity to habitats that provide better support (e.g., forest dependent species may no-longer use these modified habitats).

Forest fragmentation caused by the new right-of-way can have negative effects on forest dwelling species (e.g., causing individuals to crowd into remaining patches of habitat) while it can have beneficial effects to species that thrive in edge habitats (Hay 1994; Pearce and Moran 1994; Roberts and Arner 1984). This can lead to increased competition for nesting habitat, breeding habitat, and food resources between

[16] A seral community is an intermediate stage found in ecological succession in an ecosystem advancing towards its climax community.

forest dependent species and edge dominant species (Piatt et al. 2006). In extreme situations, the habitat openings can inhibit movement by certain wildlife species across the right-of-way (e.g., interior forest dependent species may not travel though the open habitat that would be found on the right-of-way). The distance an edge effect extends into a forest/woodland is variable, but most studies point to at least 300 feet (Rodewald 2001; Ontario Ministry of Natural Resources 2000; Robbins 1988; Rosenberg et al. 1999).

Impacts on forest habitat were minimized by locating the pipeline in existing open field habitats and reduced by crossing forested areas adjacent to existing cleared rights-of-way. About 4.3 miles of the Amendment Project would be collocated with existing rights-of-way (corresponding to 61 percent of the length of the four route modifications). Overall, the temporary construction areas of the right-of-way would be minimized to the extent practical. The mowing or clearing of vegetation would be rotated in a way that best allows for more beneficial wildlife habitat to become established. The initial schedule for the clearing of trees would be dictated by the tree clearing window established for federally-listed bat species (i.e., clearing must occur between November 1 to March 31) or other state-mandated restriction for vegetation maintenance. PennEast would conduct future mowing or clearing in the grassland habitats of the permanent right-of-way for the purpose of vegetation maintenance between September 11 and March 14 in order to prevent impacts on grassland bird species that may be breeding and nesting in the permanent right-of-way. This vegetation maintenance timing window would be more restrictive than the timing window in the FERC Plan, which limits maintenance clearing to between August 2 and April 14. Impacts regarding timing restrictions for T&E species are discussed in more detail in section B.4.3. In addition, the seed mixes that would be used for restoration of the temporary work areas would be selected to minimize competition with native woody plant species (e.g., seed mixes would be determined based on recommendations made by the local soil conservation district or land managing agency, such as the PGC or other applicable agencies). This would allow native species to become re-established and for native wildlife species that inhabit or forage in grassland areas to continue using the restored habitats.

Based on the types of available habitats within the Amendment Project area, and the measures that would be implemented to minimize adverse effects, we have determined that construction and operation of the Amendment Project would not significantly affect wildlife species (see additional discussion below for migratory birds and eagles).

4.2.2 Migratory Birds, the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA)

Section 703 of the Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the U.S. Department of the Interior. The Bald and Golden Eagle Protection Act (BGEPA) prohibits harming eagles, their nests, or their eggs. The National Bald Eagle Management Guidelines are intended to ensure that project actions avoid injury, decreased productivity, or nest abandonment. For example, the guidelines recommend buffers around nests to screen nesting eagles from noise and visual distractions caused by human activities. On March 31, 2011, FERC and the FWS signed an Memorandum of Understanding (MOU) (as required by Executive Order 13186) that identifies specific activities where cooperation between FERC and FWS would contribute to the conservation of migratory birds and their habitat and outlines a collaborative approach to promoting the conservation of migratory bird populations and furthering implementation of the migratory bird conventions, the MBTA, and the BGEPA.

Though all migratory birds are afforded protection under the MBTA, both Executive Order 13186 and the MOU require that Birds of Conservation Concern (BCC) and federally listed species be given priority when considering effects on migratory birds. BCCs are a subset of MBTA-protected species identified by FWS as those in the greatest need of additional conservation action to avoid future listing under the Endangered Species Act (ESA). PennEast utilized the FWS Information, Planning, and

Consultation tool to generate a list of BBCs by the FWS that could be present in the Amendment Project area. These include: American bittern (*Botaurus lentiginosus*), American oystercatcher (*Haematopus palliates*), bald eagle (*Haliaeetus leucocephalus*), black-billed cuckoo (*Coccyzus erythropthalmus*), black-capped chickadee (*Poecile atricapillus practicus*), blue-winged warbler (*Vermivora cyanoptera*), bobolink (*Dolichonyx oryzivorus*), Canada warbler (*Cardellina canadensis*), cerulean warbler (*Setophaga cerulean*), eastern whip-poor will (*Antrostomus vociferous*), golden-winged warbler (*Vermivora chrysoptera*), Kentucky warbler (*Geothlypis formosa*), least bittern (*Ixobrychus exilis*), long-eared owl (*Asio otus*), Louisiana waterthrush (*Parkesia motacilla*), northern saw-whet owl (*Aegolius acadicus acadicus*), peregrine falcon (*Falco peregrinus*), pied-billed grebe (*Podilymbus podiceps*), prairie warbler (*Setophaga discolor*), prothonotary warbler (*Protonaria citrea*), purple sandpiper (*Calidris maritima*), red-headed woodpecker (*Melanerpes erythrocephalus*), rusty blackbird (*Euphagus carolinus*), short-eared owl (*Asio flammeus*), snowy egret (*Egretta thula*), red knot (*Calidris canutus*), wood thrush (*Hylocichla mustelina*), worm-eating warbler (*Helmitheros vermivorum*), and yellow-bellied sapsucker (*Sphyrapicus varius*).

As discussed above, the Amendment Project would cross through the Kittatinny Ridge IBA along the Appalachian Trail PPL Crossing Realignment. IBAs are identified by the National Audubon Society and serve to identify and conserve areas that provide critical habitat for migratory birds. The Kittatinny Ridge IBA is a primary raptor migration corridor in the northeastern United States. A number of other, non-raptor species also use this corridor for migration including ruby-throated hummingbirds (*Archilochus colubris*) and monarch butterflies (*Danaus plexippus*). Hawk Mountain Sanctuary located on the Kittatinny Ridge has 16 documented regular migrant species that occur in this area, including sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), American kestrel, red-shouldered hawk (*Buteo lineatus*), and merlin (*Falco columbarius*). Another 140 non-raptor bird species have been documented as using this area for regular migration as well. Additionally, this IBA provides forest interior birds with vital nesting habitat. The Amendment Project would cross about 50,440 feet of the Kittatinny Ridge IBA, impacting about 70.2 acres during construction and 33.1 acres during operation.

The potential impacts on migratory birds would be similar to those discussed above for general wildlife species, and include mortality or injury, disruption and disturbance, loss of habitat, and displacement from adjacent habitats (see previous discussions above). PennEast would be required by the FWS to take measures to avoid and minimize the taking of migratory birds (as defined by the MBTA). PennEast has committed to developing a Migratory Bird Conservation Plan in coordination with the FWS, prior to construction. Filing of this plan with the Commission is required by Environmental Condition 34 of the Certificate Order which would also apply to the Amendment Project.

PennEast has committed to following the FWS' recommendations for implementation regarding adaptive management practices in order to minimize impact on migratory birds during construction and operation of the Amendment Project. These measures include:

- Where disturbance would be necessary, clear natural or semi-natural habitats (e.g., forests, woodlots, reverting fields, shrubby areas) and perform vegetation maintenance activities (e.g., mowing) between September 1 and March 31, which is outside the nesting season for most native bird species. PennEast has committed to a more restrictive window of September 11 to March 14, which is also more restrictive than the window of August 2 through April 14 required by the FERC Plan. Without undertaking specific analysis of breeding species and their respective nesting seasons on the Amendment Project sites, implementation of the seasonal restriction proposed by PennEast would avoid take of most breeding birds, their nests, and their young (i.e., eggs, hatchlings, fledglings).
- Minimize land and vegetation disturbance during Amendment Project design and construction. To reduce habitat fragmentation, collocate roads, fences, lay down areas, staging areas, and other infrastructure in or immediately adjacent to already-disturbed areas (e.g., existing roads,

pipelines, agricultural fields) and cluster development features (e.g., buildings, roads) as opposed to distributing them throughout land parcels. Where this is not possible, minimize roads, fences, and other infrastructure.

- Avoid permanent habitat alterations in areas where birds are highly concentrated. Examples of high concentration areas for birds are wetlands, state or federal refuges, Audubon IBA, private duck clubs, avian staging areas, rookeries, leks, roosts, and riparian areas. Avoid establishing sizable structures along known bird migration pathways or known daily movement flyways (e.g., between roosting and feeding areas).
- Conserve area-sensitive species, avoid fragmenting large, contiguous tracts of wildlife habitat, especially if habitat cannot be fully restored after construction. Maintain contiguous habitat corridors to facilitate wildlife dispersal. Where practicable, concentrate construction activities, infrastructure, and man-made structures (e.g., buildings, cell towers, roads, parking lots) on lands already altered or cultivated, and away from areas of intact and healthy native habitats. If not feasible, select fragmented or degraded habitats over relatively intact areas.
- Develop a habitat restoration plan for the proposed sites that avoids or minimizes negative impacts on birds, and that creates functional habitat for a variety of bird species. Use only plant species that are native to the local area for revegetation of the Amendment Project area.

PennEast has committed to only conducting initial tree clearing activities between November 1 and March 31 in order to protect federally-listed bat species. This commitment would minimize impact from vegetation clearing on both avian and bat species (see section B.4.3 for more details regarding potential impacts and minimization measures for bat species).

In the event that migratory bird's eggs or chicks (nestlings or fledglings) are found out of a nest during construction, PennEast would take the following actions: PennEast would contact the FWS immediately during normal business hours. If eggs or chicks can be salvaged (i.e., if not cracked or dead), then they would be taken to a federal or state permitted wildlife rehabilitation center by a person authorized to handle migratory birds. The EI would maintain a log of MBTA bird salvage efforts, including unintentional mortalities and individuals transferred to wildlife rehabilitation care facilities. PennEast would file a report with the FWS within 24 hours of an occurrence.

Bald eagles, which are protected under both the MBTA and the BGEPA, could be present in the Amendment Project area. They are raptors with a characteristic white head and tail, and black body plumage. They primarily feed on fish; however, their diet can also include smaller birds, mammals and reptiles. Important habitat for this species includes areas of low human development with large areas of open water with abundant of prey and forested areas with large mature canopy trees for perch hunting, roosting, and nesting. Breeding activities for these birds include courtship, nest building, egg laying, incubation, and hatching, rearing and fledging of young. Breeding and nest building can occur one to three months prior to egg laying. For eagles occurring in Pennsylvania, egg laying and incubation typically occurs between January and the end of March, and young stay in the nest until they are approximately 8 to 14 weeks old when they fledge. Bald eagles have high nest fidelity and typically return to the same nesting sites every year.

PennEast has committed to the following guidelines regarding bald eagles, as requested by the FWS:

- A linear distance buffer of at least 330 feet (100 meters) would be maintained between areas with active construction and eagle nests (including alternate nests that are not actively used that year). If an existing activity that is similar in kind and size is closer than 330 feet and has been

tolerated by eagles, the distance buffer for the PennEast construction activity would be the same or greater than that of the existing tolerated activity;

- Within 660 feet of an eagle nest, all activities that may disturb bald eagles would be avoided from January 1 to July 31 (the breeding season). These activities include, but are not limited to: construction, excavation, use of heavy equipment, use of loud equipment or machinery, vegetation clearing, earth disturbance, planting, and landscaping. If Amendment Project activities encroach within 660 feet of an eagle nest, PennEast would secure the necessary BGEPA permits from the FWS prior to the activity occurring;
- Established landscape buffers that screen the activity from an eagle nest would be maintained; and
- From January 1 to July 31, blasting and other activities that produce extremely loud noises would not occur within 0.5 mile of active eagle nests, unless greater tolerance to the activity (or similar existing activity) has been demonstrated by the eagles in the breeding area.

Based on the measures described above, as well as the ongoing consultation with the FWS, we believe that the Amendment Project would be in compliance with the MBTA and the BGEPA.

4.2.3 Aquatic Resources

Aquatic biological resources include invertebrates and fish species that are reliant on aquatic habitats. The FWS, National Marine Fisheries Service (NMFS), PFBC, PGC, and PADCNR were consulted to identify the game and non-game fish species that could occur in the Amendment Project area and to determine the appropriate classifications for waterbodies crossed by the Amendment Project. General water quality and impacts to water resources are addressed in detail in section B.4.3; while federal or state listed T&E aquatic species are discussed in section B.4.6 of this document.

A list of common or representative fish species that may be found in waterbodies crossed by the Amendment Project were identified using data available from PFBC and are presented in table B.4.2-1.

Fisheries of Special Concern are waters considered by the state or federal agencies to have exceptional resource value. These fisheries support unique or rare aquatic species, host significant migratory fish populations, are associated with state or federal stocking programs, or are governed by state fishery management regulations. In Pennsylvania, these criteria include HQ waters, EV waters, WTW, and TSF. Section B.3.2 discusses Fisheries of Special Concern that would be crossed by the Amendment Project.

Federally listed essential fish habitat (EFH), as defined under the Magnuson-Stevens Fishery Conservation and Management Act, are comprised of federally listed waters that are essential to the long-term survival and health of our nation's marine fisheries. EFH can consist of both the water column and the underlying surface of a particular area. As stated in PennEast's response to the March 8, 2019 Environmental Information Request, the NMFS has indicated that the Amendment Project would not affect NMFS-jurisdictional EFH, and as such, EFH are not addressed further in this document.

Table B.4.2-1

Representative Fish Species in Waterbodies Crossed by the Amendment Project

Common Name	Scientific Name
Warmwater Fish	
Largemouth bass	*Micropterus salmoides*
Smallmouth bass	*Micropterus dolomieu*
Rock bass	*Ambloplites rupestris*
Channel catfish	*Ictalurus punctatus*
Muskellunge	*Esox masquinongy*
Chain pickerel	*Esox niger*
Black crappie	*Pomoxis nigromaculatus*
White crappie	*Pomoxis annularis*
Bluegill	*Lepomis macrochirus*
Pumpkinseed	*Lepomis gibbosus*
Redbreast sunfish	*Lepomis auratus*
White perch	*Morone americana*
White bass	*Morone chrysops*
Yellow perch	*Perca flavescens*
Walleye	*Sander vitreus*
Coldwater Fish	
Brown trout	*Salmo trutta*
Rainbow trout	*Oncorhynchus mykiss*
Brook trout	*Salvelinus fontinalis*
Longnose dace	*Rhinichthys cataractae*
Eastern blacknose dace	*Rhinichthys atratulus*
Mottled sculpin	*Cottus bairdi*
Slimy sculpin	*Cottus cognatus*
Migratory Fish	
Striped bass	*Morone saxatilis*
American shad	*Alosa sapidissima*
American eel	*Anguilla rostrate*
Blueback herring	*Alosa aestivalis*
Alewife	*Alosa pseudoharengus*

Source: PFBC 2015a,b,c,d,e,f,g

Construction of the pipeline could have both direct and indirect impacts on aquatic biological resources. In-stream pipeline construction could remove habitat, temporarily increase sedimentation and turbidity in the water column, restrict species movement within a waterbody, increase the potential for streambank erosion, temporarily disturb streambed foraging areas, and temporarily increase the potential for fuel or chemical spills.

Multiple waterbody crossing methods would be used by PennEast (see section B.3.2 for discussion of waterbody crossing methods and their potential impacts). Use of flume or dam-and-pump would be the

primary crossing method used for most of the smaller waterbodies that have a perceptible flow at the time of construction. With this method, a temporary diversion of the stream would occur typically accomplished through the use of a cofferdam or pump methods to divert flow and allow construction to occur under dry conditions across the natural streambed. In-stream work could result in short-term increase of suspended sediments in the stream channel during construction. These increases would be short-term in nature and would subside after construction is complete. The use of dry-crossing methods, as opposed to wet-crossing methods, would minimize in-water disturbance within the stream basin during excavation activities. Stockpiling and segregation of soils and stream cobbles would be done using methods consistent with PennEast's E&SCP to allow for reuse of the material for burial of the pipeline and stabilization of the streambed. An HDD or conventional bore crossing method is used to cross larger waterbodies in order to avoid direct in-water impacts on aquatic resources. This would be accomplished by installing the main pipeline segment beneath the waterbody and would prevent disturbance of bottom sediments. During HDD operations, the use of drilling fluids to advance the pipeline may result in breakthrough of pressurized drilling fluids into the water column and result in temporary increases in total suspended solids or turbidity. Should monitoring reveal that a breach of drilling fluids is occurring, PennEast's HDD Inadvertent Returns and Contingency Plan and E&SCP would be implemented to minimize the environmental impacts on the stream being crossed.

Construction of the pipeline as well as the associated access roads across a waterbody has the potential to restrict the flow of water as well as the movement of aquatic organisms within the waterbody if the crossing is not constructed correctly. The use of pumps to maintain stream flow around the construction work areas during the dam-and-pump crossings could entrain or impinge fish and ichthyoplankton. Although the duration of this effect would be short and would cease when the crossing is completed and normal streamflow is restored, some small fish and larvae as well as all forms of ichthyoplankton would still be subject to entrainment. This potential impact would be minimized by screening the intakes of the pumping system, as described in PennEast's E&SCP. This short-term and localized interruption of fish passage is not anticipated to dramatically affect the migration of fish within the stream systems that would be crossed by the Amendment Project. The dam and pump crossing method could also result in sediment scour downstream of the crossing if measures were not implemented to dissipate the energy of the pump discharge. However, as described in the E&SCP, PennEast would direct all discharges from the pumps through energy dissipaters to minimize scour and downstream siltation.

Any impacts related to the flow of the waterbody would be temporary and limited to the construction phase of the Amendment Project as long as the pipeline is buried to sufficient depth (i.e., the pipe does not become exposed due to erosion of the streambed and become "perched" in the waterbody) and all access roads across streams are constructed so as to allow fish passage up and down-stream of the crossing (e.g., culverts are constructed properly and in compliance with state and federal requirements). In order to ensure that fish passage is maintained at any proposed new access roads across waterbodies that would be constructed, PennEast would be required to comply with all state and federal requirements related to culvert or bridge construction.

Some limited blasting could be required along the pipeline to increase the depth and width of trenches in order to accommodate the buried pipeline. Potential adverse effects of blasting in waterbodies could include direct mortality of organisms in the immediate vicinity of the blast. Blasting can also have some short-term adverse impacts, similar to trenching, including reduced macroinvertebrate prey base, alteration of substrate characteristics, and loss of large woody debris and structure (e.g., impacts on riparian areas). If blasting is required, all blasting activity would be performed according to federal and state safety standards and in accordance with PennEast's Blasting Plan to be implemented by a certified blasting contractor. PennEast would make every attempt to utilize non-blasting bedrock removal techniques whenever possible.

Impacts on riparian areas can affect aquatic organisms by increasing erosion and sedimentation input to the waterbody (e.g., effecting stream bank erosion), reducing organic input (e.g., woody debris), and altering shade or cover habitats across waterbodies. Where forested riparian vegetation would be converted to herbaceous cover on the permanent right-of-way (see section B.4.1), some thermal enhancement and light penetration of the stream channel could occur. This effect would be mostly associated with smaller stream crossings where forested canopies fully shaded the channel prior to construction. Greater light penetration may lead to some avoidance of illuminated streambeds by fish due to enhanced risk from predation. These impacts would be considered permanent and would be part of the operational phase of the Amendment Project. Riparian buffers within Pennsylvania would be protected in accordance with Chapter 102 Riparian Buffer Rules (PA Code 025 Chapter 102.14) and permit conditions. The protection of vegetated buffers around waterbodies, in accordance with state regulations, would help to minimize impacts on aquatic biological resources by preserving water quality and reducing potential for streambank erosion and increased sedimentation as well as turbidity in the water column.

Hydrostatic testing of the pipe following construction has the potential to impact both aquatic habitats as well as organisms. PennEast would be required to obtain state and federal permits to withdraw water from Waters of the U.S., and these permits would contain measures that would be required in order to minimize impacts on aquatic resources (e.g., restrictions on when and how much water can be withdrawn, as well as how the water can be withdrawn and discharged). PennEast would be required to ensure that hydrostatic test water withdrawals and discharges would not result in a significant fish entrainment, loss of habitat, or an adverse effect to water quality. For non-municipal sources of hydrostatic test water, the withdrawal intake hoses would be fitted with intake screen devices that would minimize the risk of the entrainment of fingerling and small fish during water withdrawal. Discharge would comply with regulatory permit conditions and be controlled to prevent scour and sedimentation, flooding, or the introduction of foreign or toxic substances into the aquatic system. With these measures, the intake and discharge of water for hydrostatic testing would not significantly impact aquatic resources.

PennEast would comply with all waterbody crossing windows established by state and federal permit requirements. In accordance with the FERC Procedures, to minimize impact on fisheries resources, all in-stream work would be performed between June 1 and September 30 to protect CWF and between June 1 and November 30 to protect warm water fisheries, unless other more stringent agency timing restrictions would apply to the affected waterbody. In Pennsylvania, the timing restrictions specific to in-stream construction in trout streams encompass three sets of dates:

- October 1 through December 31 for wild trout streams;
- October 1 through April 1 for Class A wild trout streams; and
- March 1 through June 15 for ATW and stocked trout streams.

Only the March 1 through June 15 instream restriction period for ATW and stocked trout streams is more restrictive that the FERC Procedures for cold-water or WWF. Additional timing restrictions would likely be developed as part of the Pennsylvania State Programmatic General Permit (PSPGP-5); PennEast would be required to adhere to any timing restrictions developed a part of the PSPGP-5. The PennEast proposed work schedule for this Amendment Project currently does not identify all potential applicable in-water timing restrictions by waterbody. However, this outstanding information is required by Environmental Condition 29 of the Certificate Order, which would also apply to the Amendment Project.

As discussed in section B.3.2, PennEast would be required to adhere to the measures outlined in our Plan and Procedures to minimize the risk of fuel or chemical spills entering a waterbody.

Following construction, streambeds would be restored to pre-construction conditions using native substrates excavated from the surface interval of streambed prior to construction, maintaining

preconstruction sediment bed consistency to the fullest extent possible. No long-term impacts are anticipated after restoration of stream bottoms and regrowth of riparian vegetation. Therefore, based on the species potentially present, habitats that would be affected, and the measures and timing restrictions that would be implemented, we have determined that construction and operation of the Amendment Project would not significantly affect aquatic resources.

4.3 Special Status, Threatened, and Endangered Species

Section 7 of the ESA (19 U.S.C 1536(c)), as amended, requires that any actions authorized, funded, or carried out by a federal agency do not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of federally listed designated critical habitat. The action agency is required to consult with the FWS and/or NMFS (collectively referred to as the Services) to determine whether federally listed endangered or threatened species or designated critical habitat are found within the vicinity of the project, and to determine the proposed action's potential effects on those species or critical habitats.

PennEast, acting as the FERC's non-federal representative for the purpose of complying with section 7(a)(2) of the ESA, initiated informal consultation with the FWS and NMFS through correspondence on August 12, 2014, and continued with various follow-up correspondence as the pipeline route was modified, through October 7, 2015. On September 18, 2014, NMFS replied stating that no threatened or endangered species under its jurisdiction are known to occur in the Amendment Project area, and no further consultation is necessary with NMFS (NMFS 2014). On July 17, 2017 the FERC submitted its Biological Assessment (BA) to the FWS and requested the initiation of formal consultation under the ESA for the Certificated Project as designed/proposed as of 2017 (FERC 2017b); the FWS released their Biological Opinion (BO) on November 28, 2017 (FWS 2017). On June 18, 2019, FERC staff emailed FWS requesting the addition of a map showing the proposed modifications to the BO and concurrence that the concurrence that the current BO, with the addition of the figure, could serve the proposed modifications (see accession number 20190730-3073). On July 30, 2019, we received an amended BO from FWS (see accession number 20190822-5071), thereby completing consultation under section 7(a)(2) of the ESA.

Pennsylvania has enacted the Endangered Species Coordination Act (under Pennsylvania House Bill 1576) to designate and protect state listed species. This EA provides general information related to impacts on state listed species in compliance with these state laws; however, the applicable state wildlife agencies would take the lead on any state permitting requirements and assessments related to state listed species (see section B.4.3.2 for more details).

4.3.1 Federally Listed Species

This section addresses species that have official status under the ESA (including officially proposed species). If additional species become listed under the ESA and these species have the potential to be impacted by the Amendment Project, then consultation with the Services would need to be reinitiated. It is possible that additional requirements or modifications to the Amendment Project may result from this re-initiation of consultation.

Species listed under the ESA as threatened or endangered are afforded the highest level of federal protection regarding limits to impacts on the species and habitats. Through consultation with the applicable federal agencies, six federally listed threatened or endangered species were identified. These species include two mammals, two invertebrates, one reptile, and one plant species (FWS 2014; NMFS 2014). There is no Designated Critical Habitat for any ESA listed species in the Amendment Project area (FWS 2014; FERC 2017b). Table B.4.3-1 describes the federally listed species addressed in the Certificated Project's BA. A summary of each species follows.

Table B.4.3-1

Federally Listed Species

Species	Federal Status [a]	State Status [a]	Potential Occurrence in the Amendment Project Area	Preferred Habitat
Mammals				
Indiana bat (Myotis sodalist)	E	E	All counties	Winter habitat consists of caves or mines. Summer roosting habitat consists of dead or dying trees, or trees with exfoliating bark.
Northern long-eared bat (Myotis septentrionalis)	T	SC	All counties	Winter habitat consists of caves or mines. Summer roosting habitat consists of dead or dying trees, or trees with exfoliating bark.
Reptiles				
Bog turtle (Glyptemys muhlenbergii)	T	E	Carbon (Aquashicola drainage only) and Northampton	Wetland bogs that have deep organic soils, and a spring-fed hydrology. These wetlands are typically surrounded by an open canopy with a minimal presence of woody species.
Plants				
Northeastern bulrush (Scirpus ancistrochaetus)	E	E	Carbon and Northampton	Small wetlands, sinkholes, or wet depressions.
Invertebrates				
Rusty patched bumble bee (Bombus affinis)	E	-	N/A	Grasslands and tallgrass prairies of the Upper Midwest and Northeast. Needs areas that provide food (nectar and pollen from flowers), nesting sites (underground and abandoned rodent cavities or clumps of grasses above ground), and overwintering sites for hibernating queens (undisturbed soil).
Dwarf wedgemussel (Alasmidonta heterodon)	E	E	N/A	Regionally in the Delaware River, as well as some smaller tributaries of the Delaware River.

Notes:
[a] E = endangered, T = threatened, SC = special concern.

4.3.1.1 Indiana Bat and Northern Long-Eared Bat

The Indiana bat is federally, and state listed as endangered. It was federally listed as endangered under the ESA on March 11, 1967 (32 FR 4001). It is a small insectivorous bat with grayish brown fur, weighing 0.25 ounce with a wingspan of 9 to 11 inches. Indiana bats hibernate during the winter in caves or occasionally abandoned mines, typically from November through March. Hibernacula need to be cool and humid with stable temperatures under 50° F, but still above freezing, and typically have large caverns with lengthy passages that can accommodate large volumes of bats (FWS 2006). In April and May, Indiana bats migrate to their summer roosting sites, which include dead or dying trees, or live trees with exfoliating bark. Roost trees may be in upland areas or floodplain forests and occasionally in manmade structures, such as sheds or bridges. Large trees of species such as shagbark hickory (*Carya ovata*) and white oak (*Quercus alba*) are often preferred roost sites. Reproductive females roost in trees that receive sunlight for most of the day, such as those within canopy gaps, along fence lines, or wooded edges. Indiana bats also forage within wooded riparian corridors, along streams, and along forest edges (FWS 2007). The Amendment Project does not cross any known bat hibernacula, swarming areas, or maternity colonies for the Indiana bat.

The northern long-eared bat was listed by the FWS as threatened on April 2, 2015 (80 FR 17974), and the listing became effective on February 16, 2016 with a final 4(d) rule, which established special regulations specific to the conservation needs of the northern long-eared bat under section 4(d) of the ESA

(81 FR 1900). This species is a medium-sized bat about 3-3.7 inches from head to tail with a wingspan of 9-10 inches and brown fur. As its name suggests, its distinguishing characteristic is its long ears. Northern long-eared bats spend winter hibernating in caves and mines, and during the summer they roost singly or in colonies underneath bark in cavities or crevices of live and dead trees (FWS 2015). The main threat to the northern long-eared bat is White Nose Syndrome, a fungal disease affecting many hibernating U.S. bat species that has caused a precipitous decline in bat numbers (81 FR 1900). This species of bat is more of a habitat generalist than the Indiana bat, but their habitat requirements are similar. Therefore, habitat assessments and surveys for the two species often focus on the same areas and criteria. The Amendment Project does not cross through or within 0.25 mile of any known bat hibernacula or within 150 feet of any maternity colonies for the northern long-eared bat but would impact about 2.8 acres of swarming areas (i.e., areas within 5 miles of a hibernaculum).[17]

PennEast conducted surveys for listed bat species, in coordination with the FWS and the PAGC, to support the analysis found in the 2017 BA and BO. The results of these surveys are provided in the 2017 EIS, BA, and BO (FERC 2017a, 2017b, and FWS 2017). Five additional mist net surveys for listed bat species have been conducted since the BA/BO to support of the proposed Amendment Project addressed in this EA. These mist net surveys were conducted following the FWS guidelines and under the supervision of FWS permitted biologists. One hundred and twenty-nine bats representing five species were captured during these surveys. Species captured included 1 federally listed species (a non-reproductive adult male northern long-eared bat), as well as 128 non-listed species (i.e., 118 big brown bats, 7 eastern red bats, one little brown bat, and two hoary bats). On May 22, 2019 the FWS determined that no additional mist net surveys would be required for the proposed Amendment Project.

Impacts on northern long-eared bats can be addressed through either the final 4(d) rule, or through the traditional section 7 consultation process. As a result of the final 4(d) rule, incidental take of northern long-eared bats within the White Nose Syndrome zone[18] (which encompasses the Amendment Project) is not prohibited, except (1) within hibernacula, or resulting from an action affecting a hibernacula entrance, (2) as a result of tree removal within 0.25 mile of hibernacula, and/or (3) as a result of tree removal within 150-foot radius of maternity roost tree between June 1 and July 31 (81 FR 1900). Projects with a federal nexus can elect to use the "*Optional Framework to Streamline Section 7 Consultation for the Northern Long-eared Bat*" (FWS 2016a) and request coverage under the FWS "*Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions*" (FWS 2016b). However, such projects must not involve incidental take prohibited under the final 4(d) rule, and if prohibited incidental take of northern long-eared bats may occur as the result of a project, standard ESA Section 7 consultation procedures apply (FWS 2016a). The FERC has chosen to use the standard ESA Section 7 consultation procedures for the northern long-eared bat (FERC 2017b, FWS 2017).

No direct impacts on mines and caves (i.e., habitats used as hibernacula by these listed bat species) are expected to occur as these habitats would not be directly crossed by the Amendment Project. However, indirect impacts are possible if construction were to occur in winter and early spring near mines or caves when bats are hibernating. As stated above, there are no known bat hibernacula within 0.25 miles of the Amendment Project, but it is possible that unknown hibernacula (e.g., caves) are located within 0.25 miles.[19] Disturbed bats could flee the mines and caves, thereby using up limited bodily energy reserves

[17] Note that the distance criteria of 0.25 miles of hibernacula and 150 feet of maternity colonies are specified in the FWS 4(d) rule for the northern long-eared bat and are not directly applicable to the Indiana bat.

[18] The White Nose Syndrome Zone consists of counties with documented White Nose Syndrome, plus a 150-mile buffer (81 FR 1900).

[19] The FWS has concluded that a 0.25-mile buffer around mines and caves provides adequate protection from indirect impacts (e.g., disturbance and disruption) to northern long-eared bat hibernacula and hibernating colonies (FWS 2016b), that no clearing of trees is allowed within 0.25 mile of hibernacula, and that any project activity with the potential to impact bats such as filling, excavation, blasting, noise, or the production of smoke should be restricted within this 0.25-mile buffer area.

that are critical during hibernation, potentially resulting in mortality. We received a comment about possible impact on bats in the area of Hexenkopf Hill/Ridge which is near the Certificated Route. The Freemansburg Ave Realignment is the nearest modification and would be about 4 miles from this area, therefore the Amendment Project would not affect this area.

During warmer months, the Indiana bat and northern long-eared bat occupy forested habitats where they roost and forage. Construction of the Amendment Project would disturb a total of approximately 50 acres of forested habitats (see section B.4.1), which could potentially support these bat species. Young bats or those that are unable to fly could be killed if tree clearing activities occur while the trees are occupied by bats. In addition, bats are sensitive to disturbance and may abandon disturbed roosts trees if the trees are occupied at the time of construction. If this occurs, then the disturbance and subsequent abandonment could have energetic repercussions on affected bats, potentially decreasing the likelihood of successful reproduction and survival. Therefore, to minimize the potential impact that tree clearing could have to listed bat species, PennEast has committed to following the FWS-required timing restrictions for tree clearing (i.e., only clearing between November 1 and March 31), in locations deemed appropriate by the FWS. Additionally, PennEast has agreed to follow the recommendation made by PGC to only harvest/clear tree species greater than 5-inch dbh between November 1 and March 1 (PGC 2014; Taucher 2014).

The Amendment Project also has the potential to impact listed bat species during operation. Noise, visual, and ground-vibration disturbance would occur during certain operation and maintenance-related activities (e.g., during routine inspections of the line). Potential disturbance to listed bat species could occur during ongoing maintenance activities, and disturbances to bats can result in individuals fleeing the area, thereby using up critical limited energy reserves, which can potentially result in mortality (see discussion above for construction related disturbance impacts).

PennEast would be required to adhere to all conditions and requirements for the Certificated Project and BA (FERC 2017a and 2017b), the Certificate Order (FERC 2018), and the FWS' BO (FWS 2017). These measures would minimize impacts on listed bat species; however, take of listed bats would still be possible. Based on the scope, extent, and location of the four proposed modifications assessed in the EA, we have concluded that the currently proposed Amendment Project would not result in effects above what was analyzed in the 2017 BA or BO. FWS has concurred in the amended BO issued July 30, 2019 and consultation has been completed.

4.3.1.2 Bog Turtle

The bog turtle is native to the eastern United States and ranges from Georgia to the lower New England states. It is listed as threatened under the ESA (62 FR 59605; November 4, 1997) and endangered by the state of Pennsylvania. Bog turtles inhabit distinct types of wetland habitats that include spring-fed hydrology and mucky soils. Clear groundwater with rivulets (i.e., a very small stream) and shallow pockets of surface water typify the hydrology of bog turtle wetlands, and subterranean tunnels with flowing water are used by bog turtles both in winter for hibernation and during the hot summer months. Deep, organic, mucky soils in which bog turtles can burrow are an important component of their habitat. An open canopy with minimal woody species is also important to allow for sufficient sunlight for basking and nesting, though some shrubs and small trees may be scattered throughout a predominantly emergent wetland. Bog turtles can sometime be found hiding among the roots of woody plant species such as willows and alders. Bog turtles typically emerge from hibernation in late March or early April, and return to hibernacula in late October, depending on weather conditions. Breeding occurs from late April through early June, with nesting typically occurring from June through early July. Eggs are laid on top of vegetation such as tussock sedge or sphagnum moss. Hatchlings emerge from the nest from August through September and overwinter near their nest (PFBC 2011a).

PennEast conducted Phase 1 and Phase 2 surveys for bog turtles in wetlands, in accordance with federal bog turtle survey guidelines as established by the FWS Bog Turtle Recovery Plan (FWS 2001), to support the analysis found in the 2017 BA and BO.[20] The results of these surveys are provided in the FEIS for the Certificated Project, BA, and BO (FERC 2017a, 2017b, and FWS 2017). An additional 53 Phase 1 surveys have been conducted since the BA/BO in support of the proposed Amendment Project addressed in this EA, which covers 100 percent of the wetlands requiring Phase 1 surveys along the proposed Amendment Project. An additional 16 Phase 2 surveys have been conducted in habitats identified as potential bog turtle habitat during the Phase 1 surveys along the proposed Amendment Project covered in this EA. Two occupied bog turtle habitats were identified along the proposed Appalachian Trail PPL Crossing Realignment.

Construction of the Amendment Project within wetland habitats has the potential to impact bog turtles. If present during construction, bog turtles could be directly injured or killed by construction equipment or disturbed due to the presence of humans and machines in the area. In addition, construction and operation of the Amendment Project could alter wetland habitats that support this species. As discussed in detail in the previous sections, construction of the Amendment Project has the potential to alter wetland hydrology, increase the risk of invasive plant establishment/spread, and can fragment habitats. PennEast would be required to follow the FERC's Plan and Procedures which would minimize the effects of potential altered wetland hydrology, invasive plant establishment/spread, and fragmentation, but the measures outline in these plans would not completely prevent all risks of invasive plants or fragmentation, and wetland hydrology would likely be temporarily altered during construction. Impacts from invasive plants and habitat fragmentation have been identified as two of the primary factors that currently threaten this listed species (NRCS 2016; PFBC 2016). For example, fragmentation of connected wetlands limits the bog turtle's ability to find mates and new habitat and increases the amount of edge around the wetlands. This increased edge provides habitat for predators and increases the likelihood of invasion by non-native and non-wetland plants, which can compete with native wetland plants and degrade the habitat quality of the wetland for the bog turtle.

In accordance with the Terms and Conditions of the BO, PennEast is coordinating with the FWS in order to determine appropriate Amendment Project design features and wetland crossing methods to be used to avoid and minimize impacts to bog turtles. For the occupied bog turtle habitat in Carbon County, PennEast has agreed to use a trenchless boring technique to cross the habitat, which would not require hydraulic fluids and would avoid the potential for the inadvertent return of drilling fluids to the occupied habitat. For the occupied bog turtle habitat in Northampton County, PennEast has incorporated minor route adjustments to avoid much of the occupied wetland (routing through the narrowest point of the wetland) and would utilize a trenchless boring technique (as discussed above). PennEast would continue to work with the FWS to determine and implement the appropriate measures necessary to avoid and minimize impacts to bog turtles and develop a final bog turtle mitigation plan. This plan has yet to be provided to the FERC and FWS for review and approval. This outstanding information is addressed by Environmental Condition 36 of the Certificate Order that would also apply to the Amendment Project.

PennEast would be required to adhere to all conditions and requirements for the Certificated Project and BA (FERC 2017a and 2017b), the Certificate Order (FERC 2018), and the FWS' BO (FWS 2017). These measures would minimize impacts on bog turtles; however, take of bog turtles would still be possible. Based on the scope, extent, and location of the Amendment Project, and the proposed modifications to the wetland crossings at the occupied habitats, we have determined that the currently proposed Amendment

[20] PennEast's conducted Phase 1 surveys for bog turtles within all delineated wetlands within the 400-foot-wide survey corridor around the Project, followed by a Phase 2 survey in any wetlands that are identified as potential bog turtle habitat during the Phase 1 surveys (as outlined in the FWS Bog Turtle Recovery Plan).

Project would not result in effects above what was analyzed in the 2017 BA or BO. FWS has concurred in the amended BO issued July 30, 2019 and consultation has been completed.

4.3.1.3 Northeastern Bulrush

The northeastern bulrush is a wetland dependent plant species. This species was listed as endangered under the ESA on May 7, 1991 (56 FR 21091). The northeastern bulrush is tall, with narrow leaves and a drooping flower head with chocolate-brown florets. Like other sedges, northeastern bulrush grows in small wetlands, sinkhole ponds, or wet depressions with seasonally fluctuating water levels. It may be found at the water's edge, in deep water, or in just a few inches of water. During dry spells the plant may be found growing in areas where there is no water visible (FWS 2006, FWS 1993).

To support the analysis found in the 2017 BA and BO, PennEast conducted surveys for northeastern bulrush in wetlands located above 790 feet in elevation. The results of these surveys are provided in the FEIS for the Certificated Project, BA, and BO (FERC 2017a, 2017b, and FWS 2017). Additional surveys have been conducted since the BA/BO to support of the proposed Amendment Project addressed in this EA. To date, PennEast has competed all wetland delineations and surveys for northeastern bulrush along the proposed Amendment Project route. No northeastern bulrush or appropriate habitats were identified during these surveys. Therefore, the likelihood of northeastern bulrush occurring in the Amendment Project area is low.

PennEast would be required to adhere to all conditions and requirements for the Certificated Project and BA (FERC 2017a and 2017b), the Certificate Order (FERC 2018), and the FWS' BO (FWS 2017). These measures would minimize impacts on northeastern bulrush if this species is present; however, the likelihood of this species occurring in the Amendment Project area is low. Based on the scope, extent, and location of the Amendment Project, and the low likelihood of this species occurring in the Amendment Project area, we have determined that the currently proposed Amendment Project would not result in effects above what was analyzed in the 2017 BA or BO. FWS has concurred in the amended BO issued July 30, 2019 and consultation has been completed.

4.3.1.4 Rusty Patched Bumble Bee

The FWS proposed listing the rusty patched bumble bee as endangered under the ESA on September 22, 2016 (81 FR 65324), and formally listed this species as endangered under the ESA on January 11, 2017 (82 FR 3186). The listing status was then delayed until March 21, 2017 (82 FR 10285). Rusty patched bumble bees live in colonies made up of a single queen and female workers. All rusty patched bumble bees have entirely black heads and workers and males have a rusty reddish patch centrally located on the second abdominal segment of the back. Historically, rusty patched bumble bees occupied grasslands and tallgrass prairies of the Upper Midwest and Northeast, many of which have been lost, degraded, or fragmented by conversion to other uses. This species requires areas that provide food (e.g., nectar and pollen from flowers), nesting sites (e.g., underground and abandoned rodent cavities or clumps of grasses above ground), and overwintering sites for hibernating queens (e.g., undisturbed soil). In spring, a solitary queen finds a suitable nest site, collects nectar and pollen from flowers, and begins laying eggs, which are fertilized by sperm she has stored since mating the previous fall. Workers hatch from these first eggs and the colony grows as workers collect food, defend the colony, and care for young. The queen remains within the nest and continues laying eggs. In late summer, new queens and males also hatch from eggs. Males disperse to mate with new queens from other colonies (FWS 2016c).

The FWS has indicated that Pennsylvania is no longer considered within the extant range of the rusty patched bumble bee (FWS 2017c). Therefore, this species is not likely present within the Amendment Project area and is not addressed further in this analysis.

4.3.1.5 Dwarf Wedgemussel

The dwarf wedgemussel is a federal (55 FR 9447) and state-listed endangered freshwater mussel that occurs in the Delaware River and its sub-basins. This species is rarely greater than 1.5 inches in length. It prefers muddy sand to sand and gravel/pebble river bottoms and creeks with slow to moderate currents. Additionally, they prefer relatively shallow, clean water with low levels of silt deposition. Adults are filter-feeders that strain plankton, bacteria, and other particles from the water column. The larval stage of this species is parasites that feed on host fish. Fish species that often serve as host species include the tessellated darter (*Etheostoma olmstedi*), mottled sculpin, and slimly sculpin (*Cottus cognatus*; CWFNJ 2012).

The dwarf wedgemussel was included in the BA prepared for the Certificated Project; however, the Amendment Project would not impact the Delaware River or its tributaries and would have no effect to the dwarf wedgemussel. As a result, this species is not addressed further in this analysis.

4.3.2 State-listed Species

In addition to the federally listed species discussed above, there are state-listed species that may potentially occur along the Amendment Project route. Table B.4.3-2 lists the state listed wildlife species that could potentially occur along the Amendment Project.

PennEast has stated that it would adhere to the recommendations and requirements of the respective state agencies with jurisdiction over state listed species and state species of concern (e.g., PGC, PFBC, and PADCNR) in order to avoid or minimize impacts on these species, including completing all necessary surveys for state species. Ongoing permit review by Pennsylvania may result in the identification of additional avoidance, minimization, or mitigation measures that would be attached as permit conditions. In general, we believe that relying on state-level experts for the development of measures that would minimize impacts on state listed species and state species of concern would appropriately avoid or reduce impact on these species. However, all mitigation measures would need to be consistent with, and not contradictory to, any measures required by our review and attached to the Commission's authorization to the Amendment Project if so authorized. This requirement is addressed by Environmental Condition 39 of the Certificate Order, which would also apply to the Amendment Project.

Table B.4.3-2

State Listed Wildlife Species Potentially Occurring in the Vicinity of the Amendment Project (excluding those that are also federally listed)

Species	State Status [a]	Counties/ State/ Location	Preferred Habitat
Mammals			
Northern Flying Squirrel (Glaucomys sabrinus macrotis)	E	Carbon County, PA	Mature forested habitat
Allegheny woodrat (Neotoma magister)	T	Carbon and Northampton, PA	Caves, rocky cliffs, ridge crests, overhangs and boulder fields with deep crevices and underground chambers.
Eastern Small-Footed Bat (Myotis leibii)	T	Carbon and Northampton, PA	Deciduous and coniferous forest.
Reptiles and Amphibians			
Timber Rattlesnake (Crotalus horridus)	C	Luzerne, Carbon, and Northampton, PA	Deciduous forest habitat with at least 70 percent canopy cover, rocky hillsides and outcrops for use as hibernacula and exposed rocks for basking.
Eastern Redbelly Turtle (Pseudemys rubriventris)	T	N/A *(Delaware River, which is not crossed by the Amendment Project)*	Large bodies of water, including ponds, lakes, and rivers.
Northern Cricket Frog (Acris crepitans)	E	Carbon, PA	Shallow ponds with slow moving water.
Birds			
Osprey (Pandion haliaetus)	T	N/A *(Bucks County, which is not crossed by Amendment Project)*	Areas close to large bodies of water.

Note:
[a] E = endangered, T = threatened, C = Candidate

4.3.2.1 Mammals

The northern flying squirrel is a state endangered species in Pennsylvania. While this species was once found across northern Pennsylvania, it is now limited to conifer forest habitats mostly in the Pocono region (Butchkowski and Turner 2010). Largely a nocturnal species, this small squirrel makes use of mature forested habitat.

The Allegheny woodrat is a state threatened species in Pennsylvania. The Allegheny woodrat inhabits caves, rocky cliffs, ridge crests, overhangs, and boulder fields with deep crevices and underground chambers. The woodrat hoards leafy twigs, seeds, nuts, and mushrooms in and around its expansive nest, which is constructed of leaves, twigs, and moss under cover within the rocky habitat (PGC 2008).

The eastern small-footed bat is a state threatened species in Pennsylvania and is also a priority species in Pennsylvania's wildlife action plan. While this species was proposed for federal listing due to losses from White Nose Syndrome, it was determined that the listing was not warranted (Butchkowski 2014). This bat inhabits deciduous and coniferous forest, with the majority of reported sightings occurring in forested uplands within the Ridge and Valley Physiographic Province (Butchkowski 2014).

At the request of the PGC, PennEast conducted Phase 1 surveys for the eastern small-footed bat and Allegheny woodrat along the Appalachian Trail PPL Crossing Realignment in 2017 and 2018. Potential habitat for both species were identified between MP 51.3R3 and MP 52.5R3. No sign of

Allegheny woodrat occupancy was observed during these surveys. Following Phase 1 surveys, PennEast conducted Phase 2 emergence surveys for eastern small-footed bat at 24 areas of potential habitat following PGC protocol; however, no eastern small-footed bats were detected during these surveys either. Several areas of potentially suitable summer roosting habitat for eastern small-footed bats were identified along the Saylor Ave Realignment Modification during Phase 1 surveys, with Phase 2 emergence surveys planned in these areas for the 2019 survey season.

Potential impacts to state listed mammals would be similar to those discussed above for general wildlife species. Impacts could result from the clearing of forested areas that provide both denning sites and foraging habitat, as well as the possibility of vehicular traffic and construction noise impacts that may affect denning and exclusion of state listed species in the right-of-way. As a result, PennEast has committed to conducting all tree clearing activities in areas identified by PGC between April 15 and June 15. Noise and vehicular traffic from heavy equipment are expected to be temporary and limited to the construction window in the forested habitat. Permanent impacts would include the conversion of upland forested habitat to herbaceous open field habitat within the permanent pipeline right-of-way.

In addition to the timing restrictions described above, PGC requires a northern flying squirrel mitigation plan related to the loss of this species habitat as a result of the Amendment Project. This plan may include, but is not limited to, the replanting of temporary right-of-way areas with various conifer species, monitoring of five years to ensure 80 percent survival and the installation of glide poles to facilitate passage across the cleared right-of-way. PennEast has not yet developed this plan but has committed to working with the state agencies to develop this plan. This commitment is a mandatory requirement of the Certificate Order under Environmental Condition 1 and shall apply to the Amendment Project. The Habitat Mitigation Plan, developed with PGC, will be sufficient to protect the northern flying squirrel.

Based on our analysis and through implementation of the mitigation described above, we have determined that impacts on state listed mammals would not be significant.

4.3.2.2 Reptiles and Amphibians

The timber rattlesnake is listed as a candidate species by Pennsylvania. It is a venomous snake that occurs in deciduous forest habitat with at least 70 percent canopy cover, rocky hillsides and outcrops for use as hibernacula, and exposed rocks for basking (PFBC 2011b).

The northern cricket frog is a state endangered species in Pennsylvania. They inhabit areas with shallow ponds with slow moving water that are typically sunny and contain floating algal mats and abundant shoreline vegetation. Breeding takes place between June and July.

The eastern redbelly turtle is a state threatened species in Pennsylvania. It is a large, aquatic, basking turtle that prefers larger bodies of water, including ponds, lakes, and rivers, with a soft-bottom substrate in which they can hibernate (Virginia Department of Game and Inland Fisheries 2016, Crisswell 2012). This species uses nesting sites that are within approximately 1,000 feet of large waterbodies and are open and sunny with low vegetation (Crisswell 2012). The eastern redbelly turtle is not expected to occur along the proposed Amendment Project, and is not addressed further in the EA.

Habitat assessment surveys for the northern cricket frog were conducted by PennEast (via a qualified herpetologists) upon request by the PFBC, within the Hickory Run watershed. Suitable habitat was identified, and subsequent presence/absence surveys were conducted by PennEast, and no northern cricket frogs were found during these surveys. PennEast conducted Phase 1 timber rattlesnake surveys along the Appalachian Trail PPL Crossing Realignment, and two areas of potential denning habitat totaling 43 acres and 28 acres of potential gestating habitat were identified. PennEast conducted Phase 2 surveys in potential denning habitats in April and May 2017; however, no timber rattlesnake dens were documented,

and no live timber rattlesnakes were observed. One dead timber rattlesnake was observed during wetland delineations along the Appalachian Trail PPL Crossing Realignment, and the PFBC was notified of its location in a letter dated September 13, 2018.

For areas that were identified as potential habitat for the timber rattlesnake, PennEast has committed to following the PFBC recommendations to minimize impacts on this species:

- informing site workers about the proximity of areas to rattlesnakes, the regulations addressing timber rattlesnakes, and who to call if timber rattlesnakes enter the work areas;
- developing a Timber Rattlesnake Pre-Construction Encounter Plan to ensure the safety of both construction workers and snakes;
- avoiding habitat during construction, and restore any gestation habitat that is impacted following PFBC guidelines (PFBC 2010);
- avoiding denning habitat identified during surveys and adhering to a 300 foot no disturbance buffer around these dens; and
- using a qualified rattlesnake monitor on-site during construction in suitable habitats between April 15 and October 15.

As required by Environmental Condition 39 of the Certificate Order, which also applies to the Amendment Project, PennEast must continue to consult with applicable state wildlife agencies as needed to finalize the plan necessary to avoid or minimize impacts on the timber rattlesnake as well as develop appropriate mitigation measures to avoid or minimize the Amendment Project's impact on other state listed species.

Based on our analysis and the mitigation described above, we have determined that impacts on state listed reptiles and amphibians would not be significant.

4.3.2.3 Birds

The osprey is state-threatened in Pennsylvania. Ospreys are primarily fish-eating birds-of-prey that inhabit areas close to large bodies of water. They are often observed hovering over water when fishing, carrying fish and when engaging in aerial courtship displays. Ospreys nest in close proximity to water in live trees and dead snags, but in recent years have been shown to have a preference for human-made structures such as artificial nesting platforms as well as cell phone and electric transmission towers. Migrating ospreys arrive in the Northeast from overwintering locations in the south every year typically from the last week of March through early May. Ospreys are not noted as occurring in the counties crossed by the Amendment Project. However, we have included an assessment of potential impacts on this species due to the uncertainty regarding their distribution and the proximity of Bucks County to the Amendment Project area. Potential impacts to the osprey would be similar to those discussed above for general wildlife species and migratory birds. PennEast has committed to conduct work in osprey restricted areas identified by the PGC between August 1 and March 24. PennEast would also be required to follow all restrictions found in the MBTA related to impacts on migratory birds and would be required to develop a Migratory Bird Conservation Plan developed in consultation with FWS. Therefore, we have determined that impacts on state listed birds would not be significant.

4.3.2.4 Plants

Several plant species that could potentially be impacted by the Amendment Project are listed by Pennsylvania as threatened or endangered. These plant species include variable sedge (*Carex polymorpha*; endangered), white fringed orchid (*Platanthera blephariglottis*; endangered); Collin's sedge (*Carex collinsii*; endangered); rough-leaved aster (*Eurybia radula*; endangered); bog sedge (*Carex paupercula*;

threatened); spotted pondweed (*Potomogeton pulcher*; endangered); wild bleeding hearts (*Dicentra exima*; endangered); sweet-gale (*Myrica gale*; threatened); and torrey's bulrush (*Schoenoplectus torreyi*; endangered). PennEast submitted a Rare Plant Mitigation Plan to the PADCNR on April 19, 2018, which contained measures that would avoid and minimize impacts to rare plant species. In its May 22, 2018 response, the PADCNR agreed with the plan's content but requested that PennEast also incorporate a 3-year annual monitoring program into the plan. PennEast has since updated the Rare Plant Mitigation Plan to include the requested 3-year monitoring program. As stated earlier, we believe that relying on state-level experts for the development of measures that would minimize impacts on state listed species would appropriately avoid or reduce impact on these species and have not required additional measures for state listed plants beyond what has been required by PADCNR.

Through implementation of PennEast's mitigation measures, including the Rare Plant Mitigation Plan, we have determined that impacts on state listed plants would not be significant.

5.0 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires FERC to consider the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. PennEast, as a non-federal party, is assisting us in meeting our obligations under Section 106 of NHPA and implementing regulations at 36 CFR 800.

5.1 Survey Results and Consultations

We sent copies of our NOI for the Amendment Project to a range of stakeholders, including the ACHP, Pennsylvania State Historic Preservation Office (SHPO), NPS and 13 federally recognized tribes (tribes). The NOI, issued on March 15, 2019, stated that we use the NOI to initiate consultations with SHPO and to solicit their views and those of other government agencies, interested tribes, and the public on the Amendment Project's potential effect on historic properties. In response to review of the NOI, NPS commented that it supports the modification that would cross the ANST adjacent to an existing cleared powerline corridor and recognizes this as a positive modification over previous alternatives proposed to cross the ANST by the Certificated Route. In a letter dated August 19, 2019, the SHPO concurred with the finding of *No Adverse Effect* for the pipeline components of the Amendment Project, noting that the proposed route would be collocated with an existing transmission line corridor. We agree.

The SHPO requested additional information regarding the Certificated Route, detailing concerns about possible impacts to the viewshed. However, the Amendment Project would revise the Certificated Project footprint at the location that the SHPO has raised concern. The Amendment Project avoids the potential viewshed impacts of the Certificated Route.

PennEast provided the results of cultural resource investigations to SHPO for the Amendment Project. Over the period from September 2015 through March 2019, PennEast performed both archaeological and historic structures cultural resources surveys of the entirety of the Area of Potential Effect (APE) of the Amendment Project. The SHPO corresponded with PennEast and FERC over the period from 2015 through 2019, expressing concerns about potential impacts and reviewing PennEast responses and survey report results. For two archaeological sites within the Amendment Project (36NM0328, and 36CR0151), the SHPO concurred they are eligible for listing in the NRHP. At site 36NM0328, Phase II fieldwork demonstrated that Locus 1 and Locus 8 contribute to the significance of the site and a Data Recovery Workplan was developed that will recover data from features, recover associated artifacts, and will include special analyses such as radiocarbon dating, use-wear analysis of selected artifacts, and analysis of selected botanical specimens. At site 36CR0151, a Data Recovery Workplan

includes additional background research, excavation of 50 percent of Locus I of the site, full excavation of all exposed features, analysis of associated artifacts and specialized analyses including radiocarbon dating, use-wear analysis of selected artifacts, and analysis of selected botanical specimens. The SHPO has also concurred with PennEast's treatment for other archaeological sites that are located in or adjacent to the Amendment Project's APE. Based on the impacts to historic properties, FERC submitted a finding of adverse effects to the ACHP on August 15, 2019 and sites 36NM0328 and 36CR0151, which are within the Amendment Project area, were included.[21] All correspondence between PennEast and the SHPO regarding the Amendment Project is filed in the public record under docket CP19-78-000.

5.2 Unanticipated Discovery Plan

In the event that unanticipated finds are uncovered during Amendment Project construction, PennEast would implement the procedures outlined its *Unanticipated Discovery Plan* (UDP). PennEast submitted a UDP to the SHPO on August 30, 2019 and filed it with FERC. We find the UDP acceptable.

5.3 Compliance with the National Historic Preservation Act

To ensure that the Commission meets its responsibilities under Section 106 of the NHPA, Environmental Condition 51 of the Certificate Order requires that PennEast file any outstanding information required to meet its responsibilities and that the Section 106 consultation process is complete prior to construction. This condition would also apply to the Amendment Project.

6.0 LAND USE, RECREATION, AND VISUAL RESOURCES

6.1 Land Use

Construction of the Amendment Project would impact a total of about 106.2 acres. About 63.8 acres (60.1 percent) of this would be utilized for temporary workspace and ATWS for construction. The remaining 42.4 acres (39.9 percent) affected during construction would be associated with permanent easements acquired to operate the pipeline facilities. Of this about 23.3 acres would be maintained during operation. The Amendment Project would cross the ANST perpendicularly and would be collocated to an existing high-voltage powerline right-of-way that is approximately 100-feet wide. The centerline of the pipe would be located within the western edge of the existing PPL right-of-way. Appendix B contains the crossing plan for the ANST. The crossing of the ANST would be on property owned by the PGC. The existing powerline right-of-way is actively maintained, and vegetation cover is primarily mixed grasses and forbs with sporadic shrubs and saplings. PennEast would use approximately 70 feet of temporary construction workspace within this existing powerline right-of-way. PennEast's permanent right-of-way across the ANST would be 30 feet wide, approximately half of which would overlap with the existing PPL right-of-way. Construction and operation of the Amendment Project would result in approximately 15 feet of tree clearing along this western edge, which is currently relatively-young, deciduous hardwood forest.

This section describes the land requirements for construction and operation of the Amendment Project, the current use of the lands, and an evaluation of the Amendment Project-related impacts. PennEast used field surveys, aerial imagery, and PASDA GIS layers to evaluate land use cover types.

6.1.1 Environmental Setting

Six general land use types would be affected by the Amendment Project, which include open land, agricultural, forest/woodland, industrial/commercial, residential, and waterbodies. Table B.6.1-1

[21] The FERC finding of adverse effect and the subsequent ACHP letter refer to effects to the two sites within the Amendment Project area and an additional site, 36LU0110, within the Certificated Route and therefore not addressed within this document (accession number 20190815-3010).

summarizes the acreage of each land use type that would be affected by construction and operation of the Amendment Project. The definitions of each land use type are as follows:

- Open Land- includes non-forested lands such as grasslands and shrub scrub vegetation with few mature trees, or maintained utility right-of-way;
- Agricultural/Cropland- includes active or rotated croplands, pastures, orchards, vineyards, and/or hay fields;
- Forests/Woodland- includes mixed oak forest and forested wetlands; and
- Industrial/Commercial- includes electric power lines or gas utility stations, manufacturing or industrial plants.

The primary land use types affected during construction would be forest/woodland (49.6 acres; 46.7 percent), agricultural land (33.4 acres; 31.4 percent), industrial/commercial land (15.6 acres; 14.6 percent), and open land (7.6 acres; 7.1 percent). The Amendment Project would not currently affect open water or residential land.

6.1.2 Pipeline Facilities

PennEast's Amendment Project would involve four route modifications of four locations previously approved in the Certificated Project, the Blue Mountain Lateral, and the Blue Mountain Interconnect, to meet the purpose and need of the Amendment Project.

6.1.3 Aboveground Facilities

The only associated aboveground facility would be the Blue Mountain Interconnect. The facility would be located at MP49.7R3 in Carbon County, Pennsylvania. The 0.5 mile, 4-inch-diameter Blue Mountain Lateral would connect the new facility to the mainline. A side valve would be installed where the Blue Mountain Lateral connects to the mainline portion of the Appalachian Trail PPL Crossing Realignment. The location of the Blue Mountain Interconnect, owned by Blue Mountain Resort, would be predominantly forested.

6.1.4 Access Roads

The existing public and private roads would be used to the extent practicable, however, seven access roads would be necessary for the Amendment Project. Six of the roads are within the Appalachian Trail PPL Crossing Realignment, three of which are temporary. One temporary access road would be required for the Interstate 81 Workspace Adjustment. The majority of the proposed private access roads would require minor improvements. These improvements may include tree branch clearing, gravel placement, and/or access path widening. Refer to table B.6.1-2 for a list of the proposed access roads associated with the Amendment Project.

6.1.5 Construction and Permanent Right-of-Ways

Acquisition of both temporary and permanent right-of-way, along with ATWS would be required for the construction and operation of the Amendment Project. PennEast intends to minimize cumulative impacts by collocating much of the proposed Amendment Project adjacent to or in proximity to existing utility corridors. PennEast would utilize a 100-foot-wide construction right-of-way and would retain a 50-foot-wide permanent right-of-way with the exception of the ANST crossing where PennEast would retain a 30-foot permanent right-of-way, but vegetation maintenance would be limited to a 30-foot-wide corridor. Negotiated easements would be used to confer rights-of-way by a landowner to PennEast, on either a permanent or temporary basis. These easements would not be expected to modify any existing

zoning regulations along the Amendment Project although construction of any structures within the permanent right-of-way would not be permitted.

Table B.6.1-1

Acreage of Vegetation and Land Use Types Affected by Construction and Operation of the Amendment Project [a]

Modification	Agricultural [b]		Commercial / Industrial [c]		Forest/ Woodland [d]		Open Land [e]		Total [f]	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Saylor Ave Realignment										
PennEast Mainline	0	0	1.3	0.4	3.3	1.2	0.1	0	4.7	1.5
Interstate 81 Workspace Adjustment										
PennEast Mainline	0	0	2.7	0	0.1	0	0	0	2.8	0
Appalachian Trail PPL Crossing Realignment										
PennEast Mainline	19.9	3.8	3.7	0.2	37.8	12.1	7.2	1.7	68.6	17.8
Blue Mountain Lateral	0	0	0	0	5.6	1.8	0	0	5.6	1.8
Blue Mountain Interconnect [g]	0.1	0	5.3	0	1.4	0	0	0	6.8	0.0
Freemansburg Ave Realignment										
PennEast Mainline	13.4	0.8	2.6	1	1.4	0.3	0.3	0.1	17.7	2.2
Total	33.4	4.6	15.6	1.6	49.6	15.4	7.6	1.8	106.2	23.3

Notes:

[a] Acreages include new permanent right-of-way for the pipeline and temporary right-of-way for construction of the Amendment Project (includes temporary right-of-way and ATWS). All units in acres and rounded to the nearest 0.1. Open water and residential land uses would not be affected by the modifications.

[b] Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields.

[c] Commercial or Industrial Land - Electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, and roads.

[d] Forest and Woodland - Tracts of upland forest or woodland that would be removed for the construction right-of-way or extra work or staging areas.

[e] Open Land - Non-forested lands and maintained utility right-of-way.

[f] The totals shown on this table may not equal the sum of addends due to rounding.

[g] Operational impacts were calculated using the 30-foot maintained right-of-way for all Modifications except for the Blue Mountain Interconnect, which has permanent aboveground impacts not included in the 30-foot corridor.

Table B.6.1-2

Access Roads Associated with the Proposed Amendment Project

Modification/Facility	Access Road ID	MP	County	State	Existing Condition	Length (feet)	Width (feet)	Improvement Needed	Improvement Distance	Proposed Use	Reason Needed
Saylor Ave Realignment											
PennEast Mainline	-	-	-	-	-	-	-	-	-	-	-
Interstate 81 Workspace Adjustment											
PennEast Mainline	AR-015CN	10.3R2	Luzerne	PA	Grass and gravel	504	20	Yes	175	Temporary	Access to support I-81 HDD
Appalachian Trail PPL Crossing Realignment											
PennEast Mainline	AR-048AN	49R3	Carbon	PA	Dirt and gravel	541	30	Yes	541	Temporary	Access to adjacent wareyard
PennEast Mainline	AR-048CN	51.4R3	Monroe & Northampton	PA	Dirt	2,757	30	Yes	2,757	Temporary	Access to facilitate crossing of Appalachian Trail
PennEast Mainline	AR-048DN	52.6R3	Northampton	PA	Dirt and gravel	1,007	15	Yes	1,007	Temporary	Access to facilitate crossing of Appalachian Trail
PennEast Mainline	AR-048EN	51.8R3	Northampton	PA	Dirt, grass, and forest	2,222	30	Yes	2,222	Permanent	Access to facilitate crossing of Appalachian Trail
Blue Mountain Lateral											
Blue Mountain Interconnect	AR-050	0.51R3	Carbon	PA	Paved and gravel	4,828	30	No	0	Permanent	Access for light and major equipment from the north for construction to the east and west
Blue Mountain Interconnect	AR-050AN	0R3	Carbon	PA	Dirt and gravel	3,110	30	Yes	2,560	Permanent	Access for Blue Mountain Side Valve
Freemansburg Ave Realignment											
PennEast Mainline	-	-	-	-	-	-	-	-	-	-	-

6.1.6 Existing Rights-of-Way

PennEast would collocate much of the construction right-of-way adjacent to or in proximity to existing utility rights-of-way. PennEast would collocate approximately 4.3 miles, or 61 percent, of the Amendment Project. Refer to table B.6.1-3 for details of each collocation associated with the Amendment Project. Table B.6.1-4 provides information on ATWS and staging areas. Table 6.1-5 provides information about width of the existing right-of-way used for temporary construction, the permanent right-of-way width used for operation of the Amendment Project, and the area of new permanent right-of-way required adjacent to the existing utility rights-of-way.

Table B.6.1-3

Right-of-Way Co-Location for the Amendment Project

Modification	Begin MP [a]	End MP [a]	Mileage Collocated [b]	Collocated
Interstate 81 Workspace Adjustment				
PennEast Mainline Pipeline	10.0R2	10.4R2	0.5	Powerline
Appalachian Trail PPL Crossing Realignment				
PennEast Mainline Pipeline	49.8R3	51.1R3	1.3	Powerline [c]
PennEast Mainline Pipeline	51.1R3	53.1R3	2.0	Powerline
Blue Mountain Lateral	0.0R3	0.5R3	0.5	Powerline [c]
Modifications Total			**4.3**	

Notes:

[a] All route deviations implemented after the Certificate Application for CP15-558, are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application for CP15-558.

[b] The totals shown in this table may not equal the sum of addends due to rounding.

[c] These areas of collocation do not currently contain active infrastructure.

6.1.7 Additional Temporary Workspaces and Staging Areas

The Amendment Project would require 28.1 acres of ATWS or staging areas. The ATWS would be used for topsoil segregation in agricultural fields, along with being used to facilitate construction at wetland, waterbody, or road crossings. The ATWS would also be used for areas where special crossing techniques are required. Staging areas would be used during hydrostatic testing, and for equipment and material storage associated with Blue Mountain Lateral and Interconnect. Refer to table B.6.1-4 for a list of ATWS and staging areas and refer to table B.6.1-5 for a summary of land requirements required for the Amendment Project.

Table B.6.1-4

Additional Temporary Workspaces and Staging Areas Associated with the Proposed Amendment Project

Modification/Facility	ATWS/Staging ID	MP	County	State	Reason Needed	Length (feet)	Width (feet)	Area (acres)	Existing Land Use
Saylor Ave Realignment									
PennEast Mainline	ATWS-1932	8.8R3	Luzerne	PA	Necessary for installing pipe with cold bends based upon the alignment adjustment to accommodate landowner development plans.	150	50	0.2	Com./Ind (CI), Forest (UF), and Open Land (OL)/right-of-way
Interstate 81 Workspace Adjustment									
PennEast Mainline	ATWS-1933	10R2	Luzerne	PA	Necessary for the fabrication and pullback of the pipe string associated with the Highway 315 / Interstate 81 Horizontal Directional Drill installation.	300	50	0.3	(CI) (UF)
PennEast Mainline	ATWS-1934	10.2R2	Luzerne	PA	Required for Highway 315 / Interstate 81 HDD entry location.	325	145	1.1	(CI)
PennEast Mainline	ATWS-1935	10.3R2	Luzerne	PA	Required for staging of materials and equipment associated with HDD of Highway 315/Interstate 81.	120	60	0.2	(CI)
Appalachian Trail PPL Crossing Realignment									
PennEast Mainline	Staging-C-10	49R3	Carbon	PA	End of Spread 2 / Beginning of Spread 3 Staging, use of tanks for hydrostatic testing of pipe.	630	400	5.0	Agricultural (AG), (UF), and Roadways (RD)
PennEast Mainline	Staging-C-11	48.9R3	Carbon	PA	Hydrostatic testing of Spreads 2 and 3; staging of tanks.	300	175	0.8	(AG), (UF), and Roadways (RD)
PennEast Mainline	ATWS-0416	53.5R3	Northampton	PA	ATWS-0416 is necessary to complete the crossing of 050217_MB_1001_P_IN, topsoil segregation in the agricultural field and the crossing of SR 4014.	800	35	0.6	(AG)
PennEast Mainline	ATWS-0417	53.6R3	Northampton	PA	This ATWS is required for the crossing of SR 4014.	60	4	0.0	(AG) and (UF)
PennEast Mainline	ATWS-1947	48.7R3	Carbon	PA	This ATWS is required for the installation of a bend in the pipeline and also the crossing of an existing UGIU gas distribution pipeline.	170	25	0.1	(AG) and (UF)
PennEast Mainline	ATWS-1948	48.7R3	Carbon	PA	This ATWS is required for the installation of a bend in the pipeline and also the crossing of an existing UGIU gas distribution pipeline.	215	25	0.1	(AG), (UF), and (OL)

Table B.6.1-4

Additional Temporary Workspaces and Staging Areas Associated with the Proposed Amendment Project

Modification/Facility	ATWS/Staging ID	MP	County	State	Reason Needed	Length (feet)	Width (feet)	Area (acres)	Existing Land Use
PennEast Mainline	ATWS-1949	49R3	Carbon	PA	ATWS required for the bored crossing of Lower Smith Gap Road	140	50	0.2	(AG) and (UF)
PennEast Mainline	ATWS-1950	49R3	Carbon	PA	ATWS required for the bored crossing of Lower Smith Gap Road	160	50	0.2	(AG), (UF), and (RD)
PennEast Mainline	ATWS-1951	49R3	Carbon	PA	ATWS required for the bored crossing of Lower Smith Gap Road and topsoil segregation in agricultural field	110	50	0.1	(AG), (UF), and (RD)
PennEast Mainline	ATWS-1952	49R3	Carbon	PA	ATWS required for the bored crossing of Lower Smith Gap Road and topsoil segregation in agricultural field	155	15	0.1	(AG) and (UF)
PennEast Mainline	ATWS-1953	49.1R3	Carbon	PA	Topsoil segregation in agricultural field	375	25	0.2	(AG) and (CI)
PennEast Mainline	ATWS-1954	49.3R3	Carbon	PA	Installation of pipe bends and support of the bore of Aquashicola Creek	415	25	0.2	(AG) and (UF)
PennEast Mainline	ATWS-1955	49.3R3	Carbon	PA	Installation of pipe bends and support of the bore of Aquashicola Creek	185	25	0.1	(UF)
PennEast Mainline	ATWS-1956	49.4R3	Carbon	PA	Installation of pipe bends and support of the bore of Aquashicola Creek	320	35	0.3	(UF)
PennEast Mainline	ATWS-1957	51.1R3	Monroe	PA	Installation of pipe bends and support of the bore of Aquashicola Creek	100	95	0.1	(UF)
PennEast Mainline	ATWS-1958	51.6R3	Monroe	PA	Workspace required for the construction workspace cross-over and support of equipment winching operations up and over Blue Mountain.	190	45	0.2	(UF)
PennEast Mainline	ATWS-1959	51.8R3	Northampton	PA	Workspace required for the construction workspace cross-over and support of equipment winching operations up and over Blue Mountain.	200	45	0.2	(UF)
PennEast Mainline	ATWS-1960	52.6R3	Northampton	PA	Necessary for the crossing of two waterbody complexes and topsoil segregation	235	20	0.1	(AG)
PennEast Mainline	ATWS-1960.1	52.6R3	Northampton	PA	Necessary for the crossing of two waterbody complexes and topsoil segregation	72	15	0.0	(AG) and (UF)

Table B.6.1-4

Additional Temporary Workspaces and Staging Areas Associated with the Proposed Amendment Project

Modification/Facility	ATWS/Staging ID	MP	County	State	Reason Needed	Length (feet)	Width (feet)	Area (acres)	Existing Land Use
PennEast Mainline	ATWS-1960.2	52.6R3	Northampton	PA	Necessary for the crossing of two waterbody complexes and topsoil segregation	180	15	0.1	(AG) and (UF)
PennEast Mainline	ATWS-1962	53.1R3	Northampton	PA	Necessary for the crossing of Delps Road and for topsoil segregation	130	50	0.2	(AG) and (RD)
PennEast Mainline	ATWS-1962.1	53.2R3	Northampton	PA	Necessary for the crossing of Delps Road, topsoil segregation and waterbody crossing	495	35	0.4	(AG) and (RD)
PennEast Mainline	ATWS-1963	53.3R3	Northampton	PA	Topsoil segregation and two waterbody crossings at MP 53.2R3 and MP 53.32R3	415	25	0.2	(AG)
PennEast Mainline	ATWS-1964	53.4R3	Northampton	PA	Workspace required for two waterbody crossings at MP 53.32R3 and MP 53.41R3	210	50	0.2	(UF)
PennEast Mainline	ATWS-1980	53R3	Northampton	PA	Workspace required for pipe installation in area of leach field and crossing of waterbody and wetland complex.	50	25	0.0	(AG)
PennEast Mainline	ATWS-1981	53R3	Northampton	PA	Spoil storage for wetland and waterbody crossings and topsoil segregation	205	50	0.2	(AG)
Blue Mountain Lateral									
Blue Mountain Interconnect	Staging-C-12	0.51R3	Carbon	PA	Staging area for the storing of equipment and materials associated with the Blue Mountain Lateral and Interconnect facility.	230	350	1.8	(CI) and (UF)
Freemansburg Ave Realignment									
PennEast Mainline	ATWS-0572	70.8R3	Northampton	PA	Workspace required for Lehigh River HDD pipe fabrication and pullback, as well as, excavation and installation of mainline pipe to accommodate the proposed St. Luke's development and the crossing of Bikeway, creek and Hope Road.	1200	375	9.5	(AG) and (UF)
PennEast Mainline	ATWS-1976	70.7	Northampton	PA	Workspace required for excavation of pipe to meet proposed St. Luke's Development plans and for the crossing of bikeway, creek and Hope Road.	1100	40	1.1	(AG) and (UF)

Table B.6.1-5

Land Requirements for the Amendment Project

Modification	Temporary Workspace for Construction (acres) [a]	ATWS for Construction (acres) [a]	Permanent Easement Acquired to Operate Pipeline (acres) [a, b]	Total Workspace for Construction (acres) [a]	30' right-of-way Maintained During Pipeline Operations (acres) [a, c]
Saylor Ave Realignment					
PennEast Mainline	1.9	0.2	2.6	4.7	1.5
Interstate 81 Workspace Readjustment					
PennEast Mainline	1.0	1.8	0.0	2.8	0.0
Appalachian Trail PPL Crossing Realignment					
PennEast Mainline	26.6	12.7	29.3	68.6	17.8
Blue Mountain Lateral	2.6	0.0	3.0	5.6	1.8
Blue Mountain Interconnect	0.0	2.3	4.5	6.8	0.0
Freemansburg Ave Realignment					
PennEast Mainline	3.6	11.1	3.0	17.7	2.2
Total	35.7	28.1	42.4	106.2	23.3

Notes:

[a] Areas rounded by nearest tenth of an acre. The total workspace shown in the table may not equal the sum of the addends due to rounding.

[b] Permanent easement acquired for pipeline operations is typically 50 feet however based on negotiations with landowner some locations a less than 50 feet.

[c] Operational impacts were calculated using the 30-foot maintained right-of-way for all modifications except for the Blue Mountain Interconnect, which has permanent aboveground impacts not included in the 30-foot corridor. Operational impacts are a subset of total workspace and are not additive.

6.2 Agricultural Lands

PennEast would require about 4.6 acres of agricultural land as new permanent right-of-way. The operation of the Amendment Project would not affect the use of these areas for agricultural activities following construction. Following construction, all affected agricultural land would be restored to preconstruction conditions to the extent practicable, in accordance with PennEast's E&SCP and AIMP, and with any specific requirements identified by landowners or state or federal agencies with appropriate jurisdiction.

6.3 Existing Residences and Planned Developments

PennEast would acquire all appropriate easements to construct, operate, and maintain the Amendment Project. Based on discussions with government planning officials, PennEast was able to identify new residential or commercial developments scheduled to occur within 0.25 miles of the Amendment Project. These include any development on file with a local planning board or those included in a municipal master plan. Table B.6.3-1 lists two planned residential or commercial developments that would be crossed by the Amendment Project.

Table B.6.3-1

Planned Residential and Commercial Development Identified within 0.25 Mile of the Amendment Project

Line List Number	Modification	Closest MP [a]	Approximate Distance to Amendment Project
PE-LU-144.000	Saylor Ave Realignment	MP 8.5R2 - 8.9R3	Alignment goes through the planned subdivision
PE-NO-206.000	Freemansburg Ave Realignment	MP 69.7R3 - MP 70.8	Alignment goes through the planned commercial development

Notes:

[a] Route changes after PennEast's Certificate Application for CP15-558, are denoted with an "R" and indicate a milepost equation. Mileposts with an "R2" indicate route changes implemented in PennEast's September 2016 filing and included in the Final Environmental Impact Statement under CP15-558-000. Mileposts with an "R3" indicate modifications resulting from PennEast's amendment filing under CP19-78-000. Mileposts not containing an "R" indicate the original route as filed by PennEast under CP15-558-000.

PennEast has met with these developers and designed the Saylor Ave Realignment to minimize impacts on the proposed developments. The Saylor Ave Realignment would be installed through the roadway that traverses the subdivision and be located as close to non-buildable lots as practicable to reduce impacts. Likewise, the Freemansburg Ave Realignment would be adjacent to the property line along State Road 33 of the planned St. Luke's Hospital development to avoid impacts and non-buildable setbacks to the greatest extent practicable.

In order to maintain access to residences, commercial establishments, industrial areas, and other buildings, along with minimizing the disruption, PennEast would continue to coordinate with property owners during the construction process. Table B.6.3-2 identifies the existing buildings within 50 feet of the edge of the construction right-of-way of the Amendment Project. There are no residences within 50 feet of the Amendment Project. Two inhabited structures would be located within 50 feet of the Amendment Project, an office trailer within 50 feet of the proposed Blue Mountain Lateral workspace and a commercial building within 13 feet of the proposed Freemansburg Ave Realignment. PennEast has site-specific plans with applicable construction mitigations for these particular structures.[22]

[22] included as Appendix C5; accession number 20190201-5212

Table B.6.3-2

Existing Residences and Buildings within 50 feet of the Construction Workspace [a]

State/Facility/ County	Municipality	Modification	Structure Type	Nearest MP [b]	Direction from Pipeline	Distance from Centerline (feet)	Distance from Workspace [c] (feet)	Station
Pennsylvania PennEast Mainline								
Luzerne	Plains Twp.	Saylor Ave Realignment	Shed	8.4R3	NE	48	13	445+090
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Shed	49R3	NE	581	42	2584+97
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Shed	49R3	NE	752	37	2584+97
Northampton	Moore Twp.	Appalachian Trail PPL Crossing Realignment	Shed	53.4R3	SW	50	25	2821+63
Northampton	Moore Twp.	Appalachian Trail PPL Crossing Realignment	Shed	53.6R3	NE	127	17	2831+68
Northampton	Bethlehem Twp.	Freemansburg Ave Realignment	Commercial	70.1R3	SW	28	13	3700+59
Pennsylvania Blue Mountain Lateral								
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,413	34	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,430	34	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,446	21	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,455	14	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Garage	0.51R3	NW	2,464	5	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,483	46	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Storage	0.51R3	NW	2,492	35	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Shed	0.51R3	NW	1,229	11	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Office Trailer	0.51R3	NW	591	50	27+15
Carbon	Lower Towamensing Twp.	Appalachian Trail PPL Crossing Realignment	Gazebo	0.51R3	NW	577	25	27+15

Notes:
Source: The structures are based on digitized flown imagery from 2015 and Mott MacDonald civil survey.
Note: Structure types would be confirmed prior to construction.
[a] All route deviations implemented after the Certificate Application for CP15-558, are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application for CP15-558.
[b] Nearest MP as measured roughly perpendicular from the pipeline centerline to the structure.
[c] Workspace includes all construction workspace required for Modifications that falls outside of the Certificated Route.

6.4 Public Land, Recreation, and Other Special Interest Areas

The Appalachian Trail PPL Crossing Realignment would cross SGL and the ANST. The PADCNR commented that the Amendment Project would have the potential to impact the Towpath Bike Trail in Palmer and Beth Townships, Northampton County. It has been determined that there would be no impacts on the Towpath Bike Trail, as the Appalachian Trail PPL Crossing Realignment would not cross the bike path.

6.4.1 State Game Lands

Pennsylvania's SGL are managed by the PGC. The Amendment Project would cross SGL 168 between MP 51.7R3 to 52.4R3 for a total crossing length of 0.7 mile. SGL 168 consists of 7,320 acres within Carbon, Monroe, and Northampton Counties, Pennsylvania. The proposed Appalachian Trail PPL Crossing Realignment would impact 18.4 acres during construction, of which 5.5 acres would be maintained as permanent right-of-way during the Amendment Project's operation.

Consultation between PennEast and representatives from PGC began in September 2015, and right-of-way applications that included the proposed Appalachian Trail PPL Crossing Realignment pipeline and workspace were submitted in 2017. The PGC issued a license agreement for SGL 168 on December 5, 2018 as provided in PennEast's March 28, 2019 response to Environmental Information Request 1.[23] PennEast would minimize impacts to SGL 168 through compliance with the conditions of the license agreement.

6.4.2 Appalachian National Scenic Trail

The Appalachian Trail PPL Crossing Realignment would cross the ANST approximately 3.25 miles east of the crossing location proposed on the Certificated Project route, near MP 51.7R3 in Monroe County, Pennsylvania at a location that has been approved by the PGC. The ANST is a roughly 2,180-mile continuous public hiking trail that extends from Georgia to Maine, passing through 14 states along the Appalachian mountain range. The ANST was completed in 1937 and is a unit of the NPS but is managed under a unique partnership between public and private entities including the NPS, the USDA Forest Service, numerous state agencies, the ATC, and 31 local clubs that mark and maintain the trail (ATC 2015).

In October 2017, a land exchange between the NPS and PGC occurred.[24] As stated in the NPS public notice, the primary purpose of the exchange was to encourage responsible future energy corridor development across Blue Mountain and SGL 168 by allowing for pipeline or utility co-location within or immediately adjacent to the existing, cleared right-of-way. The proposed Appalachian Trail PPL Crossing Realignment would cross a 2.25-acre parcel now owned and managed by the PGC and would co-locate with an existing 100-foot-wide high voltage power line right-of-way to reduce forested and visual impacts.

PennEast has developed site-specific crossing plans for public recreation and special interest areas that would be affected. Construction activities would take place during daylight hours. PennEast states that it would ensure that no trees or limbs would obstruct the ANST after clearing of the right-of-way.

During clearing and other construction activities, PennEast's construction contractor would post personnel at or along trail crossings to inform hikers of the construction and to regulate pedestrian traffic. If personnel are not available, a sign stating "Wait here for Crossing Personnel" would be posted during daylight hours for at least 12 days after installation and backfill ends, and the "Vehicle Crossing Ahead" sign would remain visible during daylight hours for an additional 120 days after construction ends.

[23] Accession number 20190328-5307.
[24] Included as Attachment 4-2 of PennEast's response to Environmental Information Request 1 (Accession number 20190328-5307).

Appropriate barriers to mitigate noise and/or visual impacts, safety fencing, and/or signs would be installed at or along trail crossings, as appropriate, to protect hikers, minimize impacts on the trail, and allow safe passage across or around the construction work area. A high visibility fence would be installed during active construction, extending 50 feet along construction limits on both sides of the trail. Any trenches that may be required to be left open after construction activities have ceased for the day would be temporarily backfilled and covered by steel plates.

Brief trail closures would be necessary to ensure hiker safety during excavating the trench and lowering the pipe into position. The closures would last approximately six hours. During closures, PennEast would have flaggers on site to escort hikers around the workspace using the existing, cleared right-of-way. The flaggers would be equipped with radios to coordinate with construction workers. In between active construction, hikers would be able to cross through the work areas without escort once steel plates and timber mats are installed over the crossing, guided by safety fencing that would mark the trail across the entire disturbed work area.

6.5 Visual Resources

Visual resources along the Amendment Project route are a function of geology, climate, and historical processes, and include topographic relief, vegetation, water, wildlife, land use, and human uses and development. As a result, the visual resources along portions of the Amendment Project have been previously affected by other similar activities. Visual resource impacts would be minimized by collocating the Amendment Project with existing rights-of-way where practicable. However, temporary impacts to visual resources could occur as a result of the presence of construction equipment along the right-of-way. Potential permanent impacts on visual resources include from the removal of trees from the permanent operational right-of-way and construction of new aboveground facilities.

After construction, all disturbed areas, including forested areas, would be restored in compliance with PennEast's E&SCP; federal, state, and local permits; landowner agreements; and easement requirements. Generally, this would include seeding the restored areas with grasses and other herbaceous vegetation, after which trees would be allowed to regenerate within the temporary workspaces. The visual effects of construction on forested areas would be permanent on the maintained right-of-way where the regrowth of trees would not be allowed, and would be long term, lasting several years or longer, in the temporary workspaces. The greatest potential visual effect would result from the removal of large specimen trees, but even the visual effects of removing smaller trees would last for several years. PennEast proposes to reseed with native plants to revegetate the construction right-of-way which would result in the establishment of native wildflowers for pollinators along the maintained right-of-way.

In response to our March 8, 2019 Environmental Information Request, PennEast conducted a visual impact analysis from nearby viewsheds and overlooks along the ANST including Little Gap Vista, Weathering Knob Vista, an unnamed vista west of the PPL right-of-way and several unnamed overlooks such as those created by the existing PPL right-of-way with which the Amendment Project would be collocated. The viewshed's visibility was calculated based on 5.5 feet to factor in human height and a standard height of 20 feet for digitized tree canopies. The evaluation determined that due to the topography and vegetation, the proposed Blue Mountain Interconnect location would not be not visible from the vistas or the proposed ANST crossing. The Appalachian Trail PPL Crossing Realignment would not be within the viewsheds of Little Gap Vista, West of Little Gap Vista, or Weathering Knob Vista; however, portions of it would be visible from the PPL right-of-way North Viewshed, PPL right-of-way South Viewshed, PPL right-of-way Trail Crossing Viewshed, and an unnamed vista. Based on the visual impact analysis, we conclude that the Amendment Project would have no appreciable effect on the aesthetics of the area.

6.6 Pipeline Right-of-Way

With the exception of the Appalachian Trail PPL Crossing Realignment, there would be no new or different effects on visual resources than presented in previous analyses conducted for the Certificated Project. Visual impacts occurring along the ANST crossing have been minimized to the extent practicable by collocating with an existing 100-foot high voltage power line right-of-way. At the crest of the mountain that the trail runs along, PennEast has modified its "working side" of the right-of-way to the east so that the construction workspace would be almost fully within the existing, maintained right-of-way of the power line. By siting workspace within the existing right-of-way, PennEast would maximize use of previously-disturbed and continuously-maintained areas while minimizing tree clearing and long-term temporal impacts associated with reforestation. During construction in this area, equipment and materials would be continuously present on both sides of the ANST to allow for construction winch hill operations which would result in temporary visual impacts.

PennEast would restore the area by reestablishing vegetation within the workspace once the installation of the pipeline, backfilling, and grading is complete. This would include reforestation in the temporary workspace outside of the permanent easement. PennEast would overlap a portion of its permanent easement with the PPL easement, therefore minimizing the width of the permanently-cleared area. At the trail crossing, the Appalachian Trail PPL Crossing Realignment would expand the width of the existing right-of-way by approximately 15 feet. PennEast conducted a viewshed evaluation of the crossing of the ANST from potential viewpoints along the ANST.[25] We have reviewed the viewshed evaluation and concluded that the visual impacts of the ANST crossing would be minimal.

PennEast worked with the PGC to develop a Restoration Plan for SGL 168, which includes the ANST crossing. At the crossing, PennEast proposes to use a wildflower seed mix directly at and within close proximity of the trail.[26] PennEast would spread a cover crop with the wildflower seed mix (grain oat from January 1 to August 1, or winter wheat from August 1 to January 1). PennEast would also establish a mix of low shrub sod of lowbush blueberry (*Vaccinium angustifolium*) and black huckleberry (*Gaylussacia baccata*) within the permanent easement that would overlap with the seeded area.

In accordance with the license agreement, PennEast would provide the PGC with the opportunity to inspect seed and planting stock before planting. PennEast would also monitor sod placement and protection measures for three years and provide the PGC with annual monitoring reports. If survivorship rates (85 percent for the first year, 75 percent for the second year, and 60 percent for the third year) are not met, PennEast would coordinate additional restoration actions with the PGC

6.7 Aboveground Facility

The Blue Mountain Interconnect would be built along the eastern edge of the Blue Mountain Resort directly adjacent to an open area that is used for water storage and ski resort operations. The interconnect would also be sited next to an existing powerline right-of-way that runs east to west across the ski resort and surrounding properties. The existing forest would be maintained around the proposed facility in order to further reduce visual impacts from north to east. The Blue Mountain Interconnect would be located approximately 0.6-mile downslope and north of the ANST and approximately 1.8 miles west-northwest of the location that the PennEast Mainline Pipeline would cross the ANST. Due to the proposed construction of the Blue Mountain Interconnect in a previously disturbed area that is currently utilized for resort

[25] The viewshed evaluation is included as appendix Q of PennEast's response to our March 8, 2019, Environmental Information Request and in the Amendment Project docket at accession number 20190328-5307.
[26] The proposed seed mix name is: Ernst Showy Northeast Wildflower Mix (ERNMX-153-1).

operations, no visual effects to ANST hikers and surrounding landowners would be anticipated as a result of construction and operation of the Blue Mountain Interconnect.

6.8 Landfills or Hazardous Waste Sites

In December 2017, PennEast obtained an EDR database report for the Appalachian Trail PPL Crossing Realignment and identified three hazardous waste sites or landfills within 0.25 mile and two which are greater than 0.25 mile from the realignment. All three sites were previously analyzed for the Certificated Project. Table B.6.8-1 provides a summary of the sites identified.

Table B.6.8-1

Sites in Proximity to the Appalachian Trail PPL Crossing Realignment with Potential to Contain Hazardous Waste

Site Name	Site Address	Database	Approximate Distance from Amendment Project	Presumed Hydrologic Location	Findings
Bucha, Paul	1215 North Mink Road, Danielsville, PA 18038	ICIS [a], FINDS [b], and ECHO [c]	900 feet west of southern portion of the project area	Crossgradient	Based on the lack of reported releases and the violation not being related to petroleum or hazardous materials, this facility would not affect or be affected by the Modifications.
Blue Mountain View Estates STP	Lower Smith Gap Road, Palmerton, PA 18071	ICIS, FINDS, and ECHO	3,300 feet to the east of the northern portion of the project area	Crossgradient	Based on the current regulatory status of the facility, the administrative nature of the violation, and the relative distance of the facility from the Site, this facility would not affect or be affected by the Modifications.
Haines & Kibblehouse/ Chestnut Ridge Sand	Chestnut Ridge Road, Kunkletown, PA 18058	FINDS	3,300 feet to the east of the northern portion of the project area	Crossgradient	Based on the lack of reported releases and violations and the relative distance of the facility from the project area, this facility would not affect or be affected by the Modifications.

Notes:
[a] Integrated Compliance Information System (ICIS)
[b] Facility Index Systems (FINDS)
[c] Enforcement and Compliance History Online (ECHO)

6.9 Applications for Rights-of-Way or Other Land Use

PennEast submitted right-of-way applications that included the proposed Appalachian Trail PPL Crossing Realignment pipeline and workspace to the PGC in 2017. The PGC issued a license agreement for SGL 168 on December 5, 2018 that included approval to cross on land where the ANST is located. PennEast also proposes temporary use of an existing road, a portion of which would cross property owned and managed by the NPS. PennEast submitted a Special Use Permit application for use of the access road on February 4, 2019. PennEast states that no other permits or approvals would be needed from the NPS.

6.10 Conservation Easements

PennEast has performed an extensive title search and consulted with federal, state, county, and local agencies to determine existing easements on properties located within the Amendment Project area. This search has identified a number of properties that would be crossed by the proposed Appalachian Trail PPL Crossing Realignment that require conservation easements. To the extent practicable, PennEast has minimized impacts on conservation areas by collocating the Amendment Project facilities with existing utility rights-of-ways. Two parcels along the Appalachian Trail PPL Realignment include conservation

easements within portions of the parcels. PennEast has sited the Appalachian Trail PPL Crossing Realignment outside of the conservation easement areas on both of these parcels. Therefore, no additional permits or permissions would be required to cross these properties. Table B.6.10-1 summarizes the parcels crossed by the Amendment Project that are partially encumbered by conservation easements.

Table B.6.10-1

Parcels with Conservation Easements Crossed by the Amendment Project

Modification	County	State	Line List Number	Begin MP	End MP [a]	Land Owner	Managing Agency/ Site Name	Approx. Crossing Length (feet)	Land Affected During Const. (acres) [b]	Land Affected During Operation (acres) [c]
Appalachian Trail PPL Crossing Realignment	Carbon	PA	PE-CA-187.013	49.7R3	49.8R3	Private	Private	878	2.0	1.1
Appalachian Trail PPL Crossing Realignment	Carbon	PA	PE-CA-A648.000	0.3R3	0.4R3	Private	Private	944	1.8	1.4

Notes:
[a] All route deviations implemented after the Certificate Application for CP15-558, are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application for CP15-558.
[b] Acreage includes both temporary and permanent right-of-way.
[c] Acreage includes permanent right-of-way.

7.0 SOCIOECONOMICS

Socioeconomics is an evaluation of the basic conditions (attributes and resources) associated with the human environment, particularly the population and economic activity within a region. Economic activity generally encompasses regional employment, personal income, and revenues and expenditures. Impacts on the fundamental socioeconomic components can influence other issues such as regional housing availability and provision of community services. This section addresses several different factors that could affect the quality of life and economy in the area surrounding the Amendment Project area where employees might live, shop, and use public resources. These factors include public services such as fire, police, and medical facilities; educational facilities; and environmental justice.

The Amendment Project involves changes to the Certificated Route in four Pennsylvania counties: Luzerne, Carbon, Monroe, and Northampton, with net changes in pipeline length by county ranging from a 1.7-mile reduction (Northampton County) to a gain of 1.0 mile (Monroe County). In addition, the Appalachian Trail PPL Crossing Realignment would result in the relocation of 0.5 mile of 4-inch-diameter pipeline (the Blue Mountain Lateral) in Carbon County.

If approved, the Amendment Project would be constructed and operated as part of the larger Certificated Project. PennEast has indicated that the modifications would not noticeably affect the overall workforce and cost estimates developed for the Certificated Project and, therefore, in some cases, it is appropriate to evaluate potential workforce- and cost-related socioeconomic impacts in the context of the Certificated Project, as discussed below.

7.1 Population, Economy, and Employment

Total estimated population by affected county in 2018 ranged from 64,227 (Carbon County) to 317,646 (Luzerne County) (table B.7.1-1). Estimated population densities ranged from 168 persons per

square mile (Carbon County) to 825 persons per square mile (Northampton County), compared to a statewide average of 286 persons per square mile. Population grew from 2000 to 2010 in three of the four counties at rates 3 to 5.4 times the state average of 3.4 percent. Population stayed fairly constant in Luzerne County over this period, increasing by just 0.5 percent. Three of the counties lost population from 2010 to 2018, with decreases ranging from -0.2 percent (Monroe County) to -1.6 percent (Carbon County). Population in the remaining county, Northampton County, increased by 2.3 percent over the same period (table B.7.1-1). Statewide, population increased slightly by less than 1 percent over this period.

Table B.7.1-1

Population by County and State

Geographic Area	2018 Population	2018 Population Density (persons/ square mile)	Population Change (Percent)	
			2000 to 2010	2010 to 2018
Carbon County	64,227	168	9.9	-1.6
Luzerne County	317,646	357	0.5	-1.0
Monroe County	169,507	279	18.3	-0.2
Northampton County	304,807	825	10.4	2.3
Commonwealth of Pennsylvania	12,807,060	286	3.4	0.8

Sources: U.S. Census Bureau 2000, 2018a

Summary economic information is presented in table B.7.1-2. The statewide annual unemployment rate in Pennsylvania (4.3 percent) was higher than the U.S. average (3.9 percent) in 2018 (U.S. Bureau of Labor Statistics 2018a). Annual unemployment rates by county ranged from 4.4 percent (Northampton County) to 5.4 percent (Luzerne and Monroe Counties). The unemployment rate in Carbon County was 5.1 percent in 2018 (table B.7.1-2).

Statewide, median household income in 2017 in Pennsylvania ($59,165) was equivalent to about 98 percent of the national median ($60,336). Median household income was lower than the state rate in two of the four counties (Carbon and Luzerne Counties), and higher than the state median in the other two counties (Monroe and Northampton) (table B.7.1-2). An estimated 12.5 percent of the population in Pennsylvania was below the poverty level in 2017, with county rates ranging from 9.3 percent (Monroe County) to 13.8 percent (Luzerne County). The corresponding rates in Carbon and Northampton Counties were 12.5 percent and 10.0 percent, respectively (table B.7.1-2).

Based on data compiled for 2017 by the U.S. Bureau of Economic Analysis (2018), the top three economic sectors in Pennsylvania by employment in 2016 were: health care, government, and retail trade. These three sectors were also the top three employers in three of the four affected counties. Accommodation and food services also played an important role in Monroe County (table B.7.1-2).

PennEast anticipates that overall construction of the pipeline and associated facilities for the Certificated Project and the Amendment Project would begin in early 2020 with an anticipated in-service date of November 2020 and right-of-way restoration activities expected to be completed in the following spring/summer (2021). Construction would be distributed over four spreads, each employing the same workforce and schedule. This would continue to be the case with the Amendment Project, which would be parts of Spreads 1 and 3. PennEast estimates that local workers would account for approximately 40 percent of construction jobs for each spread for the duration of the Amendment Project. The remaining 60 percent of the construction workforce would consist of non-local workers, who would temporarily relocate to the Amendment Project vicinity for the duration of their employment. Very few, if any, of the non-local

workers employed during the construction phase of each spread are expected to be accompanied by family members or permanently relocate to the Amendment Project area.

Table B.7.1-2

Employment, Poverty, and Income by County and State

Geographic Area	Civilian Labor Force [a]	Unemployment Rate (Percent) [a]	Population below the Poverty Level (Percent) [a]	Median Household Income [a]	Percent of State/ US Median [b]	Top Economic Sectors by Employment [c]
Carbon County	31,526	5.1	12.5	$51,395	87	Health Care (14.8%), Government (11.7%), Retail (11.6%)
Luzerne County	157,784	5.4	13.8	$50,982	86	Health Care (14.0%), Retail (11.3%), Government (10.2%)
Monroe County	82,004	5.4	9.3	$61,296	104	Government (15.0%), Accommodation/Food Services (13.9%), Retail (13.9%)
Northampton County	158,900	4.4	10.0	$65,872	111	Retail (10.2%), Government (9.7%), Health Care (9.7%)
Commonwealth of Pennsylvania	6,424,000	4.3	12.5	$59,165	98	Health Care (14.3%), Government (10.1%), Retail (10.0%)

Notes:
[a] Civilian labor force and unemployment rate are annual average figures for 2018. Poverty and household income figures are from 2017.
[b] County median household income is shown as a percent of the corresponding state average; the state figure is shown as a percent of the national average ($60,336 in 2017).
[c] Top economic sectors by employment are identified from annual data compiled for 2017 by the U.S. Bureau of Economic Analysis. Percentages indicate the share of total employment that each sector accounts for.
Sources: U.S. Bureau of Economic Analysis 2018, U.S. Bureau of Labor Statistics 2018a, 2018b, U.S. Census Bureau 2018b

Non-local workers seeking temporary accommodation would reside within daily commuting distance of their work sites. Some non-local workers would likely reside in the counties within which they are working; others may locate in other communities in adjacent or nearby counties. Table B.7.1-3 compares the peak number of construction workers expected to temporarily relocate for Spreads 1 and 3 with the total population of the affected counties. The peak temporary increases in population would be equivalent to 0.1 percent of the estimated 2018 population in Luzerne County (Spread 1) and 0.03 percent of the combined population of the counties that would be crossed by Spread 3 (table B.7.1-3). These temporary additions would be distributed along the length of the pipeline spreads and would have no permanent impact on local populations.

An estimated 24 new permanent employees would be hired to directly support the operation phase of the Certificated Project. This would not change as a result of the Amendment Project. The addition of 24 workers and their families would not affect local population even if all of these workers were to relocate from elsewhere to the Amendment Project area.

For the Certificated Project we addressed the regional economic impacts of the larger Certificated Project construction and operation by citing an economic impact analysis of the Certificated Project prepared on behalf of PennEast by Econsult Solutions and Drexel University (Econsult and Drexel University 2015). Because the Amendment Project would not be expected to affect the overall cost or anticipated construction and operation workforce estimates that were evaluated for the Certificated Project, the findings of this analysis also apply to the four modifications. According to Econsult and Drexel University (2015), Certificated Project design and construction would generate approximately $1.19 billion in total (direct, indirect, and induced) economic output in Pennsylvania, supporting 9,290 total jobs and

$540 million in total labor income. These are one-time impacts that would occur during the construction period.

Table B.7.1-3

Projected Non-Local Workers by Construction Spread

Spread [a]	County [b]	2018 Population [c]	Average Employment		Peak Employment	
			Number of Non-Local Workers [d]	Percent of 2018 Population	Number of Non-Local Workers [d]	Percent of 2018 Population
1	Luzerne	317,646	146	0.05	360	0.11
3	Carbon, Monroe, Northampton, Bucks	1,166,736	146	0.01	360	0.03

Notes:
[a] The proposed modifications would be part of Spreads 1 and 3 of the larger PennEast Pipeline Project, which are both located entirely in Pennsylvania. The Saylor Ave Realignment and Interstate 81 Workspace Adjustment would be part of Spread 1. The Appalachian Trail PPL Crossing and Freemansburg Ave Realignments would be part of Spread 3.
[b] Counties are listed in the order they would be crossed from north to south.
[c] Existing population data are estimates prepared by the U.S. Census Bureau 2018a. These estimates are presented by county in table B.7.1-1. Population estimates are not included for Bucks County in table B.7.1-1 because it would not be directly affected by the proposed modifications. Total estimated population for Bucks County in 2018 was 628,195 (U.S. Census Bureau 2018b).
[d] Non-local workers are those who normally live outside daily commuting distance of the work sites. Non-local workers are assumed to comprise 60 percent of the total estimated workforce for each Amendment Project component.

Econsult and Drexel University (2015) also developed estimates of economic impacts based on estimated annual expenditures on operation and maintenance, which are expected to include maintenance surveys and inspections and the purchase of materials to support daily operation of the Amendment Project. According to Econsult and Drexel University (2015), Certificated Project operation would generate approximately $20.9 million in total (direct, indirect, and induced) economic output in Pennsylvania, supporting 88 total jobs and $7.5 million in total labor income. These are annual impacts that would occur over the life of the Amendment Project.

7.2 Housing

Housing resources are summarized by county and state in table B.7.2-1. Data on housing units are annual estimates prepared by the U.S. Census Bureau (2019a, 2019b). The Census Bureau defines a housing unit as a house, apartment, mobile home or trailer, group of rooms, or single room occupied or intended to be occupied as separate living quarters. Viewed by county, these estimates indicate that available rental housing units range from about 150 in Carbon County to approximately 2,400 units in Luzerne County (table B.7.2-1). In addition to these resources, the Amendment Project area counties would include numerous housing units for seasonal, recreational, or occasional use, especially in Monroe County (table B.7.2-1).

Table B.7.2-1

Housing by County and State [a]

Geographic Area	Total Housing Units	Rental Vacancy Rate	Units Available for Rent	For Seasonal, Recreational, or Occasional Use [b]
Carbon	34,703	2.4	147	5,311
Luzerne	149,737	5.5	2,376	3,728
Monroe	81,125	7.7	1,058	16,969
Northampton	122,452	4.9	1,685	806
Pennsylvania	**5,653,599**	**5.9**	**97,964**	**175,834**

Note:
[a] Data on housing units are annual estimates from the American Community Survey 5-year estimates for 2013-2017.
[b] Housing units for seasonal, recreational, or occasional use are generally considered to be vacation homes. They are not included in the estimated number of housing units available for rent.
Sources: U.S. Census Bureau 2019a, 2019b

Table B.7.2-2 presents estimated average and peak numbers of non-local workers for Spreads 1 and 3, as well as estimates of available rental housing, hotel and motel rooms, and campground and RV facilities. These estimates illustrate the numbers of non-local workers expected to be present during construction. Non-local workers seeking temporary accommodation would reside within daily commuting distance of their work sites. Some non-local workers would likely reside in the counties within which they are working; others may locate in other communities in adjacent or nearby counties. Data are only presented for those counties that would be crossed by each spread.

Table B.7.2-2

Estimated Construction-Related Housing Demand by Construction Spread

		Estimated Housing Demand [c]		Estimated Available Housing Resources		
Spread [a]	County [b]	Average Employment (Workers/ Month)	Peak Employment (Workers/ Month)	Housing Units Available for Rent [d]	Hotel and Motel Rooms [e]	Camp-ground and RV Facilities [e]
1	Luzerne	146	360	1,896	3,837	9
3	Carbon, Monroe, Northampton, Bucks	146	360	6,255	7,239	16

Notes:
[a] The proposed modifications are parts of Spreads 1 and 3.
[b] Counties are listed in the order they would be crossed from north to south.
[c] An estimated 60 percent of the total construction workforce is assumed to be non-local for the duration of the Amendment Project.
[d] Housing data are presented by county in table B.7.2-1. Data are only presented for counties that would be crossed by the Amendment Project. Housing estimates are not included for Bucks County in table B.7.1-4 because it would not be directly affected by the proposed modifications.
[e] Hotel and motel rooms and campground and RV facilities are estimated totals developed for the Certificated Project and do not include estimated numbers for Monroe County.

The data presented in table B.7.2-2 indicate that sufficient housing resources should be available to accommodate peak housing demand during construction. Peak demand for housing would, for example, be equivalent to 10 percent and 6 percent of total identified hotel and motel rooms in the affected counties. Peak demand for housing would generally coincide with peak occupancy for hotels and motels in the affected counties. Peak hotel and motel occupancy rates in the affected counties range from 69 percent (Luzerne County) to 79 percent (Northampton County) (STR 2015). The remaining share of the total rooms would normally be vacant and available for rent and would still be sufficient to accommodate the entire

peak construction demand for housing resources. Similarly, the number of housing units available for rent also exceeds the entire peak construction demand. As a result, construction crews would not encounter difficulty in finding temporary housing, and the Amendment Project construction would not significantly affect the availability of housing.

The Amendment Project would not result in a change to the estimated 24 new permanent employees as evaluated for the Certificated Project.

7.2.1 Displacement of Residences and Businesses

Construction and operation of the Amendment Project would not be expected to result in the permanent displacement of businesses or residences. The proposed Amendment Project route has been designed to avoid or minimize direct impacts on residences.

7.3 Public Services

Summary data for law enforcement and fire departments are presented by affected county in table B.7.3-1. These data provide a general overview of resources available in each county. In general, the number of police and fire departments is directly related to the overall size and population of the county, as well as the number of communities. Multiple law enforcement agencies and providers exist in the potentially affected counties, including state patrol, county sheriffs, and local police departments. More than 100 law enforcement agencies were identified in the four counties that would be affected by the proposed Amendment Project, with at least seven of these agencies located within one mile. Multiple fire departments and districts provide fire protection and suppression services in the affected counties. Many of these fire departments and districts are at least partially staffed by volunteers. A total of 42 fire and rescue units were identified in the four counties, with at least 14 of these units located within one mile of the proposed Amendment Project.

Medical facilities in the counties crossed by the proposed Amendment Project are identified in table B.7.3-1. Minor Amendment Project-related injuries would be treated at local medical facilities or emergency rooms. Workers with more serious injuries would be transported to one of the larger hospitals in the general vicinity. The number of school districts, schools, and students are summarized by county in table B.7.3-1.

Table B.7.3-1

Public Services by County

County [a]	Law Enforcement Agencies	Fire and Rescue Units	Total Hospitals	Number of Hospital Beds	Number of School Districts	Number of Schools	Number of Students
Luzerne	43	23	8	1,086	17	69	45,155
Carbon	14	5	2	155	7	22	9,063
Monroe	23	2	1	237	4	30	25,504
Northampton	25	11	3	285	14	65	45,768

Note:
[a] Data for Luzerne, Carbon, and Northampton Counties are from FERC (2017).
Sources: American Hospital Directory 2019, FERC 2017, National Center for Educational Statistics 2019, USA Cops 2019

The Certificated Project addressed the potential impacts from construction and operation on public services. Because the Amendment Project would not be expected to affect the overall construction and operation workforce estimates that were evaluated for the Certificated Project, the findings of this analysis also apply to the four modifications. The analysis performed for the Certificated Project concluded that the

temporary addition of construction workers to local communities would not be expected to affect the levels of service provided by existing law enforcement and fire protection personnel or have significant adverse effects on local and regional medical facilities and services. Further, the Certificated Project analysis concluded that construction and operation of the Amendment Project would be unlikely to noticeably affect school enrollment in the Amendment Project area.

7.4 Transportation and Traffic

For the Certificated Project we addressed potential impacts from construction and operation on transportation and traffic. The Amendment Project may temporarily impact transportation and traffic during construction across roadways and railroads. Increases in traffic volumes associated with construction workers commuting to and from job sites, deliveries of equipment and materials to the Amendment Project, and the movement of construction equipment may also affect transportation and traffic.

To the extent practicable, existing public and private road crossings along the Amendment Project route would be used as the primary means of accessing rights-of-way. The proposed Amendment Project would result in the addition of seven access roads (one for the Interstate 81 Workspace Adjustment and six for the Appalachian Trail PPL Crossing Realignment), and the removal of five access roads that would no longer be needed (one as part of the Saylor Ave Realignment and four as part of the Appalachian Trail PPL Crossing Realignment). Minor improvements would likely be required on a majority of the existing private access roads proposed for use, and these improvements may include tree branch clearing, gravel placement, and/or access path widening. The Amendment Project would not be expected to substantially affect the number of road and railroad crossings addressed for the Certificated Project, and therefore, the findings of the analysis for the Certificated Project would also apply here.

The proposed Freemansburg Ave Realignment would be located near a shopping complex in Northampton County. PennEast proposes to mitigate impacts to traffic in the vicinity of this complex by limiting construction hours, so that construction activities in this area would take place between the hours of 10 p.m. and 6 a.m. PennEast would also provide traffic control and re-route traffic (mainly delivery vehicles) to minimize impacts during construction hours to minimize disruption. In addition, no construction activities would take place in this area between November 15 and January 1, the complex's busiest time of the year. With the implementation of these mitigation measures, minor impacts on transportation and traffic would be expected to occur during construction of the Freemansburg Ave Realignment.

7.5 Property Values

For the Certificated Project we addressed the potential impacts from construction and operation on property values. This discussion was primarily based on existing professional and academic studies and, therefore, our analysis and conclusions for the Certificated Project with respect to potential impacts on property values would also apply to the Amendment Project.

7.6 Tax Revenues

For the Certificated Project we addressed the potential impacts from construction and operation on tax revenues. Because the Amendment Project would not be expected to affect the overall cost estimates that were evaluated for the Certificated Project, the findings of the analysis for the Certificated Project would also apply to the Amendment Project.

7.7 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Executive Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participating in them, denying persons the benefits of them, or subjecting persons to discrimination because of their race, color, or national origin.

For the Certificated Project we addressed the potential impacts from construction and operation on environmental justice. This assessment included a discussion of public involvement activities and the efforts made by PennEast and the FERC to ensure that stakeholders and other interested parties had opportunities to participate in the EIS process. This discussion would also apply to the proposed Amendment Project.

The Amendment Project would result in the crossing of one additional census block group that was not evaluated for the Certificated Project. The Appalachian Trail PPL Crossing Realignment would cross census block group 3013.02.1 in Monroe County, Pennsylvania. Monroe County and census block group 3013.02.1 have estimated total minority populations of 32 percent and 6 percent, respectively, and do not meet the definition of a minority population based on CEQ (1997) and EPA (1998) guidelines (U.S. Census Bureau 2019d). The estimated shares of households below the poverty level were 10.5 percent and 19.1 percent for the county and block group, respectively, compared to the statewide average of 12.7 percent (U.S. Census Bureau 2019e). The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2019f). Review of the EPA's Environmental Justice Mapping and Screening Tool (EJSCREEN) data would also indicate that census block group 3013.02.1 does not meet the definition of a minority or low-income population.[27] Although the share of households below the poverty level in census tract 3013.02 was below the 20 percent threshold, it was higher than the county and state averages, suggesting the potential presence of a low-income population.

The analysis for the Certificated Project concluded that construction and operation would not be expected to have high and adverse human health or environmental effects on any nearby communities or result in adverse and disproportionate human health or environmental effects to minority or low-income communities. The findings of this analysis would also apply to the proposed Amendment Project. In accordance with Executive Order 12898, all public documents, notices, and meetings were made readily available to the public during FERC's review of the Project (see section A.5).

8.0 AIR QUALITY AND NOISE

8.1 Air Quality

Air quality would be affected by construction activities of the four modifications. This section of the EA addresses existing air quality, applicable regulatory requirements for air quality, and projected impacts on air quality from the construction of the Amendment Project.[28] The term *air quality* refers to the relative concentrations of pollutants in the ambient air. The subsections below describe well-established

[27] EJSCREEN uses the percent of a geographic area's population in households where the household income is less than or equal to twice the federal poverty level to identify low-income populations. The share of the population in census block group 3013.02.1 was lower than the statewide average, a typical benchmark for comparison (23 percent compared to 30 percent).

[28] It should be noted that although the Blue Mountain Interconnect would be relocated a short distance away from the originally proposed location, the proposed components have not changed, and the potential operating emissions from the Blue Mountain Interconnect are the same as those in the original application as filed in September 2015, and as amended in November 2016.

air quality concepts that are applied to characterize air quality and to determine the significance of increases in air pollution. This includes metrics for specific air pollutants known as criteria pollutants, in terms of ambient air quality standards (AAQS), regional designations to manage air quality known as Air Quality Control Regions (AQCR), and the ongoing monitoring of ambient air pollutant concentrations under state and federal programs.

Combustion of fossil fuels, such as natural gas, produces criteria air pollutants, such as nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and inhalable particulate matter ($PM_{2.5}$ and PM_{10}). $PM_{2.5}$ includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM_{10} includes particles with an aerodynamic diameter less than or equal to 10 micrometers. Combustion of fossil fuels also produces volatile organic compounds (VOCs), a large group of organic chemicals that have a high vapor pressure at room temperature; and oxides of nitrogen (NO_x). VOCs react with NO_x, typically on warm summer days, to form ozone (O_3), which is another criteria air pollutant. Other byproducts of combustion are greenhouse gases (GHGs) and hazardous air pollutants (HAPs). HAPs are chemicals known to cause cancer and other serious health impacts.

Other pollutants, not produced by combustion, are fugitive dust and fugitive emissions. Fugitive dust is a mix of particulate matter sized 2.5 microns or smaller ($PM_{2.5}$), particulate matter sized 10 microns or smaller (PM_{10}), and larger particles thrown up in to the atmosphere by moving vehicles, construction equipment, earth movement, and/or wind erosion. Fugitive emissions, in the context of this EA, would be fugitive emissions of methane and/or VOCs from operational pipelines and aboveground facilities.

8.2 Regional Climate

The Amendment Project facilities would be located in southeastern Pennsylvania, which is classified as having a humid continental climate with hot summers (Köppen-Geiger climate classification *Dfa*) (NOAA 2015a).

Climate data were obtained from the Northeast Regional Climate Center (NRCC), for measurements taken either at Wilkes-Barre International Airport, or at Avoca, Pennsylvania, just west of Wilkes-Barre. The annual mean temperature is 49.3 °Fahrenheit (F), with a maximum daily mean of 71.4 °F in July, and a minimum daily mean of 25.8 °F in January. The normal daily maximum temperature is 58.7 °F, with a highest normal daily maximum of 81.9 °F in July, and a lowest normal daily maximum of 33.2 °F in January. The normal daily minimum temperature is 40.1 °F, with a highest normal daily minimum of 60.9 °F in July, and a lowest normal daily minimum of 18.5 °F in January. Maximum daily temperatures above 90 °F occur on average 7 days per year, and minimum daily temperatures below 32 °F occur on average 126 days per year.

Mean annual precipitation is 38.26 inches, evenly distributed throughout the year, and mean annual snowfall is 48.3 inches, occurring primarily in December through March. Maximum daily values for relative humidity can exceed 80 percent in the summer months. The average annual wind speed is 8.0 mph, predominantly from the west (NRCC 2015).

8.2.1 Existing Air Quality

The EPA has established National Ambient Air Quality Standards (NAAQS) for six pollutants: SO_2, CO, O_3, NO_2, particulate matter (PM) including PM_{10} and $PM_{2.5}$, and lead.[29] There are two classifications of NAAQS, primary and secondary standards. Primary standards set limits the EPA believes are necessary to protect human health including sensitive populations such as children, the elderly, and

[29] https://www.epa.gov/criteria-air-pollutants/naaqs-table

asthmatics. Secondary standards are set to protect public welfare from detriments such as reduced visibility and damage to crops, vegetation, animals, and buildings.

In addition to the national standards, Pennsylvania has established its own more stringent standards for certain pollutants. Table B.8.2-1 presents the additional standards for Pennsylvania.

Table B.8.2-1

Pennsylvania Ambient Air Quality Standards [a]

Pollutant	Averaging Period	State AAQS
Settled particulate (total)	Annual	0.8 mg/cm^2/month
	30-day	1.5 mg/cm^2/month
Beryllium	30-day	0.01 g/m^3
Fluorides (total soluble, as HF)	24-hour	5 g/m^3
Hydrogen Sulfide	24-hour	0.05 ppm
	1-hour	0.1 ppm

Note:
mg/cm^2/month = milligrams per square centimeter per month, ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter
[a] Maximum values that may not be exceeded.

AQCRs are areas established for air quality planning purposes in which implementation plans describe how ambient air quality standards will be achieved and maintained. AQCRs were established by the EPA and local agencies, in accordance with Section 107 of the CAA and its amendments, as a means to implement the CAA and comply with the NAAQS through state implementation plans (SIPs). The AQCRs are intrastate and interstate regions such as large metropolitan areas where the improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR.

An AQCR, or portion thereof, is designated based on compliance with the NAAQS. AQCR designations fall under three general categories as follows: attainment (areas in compliance with the NAAQS); nonattainment (areas not in compliance with the NAAQS); or unclassifiable. AQCRs that were previously designated nonattainment but have since met the requirements to be classified as attainment are classified as maintenance areas. Table B.8.1-2 presents the AQCRs in which various components of the Amendment Project would be located, along with the current attainment status listed in 40 CFR 81 for each pollutant. As shown, the areas in which the Amendment Project would be located are in attainment for all pollutants except ozone. Two AQCRs, in northeastern Pennsylvania and in the metropolitan Philadelphia region, were also previously in nonattainment for $PM_{2.5}$, but were re-designated as attainment in 2015.

Table B.8.2-2

Attainment Status for Amendment Project Components

Amendment Project Component	Location (County/Township)	AQCR	Attainment/ Unclassifiable	Nonattainment
Saylor Ave Realignment and Interstate 81 Workspace Adjustment	Luzerne, PA – Plains	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2	None [a]
Appalachian Trail PPL Crossing Realignment (partial), Blue Mountain Lateral, and Blue Mountain Interconnect	Carbon, PA – Lower Towamensing	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2	Marginal for O_3 2008
Appalachian Trail PPL Crossing Realignment (partial)	Monroe, PA - Eldred	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2	None [a]
Appalachian Trail PPL Crossing Realignment (partial) and Freemansburg Ave Realignment	Northampton, PA – Moore and Bethlehem	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2 Maintenance area for $PM_{2.5}$ 2006 [b]	Marginal for O_3 2008 Maintenance for $PM_{2.5}$ 2006

Notes
NO_x = nitrogen oxides, Pb = lead
[a] For new source review (NSR) purposes, all Amendment Project sites and counties in PA and NJ are subject to moderate ozone non-attainment as both states are within the Ozone Transport Region (OTR).
[b] Northampton County, PA was previously designated as moderate nonattainment for the 2006 24-hour PM2.5 standard but was re-designated as attainment on April 13, 2015.

Greenhouse Gases

The EPA has defined air pollution to include the mix of six long-lived and directly emitted GHGs (carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). The EPA found that the current and projected concentrations of the six GHGs in the atmosphere threaten the public health and welfare of current and future generations through climate change.

GHG, including CO_2, CH_4, N_2O, hydrofluorocarbons, and perfluorocarbons, are naturally occurring pollutants in the atmosphere and products of human activities, including burning fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderate day/night temperature variation. In general, the most abundant GHGs are water vapor, CO_2, CH_4, N_2O, and O_3. GHG produced by fossil-fuel combustion are CO_2, CH_4, and N_2O. GHGs are non-toxic and non-hazardous at normal ambient concentrations. Increased levels of all GHG since the industrial age are the primary cause of warming of the global climate system since the 1950s. Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_2e).

As with any fossil fuel-fired project or activity, the Amendment Project would contribute to GHG emissions. The principle GHGs that would be produced by the Amendment Project are CO_2, CH_4, and N_2O. Emissions of GHGs are quantified and regulated in units of carbon dioxide equivalents (CO_2e). The CO_2e unit of measure takes into account the global warming potential (GWP) of each GHG over a specified timeframe. The GWP is a ratio relative to CO_2 that is based on the particular GHG's ability to absorb solar radiation as well its residence time within the atmosphere. Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298 on a 100-year timescale. To obtain the CO_2e quantity, the mass of the particular compound is multiplied by the corresponding GWP, the product of which is the CO_2e for that compound. The CO_2e value for each of the GHG compounds is summed to obtain the total CO_2e GHG emissions.

The EPA has expanded its regulations to include the emission of GHGs from major stationary sources under the Prevention of Significant Deterioration (PSD) program. The EPA's current rules require that a stationary source that is major for a non-GHG-regulated New Source Review (NSR) pollutant must also obtain a GHG PSD permit prior to beginning construction of a new or modified major source with mass-based GHG emissions equal to or greater than 100,000 tons per year (tpy) and significant net emission increases in units of CO_2e equal to or greater than 75,000 tpy. There are no NAAQS or other significance thresholds for GHGs.

8.2.2 Regulatory Requirements for Air Quality

The Amendment Project would be potentially subject to a variety of federal and state regulations pertaining to the construction of air emission sources. The CAA, 42 USC 7401 et seq., as amended in 1977 and 1990, and 40 CFR Parts 50 through 99 are the basic federal statutes and regulations governing air pollution in the U.S. The PADEP has the primary jurisdiction over air emissions produced by stationary sources associated with the Project. Since this EA only addresses changes to the potential emissions from construction (as operating emissions would not change), the following sections summarize the applicability of various state and federal regulations that are relevant to construction emissions. As such the Title V Operating Permit, the NSR and Prevention of Significant Deterioration, New Source Performance Standards, and the National Emission Standards for HAPs would not be applicable to the Amendment Project.

8.2.2.1 General Conformity

A general conformity analysis must be conducted by the lead federal agency if a federal action would result in the generation of emissions that would exceed the general conformity applicability threshold levels of the pollutants(s) for which an AQCR is in nonattainment. According to Section 176(c)(1) of the CAA (40 CFR §51.853), a federal agency cannot approve or support any activity that does not conform to an approved SIP. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to any new violation of any standard in any area;
- increase the frequency or severity of any existing violation of any standard in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

General Conformity does not apply to federal actions in attainment areas or unclassifiable/attainment areas, including counties designated attainment or unclassifiable/attainment that are within the Northeast OTR. The EPA amended the General Conformity Rule in 2010 (Federal Register, Volume 75, Number 64) to exclude emissions regulated by any permit issued under minor and major NSR from a General Conformity applicability analysis.

General conformity assessments must be completed when the total direct and indirect emissions of a project would equal or exceed specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area. With regard to the Amendment Project, the relevant general conformity pollutant thresholds are shown in table B.8.1-3. These thresholds are based on the current air quality designations (e.g., serious nonattainment, moderate nonattainment, maintenance, etc.).

The changes in estimated emissions for the Amendment Project subject to review under the general conformity thresholds, along with a comparison to the applicable general conformity threshold are presented in table B.8.2-3. Only construction emissions would be subject to review under general conformity. No changes to operational emissions are anticipated as part of the Amendment Project.

Table B.8.2-3

General Conformity Emissions for the Amendment Project

Amendment Project Component	Location (County, State)	County Nonattainment or Maintenance Pollutants [a b]	Construction Emissions [c]	General Conformity "de minimis" rates for Nonattainment or Maintenance Areas	General Conformity Determination Required? (Yes/No)
Saylor Ave Realignment and Interstate 81 Workspace Adjustment	Luzerne, PA	None	N/A	N/A	No
Appalachian Trail PPL Crossing Realignment (partial), Blue Mountain Lateral, and Blue Mountain Interconnect	Carbon, PA	O_3	4.85 tons NOx 0.71 tons VOC	100 tpy NOx 50 tpy VOC	No
Appalachian Trail PPL Crossing Realignment (1 mile of the mainline pipeline)	Monroe, PA	None	N/A	N/A	No
Appalachian Trail PPL Crossing Realignment (partial) and Freemansburg Ave Realignment	Northampton, PA	$PM_{2.5}$ O_3	7.53 tons $PM_{2.5}$ 0.05 tons SO_2 3.89 tons NOx 0.59 tons VOC	100 tpy $PM_{2.5}$ 100 tpy SO_2 100 tpy NOx 50 tpy VOC	No

Notes:
[a] Marginal or Moderate Nonattainment for the 2008 8-hour Ozone standard
[b] Maintenance Area for the 1997 and/or 2006 $PM_{2.5}$ Standards
[c] Assumes that emissions of all major construction activities would occur during one calendar year

However, the General Conformity applicability evaluation cannot be performed against just the net changes in construction as a result of the Amendment Project. Rather, the General Conformity applicability evaluation must be performed against the revised total emissions for each nonattainment or maintenance area affected by the Amendment Project. The total construction emissions for each nonattainment or maintenance area along the Revised Pennsylvania Route[30] are shown in table B.8.2-4. All construction emissions (including the Certificated Project and the Project Amendment) were conservatively assumed to occur in a single calendar year (spring to November 2020). This assumption ensures that any possible exceedance of a general conformity threshold would be identified, since emissions spread over multiple calendar years would be less likely to trigger general conformity. Based on this assumption, emission estimates for construction would not exceed general conformity applicability thresholds. Based upon this evaluation, a general conformity determination would not be required.

[30] The Revised Pennsylvania Route refers to the Certificated Route inclusive of the modification from Amendment Project.

Table B.8.2-4

General Conformity Applicability Evaluation for the Revised Pennsylvania Route[a]

Amendment Project Component	Location (County, State)	County Nonattainment or Maintenance Pollutants [b c]	Construction Emissions [d]	General Conformity "de minimis" rates for Nonattainment or Maintenance Areas	General Conformity Determination Required? (Yes/No)
22.9 miles of mainline pipeline	Luzerne, PA	None	N/A	N/A	No
28 miles of mainline pipeline, 0.5 miles of lateral pipeline, Kidder Compressor Station	Carbon, PA	O_3	50.0 tons NOx 7.3 tons VOC	100 tpy NOx 50 tpy VOC	No
1.0 miles of mainline pipeline	Monroe, PA	None	N/A	N/A	No
23.7 miles of mainline pipeline, 2.1 miles of lateral pipeline	Northampton, PA	$PM_{2.5}$ O_3	78.2 tons $PM_{2.5}$ less than 1 tons SO_2[e] 42.6 tons NOx 6.3 tons VOC	100 tpy $PM_{2.5}$ 100 tpy SO_2 100 tpy NOx 50 tpy VOC	No

Notes:
[a] These emissions would include the four modifications which are part of the Amendment Project.
[b] Marginal or Moderate Nonattainment for the 2008 8-hour Ozone standard
[c] Maintenance Area for the 1997 and/or 2006 $PM_{2.5}$ Standards
[d] Assumes that emissions of all major construction activities would occur during one calendar year
[e] Table 9.1 of the February 2019 Certificate Amendment Application, Exhibit F-I Environmental Report.

8.2.3 Applicable State Air Quality Requirements

In addition to the federal regulations identified above, Pennsylvania has its own air quality regulations that may be applicable to construction emissions for the Amendment Project, which are summarized below.

8.2.3.1 Pennsylvania

Air quality regulations for the state of Pennsylvania are codified in Title 25 of the Pennsylvania Code (Pa. Code) and are administered by the PADEP.

- 25 Pa. Code Chapter 123. *Standards for Contaminants*. This chapter establishes standards and limits for emissions of various pollutants, including fugitive emissions (123.1 and 123.2), particulate matter (123.11 through 123.14), sulfur compounds (123.21 through 123.25), odor (123.31), visible emissions (123.41 through 123.46), and NO_x (123.51).

8.2.4 Air Emissions Impacts and Mitigation

8.2.4.1 Construction Emissions and Mitigation

Construction of the Amendment Project components would result in short-term increases in emissions of some air pollutants due to the use of equipment powered by diesel fuel or gasoline engines and the generation of fugitive dust due to the disturbance of soil and other dust-generating activities. More specifically, the construction activities that would generate air emissions include:

- site preparation (land clearing, grading, excavation, etc.);
- installation of pipeline and pipeline interconnection equipment;
- operation of off-road vehicles and trucks during construction; and
- workers' vehicles used for commuting to and from the construction site (i.e., on-road vehicles).

PennEast estimates approximately 64 acres would be disturbed during construction of the Amendment Project components. Pipeline site preparation and construction activities would generate fugitive dust from clearing, trenching, backfilling, grading, and traffic on paved and unpaved areas, as well as fuel combustion emissions from the construction equipment. The internal combustion engines powering most of the pipeline construction equipment and vehicles would burn ultra-low-sulfur diesel fuel and the remaining vehicles would burn gasoline. Equipment that would be used for the pipeline and interconnect station construction activities would include various earthmoving equipment (bulldozers, backhoes, trenchers, graders, and compactors), cranes, forklifts, compressors, pumps, trenchers, stringing trucks, welding rigs, rock drills, generators, and miscellaneous trucks.

Construction truck traffic (e.g., supply trucks) and worker commuter vehicles would generate fugitive dust from travel on paved and unpaved surfaces as well as tailpipe emissions. Each of the four modifications would involve the use of gasoline pickup trucks, lowboy tractor trucks, diesel parts vans, and diesel buses.

Fuel combustion emissions from off-road construction equipment and on-road vehicles were estimated using EPA's MOVES2014 model.[31] For each equipment type, MOVES2014 can generate specific emission factors, which take into account such information as regional meteorology, regional equipment mix, and the calendar year of activity. For off-road and on-road combustion emissions, PennEast used the predicted MOVES2014 emission factors for Luzerne County, Pennsylvania.

Fugitive dust emissions generated by on-site construction equipment were estimated using emission factors from the EPA reference document "Estimating Particulate Matter Emissions from Construction Operations" (Eastern Research Group, Inc. 1999). PennEast used the document's recommended values for roadway construction, which is considered similar in nature to pipeline construction, along with specific dry silt factor based on soil data collected for the Amendment Project.

Roadway fugitive dust emissions were estimated using emission factors from EPA's AP-42 document, with most of the vehicle miles occurring on paved rather than unpaved roadways. Fugitive dust emission estimates for unpaved roadways assume the use of water spray dust suppression with a control efficiency of 50 percent.

The construction emissions for criteria air pollutants and GHG (as CO_2e) from the Amendment Project only are presented in table B.8.2-5. For comparison purposes, tables B.8.2-6 through B.8.1-8 present the total construction emissions for the Revised Pennsylvania Route, for the Certificated Route, and the difference between the Revised Pennsylvania Route and Certificated Route. These totals include fuel combustion emissions as well as fugitive dust emissions. As shown, fugitive dust accounts for the majority of PM_{10} and $PM_{2.5}$ emissions during construction of the Amendment Project. PennEast has developed a Fugitive Dust Control Plan (FDCP) to mitigate these emissions.[32] We reviewed the FDCP and find it acceptable. Some of the measures outlined in the FDCP include the following:

- where possible, use of water for control of dust in the construction operations, the grading of roads, or the clearing of land;
- application of water, or suitable dust suppression chemicals on dirt roads, materials stockpiles, and other surfaces which may create significant airborne dust;
- where possible, paving/grading of roadways and maintaining them in a clean condition;

[31] EPA's most current model for estimating nonroad equipment emissions, NONROAD2008, has been incorporated into MOVES2014, which previously only modeled on-road equipment.
[32] Appendix L-5 of the original September 2015 application

- removal of spilled or tracked dirt or other materials from paved streets, and of dried sediments resulting from soil erosion;
- reducing vehicular traffic speed to a point below significant dust emission creation;
- preventing motor vehicle use in unpaved areas when necessary;
- stabilizing topsoil piles with use of BMPs, mulch, temporary seeding, tackifiers, or functional equivalents, when necessary; and/or
- covering open-bodied trucks while transporting materials.

Table B.8.2-5

Pipeline Construction Emissions for the Amendment Project

Activity	Pollutants (Tons)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Saylor Ave. Realignment								
Construction Equipment Exhaust and On-Road PM	0.70	0.52	0.13	1.99	0.40	0.003	350	0.03
Fugitive Dust from Land Disturbance	-	-	-	3.71	0.56	-	-	-
Interstate 81 Workspace Adjustment								
Construction Equipment Exhaust and On-Road PM	0.00	0.00	0.00	0.00	0.00	0.000	0	0.00
Fugitive Dust from Land Disturbance	-	-	-	2.10	0.31	-	-	-
Appalachian Trail PPL Crossing Realignment								
Construction Equipment Exhaust and On-Road PM	9.37	4.82	1.40	18.47	3.76	0.083	3,878	0.10
Fugitive Dust from Land Disturbance	-	-	-	75.70	11.36	-	-	-
Freemansburg Ave. Realignment								
Construction Equipment Exhaust and On-Road PM	0.93	0.49	0.14	1.88	0.38	0.011	391	0.01
Fugitive Dust from Land Disturbance	-	-	-	17.50	2.62	-	-	-
Total	**11.00**	**5.83**	**1.67**	**121.35**	**19.39**	**0.10**	**4,619**	**0.14**

Table B.8.2-6
Pipeline Construction Emissions for the Revised Pennsylvania Route

Activity	Pollutants (Tons)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Diesel Non-Road Equipment	128.1	38.0	16.7	6.6	6.4	0.9	54,317	2.00
Diesel and Gas On-Road Equipment	6.2	35.8	4.0	0.34	0.2	0.0	2,527	0.26
Construction Activity Fugitive Dust	-	-	-	1,102.5	166.1	-	-	-
Roadway Fugitive Dust	-	-	-	272.7	50.1	-	-	-
Compressor Station Construction	3.3	3.3	0.7	35.5	5.5	0.0	1,708	0.05
Total	**137.6**	**77.1**	**21.4**	**1,417.6**	**228.3**	**0.9**	**58,552**	**2.31**

The emissions of the Revised Pennsylvania Route include the emissions of the Amendment Project.

Table B.8.2-7
Pipeline Construction Emissions for the Certificated Route

Activity	Pollutants (Tons)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Diesel Non-Road Equipment	76	22	8	5.1	4.9	0.22	23,924	0.57
Diesel and Gas On-Road Equipment	5	22.8	2.53	0.29	0.17	0.03	1,690	0.18
Construction Activity Fugitive Dust	-	-	-	1,842	275	-	-	-
Roadway Fugitive Dust	-	-	-	132	21	-	-	-
Compressor Station Construction	6	5	1	29	4	0.02	1,712	0.05
Total	**87**	**50**	**11**	**2,008**	**305**	**0.27**	**27,326**	**0.80**

Table B.8.2-8

Difference Pipeline Construction Emissions Between the Revised Pennsylvania Route and the Certificated Route

Activity	Pollutants (Tons)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Diesel Non-Road Equipment	52.1	16.0	8.7	1.5	1.5	0.68	30,393	1.43
Diesel and Gas On-Road Equipment	1.2	13.0	1.47	0.05	0.03	-0.03	837	0.08
Construction Activity Fugitive Dust	-	-	-	-740	-109	-	-	-
Roadway Fugitive Dust	-	-	-	141	29.1	-	-	-
Compressor Station Construction	-2.7	-1.7	-0.3	6.5	1.5	-0.02	-4	-
Total	**50.6**	**27.3**	**9.9**	**-591**	**-77**	**0.63**	**31,226**	**1.51**

In addition, the Field Project Manager and EI would determine when to apply dust control measures during construction activities and these Amendment Project personnel would share the authority with the contractor and construction superintendent to determine if/when water needs to be reapplied for dust control and to determine if/when additional mitigation would be needed. In addition, the Field Project Manager and EI would have the authority to stop work on any activity that would not apply with the dust control measures outlined in the plan.

Emissions during construction would increase pollutant concentrations in the vicinity of the pipeline; however, their effect on ambient air quality would vary with time due to the construction schedule, the mobility of the sources, and the variety of emission sources. Construction emissions associated with the Amendment Project and Blue Mountain Interconnect would be considered temporary and cease at completion of construction. Following construction, air quality would not revert back to previous conditions, but would transition to permanent operational-phase emissions after commissioning and initial start-up.

8.2.4.2 Operating Emissions and Mitigation

The Amendment Project would not result in any changes to the operating emissions as described for the Certificated Project. Therefore, the operating emissions and mitigations that were presented for the Certificated Project remain unchanged.

No operational emissions would be proposed. Due to the temporary nature of construction activities, and with the implementation of the mitigation measures discussed in the FDCP, we conclude that construction of the Amendment Project would not have a significant impact on air quality.

8.3 Noise

Construction and operation of the Amendment Project would affect the local acoustical environment. The ambient sound level of a region is defined by the total noise generated within the specific environment and comprises sounds from both natural and industrial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably throughout the day and week, in part due to changing weather conditions and the impacts of seasonal vegetative cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the day-night equivalent sound level (L_{dn}). The L_{eq} is a sound level containing the same sound energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, in the calculation of the L_{dn}, late night to early morning (10:00 p.m. to 7:00 a.m.) noise exposures are penalized by 10 A-weighted decibels (dBA), to account for people's greater sensitivity to sound during the nighttime hours. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. For an essentially steady sound source that operates continuously over a 24-hour period, the L_{dn} is 6.4 dBA above the measured L_{eq}.

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. PennEast has adopted this criterion to evaluate the potential noise impacts from the Amendment Project at noise-sensitive areas (NSAs) such as residences, schools, or hospitals. FERC requires that the noise attributable to any to any new installation (i.e., new compressor stations and associated pipeline facilities) during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10 dBA nighttime penalty added when calculating the L_{dn}, for a facility to meet the L_{dn} 55 dBA limit, it must be designed such that average noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA.

There are no noise regulations or ordinances at the state or county level applicable to the Amendment Project. Lower Towamensing Township has a noise ordinance that is applicable to the Amendment Project and prescribes daytime and nighttime sound limits applicable at the lot line of Blue Mountain Interconnect. Table B.8.3-1 presents those limits.

Table B.8.3-1

Lower Towamensing Permissible Sound Limits (dBA)

Requirement		Nighttime (10:00 pm – 7:00 am)	Daytime (7:00 am – 10:00 pm)
At lot line adjacent to land zoned residential or preservation	90% of time must be less than:	60	70
	Maximum:	70	80
At lot line adjacent to land zoned industrial or commercial	90% of time must be less than:	65	75
	Maximum:	75	85

In addition, the ordinance states that no physical vibration should be perceptible without use of instruments at or beyond the lot lines.

The most stringent noise requirements for Lower Towamensing Township prescribe a nighttime sound limit not to exceed 60 dBA for 90 percent of the time and not exceed a maximum sound level of 70 dBA at the site boundary.

8.3.1 Existing Noise Conditions

The existing noise conditions for the proposed aboveground facility and HDD sites are summarized below.

8.3.1.1 Blue Mountain Interconnect

PennEast measured the existing ambient acoustic environment at the Blue Mountain Interconnect by collecting ambient sound data at one location near the closest noise sensitive area (NSA) located close to the proposed Blue Mountain Interconnect. The NSA is representative of residences positioned approximately 2,300 feet north, northeast of the proposed Station. PennEast collected ambient sound measurements during both daytime and nighttime periods on December 19, 2017. The goal of the ambient sound survey was to document the lower range of ambient sound levels for the meteorological conditions that existed during the sound survey. Measured daytime and nighttime ambient sound level values were consistent at 40 dBA, with the resulting L_{dn} value being 46.6 dBA.[33]

8.3.1.2 Horizontal Directional Drilling Sites

PennEast collected short-term daytime and nighttime sound pressure level measurements in the vicinity of the HDD entry and exit sites of the proposed HDD crossings on October 26, 2015 and September 23, 2016[34] using the same methodology as that used to collect baseline data for the Blue Mountain Interconnect. A summary of the sound level measurement data and associated meteorological conditions are presented in table B.8.3-2.

Table B.8.3-2

HDD Sites - Summary of Ambient Sound Survey Results

Nearest NSA	HDD Crossing	Distances (feet) to HDD Entry / Exit	Baseline Site ID	Ambient Sound Level (L_{dn}, dBA)
NSA-1	U.S. Hwy 81 / State Hwy 315	1,370 / 2,875	M1, M2	68
NSA-2a	U.S. Hwy 81 / State Hwy 315	3,305 / 2,030	M3	58
NSA-2b	U.S. Hwy 81 / State Hwy 315	2,875 / 2,495	M1, M2	68
NSA-7a	Lehigh River	2,625 / 4,675	Est.	51
NSA-7b	Lehigh River	2,450 / 5,340	M9	63
NSA-8	Lehigh River	4,415 / 1,375	M10	63

8.3.2 Construction Noise Impacts and Mitigation

Noise emissions would be variable during the construction period and would occasionally exceed the existing ambient sound levels in the area; however, due to the temporary nature of construction noise,

[33] Additional details are presented in an ambient acoustic report included as appendix J-2 of PennEast's amendment application filed with FERC (see accession number 20190201-5212).

[34] FERC staff requested more current data. PennEast will file in September 2019. A condition was added to provide this information.

no long-term effects would be anticipated. Potential noise impacts associated with construction were analyzed for pipeline construction and for HDD.

8.3.2.1 Pipeline Construction

Table B.8.3-3 presents the estimated L_{dn} noise levels associated with pipeline construction at the closest NSA to workspace associated with each of the four proposed modifications. The highest noise levels anticipated during pipeline construction would be associated with clearing and grading. The anticipated range of daytime, nighttime, and average 24-hour construction noise levels were estimated for each closest NSA. Construction along the Saylor Avenue Realignment and the Appalachian Trail PPL Crossing Realignment, including the Blue Mountain Interconnect, would consist of daytime construction only. Construction at the Interstate 81 Workspace Adjustment and the Freemansburg Avenue Realignment may occur up to 24 hours a day, as both modifications are associated with HDD that would require continuous operation at specific stages during the drilling process. PennEast is in the process of updating background noise levels at all HDD locations and would be monitoring and mitigating noise impacts, as needed, per the HDD Noise Mitigation Plan that would be submitted prior to construction in its Implementation Plan in accordance with Condition 54 of the Certificate Order.

Elevated nighttime construction noise levels at the Interstate 81 Workspace Adjustment and the Freemansburg Avenue Realignment are associated with HDD activities. An HDD noise assessment is provided in section 8.2.2.5. At the Freemansburg Avenue Realignment, construction also would include an area where only overnight construction would occur. The proposed Freemansburg Ave Realignment would be located near a shopping complex in Northampton County. PennEast proposes to mitigate impacts to traffic in the vicinity of this complex by limiting construction hours, so that construction activities in this area would take place between the hours of 10 p.m. and 6 a.m. PennEast stated that the overnight construction is included in a current landowner agreement and noise monitoring and mitigation would occur, as needed.

Table B.8.3-3

Predicted Pipeline Construction Noise (dBA, L_{dn}) at the Closest NSAs Relative to the Modification Construction Corridor

Noise Sensitive Area (NSA) Receiver ID	Distance from Nearest Pipeline Construction Corridor Edge	Range of Daytime (7 a.m. – 10 p.m.) Construction Noise	Range of Nighttime (10 p.m. – 7 a.m.) Construction Noise	Range of Estimated 24-Hour Construction Noise Levels
	Feet	15-hour L_{eq}, dBA	9-hour L_{eq}, dBA	L_{dn}, dBA
Saylor Avenue Realignment [a]				
NSA C-01	255	57–73	–	–
NSA C-02	209	59–73	–	–
NSA C-03	213	58–74	–	–
NSA C-04	186	60–76	–	–
Interstate 81 Workspace Adjustment [b]				
NSA 1	980	45–61	47–63	54–70
NSA 2b	147	62–78	64–80	70–86
NSA C-04	2,441	37–53	40–55	46–62
Appalachian Trail PPL Crossing Realignment [c]				
NSA C-07	235	57–74	–	–
NSA C-08	176	59–76	–	–
NSA C-09	466	51–68	–	–
NSA C-10	70	67–84	–	–
NSA C-11	106	64–81	–	–
NSA C-12	90	65–82	–	–
NSA C-13	919	45–62	–	–
NSA C-14	848	45–62	–	–
NSA C-15	826	46–63	–	–
NSA C-16	909	45–62	–	–
NSA C-17	411	52–69	–	–
NSA C-18	229	57–74	–	–
NSA C-19	350	53–70	–	–
NSA C-20ts o	46	71–88	–	–
Blue Mountain Interconnect [d]				
NSA C-06	676	47–64	–	–
Freemansburg Avenue Realignment [e]				
NSA C-21	441	51–68	53–70	60–77
NSA C-22	186	59–76	61–78	67–84
NSA 7a	2,322	37–54	39–56	45–62
NSA 7b	1,109	43–60	45–62	52–68

Note:
a Saylor Avenue Realignment construction will occur during daytime hours.
b Interstate 81 Workspace Adjustment is associated with an HDD, which may operate up to 24 hours each day.
c Appalachian Trail PPL Crossing Realignment construction will occur during daytime hours.
d Blue Mountain Interconnect construction will occur during daytime hours.
e Freemansburg Avenue Realignment is associated with an HDD, which may operate up to 24 hours each day.

8.3.2.2 Construction Noise Mitigation

For NSAs that may be subject to construction noise levels greater than 55 dBA L_{dn}, PennEast proposes to implement the following noise mitigation measures:

- Stationary noise sources, such as generators and air compressors, would be placed away from NSAs. Non-noise-producing mobile equipment such as trailers would be placed between noise sources and sensitive receivers. If such trailers or similar obstacles are used, PennEast would minimize openings using additional materials.
- Temporary noise barriers may also be used to reduce potential noise impacts. Barriers could consist of wooden panel walls built high enough to block the line-of-sight between the NSA and the targeted construction noise source. Alternately, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity.
- Back-up beepers would be replaced with alternative site safety alert measures (e.g., spotters on applicable construction equipment).
- Mufflers would be added to select construction equipment.PennEast would also monitor noise during construction activities and additional noise mitigation would be implemented, as necessary.

8.3.2.3 Blasting

Blasting may be necessary in order to excavate the trench through rock strata for pipeline installation (see section B.1). The estimated noise level from blasting activity can be derived from the Federal Highway Administration Roadway Construction Noise Model User's Guide (FHWA 2006). It describes that the maximum noise level at 50 feet from blasting would be 94 dBA. While this would be a relatively high noise level, and likely to be heard at considerable distances from the detonation point, it would be a short duration as compared to rock removal methods, such as using track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and/or rotary rock drills. Blasting activity noise would also depend on the blasting plan and individual blast design features or characteristics such as confinement, charge weight, detonation timing and delay, and orientation. PennEast has developed a blasting plan[35] which is also addressed in the geology section. Blasting would be conducted in accordance with applicable agency regulations, including advance public notification and mitigation measures as necessary. For the Certificated Project, FERC did not impose any conditions on proposed blasting activities. To maintain consistency with the requirements of the Certificated Project and based on the short-term nature of the potential noise impact, we do not recommend any additional noise mitigation for the proposed blasting activities for the Amendment Project.

8.3.2.4 Vibration

PennEast conducted a vibration analysis that compared predicted vibration levels from construction equipment with established criteria at a sensitive location, or at a distance from the vibration source at which a predicted level would exceed the criteria. According to Federal Transit Administration (FTA) guidance, the threshold for residences is 72 vibration decibels (VdB) of vibration velocity. Also, according to FTA, a large bulldozer (representing the kind of construction equipment anticipated) can exhibit 87 VdB at a reference distance of 25 feet. The vibration analysis determined that beyond a distance of 80 feet vibration levels would be below the FTA guidance threshold. Since there are no NSAs identified within

[35] see accession number 20150925-5028 (appendix O, section D).

50 feet of the construction workspace[36] the modifications and construction vibration associated with the Amendment Project would not be expected to cause a significant impact on the acoustical environment.

8.3.2.5 Horizontal Directional Drilling

The Amendment Project would include two proposed HDD crossings. Table B.8.3-4 presents an assessment of HDD noise impacts that shows the estimated L_{dn} associated with each nearest NSA identified at each HDD crossing entry and exit site associated with the Amendment Project.

Table B.8.3-4

Estimated HDD Noise Level (L_{dn}) at NSA nearest to HDD Crossings

Nearest NSA	HDD Crossing	Distances (feet) to HDD Entry /Exit	Baseline Site ID	Ambient Sound Level (L_{dn}, dBA) [a]	Estimated HDD Noise Level (L_{dn}, dBA)	Cumulative Sound Level (dBA, L_{dn})	Change in Sound Level (dBA, L_{dn})
NSA 1-Entry	U.S. Hwy 81 / State Hwy 315	1,370 / 2,875	M1, M2	68	54	68	<1
NSA 2a-Exit	U.S. Hwy 81 / State Hwy 315	3,305 / 2,030	M3	58	45	58	<1
NSA 2b-Exit	U.S. Hwy 81 / State Hwy 315	2,875 / 2,495	M1, M2	68	46	68	<1
NSA 7A-Entry	Lehigh River	2,625 / 4,675	Est.	51	47	53	2
NSA 7B-Entry	Lehigh River	2,450 / 5,340	M9	63	49	63	<1
NSA 8-Entry	Lehigh River	4,415 / 1,375	M10	63	56	64	1

Note:
Estimated HDD noise levels were calculated to represent potential worst-case noise impacts at NSAs. For instance, where an NSA is located closer to an HDD entry point, it was assumed that the associated HDD equipment was in operation at the HDD entry point. If an NSA was located closer to an HDD exit point, it was assumed that the associated HDD equipment was in operation at the HDD exit point

[a] FERC staff requested more current data. PennEast will file in September 2019.

The ambient sound data presented in table B.8.3-4 was collected in 2015. Using the 2015 ambient sound data in the HDD acoustic assessment, the predicted HDD noise may exceed the FERC threshold of 55 dBA L_{dn} at NSA 8. FERC has requested that PennEast conduct an updated ambient sound survey and HDD acoustic assessment; therefore, potential HDD noise-related impacts at NSAs may change from those presented in Table B.8.2-4. For the Amendment Project, if there are exceedances of the 55 dBA FERC noise criterion, PennEast would prepare an HDD Noise Mitigation Plan for each HDD location to reduce the projected noise level to 55 dBA at NSAs, as required by the Certificate Order (Environmental Condition 54). The noise mitigation plan would include monitoring noise levels during HDD operations and mitigation measures that may be implemented, as necessary, to restrict the noise attributed to drilling operations to no more than an L_{dn} of 55 dBA at the NSAs. Mitigation measures could include the following techniques:

- Stationary noise sources, such as generators and air compressors, would be placed away from NSAs to the farthest extent practical. As feasible, non-noise-producing mobile equipment such as trailers would be placed between noise sources and sensitive receivers. If such trailers or similar obstacles are used, to minimize flanking underneath or through vertical gaps, PennEast would cover the openings with at least one-half-inch thick plywood, hay bales or other sufficiently dense material.

[36] The commercial properties such as offices listed in the land use section are not considered NSAs.

- If there is not sufficient space to create a noise barrier using the non-noise-producing equipment in use at an active construction site, PennEast may also construct temporary noise barriers using appropriately thick wooden panel walls (at least one-half-inch thick) or other materials/assemblies built high enough to block the line-of-sight from the dominant construction noise source(s) to the NSA. Such barriers could, depending on factors such as barrier height, barrier length, and distance between the barrier and the noise-producing equipment or activity, reduce construction noise by 5 to 10 dBA at nearby NSA locations. Alternately, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity.

PennEast would implement noise mitigation measures as needed to reduce construction noise and ensure that noise from HDDs would not exceed 55 dBA L_{dn} at NSAs. For instances where the existing noise already exceeds this level, the limit would be changed to 10 dBA above the measured background level at the time, in conformance with FERC's most recent guidance.

Due to the relatively short duration of HDD activity, PennEast would also consider, on a case-by-case basis, offering compensation to the occupant(s) of an NSA towards provision of temporary hotel accommodations during the HDD activity. We conclude that the noise from HDD activities should be analyzed further with the current ambient data and potentially mitigated. Environmental Condition 54 of the Certificate Order requires PennEast to file a HDD noise mitigation plan for each HDD, and this requirement would also apply to the Amendment Project.

Due to the temporary nature of construction activities and with the implementation of the mitigation measures presented above, we conclude that construction of the Amendment Project would not have a significant impact on the acoustical environment.

8.3.3 Operational Noise Impacts and Mitigation

8.3.3.1 Blue Mountain Interconnect

Operation of the Blue Mountain Interconnect would have the potential to result in noise impacts at nearby NSAs. The proposed equipment at the interconnect would include two rotary meters, one water bath heater, two parallel pressure/flow control valves, control building and small standby generator. PennEast provided an acoustic analysis that addressed noise from the more significant sound contributors; the water bath heater and control valve and associated piping. Standard propagation conditions were assumed (i.e., no wind, 60 degrees F., 70 percent relative humidity) and any shielding from buildings, terrain or foliage was conservatively ignored and/or conservatively applied. In addition, PennEast incorporated some noise control measures into the proposed design, including:

- globe style valves with low noise trim such that the sound level at maximum pressure differential / maximum flow rate shall not exceed 85 dBA at 3 feet and 90 degrees downstream of the globe style control valve;
- aboveground piping would be placed below grade if possible. If piping noise is an issue, lagging would be used consisting of a minimum 3-inch-thick fiberglass or mineral wool that is covered with a mass-filled vinyl jacket; and
- noise from the water bath heater would not exceed a sound level of 50 dBA at 50 feet from its perimeter at maximum rated operating conditions. In addition, the near-field sound level of the water bath combustion intake and exhaust would not exceed 85 dBA at 3 feet.

Table B.8.3-5 summarizes the results of the operational acoustic analysis for the Blue Mountain Interconnect.

Table B.8.3-5

Blue Mountain Interconnect, Operational Impact Summary

NSA	Distance to Center of Proposed Interconnect	Existing Ambient L_{dn} (dBA)	Predicted Noise Contribution from Blue Mountain, L_{dn} (dBA)	Existing Ambient and Predicted Station Contribution, L_{dn} (dBA)	Expected Increase (dBA)
1	2,300 ft N-NE	46.6	27.4	46.4	<1

Sound levels were also evaluated at the interconnect lot line to assess compliance with the Town of Lower Towamensing noise ordinance. The predicted received sound level at the closest, eastern, property line, corresponds to 52.7 dBA, which would comply with the applicable 60 dBA nighttime limit prescribed by the Town of Lower Towamensing.

The results of the measurements, observations and analysis indicate that the proposed Blue Mountain Interconnect sound level contribution at the nearby NSAs would be significantly below an L_{dn} of 55 dBA. Therefore, the sound level attributable to the proposed Blue Mountain Interconnect would be expected to comply with the FERC criterion of 55 dBA L_{dn} at the nearby NSAs.

With the implementation of the noise control measures presented above we conclude that operational noise from the Amendment Project would not have a significant impact on the acoustical environment at the nearby NSAs.

9.0 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an auto-ignition temperature of 1,000 degrees F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

9.1 Pipeline Safety Standards

The USDOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49, USC Chapter 601. The USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA's safety mission is to ensure that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

Title 49, USC Chapter 601 provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. A state may also act as USDOT's agent to inspect interstate facilities within its boundaries; however, the USDOT is responsible for enforcement actions.

The USDOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 specifically addresses natural gas pipeline safety issues.

Under a MOU on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993, between the USDOT and the FERC, the USDOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the USDOT in accordance with section 3(e) of the *Natural Gas Pipeline Safety Act*. The FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert USDOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the USDOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Amendment Project must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The USDOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

The USDOT also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

Class 1	Location with 10 or fewer buildings intended for human occupancy;
Class 2	Location with more than 10 but less than 46 buildings intended for human occupancy;
Class 3	Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
Class 4	Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For instance, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; MAOP; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. The Class locations for the Amendment Project have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. Table B.9.1-1 identifies the design class for the Amendment Project facilities. If a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline and to comply with the USDOT requirements for the new class location, PennEast would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness.

The USDOT Pipeline Safety Regulations require operators to develop and follow a written integrity management program that contain all the elements described in 49 CFR 192.911 and address the risks on each transmission pipeline segment. The rule establishes an integrity management program which applies to all high consequence areas (HCA). The USDOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for USDOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density- population area.

Table B.9.1-1

Class Locations along the Amendment Project

Facility/Modification	From MP	To MP	Class Location Unit
Saylor Ave. Realignment	8.5R3	8.9R3	3
Interstate 81 Workspace Adjustment	10.0R2	10.2R2	2
Interstate 81 Workspace Adjustment	10.2R2	10.4R2	3
Appalachian Trail PPL Crossing Realignment	48.6R2	52.7R3	1
Appalachian Trail PPL Crossing Realignment	52.7R3	53.6R3	2
Blue Mountain Lateral	0.0R3	0.5R3	1
Freemansburg Ave. Realignment	69.7R3	70.5R3	3
Freemansburg Ave. Realignment	70.5R3	70.8	2

The HCAs may be defined in one of two ways. In the first method an HCA includes:

- current class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius[37] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;[38] or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

[37] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in psig multiplied by the square of the pipeline diameter in inches.
[38] The potential impact circle is a circle of radius equal to the potential impact radius.

In the second method, an HCA includes any area within a potential impact circle which contains 20 or more buildings intended for human occupancy or an identified site. Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The USDOT regulations specify the requirements for the integrity management plan at section 192.911. Table B.9.1-2 identifies HCAs.

Table B.9.1-2

HCA Locations along the Amendment Project

Facility/Modification	From MP	To MP	HCA Type
Saylor Ave. Realignment	8.5R3	8.9R3	1
Interstate 81 Workspace Adjustment	10.0R2	10.2R2	2, 3
Interstate 81 Workspace Adjustment	10.2R2	10.4R2	1
Appalachian Trail PPL Crossing Realignment	48.6R2	53.4R3	N/A
Appalachian Trail PPL Crossing Realignment	53.4R3	53.6R3	2
Blue Mountain Lateral	0.0R3	0.5R3	N/A
Freemansburg Ave. Realignment	69.7R3	70.5R3	1
Freemansburg Ave. Realignment	70.5R3	70.6R3	3
Freemansburg Ave. Realignment	70.6R3	70.8	N/A

N/A – Not Applicable

The USDOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards of a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property and making them safe from actual or potential hazards.

The USDOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. A plan would be in place for coordination between PennEast and local emergency response and management personnel in the event of an incident. PennEast would perform periodic emergency exercises and mock emergency drills with local government, law enforcement, and emergency response agencies, subject to agency availability and willingness to participate. In addition, PennEast would install pipeline markers above the buried pipeline that contain PennEast's name and the telephone number for assistance in accordance with USDOT regulations. PennEast would also be a member and become an advocate of the One Call System program. The PennEast Gas Control Center would electronically monitor the operations of the pipeline system and would be staffed 24 hours a day, 365 days a year, and would use a computerized gas-monitoring system to read pressures along the pipeline on a continuous basis. In the event of a leak,

the Gas Control Center would have the ability to isolate a segment of pipe by sending commands to close the remotely operated mainline valves (MLVs).

9.1.1 Pipeline Accident Data

The USDOT requires all operators of natural gas transmission pipelines to notify the USDOT of any significant incident and to submit a report within 20 days. Significant incidents are defined as any leaks that caused a death or personal injury requiring hospitalization or involve property damage of more than $50,000 (1984 dollars).[39] During the period from 2005 through 2018, a total of 815 significant incidents were reported on approximately 295,000 total miles of onshore natural gas transmission pipelines nationwide (USDOT, 2019b).

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table B.9.1-3 provides a distribution of the causal factors as well as the number of each incident by cause. The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure collectively constituting 55.2 percent of all significant incidents. The pipelines included in the data set in table B.9.1-3 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline. The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain are a time-dependent process.

Table B.9.1-3

Onshore Natural Gas Transmission Pipeline Significant Incidents by Cause (2005-2018)

Cause	Number of Incidents	Percentage
Corrosion	236	22.7
Excavation [a]	127	12.2
Pipeline material, weld, or equipment failure	338	32.5
Natural forces [b]	133	12.8
Outside force [c]	77	7.4
Incorrect operation	48	4.6
All other causes [d]	82	7.9
Total	1,041	-

Source: USDOT, 2019c.

[a] Includes third-party damage.

[b] Natural force damage includes earth movement, heavy rain, floods, landslides, mudslides, lightning, temperature, high winds, and other natural force damage.

[c] Outside force damage includes previous mechanical damage, electrical arcing, static electricity, fire/explosion, fishing/maritime activity, intentional damage, and vehicle damage (not associated with excavation).

[d] All other causes include miscellaneous, unspecified, or unknown causes.

The use of both an external protective coating and a cathodic protection system,[40] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

[39] $50,000 in 1984 dollars is approximately $123,510 as of January 2019 (Bureau of Labor Statistics, 2019).

[40] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline through the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

9.1.2 Impact on Public Safety

The service incident data summarized in table B.9.1-3 include natural gas transmission system failures of all magnitudes with widely varying consequences. Table B.9.1-4 presents the annual injuries and fatalities that occurred on natural gas transmission lines from incidents for the 6-year period between 2013 and 2018.

The majority of fatalities from pipelines are due to local distribution pipelines. These are natural gas pipelines that are not regulated by FERC and that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes, often made of plastic or cast iron rather than welded steel and tend to be older pipelines which are more susceptible to damage. In addition, distribution systems do not have large rights-of-way and pipeline markers common to the FERC regulated natural gas transmission pipelines.

Table B.9.1-4

Injuries and Fatalities – Natural Gas Transmission Pipelines

Year	Injuries	Fatalities
2013	44	9
2014	95	19
2015	48	11
2016	87	16
2017	38	20
2018	90	8

Source: USDOT, 2019a

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table B.9.1-5 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously because individual exposures to hazards are not uniform among all categories.

The available data shows that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 2005 through 2018, a total of 815 significant incidents were reported on approximately 295,000 of natural gas transmission lines and indicates the risk is low for an incident at any given location (USDOT, 2019b). The operation of the Amendment Project would represent a slight increase in risk to the nearby public. We conclude that, with the implementation of the standard safety design criteria, the Amendment Project would be constructed and operated safely.

Table B.9.1-5

Nationwide Accidental Fatalities by Cause

Type of Accident	Annual Number of Deaths
Motor vehicle [a]	35,369
Poisoning [a]	38,851
Falls [a]	30,208
Drowning [a]	3,391
Fire, smoke inhalation, burns [a]	2,760
Floods [b]	85
Tornado [b]	69
Lightning [b]	44
Hurricane [b]	46
Natural gas distribution lines [c]	10
Natural gas transmission pipelines [c]	3

[a] All data, unless otherwise noted, reflects 2007 statistics from U.S. Census Bureau, Statistical Abstract of the United States: 2010b (129th Edition) Washington, DC, 2009; http://www.census.gov/statab.

[b] NOAA National Weather Service, Office of Climate, Water and Weather Services, 30-year average (1989-2018) https://www.nws.noaa.gov/om/hazstats/resources/79years.pdf.

[c] Accident data presented for natural gas distribution lines and transmission pipelines represent the 20-year average between 1999 and 2019 (USDOT, 2019a).

10.0 CUMULATIVE IMPACTS

NEPA requires the lead federal agency to consider the potential cumulative impacts of proposals under its review. Cumulative impacts may result when the environmental effects associated with the Amendment Project are superimposed on or added to impacts associated with past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

The Project-specific impacts are discussed in detail in other sections of this EA. The purpose of this section is to identify and describe cumulative impacts that would potentially result from implementation of the Amendment Project along with other projects that could affect the same resources in the same approximate timeframe. To ensure that this analysis focuses on relevant projects and potentially significant impacts, the actions included in the cumulative impact analysis include projects that:

- impact a resource potentially affected by the Amendment Project;
- impact that resource within all or part of the timespan encompassed by the proposed or reasonably expected construction and operation schedule of the Project; and
- impact that resource within all or part of the same geographic area affected by the Amendment Project. The geographic area considered varies depending on the resource being discussed, which is the general area (geographic scope) in which the Project could contribute to cumulative impacts on that particular resource.

We have identified four types of actions that would potentially cause a cumulative impact when considered with the Amendment Project. These are:

- other natural gas projects, both under FERC's jurisdiction and those not under FERC's jurisdiction;

- electric generation and transmission projects;
- transportation projects; and
- commercial and large-scale residential developments.

10.1 Temporal and Geographic Distribution (Geographic Scope)

For the purpose of this analysis, the temporal extent of other projects would start in the recent past and extend out for the expected duration of the impacts caused by the Amendment Project. Some Amendment Project impacts from construction could occur as soon as site preparation begins and occur over about 9 months, while operational impacts are assumed to exist throughout the life of the facility.

The criteria listed below define the Amendment Project's geographic scope, which is used in this cumulative impacts analysis to describe the general area for which the Amendment Project could contribute to cumulative impacts. Resource-specific geographic scopes are provided in table B.10.1-1 and used to assess cumulative impacts for each resource. The geographic scope varies depending on the resource being discussed. Specifically, for the various resources our conservative approach considered that:

- Impacts on geology and soils by the Amendment Project would be highly localized. Therefore, for cumulative impacts on these resources, we evaluated other projects (e.g., residential development, small commercial development, and small transportation projects) within or adjacent to the construction workspace.
- Waterbody and wetland crossings, as well as impacts on groundwater, vegetation, and wildlife by the Amendment Project, would be localized and minimized. Therefore, we included cumulative impacts on these resources by other projects within the Hydrologic Unit Code (HUC)-12 watersheds crossed by the Amendment Project.

Table B.10.1-1

Resource-specific Geographic Scopes

Environmental Resource	Geographic Scope
Geology and Soils	Within or adjacent to the construction workspace/right-of-way
Water Resources	HUC 12 Watershed
Vegetation, Wildlife and Aquatic Resources, and Threatened, Endangered, and other Special Status Species	HUC 12 Watershed
Land Use and Visual Resources	Right-of-way and a 0.5-mile radius around the Amendment Project facilities
Socioeconomics	Luzerne, Carbon, Monroe, and Northampton Counties
Air Quality[41]	Construction: right-of-way and 0.25-mile radius around Amendment Project facilities Operation: right-of-way and 50-km radius around Amendment Project facilities
Noise	Construction: NSAs within 0.25 mile of the pipeline or aboveground facilities, and within 0.5 mile of HDD or direct pipe installation. Operation: Any facility that could have an impact on an NSA within 1-mile of a Amendment Project stationary facility (Blue Mountain Interconnect).

[41] We note that GHGs do not have a localized geographic scope. GHG emissions from the Amendment Project would combine with projects world-wide to increase CO_2, methane, and other GHG concentrations in the atmosphere.

- Impacts on general land uses would be restricted to the construction workspaces and the immediate surrounding vicinity; therefore, the geographic scope to assess cumulative land use impacts is within 0.5 mile of the construction work areas for the Amendment Project. This distance is also used to assess cumulative impacts on visual resources, to encompass the surrounding area from where new facilities would be visible.
- The geographic area for assessing contributions to cumulative impact on socioeconomics, including traffic-related impacts, was evaluated on a county-wide basis.
- Construction of the Amendment Project would result in short-term impacts on air quality in the 81.55 Northeast Pennsylvania-Upper Delaware Valley Interstate AQCR. Due to the limited amount of emissions generated by construction equipment, the geographic scope used to assess potential cumulative impacts on air from construction activities was set at 0.25 mile from the Amendment Project. For the analysis of long-term operational emissions, we evaluated potential cumulative operational air impacts for a radius of 50 kilometers from the Amendment Project, which is the distance used by the EPA for cumulative modeling of large PSD sources (40 CFR 51, appendix W, section 4.1). We consider this a conservative geographic scope for the purpose of identifying other projects which could contribute to a cumulative impact on air quality.
- The geographic scope for assessing potential cumulative impacts on noise from construction activities was determined to be areas within the immediate proximity of the construction activities (0.25 mile) and a somewhat wider area for HDD construction (0.5-mile of HDD entry/exit).

Long-term operational noise impacts from the Amendment Project's Blue Mountain Interconnect would be localized to within one mile of the site. Therefore, we evaluated other projects that would result in long-term impacts on noise affecting the same NSAs as the Blue Mountain Interconnect. Based on our analysis, the Amendment Project would not contribute to cumulative impacts on these cultural resources and we do not consider them further in this analysis. The anticipated cumulative impacts of the Amendment Project and these other actions are discussed below.

10.2 Projects and Activities Considered

Table B.10.2-1 lists past, present, or reasonably foreseeable future projects or activities that may cumulatively or additively affect resources that would be also be affected by the construction and operation of the Amendment Project.

We acknowledge that cumulative impacts would also occur within the geographic scope for the Certificated Project; however, since the Amendment Project would be a modification of the Certificated Project we did not consider this as a separate action.

Table B.10.2-1

Other Projects Potentially Contributing to Cumulative Impacts

Project Name	Project Description	Approximate distance of the project from the proposed Amendment Project (miles)	Amendment Project Modification assessed with project	Estimated Land Area (acres)	Estimated Construction Date	Estimates of construction workforce	Estimates of operation workforce	Resources Assessed for Cumulative Impacts [a]
Natural Gas Projects								
Adelphia Gateway (FERC Docket No. CP18-46)	Conversion of 50 miles of existing pipeline from oil to natural gas; two pipeline laterals, above ground facilities, meter stations, MLVs, and access roads will also be constructed	Adjacent	Freemansburg Ave Realignment	42 acres	FERC issued its Environmental Assessment on Jan. 4, 2019. Pending receipt of all the necessary permits and regulatory actions, Adelphia Gateway expects the project to be placed into service in 2019	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Auburn Line Extension	A 27.4-mile, 20-inch-diameter pipeline and compressor station with a 200,000 Dth/d capacity operated by UGI Energy Services	2.5 miles N	Saylor Ave Realignment Interstate 81 Workspace Adjustment	166.1 acres total, 0.01 PEM wetlands, 0.01 PFO wetlands, 0.01 EV PEM wetlands, 0.01 EV PSS wetlands, 0.08 EV PFO wetlands	In service since 2013	N/A	N/A	GW, SW, WT, A

Table B.10.2-1

Other Projects Potentially Contributing to Cumulative Impacts

Project Name	Project Description	Approximate distance of the project from the proposed Amendment Project (miles)	Amendment Project Modification assessed with project	Estimated Land Area (acres)	Estimated Construction Date	Estimates of construction workforce	Estimates of operation workforce	Resources Assessed for Cumulative Impacts [a]
Franklin Loop (Leidy Southeast Expansion) (FERC Docket No. CP13-551-000)	This 11.5 mile, 42-inch diameter pipeline will connect to the Transco Pipeline system and will be operated by Williams.	8 miles SE	Saylor Ave Realignment Interstate 81 Workspace Adjustment	69.7 acres total, 2.0 commercial/ industrial, 0.5 residential, 14.1 open space, 18.0 forested, 3.7 PSS wetlands, 0.2 PFO wetlands	In service since 2015	N/A	N/A	A
Atlantic Sunrise Pipeline (FERC Docket No. CP15-138-000)	This project, with 190 miles of pipeline, 2.5 miles of pipeline replacement, two new compressor stations, and other facility additions or modifications will expand the Williams' Transco pipeline system.	10 miles NW	Saylor Ave Realignment Interstate 81 Workspace Adjustment	1108.7 acres total in PA, 18.1 open land, 14.4 forested, 72.9 agriculture,5.9 PFO wetlands	In service since September 2018	N/A	N/A	GW, SW, WT, A
Transportation								
PennDOT Interstate 81	Resurfacing on Interstate 81 northbound and southbound from Exit 164 to Exit 178 in Luzerne County	Adjacent	Interstate 81 Workspace Adjustment	N/A	2019-2020	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
PennDOT State Road 11 Federal Curb Ramps	Curb ramp installation on State Route 11 from Breese St to Church St in Luzerne County	1.4 miles NW	Saylor Ave Realignment	N/A	2019-2020	N/A	N/A	GW, SW, A, N, WT, T
PennDOT Luzerne SR 2015 Paving	Resurfacing State Route 2015 (Market St, E Saylor Ave, W Saylor Ave) from State Route 2026 to State Route 2004 in Luzerne County	Adjacent	Saylor Ave Realignment	N/A	2019-2020	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N

Table B.10.2-1

Other Projects Potentially Contributing to Cumulative Impacts

Project Name	Project Description	Approximate distance of the project from the proposed Amendment Project (miles)	Amendment Project Modification assessed with project	Estimated Land Area (acres)	Estimated Construction Date	Estimates of construction workforce	Estimates of operation workforce	Resources Assessed for Cumulative Impacts [a]
PennDOT District-Wide Rumble Strips	Installation of center line rumble strips and shoulder rumble strips	Adjacent	Appalachian Trail PPL Realignment	N/A	2019	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
PennDOT State Road 248 Resurface	Resurfacing of PA248	4 miles W	Appalachian Trail PPL Realignment	N/A	2019	N/A	N/A	GW, SW, WT, A
PennDOT Median Barrier	Install median barrier or guiderail	Adjacent	Freemansburg Ave Realignment	N/A	2019	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
PennDOT Resurface/Restoration	Resurface/restoration of Bethman Rd to Farmersville Rd including ramps at SR 33 interchange	2 miles N	Freemansburg Ave Realignment	N/A	2020	N/A	N/A	GW, SW, WT, A
PennDOT Mill and Pave of Passing Lane	Concrete patching of I-78 Passing Lane from Berks County line to PA100 Lehigh County	0.7 miles S	Freemansburg Ave Realignment	N/A	2019	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
PennDOT Bridge Repair	Construction of bridge repairs and preservation in Lehigh and Northampton Counties	0.3 miles S	Freemansburg Ave Realignment	N/A	2019	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Freemansburg Ave Interchange	Roadway reconstruction and bridge rehabilitation of SR 2018 structure.	Adjacent	Freemansburg Ave Realignment	N/A	N/A	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Commercial/Residential Development								
Combined Heat and Power Plant at Blue Mountain	A Combined Heat and Power Plant by Tuthill Corporation, Funded By Pennsylvania Energy Development Authority	Adjacent	Appalachian Trail PPL Realignment	N/A	N/A	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Waterpark and Hotel at Blue Mountain	A Hotel and Waterpark resort area planned at the top of Blue Mountain	Adjacent	Appalachian Trail PPL Realignment	N/A	N/A	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N

Table B.10.2-1

Other Projects Potentially Contributing to Cumulative Impacts

Project Name	Project Description	Approximate distance of the project from the proposed Amendment Project (miles)	Amendment Project Modification assessed with project	Estimated Land Area (acres)	Estimated Construction Date	Estimates of construction workforce	Estimates of operation workforce	Resources Assessed for Cumulative Impacts [a]
Madison Farms Luxury Apartments	Mixed use rental properties.	0.3 miles W	Freemansburg Ave Realignment	N/A	Constructed in 2018	N/A	N/A	GW, SW, WT, A
Mericle River Road, LLC Commercial Subdivision	A residential development	0.4 miles NW	Saylor Ave Realignment	N/A	N/A	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Salavantis Residential Subdivision	A residential development	0.3 miles NW	Saylor Ave Realignment	N/A	N/A	N/A	N/A	GS, GW, SW, WT, VG, WD, T, L, VI, SE, A, N
Susquehanna Estates Subdivision Project	A residential development	N/A	Saylor Ave Realignment	N/A	N/A	N/A	N/A	GW, SW, WT, A
Little Gap Estates Subdivision Project	A residential development	1-mile N	Appalachian Trail PPL Realignment	N/A	N/A	N/A	N/A	GW, SW, WT, A, N
Sterling Crossing/Estates Subdivision	A 41-lot residential subdivision.	5.5 miles NW	Freemansburg Ave Realignment	N/A	Complete	N/A	N/A	GW, SW, WT, A
Saratoga Farms Subdivision	A 55-lot residential subdivision.	3.5-mile NW	Freemansburg Ave Realignment	N/A	Complete	N/A	N/A	SE, A, N
Trio Fields Subdivision	A 374-lot residential subdivision.	5 miles NW	Freemansburg Ave Realignment	89.8 acres	Complete	N/A	N/A	A
Traditions for America Subdivision	A proposed 265 home subdivision.	1-mile NW	Freemansburg Ave Realignment	119 acres	N/A	N/A	N/A	GW, SW, A, N
St. Luke's University Health Network Expansion Anderson Campus	75,000 square foot medical office building with future construction of 1.7 million square feet of additional hospital space, medical offices, and educational and research facilities.	Adjacent	Freemansburg Ave Realignment	40.7 acres	Completed in 2017	N/A	N/A	GW, SW, WT, A, SE, VG, T, GS

Table B.10.2-1

Other Projects Potentially Contributing to Cumulative Impacts

Project Name	Project Description	Approximate distance of the project from the proposed Amendment Project (miles)	Amendment Project Modification assessed with project	Estimated Land Area (acres)	Estimated Construction Date	Estimates of construction workforce	Estimates of operation workforce	Resources Assessed for Cumulative Impacts [a]
Subaru of Wyoming Valley	New car dealership	Adjacent	Interstate 81 Workspace Adjustment	12 acres	Construction complete	N/A	N/A	GW, SW, WT, A, GS, VG, VI, SE

Notes:
This table lists the projects that have the most potential to contribute to the cumulative impacts within the vicinity of the proposed Amendment Project; it is not intended to provide an all-inclusive listing of projects in the region.
N/A = Information not available.
PennDOT = Pennsylvania Department of Transportation
[a] GS = Geology and Soils GW = Groundwater SW = Surface Water WT = Wetlands VG = Vegetation WD = Wildlife and Aquatic T = Traffic L = Land Use VI = Visual SE = Socioeconomics A = Air N = Noise

10.3 Analysis of Cumulative Impacts

The potential impacts that we consider as part of our cumulative impacts review pertain to:

- geology and soils;
- groundwater, surface water, and wetlands;
- vegetation, wildlife, aquatic resources, and threatened and endangered species;
- land use, recreation, special interest areas, and visual resources;
- socioeconomics (including traffic); and
- air quality and noise.

In the following analysis we describe the potential cumulative impacts associated with the general development of the above-identified natural gas projects, commercial/residential development projects, and transportation projects. For the reasons described above, we did not consider more distant actions in our analysis.

10.3.1 Geology and Soils

The Amendment Project would be expected to have a direct but temporary impact on near-surface geology and soils. Clearing activities could expose the soil to erosive elements such as precipitation and wind. The areas crossed by the proposed modifications are predominantly characterized by hills and narrow valleys, with some areas of medium to high relief. Therefore, it would be expected that the Amendment Project would affect some soils with a relatively high erosion potential. Temporary erosion controls in accordance with FERC's Plan and Procedures would be used to minimize these impacts.

There are no mapped locations of oil and gas wells within 0.25 mile of the Amendment Project, and there are no active coal mines within the same area.

The Amendment Project's effect on geology and soils would be highly localized and primarily limited to the construction period. Cumulative impacts would only occur if other projects are constructed during the Amendment Project's construction period in a shared location. Four other projects have the potential to occur in the same timeframe as the Amendment Project; Pennsylvania Department of Transportation (PennDOT) Resurface/Restoration, PennDOT Luzerne SR 2015 Paving, PennDOT State Road 11 Federal Curb Ramps, and PennDOT Interstate 81. Compaction due to construction activity could contribute to cumulative erosion impacts on soils. Also, the Freemansburg Ave Interchange project could also lead to soil exposure, compaction, and erosion. Large residential developments like Madison Farms Luxury Apartments could have similar impacts.

Cumulative impacts on geology and soils would be mitigated through PennEast's use of BMPs during construction and restoration to restore natural grades, control erosion, and implement measures in agricultural areas to minimize long-term impact on soils. Also, PennEast would minimize impacts on soils through implementation of the E&SCP and FERC's Plan and Procedures to avoid topsoil mixing, compaction, and erosion. PennEast also developed an AIMP that would be implemented during construction. The AIMP outlines agriculture-specific construction methods and BMPs as well as restoration methods and monitoring to ensure that crop yields are not significantly impacted as a result of construction of the Amendment Project. Cumulative impacts on geology and soils from other projects in our analysis would be expected to be reduced by compliance with conditions of state and local permits that address sediment and erosion control during construction and restoration.

Should hazardous materials or contaminated soils and/or sediments be encountered during construction, they would be disposed of at fully licensed and permitted disposal facilities in accordance

with applicable state and federal laws and regulations. Consequently, any potential cumulative effects on geological and soil resources via contamination would be minor.

10.3.2 Water Resources

Cumulative impacts on water quality and use were considered for other projects that impact the same watersheds as those that would be crossed by the Amendment Project. Four other projects have the potential to occur in the same timeframe as the Amendment Project; PennDOT Resurface/Restoration, PennDOT Luzerne SR 2015 Paving, PennDOT State Road 11 Federal Curb Ramps, and PennDOT Interstate 81. Potential impacts on groundwater resources from these projects include changes to water quality, quantity (infiltration), and flow. Surface water impacts from these projects would include short-term impacts during construction, including direct impacts on wetlands and waterbodies for pipeline crossings, in addition to indirect impacts from stormwater runoff. Any projects involving ground disturbance or excavation, including the Amendment Project, natural gas development, and transportation projects, could impact groundwater resources.

We were unable to find quantitative data for the extent of impacts on water resources from non-FERC-regulated projects, but we assume that some level of impacts would occur. However, all projects would be required to obtain permits for erosion and sediment control and water use and discharge and would implement their various SPCC Plans and erosion control plans as mandated by permit requirements. Similarly, impacts on surface waters would also be minimized by other jurisdictional projects' use of FERC's Plan and Procedures or BMPs like those proposed by the Amendment Project in order to comply with state regulations for erosion and sediment control. Therefore, cumulative impacts on waterbodies would be temporary and mostly limited to construction activities associated with the projects.

Construction of the Amendment Project would affect about 1.0 acre of wetlands, and operation would affect about 0.4 acre of wetlands. The nature of the projects identified in table B.10.2-1 generally make them subject to environmental review and are expected to be constructed in compliance with federal, state, and/or local permitting requirements, including restoration, mitigation, and the installation of erosion and sediment controls, which would minimize cumulative impacts on wetlands. In addition, any net loss of wetlands and waterbodies would be mitigated through the applicable permitting agency. We expect that projects that have been completed and restored more than 3 years ago, would be in compliance with the restoration requirements of their permits and most impacts should be remedied. The only FERC-regulated project that is still within the expected restoration timing in the HUC-12, the Atlantic Sunrise Project, affected 5.9 acres of wetlands. Given the relatively small total of wetland acres affected by the combination of the Amendment Project and other projects listed in table B.10.2-1, we conclude that cumulative impacts on wetlands within the HUC-12 watersheds when considered with the projects identified in this analysis would not be significant.

10.3.3 Vegetation, Wildlife, Protected Species, and Aquatic Resources

The Amendment Project would cross agricultural areas, forest areas, open land, residential areas, and industrial/commercial areas. Cumulative impacts on vegetation and wildlife in conjunction with other projects would be expected. Most would be temporary, but there would be permanent impacts. Right-of-way clearing and grading associated with the Amendment Project and other projects would result in the removal of vegetation, alteration of wildlife habitat, displacement of wildlife, and other potential secondary effects, such as increased population stress, predation, and the establishment or spread of invasive plant species. These effects would be greatest where the other projects are constructed within the same timeframe and areas as the Amendment Project. For example, four other projects have the potential to occur in the same timeframe as the Amendment Project; PennDOT Resurface/Restoration, PennDOT Luzerne SR 2015 Paving, PennDOT State Road 11 Federal Curb Ramps, and PennDOT Interstate 81. However, even

construction that does not overlap temporally can have cumulative effects, as it takes time for vegetation/habitat to return to a preconstruction state.

Edge effects, which would be permanent due to permanent vegetation removal for some projects, and the necessity of maintaining the rights-of-way of utility projects clear of forest vegetation, would result in permanent cumulative impacts on habitat. A number of nearby linear projects, with pipelines such as the Atlantic Sunrise Pipeline and the Franklin Loop (Leidy Southeast Expansion), could contribute to these cumulative impacts. This would reduce habitat available to species that prefer deep forests, while increasing habitat for species that prefer open areas and edge habitat. White tailed deer flourish in edge environments and can serve as vectors for tick-borne diseases such as Lyme disease.

Right-of-ways can result in the spread of invasive species, because these species often flourish in areas where vegetation has been disturbed. Other linear projects that are adjacent or cross the Amendment Project could potentially lead to a greater spread of invasive vegetation. Prior to construction, PennEast would develop an Invasive Species Management Plan in coordination with the appropriate regulatory agencies to minimize the Amendment Project's contribution to the cumulative impact of all the linear projects in the area.

The species discussed in section B.4 of this EA could potentially be affected by construction and operation of other projects occurring within the same area as the Amendment Project. PennEast and all other companies would consult or have already completed consultations (via FERC and the FWS), as required, with the FWS regarding federally listed species. Section 7 of the ESA specifically requires "major federal actions" to have separate ESA consultations, so the impacts on all federally listed and proposed species within the geographic scope of the identified projects will be assessed. Different projects in the same geographic area requiring ESA consultation would be assessed (or, for completed projects, have already been assessed) and permitted by the same FWS office(s), thereby promoting awareness, consistency, and permitting requirements. Further, because protection of threatened, endangered, and other special status species is part of the various state permitting processes or resource reviews, cumulative impacts on such species would be or have already been considered and reduced or eliminated through conservation and mitigation measures identified during those relevant processes and consultations. For example, the other projects would likely also be or have already been required to conduct tree clearing within the recommended timeframe for listed bat species. Consequently, we conclude that projects in the geographic scope in combination with Amendment Project would have minor cumulative effects with regard to special status species.

Fisheries could be temporarily impacted by stream crossings throughout the Amendment Project area. PennEast plans to minimize these impacts by following the FERC Procedures and PennEast's E&SCP. As mentioned previously, we were unable to find quantitative data for the extent of impacts on water resources from projects identified in table B.10.2-1, but we assume that some level of impacts would occur. Restoration activities would take place after construction is complete. No long-term impacts on fisheries would be expected after restoration of stream bottoms, banks, and regrowth of riparian vegetation. Cumulative impacts on waterbodies (and therefore fisheries and aquatic resources) would be temporary and mostly limited to construction activities associated with the projects. As such, none of these impacts are expected to be cumulatively significant because of their temporary nature. The ensuing operations of the proposed Amendment Project would not result in any cumulative impacts unless maintenance activities occur in or near streams at the same time/location as other (non-related) project work.

10.3.4 Land Use and Visual Resources

The Amendment Project would result in temporary and permanent changes in land use. In areas crossed by the pipeline, vegetation within the permanent operational right-of-way would be maintained in an herbaceous state, however existing land uses would be allowed to continue. Land uses within new

permanent aboveground facilities would be permanently converted to natural gas facilities. Similar land use impacts would occur for other buried pipeline projects in the area such as the Atlantic Sunrise Pipeline and the Franklin Loop (Leidy Southeast Expansion), and other projects with new permanent aboveground facilities would contribute to cumulative change in land use.

The visual character of the existing landscape is defined by historic and current land uses. The visual qualities of the landscape are further influenced by existing linear installations such as highways, railroads, pipelines, mining operations, and electrical transmission and distribution lines. Temporary visual impacts would be evident during Amendment Project construction due to clearing, grading, and construction activities. Infrastructure associated with the Amendment Project and other nearby pipeline projects would be buried, with the exceptions being aboveground facilities such as Blue Mountain Interconnect. Most disturbed areas associated with these projects would be revegetated after construction, thereby limiting permanent visual impacts on forested areas where the new permanent right-of-way would be maintained as required for pipeline safety and operational requirements. The visual impact of this Amendment Project would be minimal and has been designed to further reduce impacts on visual resources.

The Amendment Project would cross the ANST in Carbon County, Pennsylvania and would be collocated with an existing power line right-of-way. The ANST crossing would minimally expand the existing right-of-way by approximately 15 feet and long-term changes would be imperceptible. PennEast has stated that the Amendment Project would not require approval by the NPS, since it would not own or manage lands crossed by the Amendment Project. There would be no other past, present, or reasonably foreseeable projects that would be within the geographic scope or have impacts on the ANST; therefore, there would only be direct impacts from construction of the Amendment Project on the ANST.

10.3.5 Socioeconomics

With other projects in the area taken into account, the cumulative socioeconomic impact would be an increase in temporary employment opportunities during construction of the various projects. However, most of these impacts would be short term. Construction of the proposed Amendment Project in combination with others could potentially negatively impact tourism and the recreation industry; however, these impacts would be expected to be temporary and isolated, primarily related to construction disturbance in isolated locations. The combined tax revenue from the various projects would be expected to have a positive cumulative impact on the Pennsylvania economy.

Other developments in the vicinity of the Amendment Project would require labor and support services, resulting in a cumulative increase in employment. Temporary housing would also be required for construction workers not drawn from the local area. The positive employment impacts resulting from the Amendment Project would mostly be temporary, however this is normal for jobs in the construction industry. Based on temporary lodging available in the Amendment Project area, Luzerne County is the only area where this may be a concern. If there was a shortage of temporary lodging for any periods during construction of the various projects, workers and others seeking temporary lodging would need to search beyond the immediate communities for temporary housing. Construction of a waterpark and hotel at the Blue Mountain ski area would result in increased employment, resulting in positive socioeconomic impacts. Blue Mountain expects that this development would create an additional 60 full-time jobs in addition to the 20 full-time and nearly 700 part-time jobs that would be created by the water park.

The cumulative impact of the Amendment Project and the other projects considered in this analysis on infrastructure and public services would depend on the number of projects under construction at one time. The small incremental demands of several projects occurring at the same time could become difficult for police, fire, and emergency service personnel to address. PennEast plans to mitigate these potential impacts by providing local emergency response and management teams with training. Also, local response teams would be provided with necessary information and instructions regarding the proposed facilities.

Construction of the proposed Amendment Project would have a temporary impact on road traffic in some areas and could contribute to cumulative traffic, parking, and transit impacts if other projects are scheduled to be constructed at the same time and in the same area as the Amendment Project. The addition of traffic on local roadways associated with construction personnel commuting to and from the Amendment Project construction work areas could also contribute to cumulative regional traffic congestion. However, any contribution by the Amendment Project to cumulative traffic impacts are expected to be temporary and short term. If construction on other projects occurs concurrently, the cumulative impact on traffic patterns could lead to congestion in localized areas. Transportation projects such as bridge construction could result in a cumulative impact on traffic patterns surrounding the construction zone, but such impacts would depend on timing and location of each project's construction.

10.3.6 Air and Noise Quality

Construction of most of the projects and activities listed in table B.10.2-1 would involve the temporary use of heavy equipment, vehicles, and other equipment powered by diesel or gasoline engines that would generate emissions of air contaminants. Construction activities would also result in the temporary generation of fugitive dust due to land clearing, ground excavation, and cut and fill operations, as well as noise. Construction of the Amendment Project would contribute cumulatively to air quality impacts. The combined impact of multiple construction projects occurring in the same airshed and timeframe as the Amendment Project could temporarily add to the ongoing air impacts in the Amendment Project area. The construction equipment emissions would result in short-term fugitive emissions that would be highly localized, temporary, and intermittent. Construction of many of the projects listed in table B.10.2-1 would not occur at the same time as construction of the Amendment Project or are located sufficiently far away as to not result in cumulative air impacts.

Some components of the proposed and other projects listed in table B.10.2-1 would have long-term air and noise impacts during operation. No operational emissions would be proposed. Due to the temporary nature of construction activities, and with the implementation of the mitigation measures discussed in the FDCP, the proposed interconnect station would be considered a non-major source of emissions, would not exceed NAAQS, and would not be expected to contribute significantly to cumulative impacts on air quality. In addition, an operating permit for a non-major source would not be required for the four modifications proposed.

Cumulative noise impacts are possible during construction, especially in areas requiring blasting and HDD operations for pipeline installation. Cumulative noise impacts during construction of the Amendment Project are also possible in areas that experience existing noise from sources such as nearby airport and vehicular traffic. Any construction impacts would be short term. During operation, there could be some cumulative noise impacts from the Blue Mountain Interconnect and the combined heat and power (co-generation) plant at the Blue Mountain resort if that project is constructed. However, as described in section 8.2.3.1, the noise contribution from the Blue Mountain Interconnect is estimated to be below the FERC criterion of 55 dBA L_{dn} at the nearby NSAs, as well as the Town of Lower Towamensing noise ordinance of 60 dBA nighttime limit at the nearest property line. If the co-generation plant is constructed it would be expected that it would also be required to comply with the local noise ordinance, such that cumulative noise impacts would not be significant.

SECTION C – ALTERNATIVES

In accordance with NEPA and FERC policy, we evaluated a range of alternatives to determine whether an alternative would be preferable to the proposed action. The range of alternatives evaluated include the No-Action Alternative, system alternatives, and route alternatives. Our criteria for determining if an alternative is "preferable" are discussed in the following section.

1.0 EVALUATION PROCESS

The purpose of this evaluation is to determine whether an alternative would be preferable to the proposed action. We generally consider an alternative to be preferable to a proposed action using three evaluation criteria, as discussed in greater detail below. These criteria include:

- the alternative meets the stated purpose of the project;
- is technically and economically feasible and practical; and
- offers a significant environmental advantage over a proposed action.

The alternatives were reviewed against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the project. An alternative that cannot achieve the purpose for the project cannot be considered as an acceptable replacement for the project.

For further consideration, an alternative has to be technically and economically feasible. Technically practical alternatives, with exceptions, would generally require the use of common construction methods. An alternative that would require the use of a new, unique, or experimental construction method may not be technically practical because the required technology is not available or is unproven. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render the project economically impractical.

Determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources (factors), we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

We considered a range of alternatives in light of the Amendment Project's objectives, feasibility, and environmental consequences. Through environmental comparison and application of our professional judgment, each alternative is considered to a point where it becomes clear whether the alternative could or could not meet the three evaluation criteria. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally used desktop sources of information (e.g., publicly available data, aerial imagery) and assumed the same right-of-way widths and general workspace requirements. We evaluated data collected in the field if surveys were completed for both the Amendment Project and its corresponding alternative route. Where appropriate, we also used site-specific information (e.g., detailed designs). Our environmental analysis and this evaluation consider quantitative data (e.g., counts, acreage, or mileage) and uses common comparative factors such as total length, amount of collocation, and land requirements.

Our evaluation also considers impacts on both the natural and human environments. The natural environment includes water resources and wetlands, vegetation, wildlife and fisheries habitat, farmland soils, and geology. The human environment includes nearby landowners, residences, land uses and recreation, utilities, and industrial and commercial development near construction workspaces. In recognition of the competing interests and the different nature of impacts resulting from an alternative that sometimes exists (i.e., impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative or discount or eliminate factors that are not relevant or may have less weight or significance. In our analysis of alternatives, we often have to weigh impacts on one kind of resource (i.e., habitat for a species) against another resource (i.e., residential construction).

It is intended that each of the cooperating agencies, as discussed in section A.4.0, will review this alternatives analysis for consistency with their own administrative procedures, and those agencies with NEPA obligations may choose to adopt this analysis as part of their decision-making process.

1.1 No-Action Alternative

Under the no-action alternative PennEast would not construct the Amendment Project. If the Amendment Project is not constructed, then the environmental impacts described in this EA would not occur. Implementing the no-action alternative would not allow PennEast to meet the purpose and need as described in section A.2.0.

It is reasonable to expect that if the Amendment Project is not constructed (the no-action alternative), PennEast would instead construct the Certificated Project as authorized by the Certificate Order in Docket No. CP15-558-000. As shown below in section 1.3, the Amendment Project would reduce environmental impacts when compared to the corresponding segments of the Certificated Route and this reduction of impacts would not occur under the no-action alternative. Thus, although the environmental impacts associated with constructing and operating the proposed Amendment Project would not occur under the no-action alternative, similar and slightly greater impacts could occur as described for the Certificated Project.

We conclude that the no-action alternative does not meet the Amendment Project objective and would likely result in construction of the Certificated Project as authorized in Docket No. CP15-558-000. Therefore, we do not consider it further.

1.2 System Alternatives

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed facilities that would meet the stated purpose of the proposed actions. A system alternative would make it unnecessary to construct part or all of the proposed facilities, though additions or modifications to existing facilities may result in environmental impacts that are less than, equal to, or greater than the environmental impacts of the proposed facility. Because the proposed Amendment Project consists of only four relatively minor modifications, there are no reasonable system alternatives that could meet the stated purpose of the four modifications. Therefore, we do not consider system alternatives further.

1.3 Pipeline Route Alternatives

We evaluated route alternatives as compared to the proposed Amendment Project to determine whether their implementation would be preferable to the proposed action. The route alternatives evaluated consist of the corresponding segment of the Certificated Route. The route alternatives evaluated are discussed below.

1.3.1 Route Alternative 1

Route Alternative 1 is an alternative to the proposed Saylor Ave Realignment. The alternative would follow the Certificated Route between approximately MPs 8.4R2 and 8.9R2 (figure C.1.3-1). Route Alternative 1 would cross areas of old coal slag and mine tailings and would be behind a number of residences along Saylor Avenue. PennEast proposes the Saylor Ave Realignment in this location to avoid the areas of old coal slag and mine tailings and move the pipeline further from residences along Saylor Avenue. A comparison of environmental factors affected by the proposed modification and the alternative is included in table C.1.3-1.

Table C.1.3-1

Comparison of Route Alternative 1 to the Proposed Saylor Ave Realignment

Environmental Factor	Route Alternative 1	Proposed Saylor Ave Realignment
Length (miles)	0.4	0.4
Length Adjacent to Existing Rights-of-way (miles)	0	0
Construction Area (acres)	5.8	4.7
Operation Area (acres)	2.6	2.6
Residences within 50 feet of construction workspace (number)	10	0
Forested Land Affected by Construction (acres)	4.3	3.3
Forested Land Affected by Operation (acres)	1.9	1.8
Wetlands Affected by Construction (acres)	0	0
Wetlands Affected by Operation (acres)	0	0
Waterbody Crossings (number)	0	0
Habitat for Rare Species (acres)	0	0

Route Alternative 1 would be about the same length as the proposed Saylor Ave Realignment but because of construction workspace requirements the alternative would require about 1.1 acres of additional construction disturbance. RouteAlternative 1 would also require about 1 acre more forest clearing and would be within 50 feet of 10 residences compared to the Saylor Ave Realignment which would not be within 50 feet of residences. The Saylor Ave Realignment would move the pipeline 100-200 feet further from the residences along Saylor Avenue and would allow preservation of some wooded area between the residences and pipeline. For these reasons, we find that Route Alternative 1 would not provide a significant environmental advantage over the proposed Saylor Ave Realignment.

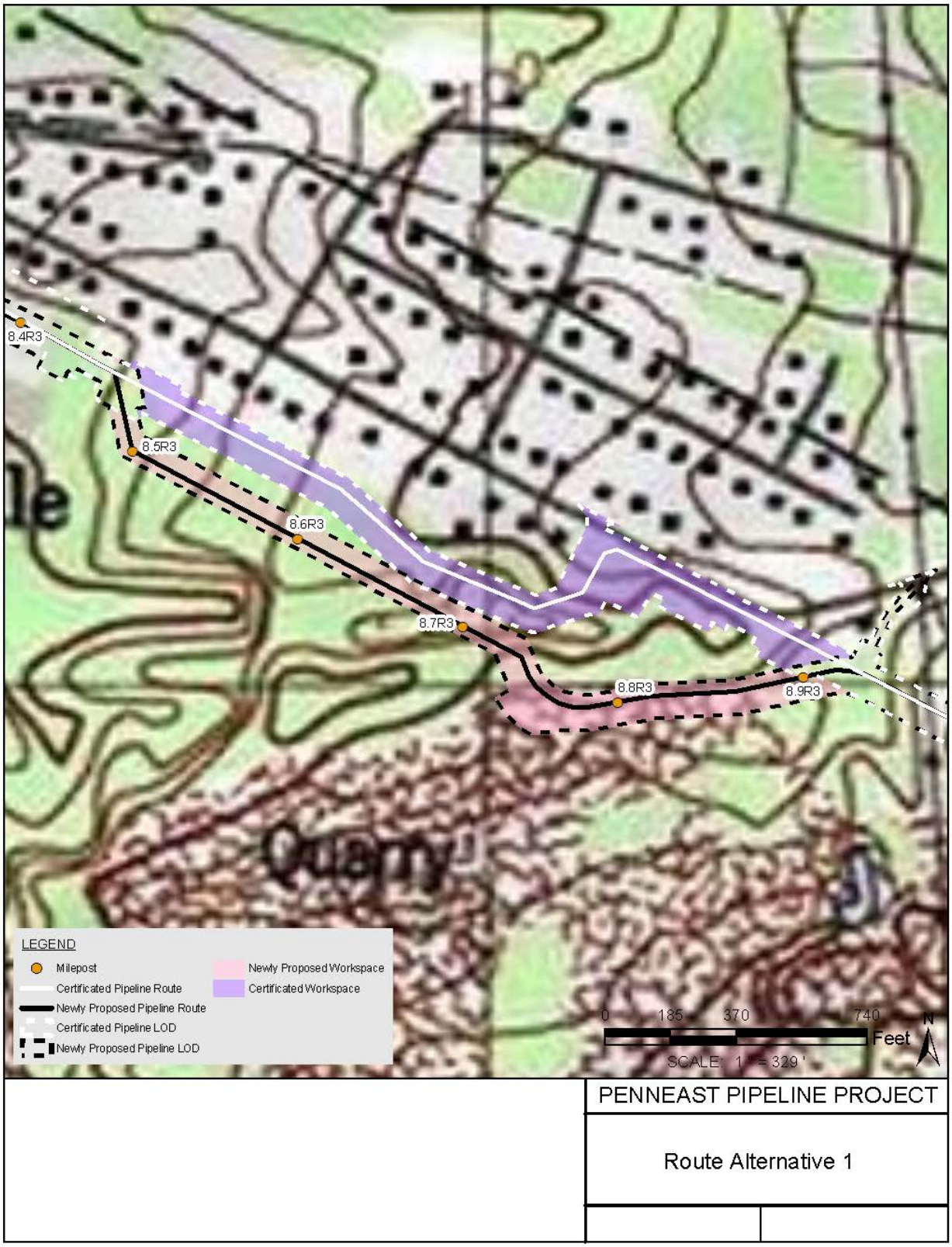

Figure C.1.3-1 Route Alternative 1

1.3.2 Route Alternative 2

Route Alternative 2 is an alternative to the proposed Interstate 81 Workspace Adjustment. The alternative would include the same pipeline alignment and workspace as the Certificated Route between approximately MPs 10.0R2 and 10.3R2 (figure C.1.3-2). PennEast proposes the Interstate 81 Workspace Adjustment in this location as a result of new information obtained from additional geotechnical investigations completed for the State Route 315/Interstate 81 HDD which revealed the presence of historical mines in the area. PennEast determined that using a shallower HDD design would reduce the risk of potentially encountering mining voids. The proposed Interstate 81 Workspace Adjustment would be along the same pipeline alignment as the Certificated Route but would include revised workspace areas required to complete the shallower HDD design. A comparison of environmental factors affected by the proposed modification and the alternative is included in table C.1.3-2.

Table C.1.3-2

Comparison of Route Alternative 2 to the Proposed Interstate 81 Workspace Adjustment

Environmental Factor	Route Alternative 2	Proposed Interstate 81 Workspace Adjustment
Length (miles)	Not Applicable	Not Applicable
Length Adjacent to Existing Rights-of-way (miles)	Not Applicable	Not Applicable
Construction Area (acres)	1.1	2.8
Operation Area (acres)	0	0
Residences within 50 feet of construction workspace (number)	0	0
Forested Land Affected by Construction (acres)	1.1	0.1
Forested Land Affected by Operation (acres)	0	0
Wetlands Affected by Construction (acres)	0	0
Wetlands Affected by Operation (acres)	0	0
Waterbody crossings (number)	1 [a]	1 [a]
Habitat for Rare Species (acres)	1.1 [b]	2.8 [b]

Notes:
[a] Intermittent waterbody.
[b] Location is within 5 miles of known hibernaculum for northern long-eared bat and therefore is within defined swarming habitat for this species.

Route Alternative 2 would require about 1.7 fewer acres of temporary construction disturbance than the proposed Interstate 81 Workspace Adjustment. However, the alternative would require about 1.1 acre of forest clearing compared to about 0.1 acre for the proposed Interstate 81 Workspace Adjustment. The forest cleared for both the alternative and the modification would be within 5 miles of known hibernaculum for northern long-eared bat and therefore is within defined swarming habitat for this species. Because the alternative would require more forest clearing in an area defined as rare species habitat, we find that Route Alternative 2 would not provide a significant environmental advantage over the proposed Interstate 81 Workspace Adjustment.

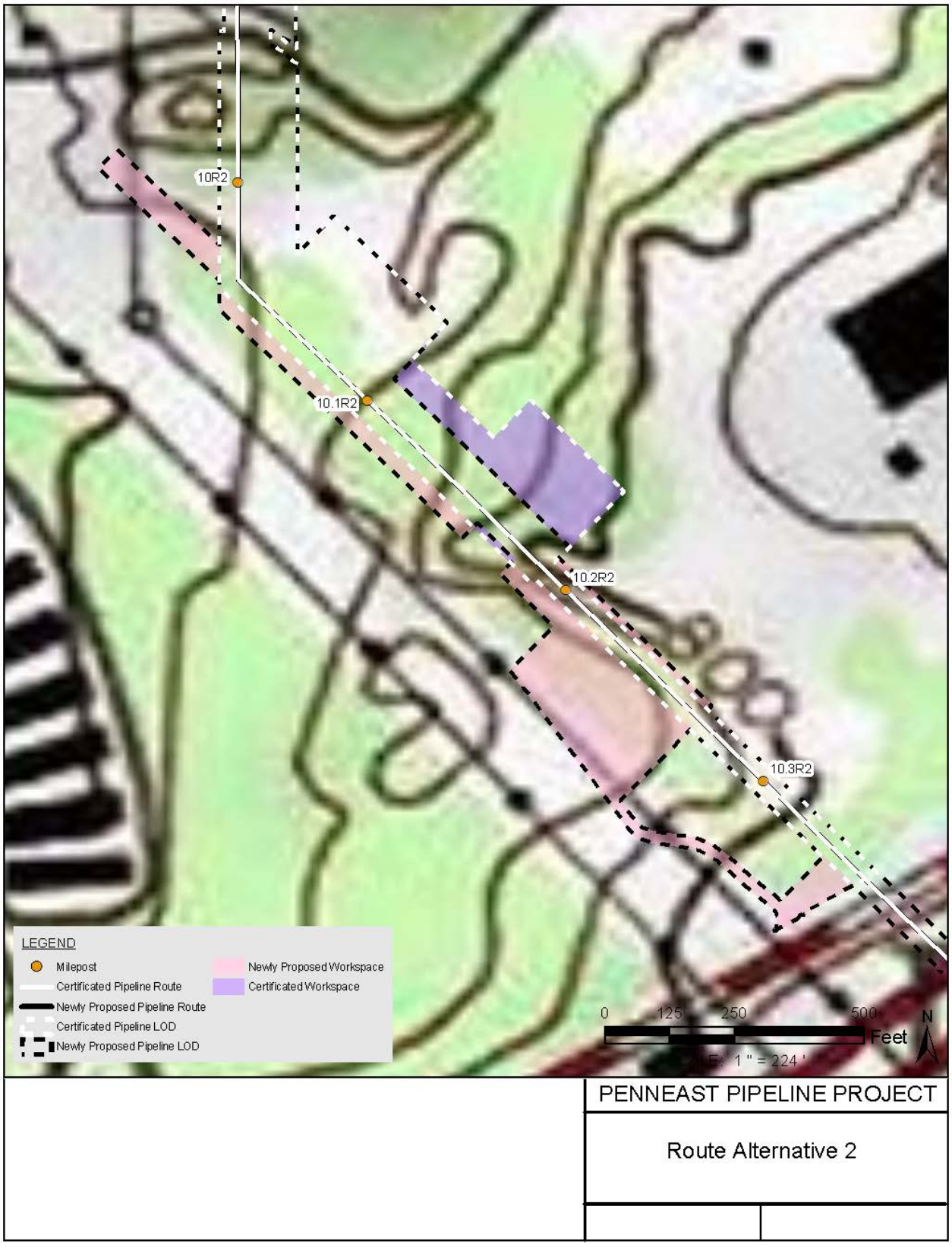

Figure C.1.3-2 Route Alternative 2

1.3.3 Route Alternative 3

Route Alternative 3 is an alternative to the proposed Appalachian Trail PPL Crossing Realignment. The alternative would follow the Certificated Route between approximately MPs 48.6R2 and 54.7 (figure C.1.3-3). PennEast proposes the Appalachian Trail PPL Crossing Realignment to address concerns from the BWA about crossing a water tunnel twice at MPs 51.0R2 and 51.6R2 of the Certificated Route, and concerns about crossing of the ANST at MP 51.2R2 of the Certificated Route. PennEast also states that the proposed realignment would move the pipeline from ski slopes within the Blue Mountain ski area which would avoid impacts on the ski resort that may result from snow melting over the pipeline due to thermal flux. A comparison of environmental factors affected by the proposed modification and the alternative is included in table C.1.3-3.

Table C.1.3-3

Comparison of Route Alternative 3 to the Proposed Appalachian Trail PPL Crossing Realignment

Environmental Factor	Route Alternative 3	Proposed Appalachian Trail PPL Crossing Realignment
Length (miles)	6.5	5.5
Length Adjacent to Existing Rights-of-way (miles)	0.6	3.8
Construction Area (acres)	98.5	68.6
Operation Area (acres)	39.1	26.2
Residences within 50 feet of construction workspace (number)	21	14
State Game Lands Crossed (miles)	2.3	1.4
Forested Land Affected by Construction (acres)	58.1	37.8
Forested Land Affected by Operation (acres)	23.1	14.4
Wetlands Affected by Construction (acres)	3.0	1.4
Wetlands Affected by Operation (acres) [a]	2.1	0.6
Waterbody crossings (number)	3	8
Habitat for Rare Species (acres)	58.1 [b]	37.8 [b]
Known Occupied Bog Turtle Sites Crossed (number)	1	2

Notes:
[a] Forested wetlands affected by construction assumed to be also affected by operation.
[b] Forest areas are potential summer maternity habitat for northern long-eared bat.

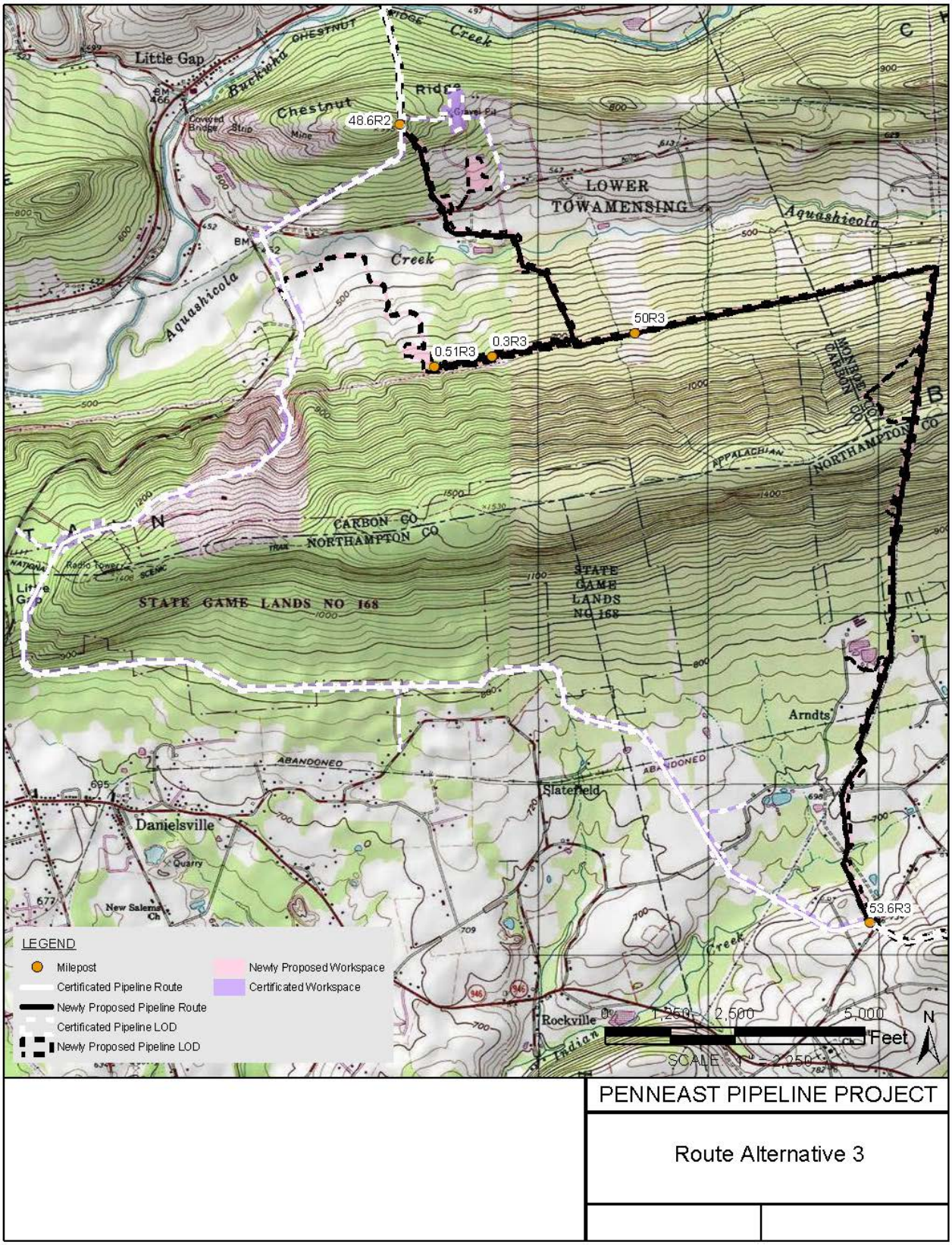

Figure C.1.3-3 Route Alternative 3

The environmental advantages of Route Alternative 3 compared to the proposed Appalachian Trail PPL Crossing Realignment would include fewer waterbody crossings (3 vs. 8) and fewer crossings of known bog turtle sites (1 vs. 2). There are a number of environmental disadvantages of the alternative compared to the proposed Appalachian Trail PPL Crossing Realignment, including a longer length (6.5 vs. 5.5 miles) and associated greater construction disturbance (98.5 vs. 68.6 acres), less length adjacent to existing rights-of-way (0.6 vs. 3.8 miles), more residences within 50 feet of construction workspace (21 vs. 14), more forest land affected during construction (58.1 vs. 37.8), and more wetlands affected during construction (2.1 vs. 0.6 acres). The Appalachian Trail PPL Crossing realignment would result in a reduction of 1.6 acres of wetland impacts, which would include a 1.5-acre reduction in PFO wetland impacts. In particular, the alternative would cross the BWA water tunnel twice which would be avoided by the Appalachian Trail PPL Crossing Realignment, and the alternative would cross the ANST at a location with no existing right-of-way crossing, whereas the Appalachian Trail PPL Crossing Realignment would cross the ANST adjacent to an existing cleared PPL right-of-way. For these reasons, we find that Route Alternative 3 would not provide a significant environmental advantage over the proposed Appalachian Trail PPL Crossing Realignment.

1.3.4 Route Alternative 4

Route Alternative 4 is an alternative to the proposed Freemansburg Ave Realignment. The alternative would follow the Certificated Route between approximately MPs 69.8 and 70.7, including installation of the pipeline by HDD between MPs 69.9 and 70.5 (St. Luke's (Lowe's) HDD). The alternative is shown on figure C.1.3-4. PennEast conducted additional geophysical investigations along the route of the St. Luke's (Lowe's) HDD and identified subsurface karst features that would cause a high risk of HDD failure, and is therefore proposing the Freemansburg Ave Realignment which would include installation of the pipeline using open cut methods. PennEast also states that the Freemansburg Ave Realignment would avoid potential future development identified by St. Luke's Hospital. A comparison of environmental factors affected by the proposed modification and the alternative is included in table C.1.3-4.

Table C.1.3-4

Comparison of Route Alternative 4 to the Proposed Freemansburg Ave Realignment

Environmental Factor	Route Alternative 4	Proposed Freemansburg Ave Realignment
Length (miles)	0.6	0.6
Length Adjacent to Existing Rights-of-way (miles)	0	0
Construction Area (acres)	67.9	17.8
Operation Area (acres)	3.6	3.6
Residences within 50 feet of construction workspace (number)	5	4
Forested Land Affected by Construction (acres)	2.4	1.4
Forested Land Affected by Operation (acres)	0.7	0.1
Wetlands Affected by Construction (acres)	0	0
Wetlands Affected by Operation (acres)	0	0
Waterbody Crossings (number)	2 [a]	2 [a]
Habitat for Rare Species (acres)	0	0

Notes:
[a] Intermittent waterbodies

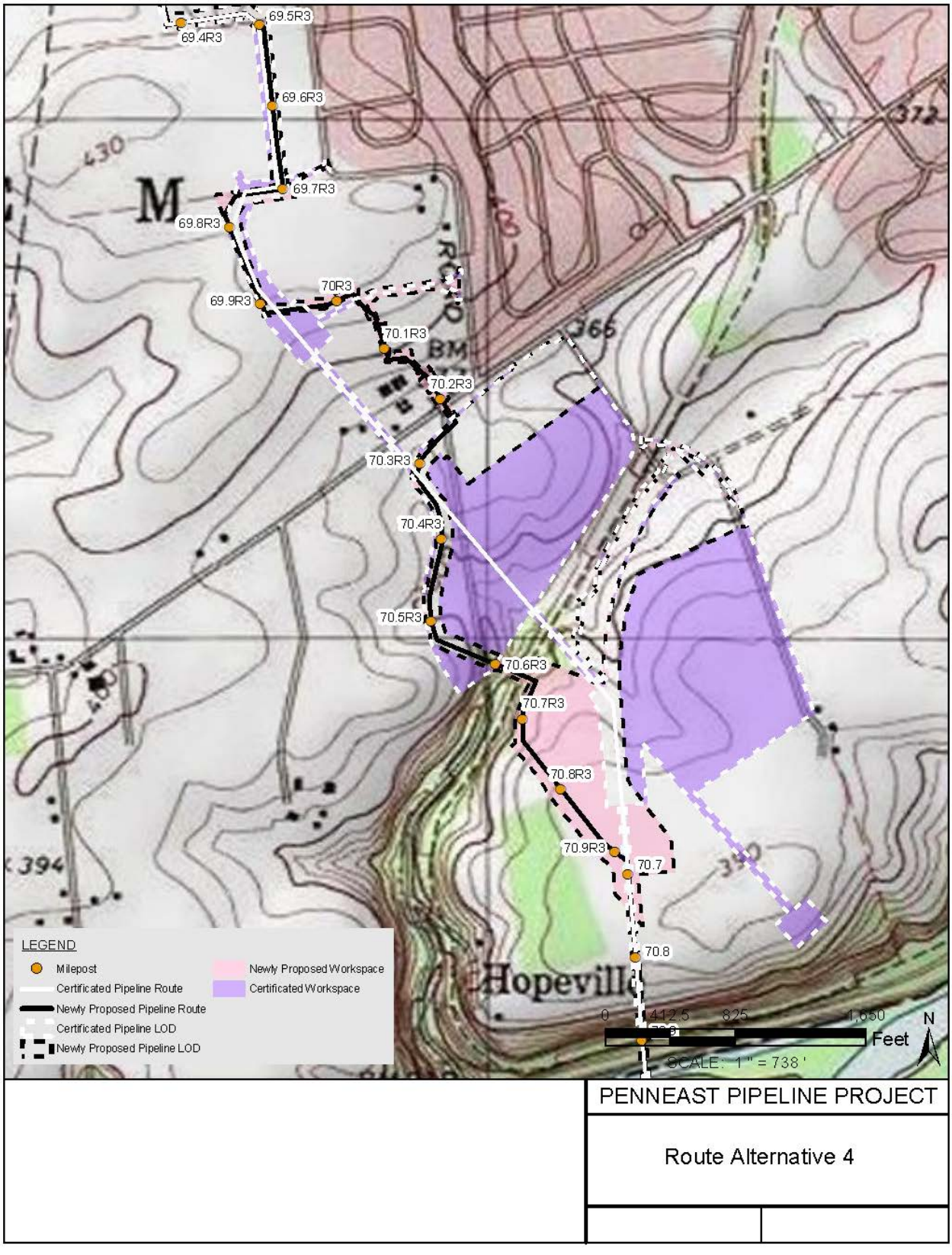

Figure C.1.3-4 Route Alternative 4

Route Alternative 4 would be about the same length as the proposed Freemansburg Ave Realignment but because of the proposed change from HDD to open cut pipeline installation the alternative would require about 50.1 acres of additional construction disturbance. Route Alternative 4 would also require about 1 acre more forest clearing and would be within 50 feet of 1 more residence than the Freemansburg Ave Realignment. The Freemansburg Ave Realignment would avoid the potential high risk of HDD failure due to the presence of subsurface karst features identified along the HDD alignment of the alternative. For these reasons, we find that Route Alternative 4 would not provide a significant environmental advantage over the proposed Freemansburg Ave Realignment.

1.4 Aboveground Facility Site Alternatives

The proposed modifications include one aboveground facility, the Blue Mountain Interconnect, and we evaluated one site alternative for this facility based on information provided by PennEast and our independent evaluation.

1.4.1 Blue Mountain Interconnect Alternative Site

The proposed site for the Blue Mountain Interconnect is on the Blue Mountain Resort property at the end of the newly proposed 0.5-mile-long Blue Mountain Lateral. PennEast identified one alternative site, on private property, that would be directly on the PennEast mainline pipeline at about MP 48.7R3 of the proposed Appalachian Trail PPL Crossing Realignment (figure C.1.4-1). The alternative site would allow a direct connection into UGI Utilities' existing Central Penn Gas distribution pipeline, however additional distribution pipeline would be required to transport natural gas to the Blue Mountain Resort. Approximately 2.3 miles of additional distribution pipeline would be required assuming the route of the additional pipeline could follow the Certificated Route and connect to a point similar to the Blue Mountain Interconnect facility on the Certificated Route. A comparison of environmental factors affected by the proposed Blue Mountain Interconnect site and the alternative site is included in table C.1.4-1.

Table C.1.4-1

Comparison of the Blue Mountain Interconnect Alternative Site to the Proposed Blue Mountain Interconnect Site

Environmental Factor	Alternative Site	Proposed Site
Construction Area (acres)	1.8	6.8
Operation Area (acres)	1.8	4.5
Lateral Pipeline Length (miles) [a]	0	0.5
Distribution Pipeline Length (miles) [b]	2.3	0
Residences within 50 feet of construction workspace (number)	0	0
Forested Land Affected by Construction (acres)	0	1.1
Forested Land Affected by Operation (acres)	0	1.1
Wetlands Affected by Construction and Operation (acres)	0	0
Prime Farmland Soils Affected by Operation (acres)	1.3	0.4
Habitat for Rare Species (acres)	0	0
Noise Sensitive Areas within 0.5 miles (number)	17	3

Notes:
[a] Lateral pipeline constructed by PennEast between PennEast mainline and Blue Mountain Interconnect.
[b] Non-jurisdictional pipeline built by others between the Interconnect and Blue Mountain Resort.

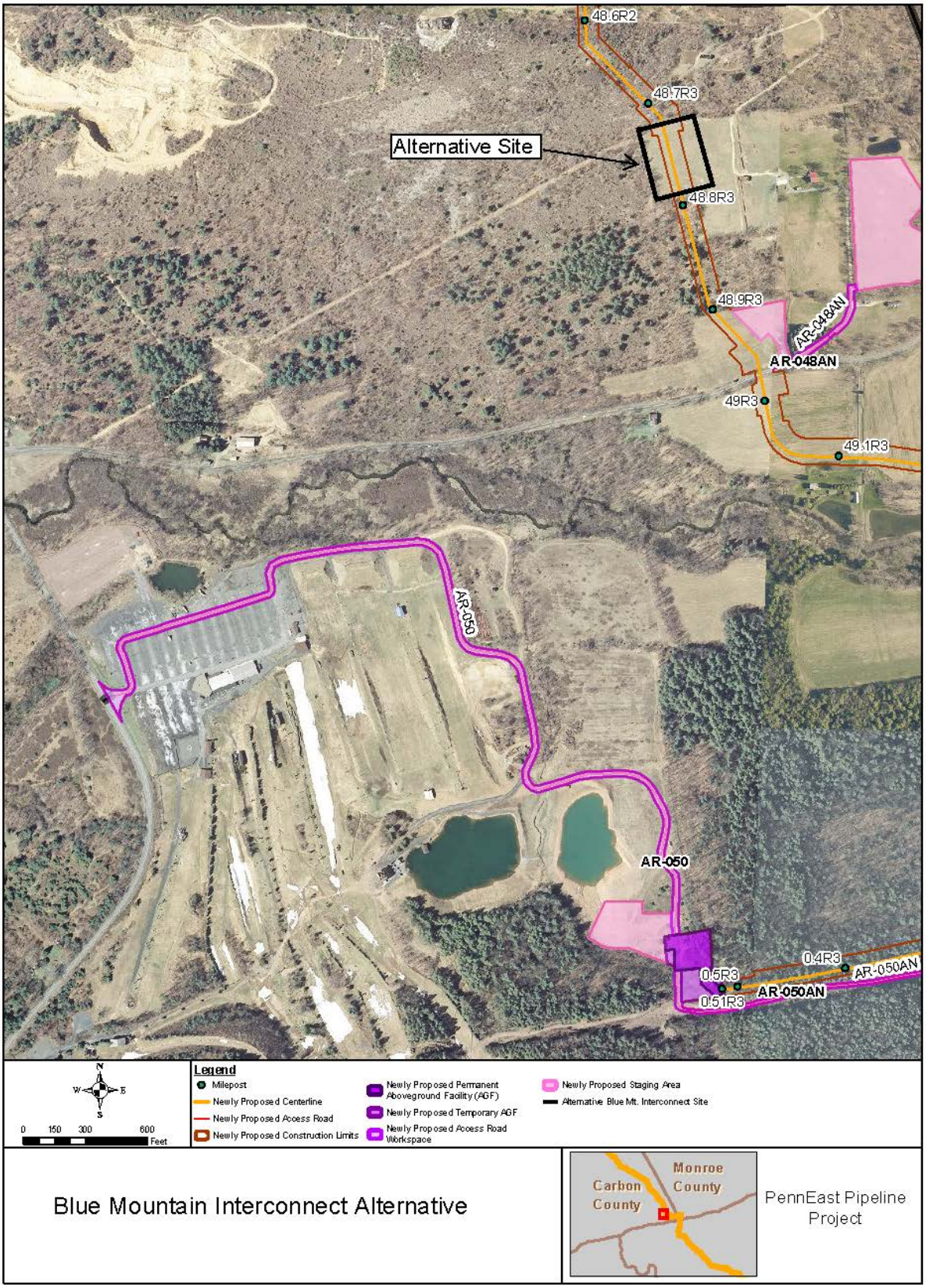

Figure C.1.4-1 Blue Mountain Interconnect Alternative Site

The potential environmental advantage of the Blue Mountain Interconnect alternative site is that it would be located directly on the Certificated Route thus avoiding the need for the 0.5-mile-long Blue Mountain Lateral pipeline. The alternative site would also be located on agricultural land and would avoid clearing forest vegetation. The environmental disadvantages of the alternative site are that it would require construction of about 2.3 miles of non-jurisdictional pipeline between the interconnect site and Blue Mountain Resort in order to complete the delivery of natural gas to the resort. The alternative site would also result in permanent impact on 1.3 acres of prime farmland soil compared to 0.4 acre at the proposed site and would be within 0.5 mile of 17 NSAs (residences) compared to 3 for the proposed site. For these reasons, we find that Blue Mountain Interconnect alternative site would not provide a significant environmental advantage over the proposed Blue Mountain Interconnect site.

1.5 Alternatives Conclusion

Based on the results of the alternatives analysis discussed in the preceding sections, we find that the Amendment Project with our recommended mitigation measures incorporated, is the preferred alternative that meets the purpose and need as defined in this EA.

SECTION D – CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis contained in this EA, we have determined that if PennEast constructs and operates the proposed facilities in accordance with its application and supplements and our recommended mitigation measures, approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Order contain a Finding of No Significant Impact and include the following mitigation measures listed below as conditions to any authorization the Commission may issue.

1. PennEast shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. PennEast must:
   a. request any modifications to these procedures, measures, or conditions in a filing with the Secretary;
   b. justify each modification relative to site-specific conditions;
   c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
   d. receive approval in writing from the Director of the Office of Energy Projects (OEP) **before using that modification**.

2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Amendment Project. This authority shall allow:
   a. the modification of conditions of the Order;
   b. stop-work authority; and
   c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Amendment Project construction and operation.

3. PennEast shall continue to comply with environmental conditions set forth in Appendix A of the January 19, 2018 Order in Docket No. CP15-558-000.

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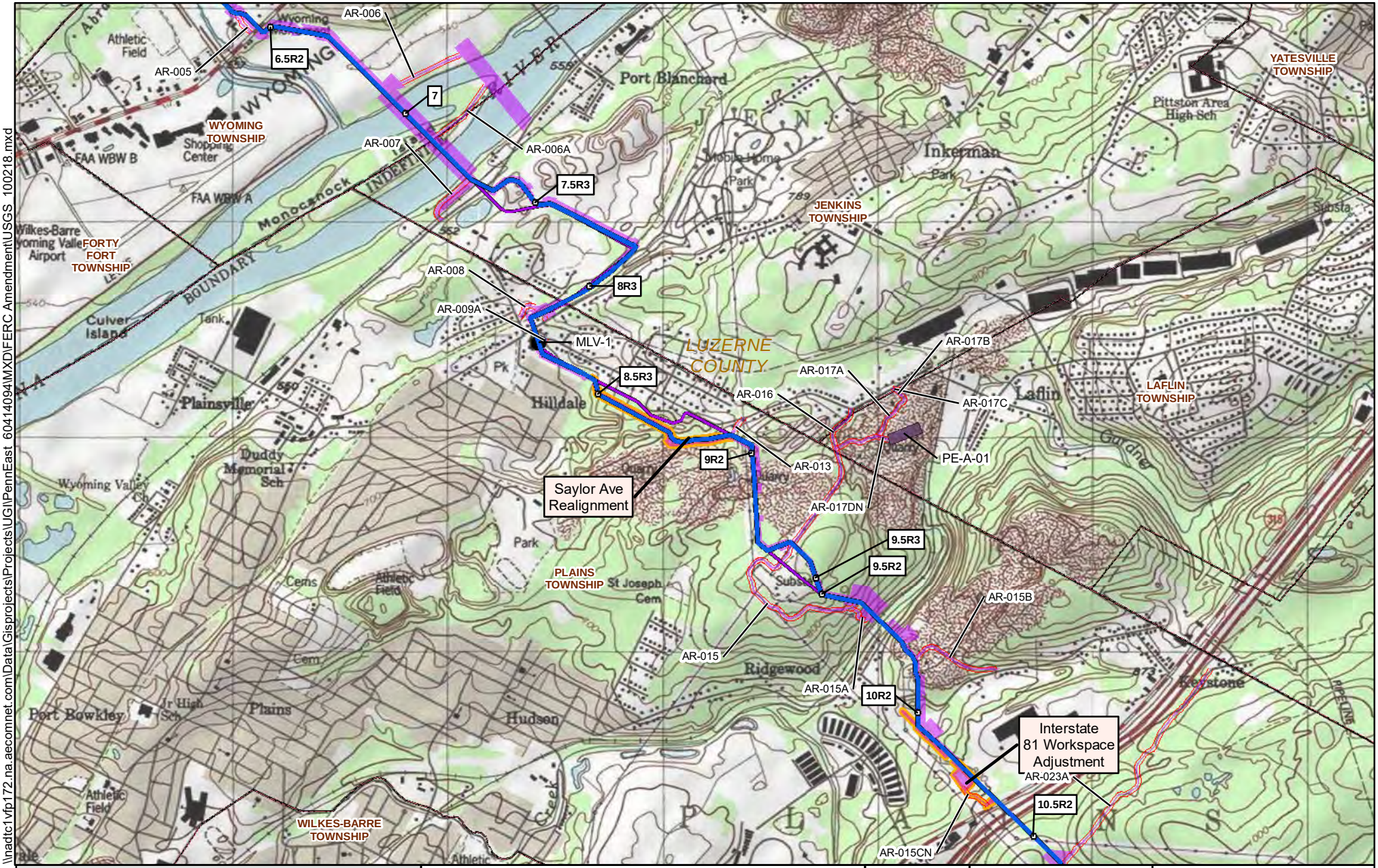
Tetra Tech, Inc. is a third-party contractor assisting the Commission staff in reviewing the environmental aspects of the project application and preparing the environmental documents required by NEPA. Third-party contractors are selected by Commission staff *and funded by project applicants. Per the procedures in 40 CFR 1506.5(c), third-party contractors execute a disclosure statement specifying that they have no financial or other conflicting interest in the outcome of the project. Third-party contractors are required to self-report any changes in financial situation and to refresh their disclosure statements annually. The Commission staff solely directs the scope, content, quality, and schedule of the contractor's work. The Commission staff independently evaluates the results of the third-party contractor's work and the Commission, through its staff, bears ultimate responsibility for full compliance with the requirements of NEPA.*

APPENDIX A

MAPS OF PROPOSED AMENDMENTS



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1 MILEPOST
1R MILEPOST (STATION EQUATION DUE TO REROUTE)
PROPOSED PERMANENT ABOVE GROUND FACILITY
REVISED PA ROUTE
CERTIFICATED ROUTE
PROPOSED PERMANENT ACCESS ROAD
PROPOSED TEMPORARY ACCESS ROAD
PROPOSED CONSTRUCTION LIMIT
PROPOSED WAREYARD
MODIFICATION
USGS QUADRANGLE BOUNDARY
TOWNSHIP BOUNDARY
COUNTY BOUNDARY
STATE BOUNDARY

PENNEAST PIPELINE PROJECT
USGS QUADRANGLE MAP

Saylor Ave Realignment

LUZERNE COUNTY
PENNSYLVANIA

2,000 1,000 0 2,000 4,000 Feet

N W E S

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PennEast PIPELINE

AECOM

DRAWN BY: MJF
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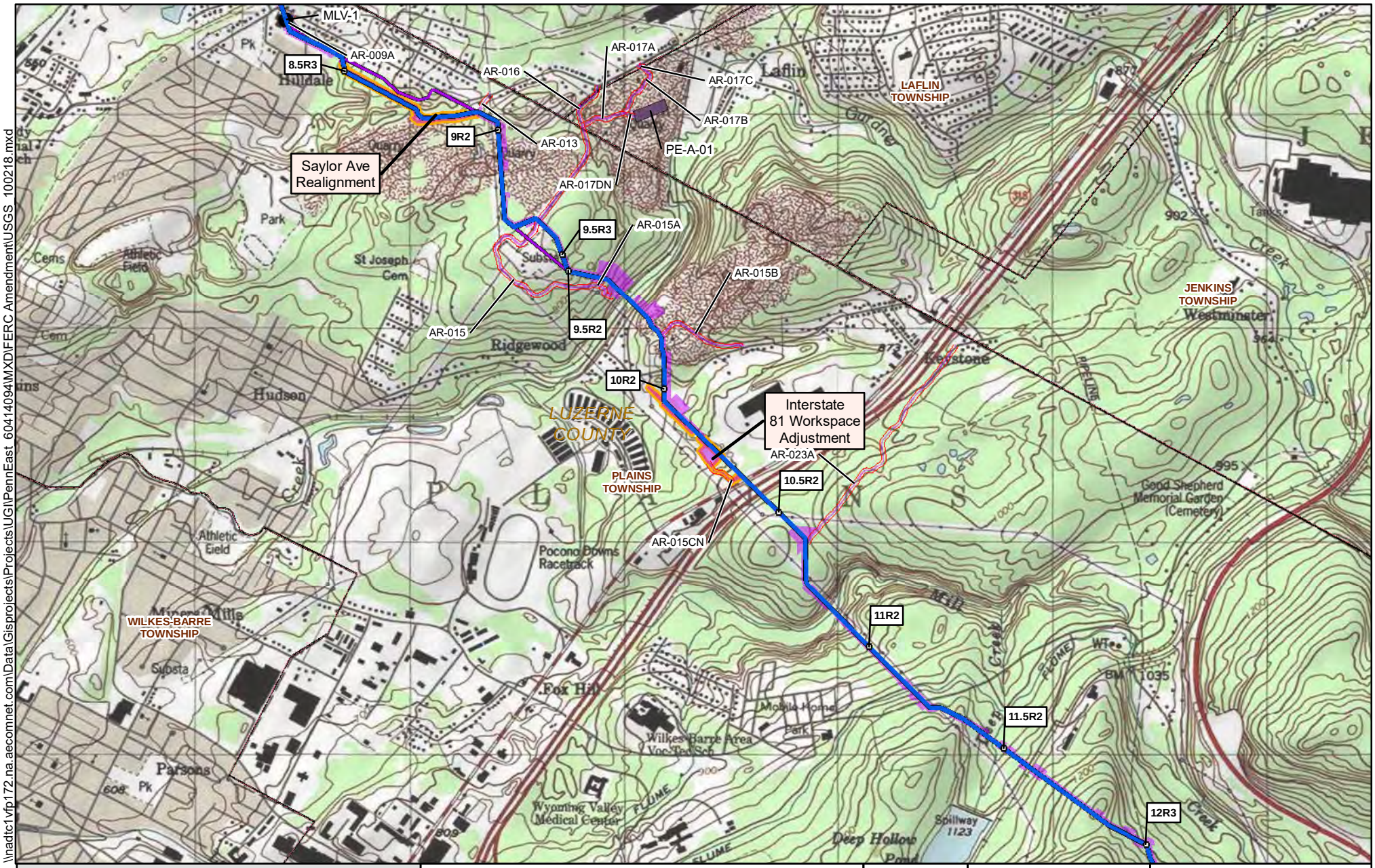
APPROVED BY:
REV. DATE: 10/2/2018
REVISION:
DESC: ISSUED FOR FERC
PAGE: PAGE 1 OF 5



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MODIFICATION
USGS QUADRANGLE BOUNDARY
TOWNSHIP BOUNDARY
COUNTY BOUNDARY
STATE BOUNDARY

PENNEAST PIPELINE PROJECT
USGS QUADRANGLE MAP

Interstate 81 Workspace Adjustment

LUZERNE COUNTY
PENNSYLVANIA

2,000 1,000 0 2,000 4,000 Feet

N W E S

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PennEast PIPELINE

AECOM

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APPROVED BY:
REV. DATE: 10/2/2018
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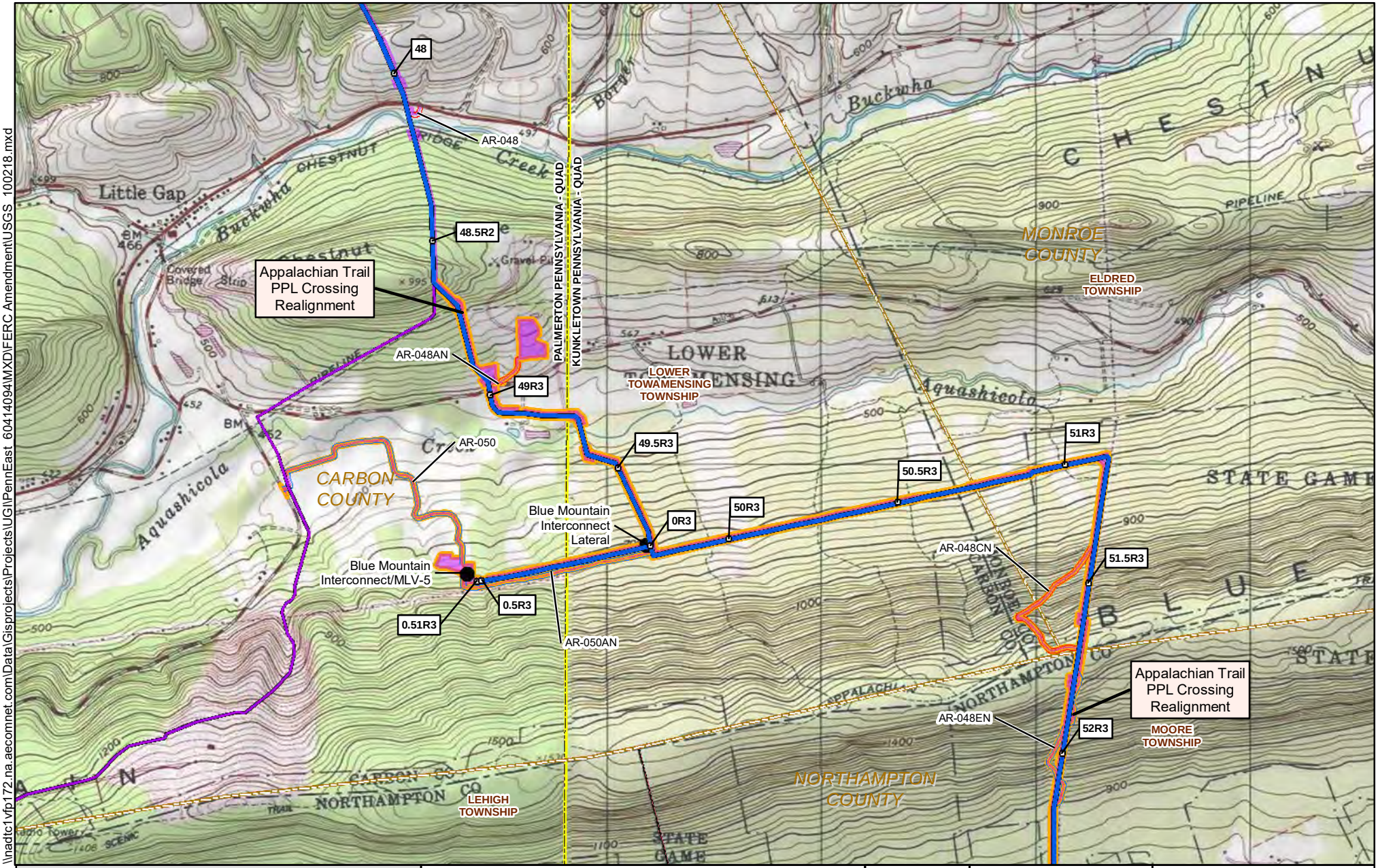
PAGE: PAGE 2 OF 5



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PENNEAST PIPELINE PROJECT
USGS QUADRANGLE MAP

Appalachian Trail PPL Crossing Realignment

CARBON/MONROE/NORTHAMPTON COUNTIES
PENNSYLVANIA

2,000 1,000 0 2,000 4,000 Feet

N W E S

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PennEast PIPELINE

AECOM

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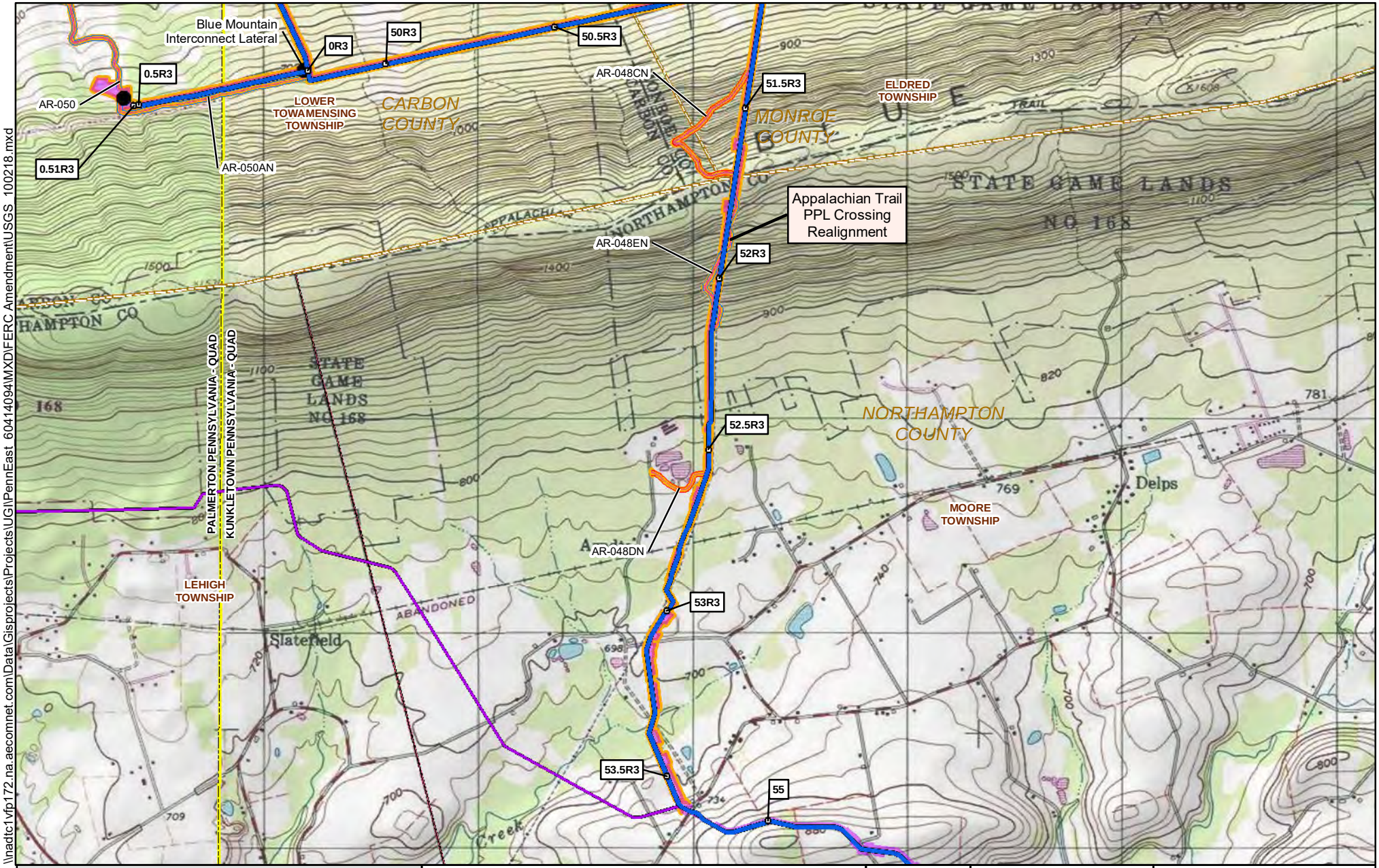

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PENNEAST PIPELINE PROJECT
USGS QUADRANGLE MAP

Appalachian Trail PPL Crossing Realignment

CARBON/MONROE/NORTHAMPTON COUNTIES PENNSYLVANIA

2,000 1,000 0 2,000 4,000 Feet

N W E S

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PennEast PIPELINE

AECOM

DRAWN BY: MJF
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APPROVED BY:
REV. DATE: 10/2/2018
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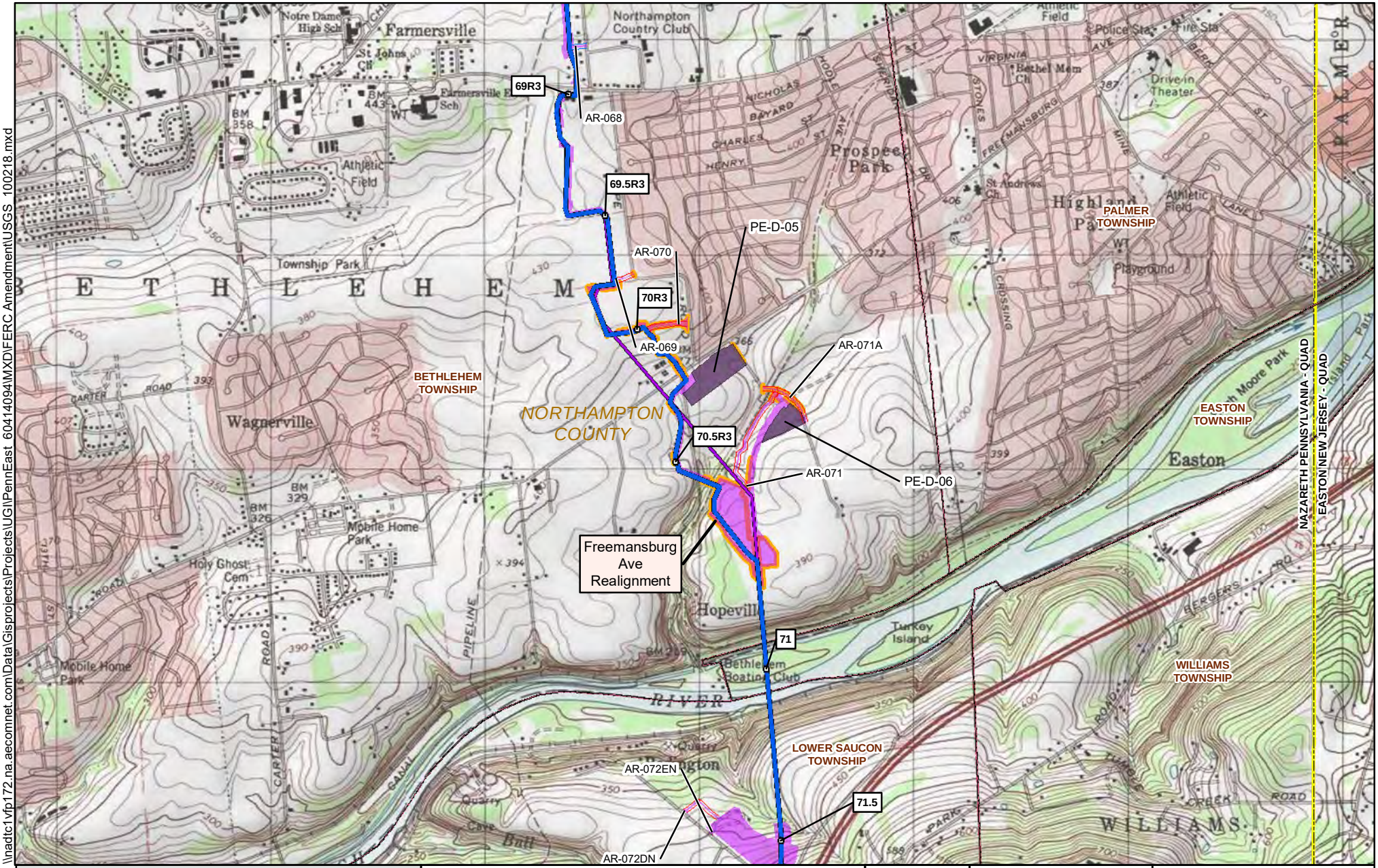
PAGE: PAGE 4 OF 5



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TOWNSHIP BOUNDARY
COUNTY BOUNDARY
STATE BOUNDARY

PENNEAST PIPELINE PROJECT
USGS QUADRANGLE MAP

Freemansburg Ave Realignment

NORTHAMPTON COUNTY
PENNSYLVANIA

2,000 1,000 0 2,000 4,000 Feet

N W E S

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PennEast PIPELINE

AECOM

DRAWN BY: MJF
CHECKED BY:
APPROVED BY:
REV. DATE: 10/2/2018
REVISION:
DESC: ISSUED FOR FERC
PAGE: PAGE 5 OF 5

APPENDIX B

APPALACHIAN NATIONAL SCENIC TRAIL CROSSING PLAN

PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT
FERC Docket # CP19-78.000

APPALACHIAN TRAIL CROSSING PLAN

March 2019

Submitted by:

PennEast Pipeline Company, LLC

Table of Contents

Attachments

Acronym List

Algonquin	Algonquin Gas Transmission, LLC
ATC	Appalachian Trail Conservancy
Blue Mountain Interconnect	Interconnect with UGI Central Penn Gas, Inc
ETC	Elizabethtown Gas
FERC	Federal Energy Regulatory Commission
Gilbert	NRG REMA, LLC
MLV	mainline block valves
MP	milepost
NPS	National Park Service
PADEP	Pennsylvania Department of Environmental Protection
PennEast	PennEast Pipeline Company, LLC
PGC	Pennsylvania Game Commission
ROW	right-of-way
SGL	State Game Land
TCO	Columbia Gas Transmission
Texas Eastern	Texas Eastern Transmission, LP
UGI-LEH	UGI Utilities, Inc.
USACE	United States Army Corps of Engineers

Introduction

PennEast Pipeline Company, LLC (PennEast) proposes to construct approximately 115 miles of 36-inch diameter pipeline from Luzerne County, Pennsylvania to Mercer County, New Jersey. The Blue Mountain Lateral, an approximately 0.5-mile lateral of 4-inch diameter pipe, will be constructed in Carbon County, Pennsylvania. This lateral will serve as an Interconnect with UGI Central Penn Gas, Inc. (Blue Mountain Interconnect). The Hellertown Lateral, an approximately 2.1-mile lateral of 24-inch diameter pipe, will be constructed in Northampton County, Pennsylvania. This lateral will serve as an Interconnect with Columbia Gas Transmission (TCO) and UGI Utilities, Inc. (UGI-LEH). The Gilbert Lateral, an approximately 0.6-mile lateral of 20-inch diameter pipe, will be constructed in Hunterdon County, New Jersey. This lateral will serve as an Interconnect with Elizabethtown Gas (ETG) and Gilbert (NRG REMA, LLC). The Lambertville Lateral, an approximately 1.4-mile lateral of 36-inch diameter pipe, will be constructed in Hunterdon County, New Jersey. This lateral will serve as an Interconnect with Algonquin Gas Transmission, LLC (Algonquin) and Texas Eastern Transmission, LP (Texas Eastern). The associated aboveground infrastructure for the Project will consist of interconnect meter stations, mainline block valves (MLV), and a single compressor station and their appurtenant facilities and equipment (e.g., pig launchers/receivers, milepost markers, cathodic protection test posts, etc.).

The Project crosses the Appalachian Trail near milepost (MP) 51.7R3 in Monroe, PA at a location that has been approved by the Pennsylvania Game Commission (PGC). The Appalachian Trail is a roughly 2,180 mile continuous public hiking trail that extends from Georgia to Maine, passing through 14 states along the Appalachian mountain range. The Appalachian Trail was completed in 1937 and is a unit of the National Park Service (NPS), but is managed under a unique partnership between public and private entities including the NPS, the USDA Forest Service, numerous state agencies, the Appalachian Trail Conservancy (ATC), and 31 local clubs that mark and maintain the trail (ATC 2015).

The Appalachian Trail extends across the entire length of Monroe, Northampton, and neighboring counties, making the crossing of this feature unavoidable by the Project. Since PennEast began the Pre-Filing process in October 2014, PennEast has evaluated and designed several alternatives to cross the Appalachian Trail, which were documented in PennEast's Certificate Application and subsequent filings. These alternatives were discussed in Resource Report 10 of the Certificate Application, shown in Route Variation Numbers 20-25 in Appendix P, described in PennEast's December 14, 2015 Response to the Federal Energy Regulatory Commission's (FERC) November 24, 2015 Data Request, and further discussed in FERC's Final Environmental Impacts Statement for the Project.

The Project would cross the trail approximately 3.25 miles east of the crossing location proposed on the Certificated PA Route, which is the same crossing location shown in Route Deviation 20 in the Certificate Application. However, unlike Route Deviation 20, the proposed Modification would deviate from the Certificated PA Route near MP 48.6R2 rather than at MP 47.3.

In October 2017, a land exchange between the NPS and PGC occurred. As stated in the NPS public notice, the primary purpose of the exchange was to encourage responsible future energy corridor development across Blue Mountain and State Game Land (SGL) 168 by allowing for pipeline or utility co-location within or immediately adjacent to the existing, cleared right-of-way (ROW). The proposed Appalachian Trail PPL Crossing Realignment would cross a 2.25-acre parcel now owned and managed by the PGC and will co-locate with an existing 100-foot wide high voltage power line ROW to reduce forested and visual impacts.

PennEast has developed a site-specific crossing plan after considering comments and perspectives shared by NPS, ATC, PGC and other stakeholders for the crossing of the Appalachian National Scenic Trail. The crossing exhibit provided in Attachment 1 has been approved by the PGC (PGC 2018).

Crossing Location Description

The Project will cross the Appalachian Trail perpendicularly and directly adjacent to an existing, approximately 100-foot wide high-voltage powerline ROW. The existing powerline ROW is actively maintained, and vegetation cover is primarily mixed grasses and forbs with sporadic shrubs and saplings (see Photo log in Attachment 2). As shown on the exhibit in Attachment 1, PennEast would use approximately 70 feet of temporary construction workspace within this previously-disturbed and actively-maintained powerline ROW. The permanent ROW across the Appalachian Trail would be 30-feet wide, approximately half of which would overlap with the existing PPL easement along its western edge. Construction and operation of the Project would result in approximately 15 feet of tree clearing along this western edge, which is currently relatively-young, deciduous hardwood forest (see Attachment 2).

Pre-Construction Notifications

PennEast will schedule a pre-construction meeting with the PGC to review the terms and conditions of the license agreement and to confirm the site-specific construction procedures that will be implemented to minimize environmental and recreational impacts. PennEast will adhere to all FERC, United States Army Corps of Engineers (USACE), Pennsylvania Department of Environmental Protection (PADEP), and additional regulatory agencies' safety requirements during construction. PennEast will ensure that all personnel entering the work area have received the necessary safety and environmental training. During construction, PennEast's environmental and construction inspectors will be on-site to serve as the primary points of contact.

Construction Methods

PennEast proposes to install the pipe at the Appalachian Trail crossing using a drag section construction technique to minimize trail closures. This technique involves excavating a specified length of trench line, installing a prefabricated length of pipe that contains several pipe joints, then backfilling the trench. The trench excavation and pipe installation/backfilling stages are expected to take approximately 6 hours each to complete.

In between active construction periods, the trench will be covered with steel plates or timber mats to allow pedestrian use of the trail. Once the pipe installation is complete, PennEast shall backfill the trench and begin site restoration. Safety fencing will remain on-site for an additional 120 days following installation.

Safety Measures

Before pipeline construction begins, PennEast will install high-visibility safety fencing that extends 50-feet along the construction limits on either side of the trail as shown in the Detail View of the exhibit provided in Attachment 1. Additional high-visibility safety fencing will be installed around the trench. PennEast will also install "Wait Here for Crossing Escort" and "Vehicle Crossing Ahead" signs at the edges of the construction areas along the trail. Both signs will include PennEast contact information. The

"Wait Here For Crossing Escort" signs will remain on-site for at least an additional 12 days after construction end and the "Vehicle Crossing Ahead" signs shall remain for an additional 120 days.

Brief trail closures will be necessary to ensure hiker safety when the trench is being excavated and when the pipe is being lowered into position. The closures shall last approximately 6 hours. During closures, PennEast will provide flaggers to escort pedestrians around the workspace using the existing, cleared ROW. Flaggers shall be equipped with radios to coordinate with construction workers and will escort pedestrians in one direction. In between active construction, pedestrians shall be able to cross through the work area without escort once steel plates and timber mats are installed over the crossing. At no point will excavated areas remain uncovered when safety flaggers are not present.

Seasonal and Daily Construction Timing

Construction will take place during daylight hours. There are no anticipated seasonal restrictions to the construction timing.

To adhere to commitment PennEast has made to avoid and minimize impacts to protected bat and bird species, tree felling may occur out of sequence with pipeline construction. If this situation occurs, trees would be felled and left in place until construction clearing and grading is ready to begin. PennEast would verify that no trees or limbs obstruct the trail after tree felling is complete.

Restoration

After backfilling is complete, PennEast would restore pre-construction contours to the extent practicable and seed and replant the area in accordance with the SGL 168 Restoration Plan that the PGC approved in February 2018 (Attachment 3). As show on the SGL 168 Restoration Plan figure, PennEast proposed to use a wildflower seed mix [Ernst Showy Northeast Wildflower Mix (ERNMX-153-1)] directly at and within close proximity of the trail. A cover crop will be sown with the wildflower seed mix (grain oat from January 1 to August 1, and winter wheat from August 1 to January 1). A low shrub sod of lowbush blueberry (*Vaccinium angustifolium*) and black huckleberry (*Gaylussacia baccata*) will be installed within the permanent easement, overlapping with the seeded area.

In accordance with the license agreement with the PGC, the PGC will be provided the opportunity to inspect seed and planting stock before it is planted. PennEast will also monitor sod placements and protection measures for three years, and provide the PGC with annual monitoring reports. If survivorship rates of 85% for the first year, 75% for the second year, and 60% for the third year are not met, PennEast will coordinate remedial actions with the PGC.

Mitigation

License fees, proposed restoration, and mitigation for impacts associated with SGL168 are documented in the license agreement with PGC.

References

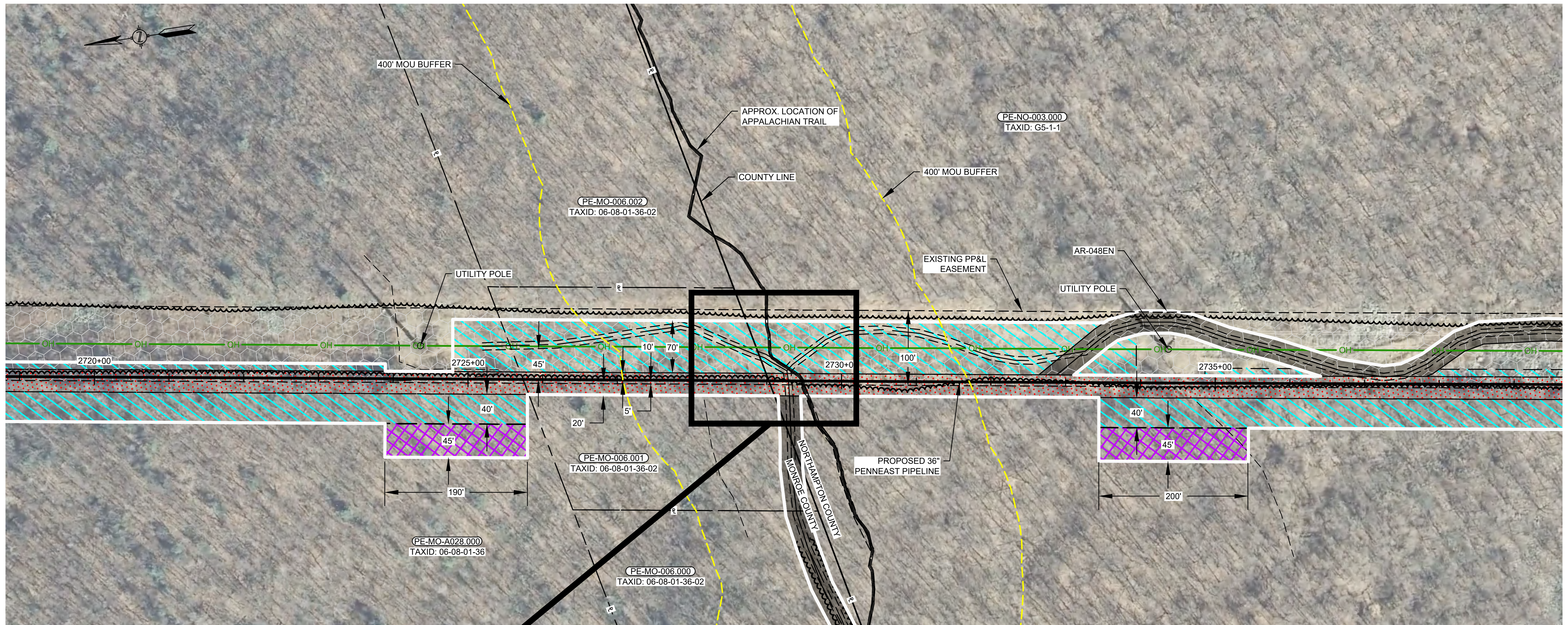
Appalachian Trail Conservancy. 2015. About the Trail. Available at: https://www.appalachiantrail.org/about-the-trail. Accessed on February 5, 2015.

PennEast Pipeline Company, LLC. 2018a. SGL-168 Restoration Plan dated February 15, 2018.

PennEast Pipeline Company, LLC. 2018b. ANST Crossing Exhibit revised September 2018.

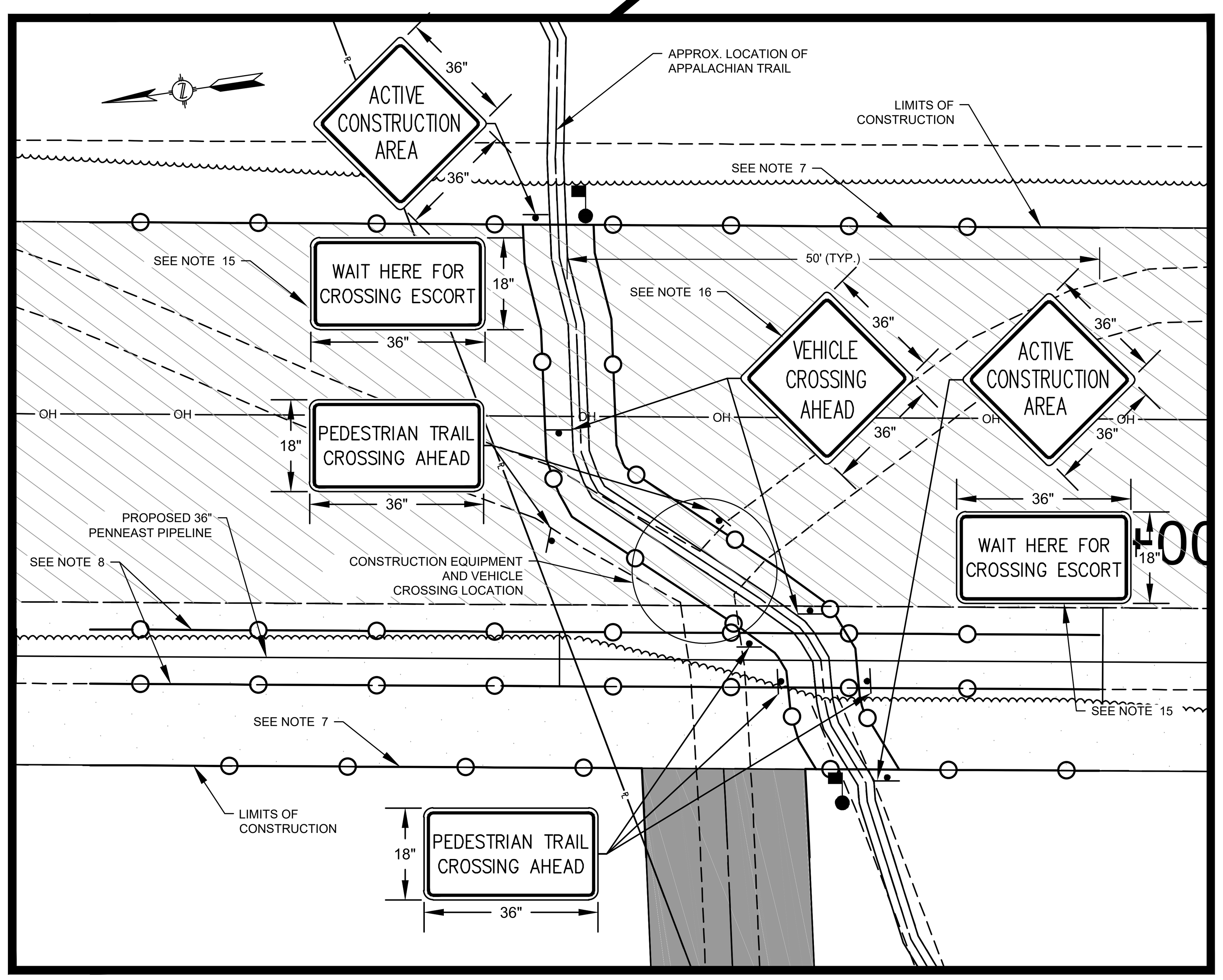
Pennsylvania Game Commission. 2018. Email dated September 18, 2018 from Nathan Havens, Right-of-Way Administrator, to Sarah Binckley, AECOM.

Attachment 1 - Approved ANST Crossing Exhibit



PLAN VIEW
SCALE: 1" = 100'

SCALE: 1" = 100'



DETAIL VIEW
SCALE: 1" = 20'

SCALE: 1" = 20'

NOTES:

1. PENNEAST WILL ADHERE TO PROJECT CONSTRUCTION SPECIFICATIONS AND APPLICABLE FERC, USACE, PADEP AND/OR REGULATORY REQUIREMENTS, INCLUDING THOSE PERTAINING TO SAFETY; ENVIRONMENTAL INSPECTION; SPILL PREVENTION, CONTROL, AND CLEANUP; AND EROSION/SEDIMENT CONTROL IN BOTH UPLAND AND WETLAND AREAS.ENVIRONMENTAL TRAINING WILL BE REQUIRED FOR ALL LAND AGENTS, CONSTRUCTION PERSONNEL AND ENVIRONMENTAL INSPECTORS; AGENCY PERSONNEL WILL ALSO BE INVITED TO THE TRAINING.

2. PENNEAST WILL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE LANDOWNER AND/OR LAND MANAGER TO REVIEW THE TERMS AND CONDITIONS OF THE EASEMENT ACROSS THE AFFECTED PROPERTY(IES), IDENTIFY SENSITIVE RESOURCES IN THE FIELD (E.G., WETLANDS, WATERCOURSES, SURVEY MARKERS, TRAILS), AND CONFIRM THE SITE-SPECIFIC CONSTRUCTION PROCEDURES TO BE USED TO MINIMIZE POTENTIAL ADVERSE EFFECTS TO SUCH RESOURCES.

3. PENNEAST WILL PROVIDE THE LAND-OWNER AND/OR LAND-MANAGER WITH PROJECT SAFETY AND ENVIRONMENTAL AWARENESS TRAINING (WHICH WILL BE REQUIRED FOR ALL PERSONNEL ENTERING PROJECT CONSTRUCTION WORK AREAS), AS WELL AS RELEVANT CONTACT INFORMATION FOR PENNEAST AND CONTRACTOR REPRESENTATIVES INVOLVED IN WORK ACTIVITIES ON THE AFFECTED RECREATIONAL OR SPECIAL USE PROPERTY(IES).

4. PENNEAST'S ENVIRONMENTAL AND CONSTRUCTION INSPECTORS AS WELL AS ROW LAND AGENTS WILL BE ON-SITE DURING CONSTRUCTION AND WILL BE THE PRIMARY POINTS OF CONTACT WITH THE LANDOWNER AND/OR LAND MANAGER

5. CONSTRUCTION AREAS WILL BE INSPECTED AND MAINTAINED IN A SANITARY CONDITION AT ALL TIMES; WASTE MATERIALS (INCLUDING BUT NOT LIMITED TO HUMAN WASTE, TRASH, GARBAGE, REFUSE, AND OIL AND PETROLEUM PRODUCTS) WILL BE DISPOSED OF PROMPTLY AT AN APPROVED WASTE DISPOSAL SITE.

6. CONSTRUCTION MATERIALS AND CONSTRUCTION EQUIPMENT IN THE VICINITY OF PUBLIC RECREATIONAL AREAS WILL BE MOVED OUTSIDE OF SENSITIVE RESOURCE AREAS IN ACCORDANCE WITH FERC PLANS AND PROCEDURES, AND APPROPRIATELY SECURED PRIOR TO CESSATION OF WORK AT THE END OF EACH WORK DAY.

7. HIGH VISIBILITY SAFETY FENCING SHALL BE INSTALLED AND MAINTAINED DURING ACTIVE CONSTRUCTION AT THE INTERSECTION OF THE CONSTRUCTION LIMITS AND THE APPALACHIAN TRAIL. THE FENCING SHALL EXTEND 50' ALONG THE CONSTRUCTION LIMITS ON EITHER SIDE OF THE TRAIL AND ALSO BE PLACED ALONGSIDE (PARALLEL) TO THE TRAIL BETWEEN THE CONSTRUCTION LIMITS.

8. HIGH VISIBILITY SAFETY FENCE SHALL BE INSTALLED AND MAINTAINED OUTSIDE OF ANY OPEN EXCAVATION.

9. FLAGGERS EQUIPPED WITH TWO-WAY RADIOS WILL BE PRESENT AT THE INTERSECTIONS OF THE LIMITS OF CONSTRUCTION AND THE TRAIL DURING ACTIVE CONSTRUCTION. FLAGGERS WILL ESCORT PEDESTRIANS THOUGH OR AROUND THE WORKSPACE. PEDESTRIAN TRAFFIC, ACCOMPANIED BY A FLAGGER, WILL ONLY PROCEED IN ONE DIRECTION AT A TIME.

10. THE PIPE SHALL BE INSTALLED USING A DRAG SECTION CONSTRUCTION TECHNIQUE TO MINIMIZE TRAIL CLOSURES. THIS TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL PIPE JOINTS LOWERED INTO THE TRENCH. HOWEVER, BRIEF TRAIL CLOSURES WILL BE NECESSARY DURING TWO (2) PERIODS WHEN ACTIVE CONSTRUCTION WILL BE UNDERWAY BETWEEN THE HIGH VISIBILITY SAFETY FENCE PARALLELING THE APPALACHIAN TRAIL:
    1) WHILE THE TRENCH IS BEING EXCAVATED AND PREPARED FOR PIPE, AND UNTIL STEEL PLATES OR TIMBER MATS CAN BE INSTALLED IMMEDIATELY THEREAFTER (TOTAL OF 6 HOURS ESTIMATED).
    2) WHILE THE PIPE IS BEING LOWERED INTO POSITION, AND UNTIL BACKFILLING CAN BE COMPLETED IMMEDIATELY THEREAFTER (TOTAL OF 6 HOURS ESTIMATED).

    DURING THESE CLOSURES, FLAGGERS WILL ESCORT PEDESTRIANS OFF THE APPALACHIAN TRAIL AND AROUND THE WORKSPACE TO THE NORTH OR SOUTH USING THE EXISTING CLEARED PPL ROW. SINCE ACTIVE CONSTRUCTION WILL NOT BE OCCURRING SIMULTANEOUSLY NORTH AND SOUTH OF THE TRAIL, PEDESTRIANS WILL HAVE SAFE, ESCORTED PASSAGE THROUGH THE LIMITS OF CONSTRUCTION AT ALL TIMES.

11. AT THE END OF EACH DAY, OR IN THE EVENT THAT ACTIVE CONSTRUCTION WOULD OTHERWISE NEED TO CEASE PRIOR TO COMPLETING EITHER OF THE TWO (2) TASKS ABOVE NECESSITATING TRAIL CLOSURE, THE TRENCH WILL BE BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS IN ORDER TO RE-ESTABLISH PEDESTRIAN USE OF THE TRAIL.

12. ALL POSTED SIGNAGE FOR TRAIL USERS SHALL INCLUDE APPROPIATE PENNEAST CONTACT INFORMATION, INCLUDING PHONE NUMBER. ALL TEMPORARY SIGNS SHALL HAVE BLACK COPY ON ORANGE BACKGROUND AND SHALL BE RETRO-REFLECTORIZED.

13. SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 60" MINIMUM MOUNTING HEIGHT FROM THE GROUND SURFACE TO THE BOTTOM OF SIGN.

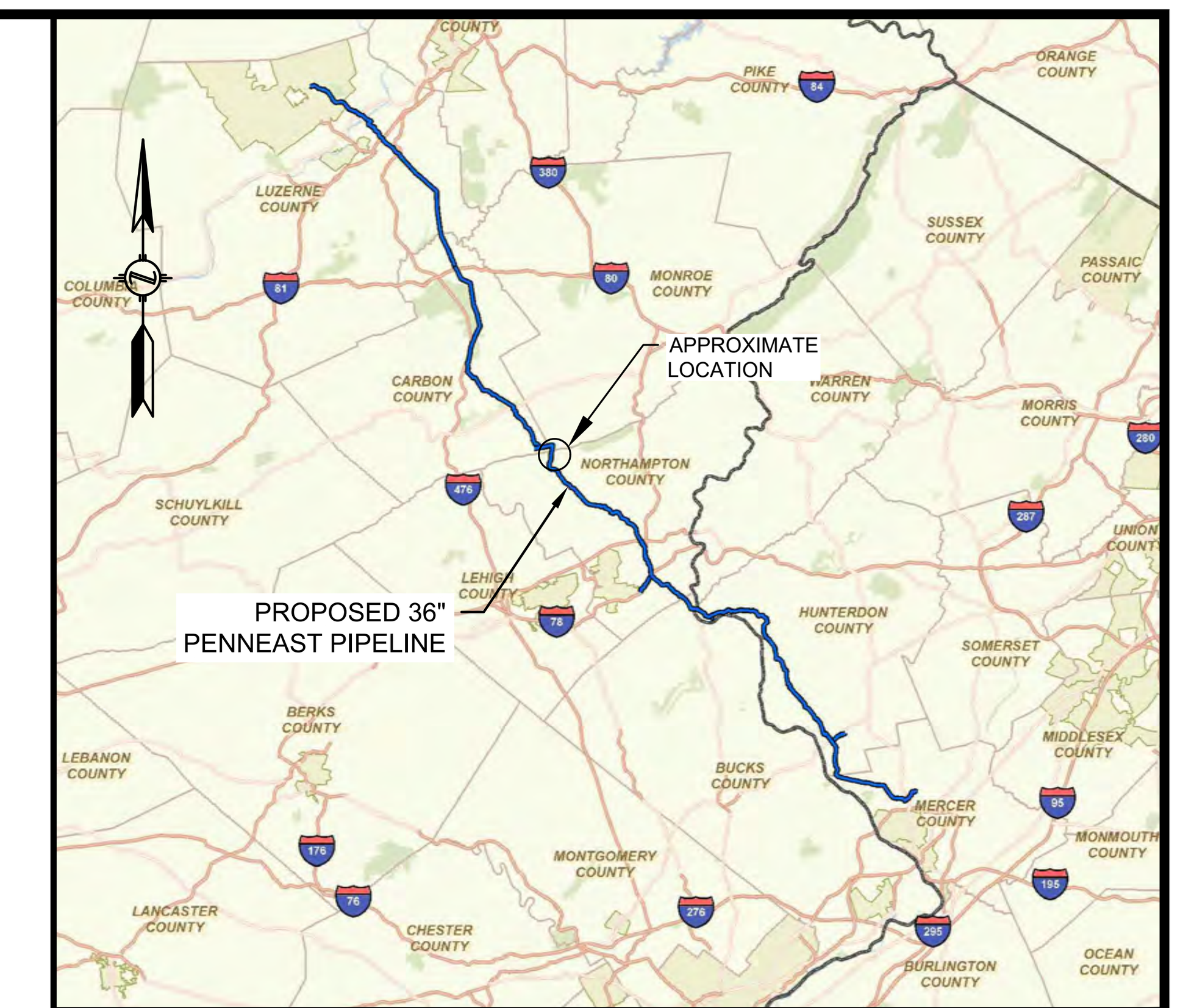
14. SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84" MOUNTING HEIGHT FROM THE GROUND SURFACE TO BOTTOM OF SIGN.

15. "WAIT HERE FOR CROSSING ESCORT" SIGN TO BE COVERED OR REMOVED DURING NON-WORKING HOURS.

16. "WAIT HERE FOR CROSSING ESCORT" SIGNS WILL BE REMOVED AFTER PIPELINE INSTALLATION AND BACKFILL IS COMPLETE AND FLAGGERS ARE NO LONGER NEEDED (12 DAYS FROM INSTALLATION ESTIMATED). HOWEVER, "VEHICLE CROSSING AHEAD" SIGNS AND ALL HIGH VISIBILITY SAFETY FENCING WILL REMAIN IN PLACE AFTER PIPE INSTALLATION AND BACKFILL IS COMPLETE. THESE MEASURES WILL REMAIN IN PLACE UNTIL VEHICLE TRAVEL IS NO LONGER NECESSARY (120 DAYS FROM INSTALLATION ESTIMATED), AND SIGNS AND FENCING WILL BE INSPECTED PERIODICALLY TO ENSURE THEY REMAIN IN PLACE. CONSTRUCTION VEHICLES WILL BE REQUIRED TO STOP AT THE HIGH VISIBILITY SAFETY FENCE THAT PARALLELS THE TRAIL, PULL BACK BOTH SIDES OF THE FENCING TO ALLOW FOR VEHICLE PASSAGE ACROSS THE APPALACHIAN TRAIL, AND IMMEDIATELY REPLACE BOTH SIDES OF THE FENCING AFTER PASSING THROUGH.

17. THE PERMANENT ROW WILL BE MAINTAINED AFTER CONSTRUCTION, DURING MAINTENANCE AND OPERATION ACTIVITIES.

18. THE WORKSPACE WILL BE RESTORED IN ACCORDANCE WITH THE SGL-168 RESTORATION PLAN DATED 2/15/2018 AND APPROVED BY THE PGC ON 2/16/2018.



LOCATION MAP
SCALE:N.T.S

LEGEND

- PROPOSED PIPELINE
- PROPERTY LINE
- PROPOSED ACCESS ROAD
- PROPOSED ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED TEMPORARY WORKSPACE
- PROPOSED PERMANENT EASEMENT
- EXISTING EASEMENT
- OH — EXISTING OVERHEAD LINES
- 400' MOU
- EXISTING TREELINE
- UTILITY POLE
- (PE-NO-003.000) LINE LIST NUMBER
- TEMPORARY CONSTRUCTION SIGN
- FLAGGER
- SAFETY FENCE

CONSTRUCTION SEQUENCE:

PRIOR TO EXCAVATION
1. STRING PIPE (WELD, X-RAY, COAT), 2 DRAG SECTIONS TO SPAN MOC)

DAY 1
1. EXCAVATE TRENCH ON ONE SIDE OF THE AT TRAIL (EAST OR WEST) AND INCLUDE THE TRAIL ITSELF
2. LOWER PIPE INTO TRENCH
3. BACKFILL TRENCH

DAY 2
1. EXCAVATE TRENCH ON OPPOSITE SIDE OF TRAIL (EAST OR WEST) TRAIL ITSELF HAS ALREADY BEEN BACKFILLED AND IS NOT INCLUDED
2. LOWER PIPE INTO TRENCH
3. PERFORM TIE IN WELD INCLUDING COATING
4. BACKFILL TRENCH

NOTES:
1. THE IMAGERY SHOWN WAS PROVIDED BY PASDA.
2. EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.
3. PROPERTY LINES DEPICTED ON THIS PLAN ARE BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY.

REFERENCE DRAWINGS

DWG. NO.	TITLE
000-03-01-104	ALIGNMENT SHEET
000-03-01-105	ALIGNMENT SHEET

REVISIONS

NO.	REVISIONS	DATE	DRAWN	CK	APPR
A	ISSUED FOR INFORMATION	05/2018	DJH(MM)	ARY(MM)	MAW(MM)
B	REISSUED FOR INFORMATION	09/2018	DJH(MM)	ARY(MM)	MAW(MM)

PROJECT ENGINEER STAMP

APPROVALS

DRAWN BY	DATE
DJH (MM)	05/2018
CHECKED BY	DATE
ARY (MM)	05/2018
ENG. APPROVAL	DATE
DJH (MM)	05/2018
P.M. APPROVAL	DATE
MAW (MM)	05/2018

811 Know what's below. Call before you dig.

CLIENT APPROVAL

DATE

PREPARED FOR

PennEast PIPELINE

PENNEAST PIPELINE PROJECT
ANST CROSSING EXHIBIT
PROPOSED 36" PENNEAST PIPELINE
MONROE/NORTHAMPTON COUNTY,
PENNSYLVANIA

SCALE	DRAWING NO.	REVISION
AS NOTED	ANST CROSSING PLAN	B

Attachment 2 - Photos of Existing Conditions at the Proposed Trail Crossing

Photograph:	Date:
1	08/15/2017

Direction:

West

Description:

Appalachian Trail at the top of the ridge within the existing PPL powerline right-of-way. Vegetation cover is predominantly grasses and forbs.

Photograph:	Date:
2	08/15/2017

Direction:

East

Description:

Appalachian Trail within the forested area west of the PPL powerline right-of-way.

Photograph:	Date:	
3	08/15/2017	
Direction: West		
Description: Appalachian Trail within the PPL powerline right-of-way looking toward the forested area to the west.		

Attachment 3 - Approved SGL-168 Restoration Plan

Legend

- Proposed Pipeline Centerline
- Permanent Easement
- Proposed Workspace
- Parcel Boundary
- Not SGL
- Appalachian Trail
- 10' contour
- 100' contour

Recommended Plantings

- Shrub/Tree Planting Area
- Shrub Sod Area
- Steep slope seed mix
- Food plot seed mix
- Wildflower seed mix
- Access Road

References:
ESRI Aerial Imagery 2017
The depicted contours for the PennEast project are a combination of public and flown data. Data current as of 11/28/2017.

PennEast PIPELINE

N E W S

0 80 160 320 480 640 Feet

SGL-168 Restoration Plan

Date: 2/15/2018

LOWER TOWAMENSING TWP / ELDRED TWP, CARBON / MONROE, PA

PE-MO-006-002

Area 2: 1.68 ac.
(1139 sod pieces)
Shrub Sod Area

Area 4: 5.04 ac.
Steep slope seed mix

Area 7: 0.50 ac.
Food plot seed mix

Area 10: 0.08 ac.
Steep slope seed mix

Area 8: 0.65 ac.
(442 sod pieces)
Shrub Sod Area

Area 13: 3.24 ac.
Steep slope seed mix

Area 14: 0.57 ac.
(249 plants)
Shrub/Tree Planting Area

PE-MO-006-001

Area 9: 0.75 ac.
Wildflower seed mix

Area 3: 1.66 ac.
(825 plants)
Shrub/Tree Planting Area

Area 6: 1.34 ac.
(580 plants)
Shrub/Tree Planting Area

Area 11: 0.67 ac.
Food plot seed mix

Area 12: 0.99 ac.
(432 plants)
Shrub/Tree Planting Area

PE-MO-A028.000

PE-NO-003.000

PE-MO-006.000

1000 1100 1200 1300 1400 1500 900 1300 1400 1500

Legend

- Proposed Pipeline Centerline
- Permanent Easement
- Proposed Workspace
- Parcel Boundary
- Not SGL
- Appalachian Trail
- 10' contour
- 100' contour

Recommended Plantings

- Shrub/Tree Planting Area
- Shrub Sod Area
- Steep slope seed mix
- Food plot seed mix
- Wildflower seed mix
- Access Road

References:
ESRI Aerial Imagery 2017
The depicted contours for the PennEast project are a combination of public and flown data. Data current as of 11/28/2017.

PennEast PIPELINE

0 80 160 320 480 640 Feet

SGL-168 Restoration Plan

Date: 2/15/2018 Page 2 of 3

LOWER TOWAMENSING TWP / ELDRED TWP / MOORE TWP,
CARBON / MONROE / NORTHAMPTON, PA

PE-NO-003.000
PE-NO-A004.000
PE-NO-010.000
PE-NO-A003.000
PE-NO-009.000
1200
1100
1000
900
800
1300
1400
1500
Area 12: 0.99 ac.
(432 plants)
Shrub/Tree Planting Area
Area 14: 0.57 ac.
(249 plants)
Shrub/Tree Planting Area
Area 13: 3.24 ac.
Steep slope seed mix
Area 15: 1.71 ac.
(749 plants)
Shrub/Tree Planting Area
Area 16: 2.66 ac.
Food plot seed mix

Legend

- Proposed Pipeline Centerline
- Permanent Easement
- Proposed Workspace
- Parcel Boundary
- Not SGL
- Appalachian Trail
- 10' contour
- 100' contour

Recommended Plantings

- Shrub/Tree Planting Area
- Shrub Sod Area
- Steep slope seed mix
- Food plot seed mix
- Wildflower seed mix
- Access Road

References:
ESRI Aerial Imagery 2017
The depicted contours for the PennEast project are a combination of public and flown data. Data current as of 11/28/2017.

PennEast PIPELINE

N E S W

0 80 160 320 480 640 Feet

SGL-168 Restoration Plan

Date: 2/15/2018

MOORE TWP,
NORTHAMPTON, PA

OVERALL PLANTING SCHEDULE

SEED MIXES

SCIENTIFIC NAME	COMMON NAME	PERCENT OF MIX	POUNDS PER ACRE	ACREAGE	POUNDS NEEDED
Ernst NATIVE STEEP SLOPE MIX W/GRAIN OATS	*Ernst Item Number: ERNMX-181-1*	100.0	75 (includes cover crop)	8.36	626.85
Avena sativa, Variety Not Stated	Oats, Variety Not Stated	40.0	30.00	8.36	250.74
Sorghastrum nutans, PA Ecotype	Indiangrass, PA Ecotype	12.0	9.00	8.36	75.22
Elymus virginicus, PA Ecotype	Virginia Wildrye, PA Ecotype	10.0	7.50	8.36	62.69
Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype	Little Bluestem, Fort Indiantown Gap-PA Ecotype	10.0	7.50	8.36	62.69
Tridens flavus, Fort Indiantown Gap-PA Ecotype	Purpletop, Fort Indiantown Gap-PA Ecotype	7.7	5.78	8.36	48.27
Andropogon gerardii, 'Niagara'	Big Bluestem, 'Niagara'	6.0	4.50	8.36	37.61
Elymus canadensis	Canada Wildrye	6.0	4.50	8.36	37.61
Panicum virgatum, 'Shawnee'	Switchgrass, 'Shawnee'	3.0	2.25	8.36	18.81
Echinacea purpurea	Purple Coneflower	1.2	0.90	8.36	7.52
Chamaecrista fasciculata, PA Ecotype	Partridge Pea, PA Ecotype	1.0	0.75	8.36	6.27
Coreopsis lanceolata	Lanceleaf Coreopsis	0.8	0.60	8.36	5.01
Rudbeckia hirta	Blackeyed Susan	0.8	0.60	8.36	5.01
Aster lateriflorus	Calico Aster	0.5	0.38	8.36	3.13
Lespedeza virginica, VA Ecotype	Slender Lespedeza, VA Ecotype	0.5	0.38	8.36	3.13
Liatris spicata	Marsh (Dense) Blazing Star (Spiked Gayfeather)	0.5	0.38	8.36	3.13
Ernst SHOWY NORTHEAST NATIVE WILDFLOWER MIX	*Ernst Item Number: ERNMX-153-1*	100.0	6-10 (plus 30 lbs cover crop)	0.75	7.47
Echinacea purpurea	Purple Coneflower	25.7	2.57	0.75	1.92
Coreopsis lanceolata	Lanceleaf Coreopsis	13.0	1.30	0.75	0.97
Chamaecrista fasciculata, PA Ecotype	Partridge Pea, PA Ecotype	12.0	1.20	0.75	0.90
Rudbeckia hirta, VT Ecotype	Blackeyed Susan, VT Ecotype	10.0	1.00	0.75	0.75
Penstemon digitalis, PA Ecotype	Tall White Beardtongue, PA Ecotype	7.0	0.70	0.75	0.52
Asclepias tuberosa	Butterfly Milkweed	5.5	0.55	0.75	0.41
Aster laevis, NY Ecotype	Smooth Blue Aster, NY Ecotype	4.0	0.40	0.75	0.30
Aster novae-angliae (Symphyotrichum n.), PA Ecotype	New England Aster, PA Ecotype	3.0	0.30	0.75	0.22
Aster prenanthoides, PA Ecotype	Zigzag Aster, PA Ecotype	3.0	0.30	0.75	0.22
Monarda fistulosa, Fort Indiantown Gap-PA Ecotype	Wild Bergamot, Fort Indiantown Gap-PA Ecotype	3.0	0.30	0.75	0.22
Aquilegia canadensis	Eastern Columbine	2.0	0.20	0.75	0.15
Liatris spicata, PA Ecotype	Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype	2.0	0.20	0.75	0.15
Baptisia australis, Southern WV Ecotype	Blue False Indigo, Southern WV Ecotype	1.8	0.18	0.75	0.13
Zizia aurea, PA Ecotype	Golden Alexanders, PA Ecotype	1.5	0.15	0.75	0.11
Rudbeckia fulgida var. fulgida, Northern VA Ecotype	Orange Coneflower, Northern VA Ecotype	1.0	0.10	0.75	0.07
Rudbeckia triloba, WV Ecotype	Browneyed Susan, WV Ecotype	1.0	0.10	0.75	0.07
Senna hebecarpa, VA & WV Ecotype	Wild Senna, VA & WV Ecotype	1.0	0.10	0.75	0.07
Senna marilandica	Maryland Senna	1.0	0.10	0.75	0.07
Solidago juncea, PA Ecotype	Early Goldenrod, PA Ecotype	1.0	0.10	0.75	0.07
Solidago nemoralis, PA Ecotype	Gray Goldenrod, PA Ecotype	0.5	0.05	0.75	0.04
Tradescantia ohiensis, PA Ecotype	Ohio Spiderwort, PA Ecotype	0.5	0.05	0.75	0.04
Penstemon hirsutus	Hairy Beardtongue	0.3	0.03	0.75	0.02
Baptisia tinctoria, PA Ecotype	Yellow False Indigo (Horseflyweed), PA Ecotype	0.2	0.02	0.75	0.01

OVERALL PLANTING SCHEDULE

SEED MIXES (con't)

SCIENTIFIC NAME	COMMON NAME	PERCENT OF MIX	POUNDS PER ACRE	ACREAGE	POUNDS NEEDED
CLOVER/FOOD PLOT		100.0	10-12 (plus 30 lbs cover crop)	6.11	73.34
Trifolium var.	Medium Red Clover	33.0	3.96	6.11	24.20
Trifolium repens L.	Ladino Clover	37.0	4.44	6.11	27.14
Trifolium repens L.	Pinnacle (jumbo) Ladino Clover	22.0	2.64	6.11	16.13
Trifolium repens L.	White Dutch Clover	8.0	0.96	6.11	5.87

SHRUB SOD MIX

SCIENTIFIC NAME	COMMON NAME	SIZE	PLANTS PER ACRE	ACREAGE	TOTAL
Vaccinium angustifolium	Lowbush Blueberry	2'x3' sod piece	680	2.33	791
Gaylussacia baccata (Wangenh.) K. Koch	Black Huckleberry	2'x3' sod piece	680	2.33	791

SHRUB/TREE PLANTING MIX

SCIENTIFIC NAME	COMMON NAME	SIZE	PLANTS PER ACRE	ACREAGE	TOTAL
Prunus virginiana L.	Red choke cherry	1-2 gallon	435	6.03	391
Cornus racemosa Lam.	Gray dogwood	1-2 gallon	435	6.03	391
Ilex verticillata (L.) A. Gray	Winterberry	1-2 gallon	435	6.03	391
Sambucus racemosa L.	Red Elderberry	1-2 gallon	435	6.03	391
Quercus berberidifolia Liebm.	Scrub Oak	1-2 gallon	435	6.03	391
Quercus muehlenbergii	Chinquapin Oak	1-2 gallon	435	6.03	391
Quercus montana Willd.	Chestnut Oak	1-2 gallon	435	6.03	391

GENERAL NOTES:

1) Hay/mulch will be used with seeding and planting.
2) Erosion control blankets will be used. For further erosion control measures please see the Erosion and Sediment Control Plan (E&SCP).
3) Planting and seeding may happen at different times of year, or in different growing seasons. Areas disturbed during planting will be reseeded with the previously designated seed mix after planting.
4) Seeding
    a. All disturbed areas (excepting existing gravel access roads) will be seeded.
    b. Ernst Steep Slope Mix (ERNMX-181-1) was designated for areas of workspace where the slope was over 15%.
        i. This mix includes grain oats as a cover crop for use in the spring and summer (until September 1st).
        ii. If seeding in fall or winter an alternative mix with winter wheat instead of grain oats should be used.
    c. A wildflower plot will be planted along the Appalachian Trail crossing to create a scenic area.
    d. Clover/Food Plot Seed Mix:
        i. Legumes should be treated with a species specific inoculate prior to seeding. Legume seed and soil should be scarified.
        ii. Will be used in any Access Road areas not left as stone.
    e. A cover crop will be used with the wildflower and food plot mixes.
        i. From Jan 1-Aug 1 grain oats will be used at a rate of 30 lbs per acre.
        ii. From Aug 1-Jan 1 winter wheat will be used at a rate of 30 lbs per acre.
    f. Ernst seed mix links:
        i. Ernst Native Steep Slope Mix w/Grain Oats (ERNMX-181-1) - https://www.ernstseed.com/product/native-steep-slope-mix-wgrain-oats/
        ii. Ernst Showy Northeast Native Wildflower Mix (ERNMX-153-1) - https://www.ernstseed.com/product/showy-northeast-native-wildflower-mix/
5) Low Shrub Sod Installation:
    a. Plantings will overlap seeded areas.
    b. Will be planted in permanent ROW in “patchwork quilt” fashion that would eventually fill in.
        i. Planting locations will be at the discretion of the forestry contractor.
    c. If inappropriate planting conditions are encountered during restoration, PennEast will coordinate with PGC to discuss limitations, and will request planting waivers where planting is not practicable. Plantings also would not occur in areas that will be used for sensitive habitat restoration or enhancement.
    d. Guarantee 75% survival at the end of the second growing season.
6) Shrub/Tree Plantings:
    a. Plantings will overlap seeded areas.
    b. Will be planted in temporary workspace in non-rocky areas.
        i. Planting locations and species distribution will be at the discretion of the forestry contractor.
    c. If inappropriate planting conditions are encountered during restoration, PennEast will coordinate with PGC to discuss limitations, and will request planting waivers where planting is not practicable. Plantings also would not occur in areas that will be used for sensitive habitat restoration or enhancement.
    d. Protection and survival measures will include:
        i. 24” Coco mats,
        ii. Spiral tree wraps on all trees,
        iii. 2 Repellex® applications, and
        iv. a 2’ diameter x 4’ tall polypropylene deer fence around all stems using (3) 5’ pressure treated stakes for support. Fence will be fastened using plastic zip ties.
    e. Guarantee 75% survival at the end of the second growing season.

APPENDIX C

WATERBODIES AND WETLANDS CROSSED BY THE PROJECT

TABLE C-1

Waterbodies Crossed by the Modifications

Modification	Milepost a/	Waterbody ID b/	Name	Type c/	Crossing Width (feet)	Water Quality Classification d/	County	General Fishery Type		Proposed Crossing Method g/
								Wild Trout e/	Stocked Trout f/	
Saylor Ave Realignment										
PennEast Mainline	None crossed									
Interstate 81 Workspace Adjustment										
PennEast Mainline	10.1R2	050416_DB_1002_I_MI	UNT to Mill Creek	I	3	CWF, MF	Luzerne	III	-	DPX
Appalachian Trail PPL Crossing Realignment										
PennEast Mainline	49.3R3	041217_GM_1001_P_IN	Aquashicola Creek	P	34	HQ-CWF, MF	Carbon	III	TS	BX
PennEast Mainline	50.6R3	072618_WA_1009_I_MI	UNT to Aquashicola Creek	I	3	HQ-CWF, MF	Carbon	III	-	DPX
PennEast Mainline	50.6R3	072618_WA_1007_I_MI	UNT to Aquashicola Creek	I	1	HQ-CWF, MF	Carbon	III	-	DPX
PennEast Mainline	50.6R3	072618_WA_1010_I_MI	UNT to Aquashicola Creek	I	2	HQ-CWF, MF	Carbon	III	-	DPX
PennEast Mainline	50.7R3	072618_WA_1004_I_MI	UNT to Aquashicola Creek	I	2	HQ-CWF, MF	Carbon	III	-	DPX
PennEast Mainline	50.7R3	072618_WA_1005_I_MI	UNT to Aquashicola Creek	I	7	HQ-CWF, MF	Carbon	III	-	N/A
PennEast Mainline	50.7R3	072618_WA_1003_I_MI	UNT to Aquashicola Creek	I	2	HQ-CWF, MF	Carbon	III	-	N/A
PennEast Mainline	50.7R3	072618_WA_1001_P_MI	UNT to Aquashicola Creek	P	6	HQ-CWF, MF	Carbon	III	-	DPX
PennEast Mainline	52.7R3	080917_WA_1002_P_MI - 1	UNT to Indian Creek	P	18	CWF, MF	Northampton	III	-	N/A
PennEast Mainline	52.7R3	080917_WA_1002_P_MI - 2	UNT to Indian Creek	P	5	CWF, MF	Northampton	III	-	DPX
PennEast Mainline	52.9R3	110217_WA_1003_P_MI	UNT to Indian Creek	P	5	CWF, MF	Northampton	III	TS	DPX
PennEast Mainline	53.2R3	080917_WA_1001_I_MI	UNT to Indian Creek	I	3	CWF, MF	Northampton	III	-	DPX
PennEast Mainline	53.3R3	050217_MB_1002_I_MI	UNT to Indian Creek	I	5	CWF, MF	Northampton	III	-	DPX
PennEast Mainline	53.4R3	050217_MB_1001_P_IN	UNT to Indian Creek	P	10	CWF, MF	Northampton	III	TS	DPX
Blue Mountain Lateral	0.5R3	041017_GM_1001_P_MI	UNT to Aquashicola Creek	P	8	HQ-CWF, MF	Carbon	III	-	FX
Blue Mountain Lateral	0.5R3	041017_GM_1001_P_IN	UNT to Aquashicola Creek	P	7	HQ-CWF, MF	Carbon	III	-	N/A
Blue Mountain Lateral	0.51R3	041117_GM_1002_E_MI	UNT to Aquashicola Creek	E	5	HQ-CWF, MF	Carbon	III	-	DPX
Blue Mountain Interconnect	None crossed									
Freemansburg Ave Realignment										
PennEast Mainline	70.6R3	010615_JC_1000_E_MI	UNT to Lehigh River	E	8	CWF, MF	Northampton	-	-	DPX

TABLE C-1

Waterbodies Crossed by the Modifications

Modification	Milepost a/	Waterbody ID b/	Name	Type c/	Crossing Width (feet)	Water Quality Classification d/	County	General Fishery Type		Proposed Crossing Method g/
								Wild Trout e/	Stocked Trout f/	
PennEast Mainline	70.7R3	010615_JC_1001_E_MI	UNT to Lehigh River	E	4	CWF, MF	Northampton	-	-	N/A

a/ Route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an “R3 indicate route deviations implemented post-FERC Certificate issuance.

b/ P = perennial, I = intermittent, E = ephemeral, IN = intermediate, MI = minor. Where a waterbody is crossed multiple times, a number is added to the end of the ID.

c/ P = perennial, I = intermittent, E = ephemeral

d/ CWF = cold water fisheries; MF = migratory fisheries; HQ= high quality. Sources: PADEP Streams Chapter 93 Existing Use, dated 7/2017 and PADEP Streams Chapter 93 Designated Use, dated 2/2017. If a stream has an existing use, the designated use has been replaced with that value. Available at www.pasda.psu.edu.

e/ Sources: Pennsylvania Fish and Boat Commission (PFBC) Stream Sections that Support Wild Trout Production, dated 8/2018 and PFBC Class A Wild Trout Streams, dated 8/2018. Available at www.pasda.psu.edu. I = Approved Trout Water, II = Wilderness Trout Stream, III = Naturally Reproducing Trout Stream.

f/ Sources: Pennsylvania Spatial Data Access (PASDA) Stocked Trout Waters (Flowing Waters), dated 2/2018 and PASDA Trout Stocked Streams, dated 2018. Available at www.pasda.psu.edu.

g/ CD = Cofferdam Crossing; DPX = Dam-and-Pump Crossing; DX-NF = Dry Crossing If No Flow; FX = Flume Crossing; N/A = Not Applicable

Table C-2

Wetlands Crossed by the Modifications

Modification	Milepost a/	Wetland ID and Crossing Number b/	Cowardin Classification c/	Source d/	Crossing Length (feet)	Construction Impact (acres) e/	Operation Impact (acres) f/	Secondary Pipeline Crossing Method g/
Saylor Ave Realignment								
PennEast Mainline	None crossed							
Interstate 81 Workspace Adjustment								
PennEast Mainline	None crossed							
Appalachian Trail PPL Crossing Realignment								
PennEast Mainline	52.4R3	040517_GM_1001_PFO	PFO1	FD	40	0.04	0.03	CL - Open Cut
PennEast Mainline	52.4R3	040517_GM_1001_PEM	PEM1	FD	4	0.00	-	N/A - Workspace
PennEast Mainline	52.5R3	040617_GM_1001_PFO	PFO1	FD	50	0.06	0.03	CL - Open Cut
PennEast Mainline	52.5R3	040617_GM_1001_PEM	PEM1	FD	5	0.00	0.00	N/A - Workspace
PennEast Mainline	49.3R3	041117_GM_1001_PFO	PFO4	FD	153	0.01	-	CL - Bore
PennEast Mainline	49.3R3	041117_GM_1001_PSS	PSS1	FD	116	0.01	-	CL - Bore
PennEast Mainline	53.4R3	050217_MB_1001_PEM	PEM1	FD	44	0.07	0.03	CL - Open Cut
PennEast Mainline	53.3R3	050217_MB_1002_PEM	PEM1	FD	11	0.01	0.01	CL - Open Cut
PennEast Mainline	53.4R3	050217_MB_1004_PFO	PFO1	FD	5	0.00	0.00	N/A - Workspace
PennEast Mainline	53.2R3	080917_WA_001_PEM - 1	PEM1	FD	9	0.03	0.01	CL - Open Cut
PennEast Mainline	53.3R3	080917_WA_001_PEM - 2	PEM1	FD	154	0.24	0.10	CL - Open Cut
PennEast Mainline	52.7R3	080917_WA_003_PEM	PEM1	FD	13	0.02	0.01	CL - Open Cut
PennEast Mainline	52.8R3	080917_WA_002_PSS	PSS1	FD	16	0.01	0.01	CL - Open Cut
PennEast Mainline	52.7R3	080917_WA_002_PEM - 1	PEM1	FD	4	0.02	0.00	N/A - Workspace
PennEast Mainline	52.7R3	080917_WA_002_PEM - 2	PEM1	FD	22	0.01	0.01	CL - Open Cut
PennEast Mainline	52.9R3	110217_WA_005_PFO - 1	PFO1	FD	55	0.07	0.03	CL - Open Cut
PennEast Mainline	52.9R3	110217_WA_005_PFO - 2	PFO1	FD	87	0.01	0.00	CL - Open Cut
PennEast Mainline	52.9R3	110217_WA_005_PFO - 3	PFO1	FD	87	0.00	0.00	N/A - Workspace
PennEast Mainline	52.9R3	110217_WA_006_PEM	PEM1	FD	43	0.00	0.00	N/A - Workspace
PennEast Mainline	53.1R3	110217_WA_008_PEM	PEM1	FD	7	0.01	0.01	CL - Bore
PennEast Mainline	52.5R3	052918_WA_003_PFO	PFO1	FD	87	0.12	0.05	CL - Open Cut

Table C-2

Wetlands Crossed by the Modifications

Modification	Milepost a/	Wetland ID and Crossing Number b/	Cowardin Classification c/	Source d/	Crossing Length (feet)	Construction Impact (acres) e/	Operation Impact (acres) f/	Secondary Pipeline Crossing Method g/
PennEast Mainline	52.5R3	052918_WA_004_PFO	PFO1	FD	69	0.07	0.03	CL - Open Cut
PennEast Mainline	52.5R3	052918_WA_005_PEM	PEM1	FD	6	0.01	0.01	CL - Open Cut
PennEast Mainline	52.6R3	052918_WA_007_PUB	PEM2	FD	53	0.04	0.01	N/A - Workspace
PennEast Mainline	52.6R3	052918_WA_008_PUB	PEM2	FD	17	0.02	0.01	CL - Open Cut
PennEast Mainline	50.6R3	072618_WA_001_PEM	PEM1	FD	61	0.13	0.05	CL - Open Cut
PennEast Mainline	50.6R3	072618_WA_002_PEM	PEM2	FD	4	0.00	-	N/A - Workspace
Blue Mountain Lateral	None crossed							
Blue Mountain Interconnect	None crossed-							
Freemansburg Ave Realignment								
PennEast Mainline	None crossed							

a/ Route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an “R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
b/ In instances where a wetland is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. “-1”, “-2”) have been added to the Wetland ID.
c/ Wetland Cover Type based on Cowardin, 1979
Key: PEM1 = palustrine emergent, persistent; PEM2 = palustrine emergent, non-persistent; PFO1 = palustrine forested, broad-leaved deciduous; PFO4 = palustrine forested, needle-leaved evergreen; PSS1 = palustrine scrub-shrub, broad-leaved deciduous; PSS3 = palustrine scrub-shrub, broad-leaved evergreen.
d/ FD = field delineated
e/ Temporary impact acres include acreages of wetlands the will be impacted during project construction (within the 50-foot wide permanent easement, temporary workspace, additional temporary workspace, and access roads). This calculation excludes wetlands that will be crossed under using HDD technology. A value of 0.00 denotes impact acreages less than 0.005 acres. A “-“ denotes no impacts to the wetland.
f/ A 30’ wide ROW will be maintained through wetlands.
g/ CL-Bore = Pipeline centerline crosses under wetland. Construction method is bore.
• CL-Open Cut = Pipeline centerline impacts wetland. Construction method is open cut.
• N/A-Workspace = Pipeline trench does not impact wetland.