



PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

**L2 - ENVIRONMENTAL ASSESSMENT MODULE 2
RESOURCE IDENTIFICATION
NORTHAMPTON COUNTY**

REVISED OCTOBER2019

Submitted by:
PennEast Pipeline Company, LLC



TABLE OF CONTENTS

S2.A	Standard Resource Identification	1
S2.A.1	Identification and Qualifications	1
S2.A.2	Wetland Delineation Report.....	3
S2.A.3	Watercourse Report.....	3
S2.A.4	Location Map.....	3
S2.A.5	Areas of Special Interest	3
National, State or Local Park, Forest or Recreation Areas	4	
State Game Lands	4	
Areas Identified as Prime Farmland.....	5	
Source for a Water Supplies.....	5	
S2.B	Aquatic Resource Identification.....	7
Watercourses.....	7	
Wetlands	14	
S2.C	Federal and State Threatened and Endangered Species Habitat	18
S2.C.1	Pennsylvania Natural Diversity Inventory Receipts	20
S2.C.2	Pennsylvania Natural Diversity Inventory Potential Conflicts	20
S2.D	Aquatic Resource Characterization.....	23
S2.D.1	Riverine Resources	23
Riparian Property	27	
S2.D.2	Wetland Resources.....	27
Functions and Values.....	36	
S2.D.3	Lacustrine Resources	40



TABLES

Table NO-L2-1 Resource Identification Information 1

Table NO-L2-2 Areas of Special Interest crossed by the Project in Northampton County 4

Table NO-L2-3 Size and Designations of Impacted Watercourses in Northampton County 10

Table NO-L2-4 Size and Classifications of Impacted Wetlands in Northampton County¹ 16

Table NO-L2-5 Federally and State Listed Species Potentially Occurring Within the Action Area
Northampton County 19

Table NO-L2-6 Characterization of Impacted Riverine Resources in Northampton County¹ 25

Table NO-L2-7 Characterization of Impacted Wetland Resources in Northampton County¹ 29

Table NO-L2-8 Functions and Values of Impacted Wetland Resources in Northampton County¹ 36

APPENDICES

Appendix NO-L-2A Resumes

Appendix NO-L-2B Wetland and Watercourse Delineation Report (Appendix C-4 Replaced October 2019
and NO-L-2B Addendum Submitted October 2019)

Appendix NO-L-2C Prime Farmland and Farmland of State Wide Importance

Appendix NO-L-2D Riverine RAP Forms and Figures

Appendix NO-L-2E Wetland RAP Forms and Figures (Addendum Submitted October 2019)

Appendix NO-L-2F Wetland Functions and Value Forms (Addendum Submitted October 2019)

Appendix NO-L-2G Lacustrine RAP Forms and Figures – *Does not apply in Northampton County*

Appendix NO-L-2H Public Water Supply Consultations

Appendix NO-L-2I Water Supply Location Map (New Appendix in October 2019 – Contains Privileged
Information and Should Not Be Released)



ACRONYMS LIST

BMP	best management practice
BO	Biological Opinion
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWF	Cold Water Fishes
dbh	diameter at breast height
EA	Environmental Assessment
EA Form	Environmental Assessment Form
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
HGM	hydrogeomorphic
HQ	High-Quality
JPA	Joint Permit Application
L2RAP	Level 2 Rapid Assessment Protocol
MF	Migratory Fishes
mi ²	square miles
MP	milepost
NCDWQ	North Carolina Division of Water Quality
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
PA	Pennsylvania
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PEM	palustrine emergent
PennEast	PennEast Pipeline Company, LLC
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PGC	Pennsylvania Game Commission
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PNHP	Pennsylvania Natural Heritage Program
PNDI	Pennsylvania Natural Diversity Inventory
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	PennEast Pipeline Project
PSS	palustrine scrub-shrub
ROW	right-of-way
RQBTS	Recognized Qualified Bog Turtle Surveyor
SGL	State Game Lands
T&E	threatened and endangered
TGD	Technical Guidance Document



TSF	Trout Stocking Fishery
USACE	U.S. Army Corps of Engineers
USCA	U.S. Code Annotated
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WWF	Warmwater Fishes



Module S2: Resource Identification and Characterization

In accordance with the requirements contained within the Pennsylvania Department of Environmental Protection’s (PADEP) Comprehensive Environmental Assessment of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications Technical Guidance Document (TGD) (Document No. 310-2137-006) and the assessment criteria detailed in Module 2 of the Environmental Assessment (EA) Form (EA Form) Instructions (Document No. 3150-PM-BWEW0017, Revised 6/2017), PennEast Pipeline Company, LLC (PennEast) has provided a complete analysis and discussion of the aquatic habitat resources located within the right-of-way (ROW) workspace limits of the proposed PennEast Pipeline Project (Project) in Northampton County, Pennsylvania. This document follows the sequence of the requirements presented in the EA Form Instructions Module S2 Section.

S2.A Standard Resource Identification

S2.A.1 Identification and Qualifications

The contact information and a summary of qualifications of the professional biologists who have identified resources present on the Project site are included in Table NO-L2-1. Resumes are provided in Appendix NO-L-2A.

**Table NO-L2-1
Resource Identification Information**

Organization Name	Mailing Address	Staff	Email Address	Portions of Work Completed
AECOM Technical Services, Inc.	625 West Ridge Pike Suite E100 Conshohocken, PA 19428	Sarah Binckley	sarah.binckley@aecom.com	Oversaw Aquatic Resource Identification and Permit Application (2015-2019)
AECOM Technical Services, Inc.	625 West Ridge Pike Suite E100 Conshohocken, PA 19428	Bruce Bayne	bruce.bayne@aecom.com	Aquatic Resource Identification Technical Lead (2014-2018)
AECOM Technical Services, Inc.	715 Washington Boulevard Williamsport, PA 17701	Shannon Haight	shannon.haight@aecom.com	Permit Application Technical Lead



Organization Name	Mailing Address	Staff	Email Address	Portions of Work Completed
AECOM Technical Services, Inc.	100 Sterling Parkway, Suite 205 Mechanicsburg, PA 17050	Will Anderson	william.anderson@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2018)
AECOM Technical Services, Inc.	625 West Ridge Pike, Suite E100 Conshohocken, PA 19428	David Brightbill	david.brightbill@aecom.com	Wetland and Watercourse Delineations, L2RAP ¹ Field Work (2015-2019)
AECOM Technical Services, Inc.	625 West Ridge Pike, Suite E100 Conshohocken, PA 19428	Carolyn Steinberg	carolyn.steinberg@aecom.com	Wetland and Watercourse Delineation and L2RAP data management (2014-2018)
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Mark Fox	mark.fox@aecom.com	L2RAP Desktop Analysis
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Colleen Ashbaugh	colleen.ashbaugh@aecom.com	Wetland and Watercourse Delineation Report and L2RAP data management (2017-2018)
AECOM Technical Services, Inc.	625 West Ridge Pike, Suite E100 Conshohocken, PA 19428	Gavin McBrien	gavin.mcbrien@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2014-2017)
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Matt Kline	matthew.kline@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2017)



Organization Name	Mailing Address	Staff	Email Address	Portions of Work Completed
AECOM Technical Services, Inc.	100 Sterling Parkway, Suite 205 Mechanicsburg, PA 17050	Bridger Thompson	bridger.thompson@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2017)
AECOM Technical Services, Inc.	715 Washington Boulevard Williamsport, PA 17701	Mark Benfer	mark.benfer@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2017)
<u>Notes:</u> ¹ Level 2 Rapid Assessment Protocol (L2RAP) includes PA Riverine Condition and PA Wetland Condition protocols.				

S2.A.2 Wetland Delineation Report

A Wetland and Watercourse Delineation Report is provided in Appendix NO-L-2B.

S2.A.3 Watercourse Report

A Wetland and Watercourse Delineation Report is provided in Appendix NO-L-2B.

S2.A.4 Location Map

A Project Location Map specific to Northampton County that identifies regulated waters of the Commonwealth, natural areas, wildlife sanctuaries, natural landmarks, political boundaries, publicly available service areas for public water supplies, and historic landmarks within 1 mile of the Project and, State Forests, State Parks, State Game Lands, and prime farmland within 100 feet of the Project is included in JPA Section I. There are no National Parks, Forests, or Recreation Areas within 100 feet of the Project. As indicated in Table NO-L2-2 below, there are no National Wildlife Refuges, or Federal, State, Local, or Private Wildlife or Plant Sanctuaries, Public Water Supply sources, Natural Wild or Scenic Rivers, Commonwealth’s Scenic Rivers, or Designated Federal Wilderness Areas within 100 feet of the Project in Northampton County.

S2.A.5 Areas of Special Interest

A portion of the Project in Northampton County crosses State Game Lands and areas identified as prime farmland, as summarized in Table NO-L2-2. Where areas of special interest will be crossed, a description of these areas is provided below.



**Table NO-L2-2
Areas of Special Interest crossed by the Project in Northampton County**

Area of Special Interest	Yes	No
National, State or Local Park, Forest or Recreation Areas	X	
National Natural Landmarks		X
National Wildlife Refuge, or Federal, State, Local, or Private Wildlife or Plant Sanctuaries		X
State Game Lands	X	
Areas Identified as Prime Farmland	X	
Source for a Public Water Supply		X ¹
Natural Wild or Scenic River or the Commonwealth’s Scenic Rivers System		X
Designated Federal Wilderness Areas		X

Notes:

¹ No public water supplies have been identified to date.

National, State or Local Park, Forest or Recreation Areas

The Project crosses the Appalachian Trail near milepost (MP) 51.7R3 at the Monroe/Northampton County boundary 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 U.S. National Park Service (NPS), but is managed under a unique partnership between public and private entities including the NPS, the U.S. Department of Agriculture (USDA) Forest Service, numerous state agencies, the Appalachian Trail Conservancy (ATC), and 31 local clubs that mark and maintain the trail (ATC, 2015). Impacts associated with this resource are discussed in Module 3.

The Project crosses the Palmer-Bethlehem Township Bikeway in two locations. The first crossing is at approximate MP 70.7R3, south of Hope Road, on Bethlehem Township property. The second crossing of the Palmer-Bethlehem Township Bikeway is at approximate MP 70.9 on Bethlehem Township property. PennEast will implement best management practices (BMPs) to avoid and minimize impacts to recreational trail users. The impacts and BMPs are discussed in Module 3.

State Game Lands

Pennsylvania’s State Game Lands (SGL) are managed by the Pennsylvania Game Commission (PGC). The Project’s crosses SGL 168 between MP 51.7R3 to 52.4R3 for a total crossing length of 0.7 miles. Within Northampton County, approximately 8.5 acres of lands associated with SGL 168 will be affected by the



construction of the Project and 2.6 acres will be located in the permanent ROW. SGL 168 consists of 7,320 acres within Carbon, Monroe, and Northampton counties. Impacts associated with this resource are discussed in Module 3.

Consultation between PennEast and representatives from PGC began in September 2015, and ROW applications were submitted in 2017. The PGC issued license agreements for the Project on December 5, 2018.

Areas Identified as Prime Farmland

Based on soil units, 291.0 acres of area classified as prime farmland or farmland of statewide importance will be located within the construction work area within Northampton County. This acreage includes 181.3 acres in the temporary ROW and 109.7 acres in the permanent ROW. The prime farmland and farmland of statewide importance are listed by MP, soil map unit, and classification in Appendix NO-L-2C.

Source for a Water Supplies

PennEast used several data sources including public sources, consultations with public water suppliers, desktop assessments, and landowner outreach to identify public and private water supplies near the Project area. The data collection methods are described below.

Water Supply Search Radii

In accordance with its Well Monitoring Plan and Federal Energy Regulatory Commission (FERC) Certificate conditions (FERC, 2018), PennEast will monitor all water supply wells within 150 feet of the Project workspace [500 feet in karst areas and surrounding horizontal directional drills (HDDs)]. Monitoring will require the approval of the landowner and will include both public and private water supplies.

In its July 3, 2019 Technical Deficiency letter, PADEP requested that PennEast identify private water supplies within 450 feet of HDDs (1,000 feet in karst areas) and public water supply wells within 0.5 mile of HDD alignments. Within Northampton County, PennEast proposes two HDDs, the Lehigh River and the Interstate-78 HDDs, both of which are in areas of karst terrain. PADEP also requested that PennEast identify surface water intakes within one mile downstream of the Lehigh River crossing.

Public Data Sources

PennEast reviewed the PADCNR Pennsylvania Groundwater Information System (PaGWIS) to identify groundwater wells within 150 feet of the Project workspace, 500 feet of Project workspace in areas of karst terrain, and 0.5 mile of the proposed HDDs, (PaGWIS, 2019).

Public Water Supply Consultations

PennEast reviewed PADEP's Public Water Supplier's (PWS) Service Areas to identify PWS areas with surface water sources within 1 mile upstream or 10 miles downstream of Project workspace and PWS areas



with groundwater sources within 0.5 mile of proposed HDD alignments (PADEP, 2019a). The results of this screening were used for direct consultation with public water suppliers. Within Northampton County, PennEast consulted with Bath Municipal Water Works, the City of Bethlehem, Easton Suburban Water Authority, and American Water Company. Initial letters were mailed on April 23, 2018, and follow up letters were mailed on June 21, 2018 to those who had not responded to the initial request. PennEast received responses from each public water supplier (Appendix NO-L-2H). Bath Borough does not have any wells within 500 feet of the Project workspace. The City of Bethlehem (Bethlehem Water Authority) issued a license agreement for the Project, terms and conditions of which PennEast must adhere to. The Easton Suburban Water Authority has a surface water intake more than 10 miles upstream of the Project. Coordination with the American Water Company is ongoing with regards to the notification process if an unanticipated pollution event occurs. PennEast will provide the PADEP with any updates to public water supply consultations as they are received.

PennEast also reviewed PADEP's Water Resources layer available on eMAP PA (<http://www.depgis.state.pa.us/emappa/>) and through the Pennsylvania Spatial Data Access (PASDA), to identify surface water intakes within 1 mile downstream of the Lehigh River crossing (PADEP, 2019b). No surface water intakes were identified within 1 mile downstream of the proposed crossing.

Desktop Assessment

PennEast used aerial photography to assess the potential for private and public water wells to exist in parcels within the distances specified above. If homes, businesses, or other buildings were observed on aerial photography within the buffers, PennEast noted whether it was probable for water supply wells to exist on the property. Although all property owners within 1000 feet of the Lehigh River and Interstate-78 HDDs were contacted to request information about well presence or absence on their properties, only parcels with commercial, industrial, or multiple buildings on a single parcel within 0.5 mile of the HDDs were contacted to request information about public water supply wells.

Landowner Outreach

PennEast's land agents contacted landowners with potential private and public water supply wells within the search radii described above. Landowners with potential private water supply wells were asked to complete questionnaires that included questions about the presence/absence of wells, springs, and septic systems on their property, the status of any wells (abandoned, sealed, currently in use), what the water is used for (human consumption, irrigation, livestock, business/commercial use), and any known information about when wells were installed, well depths, and treatment systems. Landowners with potential public water supply wells were asked to complete questionnaires that included questions related to water use, the community the well services (community water supply, school, hospital, office building, factory, campground, gas station), and any known information about when the wells were installed, depth and diameter of the well and casing, production rate, static water level, and aquifer transmissivity. Landowners were also asked to describe the location of the well and mark the location on a map. When granted permission by the landowner(s), land agents would collect well location information.



Water Supply Investigation Results

In Northampton County, 152 private water supply wells have been identified within the well monitoring buffer; no public water supply wells have been identified within the monitoring buffer. Within the PADEP-specified buffers at HDD locations, PennEast has identified one private water supply well within 1,000 feet and one public water supply well within 0.5 mile of the Lehigh River HDD. PennEast has identified ten water private water supply wells and no public water supply wells within 0.5 mile of the Interstate-78 HDD.

The locations of private wells within the PADEP-specified buffers at HDD locations are shown on figures in Appendix NO-L-2I. Water supply location information should be treated as privileged information that should not be released.

S2.B Aquatic Resource Identification

Aquatic habitats identified in the general Project area include watercourses (i.e. lakes, ponds, reservoirs, ephemeral, intermittent and perennial watercourses) and wetlands. Watercourses and wetlands within Northampton County were field delineated by AECOM in accordance with U.S. Army Corps of Engineers (USACE) requirements between 2014 and 2019. The identification of regulated wetland and watercourse boundaries occurred within a 400-foot-wide survey corridor centered over the proposed pipeline (i.e., 200-feet on either side of the pipe centerline). Other areas in the survey scope included aboveground facilities, pipeyards, construction staging areas, and access road areas required to facilitate Project construction and operation.

Results of the field surveys determined construction of the Project in Northampton County would require the crossing of 69 watercourses and 66 wetlands. Tables NO-L2-3 and NO-L2-4 below list the unique resource identifier, location, type, size, state designation, and fisheries classifications (where applicable) for watercourses and wetlands, respectively. Proposed impacts are presented in Module 3.

Watercourses

Watercourse flow type classifications for surface waters located within the survey corridor were assigned in accordance with the criteria found in the Pennsylvania Code 025 §93, as well as by determination of watercourse flow using geomorphic, hydrological and biological indicators, utilizing the North Carolina Division of Water Quality (NCDWG), Identification Methods for the Origins of Intermittent and Perennial Streams (NCDWQ, 2005 and PADEP, 2012). Of the 88 watercourses surveyed within the 400-foot-wide survey corridor in Northampton County, 17 were classified as ephemeral, 33 were classified as intermittent and 38 were classified as perennial. Only 69 of the surveyed watercourses will be impacted by the Project. A summary of the total top-of-bank crossing widths for all watercourses crossed in Northampton County consists of the following:

- 56 watercourse crossings have top-of-bank crossing width equal to or less than 10 feet;
- 11 watercourse crossings have top-of-bank crossing width between 11 and 100 feet; and
- 1 watercourse crossing has a top-of-bank crossing width greater than 100 feet.



The major watercourse crossing (i.e., total crossing widths that are 100-feet or larger) within Northampton County consists of the following:

- Lehigh River (Watercourse ID 031918_WA_1004_P_MA)

Designated/Existing Uses and High Quality/Exceptional Value Waters

The Commonwealth of Pennsylvania has established Water Quality Standards that classify surface waters in Pennsylvania according to their use. These standards were established to implement Pennsylvania's Clean Streams Law that protects existing and designated surface water uses from degradation and negative change to the water's use. Uses include those associated with aquatic life, water supply, recreation and fish consumption, special protection, and navigation. The water use classification system and criteria are established for Pennsylvania Code Title 25, Chapter 93 and include the following designations related to fisheries:

- Warmwater Fishes (WWF) - Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat;
- Cold Water Fishes (CWF) - Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to cold water habitat;
- Migratory Fishes (MF) - 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; and
- Trout Stocking Fishery (TSF) Maintenance of stocked trout from February 15 to July 31, and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

In addition, watercourses may be classified as special protection waters, including Exceptional Value (EV) and High-Quality (HQ) based on a variety of criteria. HQ waters are those surface waters with water quality that exceed levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water by satisfying Pennsylvania Code 025 §93.4b(a). EV waters include high quality surface waters that satisfy Pennsylvania Code 025 §93.4b(b). The water quality of all HQ and EV watercourses must be maintained and protected in accordance with antidegradation requirements (Pennsylvania Code 025 §93.4a). The Pennsylvania Fish and Boat Commission (PFBC) further defines watercourses based upon their status with regard to their ability to support the propagation of trout, wild or otherwise. Stocked Trout Waters include watercourses that have significant portions that are open to public fishing and are stocked with trout by the PFBC. Wild Trout Waters are sections of watercourses that support naturally reproduction populations of trout. Class A Wild Trout Streams are wild trout watercourses that have a population that is of sufficient size and abundance to support a long-term sport fishery. Table NO-L2-3 below provides an overview of the fishery resource classifications based on review of appropriate drainage lists found in Pennsylvania Code, Title 25, Chapter 93, §93.9 and the trout water classification lists published by the PFBC.



Floodways

As defined by the PADEP under Pennsylvania Code 025 §105.1, the floodway of a watercourse is identified as the channel of the watercourse and portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by the Federal Emergency Management Agency (FEMA). In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed, absent evidence to the contrary, that the floodway extends 50-feet from the top of the bank of the watercourse.

PennEast assessed the Flood Insurance Rate Maps issued by FEMA to identify mapped Regulatory Floodways. Where no mapped floodway exists, PennEast assumed that a 50-foot wide buffer on each watercourse, measured landward from the top of bank of both the left and the right bank of the watercourse, represents the floodway. Table NO-L2-3 provides information about the floodway size within the study corridor for each floodway that will be impacted by the Project. Figures contained within Joint Permit Application (JPA) Section H-2 show the FEMA 100-year floodways and the presumed 50-foot PADEP floodways within Northampton County. Impacts are presented in Module 3.

**Table NO-L2-3
Size and Designations of Impacted Watercourses in Northampton County**

Milepost ²	Watercourse ID ^{3,4}	Watercourse Name	Resource Type ⁵	Watercourse Type ⁶	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway acreage within the Study Corridor (acre)	PFBC Wild Trout Water ⁷	PFBC Trout Stocked Water ⁸	Chapter 93 Existing or Designated Use ⁹
PennEast Mainline Pipeline										
52.7R3	080917_WA_1002_P_MI - 1	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Perennial	878	5	2.020	III	-	CWF, MF
52.7R3	080917_WA_1002_P_MI - 2	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Perennial	878	5	-	III	-	CWF, MF
52.8R3	080917_WA_1002_P_MI - 3	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Perennial	878	5	-	III	-	CWF, MF
52.9R3	110217_WA_1003_P_MI	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Perennial	1067	5	1.525	III	TS	CWF, MF
52.9R3	110217_WA_1002_I_MI	UNT to Indian Creek	Watercourse floodway	Intermittent	-	-	0.303	III	TS	CWF, MF
53.2R3	080917_WA_1001_I_MI	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Intermittent	535	2	1.269	III	-	CWF, MF
53.3R3	050217_MB_1002_I_MI	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Intermittent	160	5	0.633	III	-	CWF, MF
53.4R3	050217_MB_1001_P_IN	UNT to Indian Creek	Watercourse-channel and watercourse floodway	Perennial	494	12	1.180	III	TS	CWF, MF
55.7	102815_WA_1001_E_MI	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Ephemeral	679	10	1.472	III	-	CWF, MF
55.9	051215_JC_1002_P_IN	Hokendauqua Creek	Watercourse-channel and watercourse floodway	Perennial	724	22	1.334	III	TS	CWF, MF
55.9	051215_JC_1001_E_MI	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Ephemeral	485	5	0.578	III	-	CWF, MF
56	051215_JC_1003_I_MI	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Intermittent	299	2	0.258	III	TS	CWF, MF
56	062218_WA_1000_P_MI	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Perennial	281	2	0.366	III	TS	CWF, MF
56.6	050417_GM_1001_I_MI	UNT to Hokendauqua Creek	Watercourse floodway	Intermittent	-	-	0.646	III	-	CWF, MF
56.7	050417_GM_1002_P_MI	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Perennial	276	5	0.753	III	-	CWF, MF
56.7	050417_GM_1003_P_IN	UNT to Hokendauqua Creek	Watercourse-channel and watercourse floodway	Perennial	500	12	0.534	III	-	CWF, MF
58R2	071917_MB_1001_I_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Intermittent	547	2	1.104	III	-	HQ-CWF, MF
58.1R2	052218_WA_1001_E_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Ephemeral	289	4	0.798	III	-	HQ-CWF, MF
58.5	052218_WA_1002_P_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	596	6	1.388	III	-	HQ-CWF, MF
58.5	052218_WA_1003_P_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	332	4	0.396	III	-	HQ-CWF, MF
59	090314_DB_1011_E_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Ephemeral	447	5	1.090	III	-	HQ-CWF, MF



Milepost ²	Watercourse ID ^{3,4}	Watercourse Name	Resource Type ⁵	Watercourse Type ⁶	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway acreage within the Study Corridor (acre)	PFBC Wild Trout Water ⁷	PFBC Trout Stocked Water ⁸	Chapter 93 Existing or Designated Use ⁹
59.2	090414_DB_1012_I_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Intermittent	328	4	0.534	III	-	HQ-CWF, MF
59.2	090414_DB_1013_I_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Intermittent	708	8	1.434	III	-	HQ-CWF, MF
60.3	051215_JC_1005_P_IN	Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	396	23	0.911	I, III	TS	HQ-CWF, MF
60.6	090314_DB_1005_E_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Ephemeral	431	9	1.039	III	-	HQ-CWF, MF
60.7	090314_DB_1007_E_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Ephemeral	353	4	0.531	III	-	HQ-CWF, MF
60.7	090314_DB_1006_I_MI	UNT to Monocacy Creek	Watercourse-channel and watercourse floodway	Intermittent	506	6	1.085	III	-	HQ-CWF, MF
61.5R3	111214_JC_1004_P_IM	East Branch Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	441	23	1.319	III	-	HQ-CWF, MF
62.4R3	102715_WA_1002_P_MI	UNT to East Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	483	3	1.027	III	-	HQ-CWF, MF
62.8R3	051415_JC_1001_I_MI	UNT to East Branch Monocacy Creek	Watercourse-channel and watercourse floodway	Intermittent	448	3	1.171	III	-	HQ-CWF, MF
63.5	051415_JC_1002_P_IN	UNT to East Branch Monocacy Creek	Watercourse-channel and watercourse floodway	Perennial	429	24	1.070	III	-	HQ-CWF, MF
70.6R3	010615_JC_1000_E_MI	UNT to Lehigh River	Watercourse-channel and watercourse floodway	Ephemeral	473	8	0.399	-	-	CWF, MF
70.7R3	010615_JC_1001_E_MI	UNT to Lehigh River	Watercourse-channel and watercourse floodway	Ephemeral	84	3	0.308	-	-	CWF, MF
70.9	061416_GM_1001_P_IN	Lehigh Coal and Navigation Canal	Watercourse-channel and watercourse floodway	Perennial	400	80	1.443	-	-	WWF, MF
71	031918_WA_1004_P_MA	Lehigh River	Watercourse-channel and watercourse floodway	Perennial	400	337	6.406	-	-	WWF, MF
71.4	012116_GM_1001_E_IN	UNT to Lehigh River	Watercourse-channel and watercourse floodway	Ephemeral	576	18	1.397	-	-	CWF, MF
71.7	010615_JC_1002_E_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Ephemeral	600	2	0.982	III	-	CWF, MF
72.1	040318_WA_1000_P_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Perennial	273	6	0.356	III	-	CWF, MF
72.1	092614_GO_1001_P_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Perennial	516	6	1.215	III	-	CWF, MF
72.4	040318_WA_1001_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	211	2	0.227	III	-	CWF, MF
72.4	031918_WA_1003_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	332	1	0.844	III	-	CWF, MF
72.5	031918_WA_1000_P_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Perennial	142	3	0.448	III	-	CWF, MF
72.5	051415_JC_1006_E_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Ephemeral	243	1	0.672	III	-	CWF, MF
72.5	051415_JC_1005_P_IN	UNT to Bull Run	Watercourse floodway	Perennial	-	-	2.186	III	-	CWF, MF



Milepost ²	Watercourse ID ^{3,4}	Watercourse Name	Resource Type ⁵	Watercourse Type ⁶	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway acreage within the Study Corridor (acre)	PFBC Wild Trout Water ⁷	PFBC Trout Stocked Water ⁸	Chapter 93 Existing or Designated Use ⁹
72.6	012016_GM_1001_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	61	4	0.034	III	-	CWF, MF
72.6	102715_WA_1001_P_MI - 1	UNT to Bull Run	Watercourse-channel and watercourse floodway	Perennial	896	8	2.063	III	-	CWF, MF
72.7	102715_WA_1001_P_MI - 2	UNT to Bull Run	Watercourse-channel and watercourse floodway	Perennial	896	8	-	III	-	CWF, MF
72.7	012016_GM_1003_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	418	4	0.498	III	-	CWF, MF
72.7	012016_GM_1002_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	65	6	0.055	III	-	CWF, MF
72.7	102715_WA_1001_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	146	2	0.196	III	-	CWF, MF
72.7	102715_WA_1002_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	148	3	0.216	III	-	CWF, MF
72.8	042815_JC_1005_I_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Intermittent	437	6	0.999	III	-	CWF, MF
73	042815_JC_1001_E_MI	UNT to Bull Run	Watercourse-channel and watercourse floodway	Ephemeral	748	5	1.781	III	-	CWF, MF
73.6R2	042117_GM_1003_P_MI	UNT to Frys Run	Watercourse-channel and watercourse floodway	Perennial	198	3	0.644	III	-	HQ-CWF, MF
73.6R2	042117_GM_1001_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	99	6	0.931	III	-	HQ-CWF, MF
73.6R2	042418_WA_1005_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	311	5	0.556	III	-	HQ-CWF, MF
73.7R2	042418_WA_1004_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	570	5	1.388	III	-	HQ-CWF, MF
73.7R2	042418_WA_1003_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	220	5	0.332	III	-	HQ-CWF, MF
73.7R2	042418_WA_1002_I_MI - 2	UNT to Frya Run	Watercourse-channel and watercourse floodway	Intermittent	152	2	-	III	-	HQ-CWF, MF
73.7R2	042418_WA_1002_I_MI - 1	UNT to Frya Run	Watercourse-channel and watercourse floodway	Intermittent	152	2	0.235	III	-	HQ-CWF, MF
74.6	091814_MK_1009_P_IM	Frya Run	Watercourse-channel and watercourse floodway	Perennial	800	14	0.951	III	-	HQ-CWF, MF
74.9	062415_BT_1001_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	1160	12	1.964	III	-	HQ-CWF, MF
74.9	062415_BT_1002_I_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Intermittent	209	4	0.287	III	-	HQ-CWF, MF
75.1	122016_LZ_1001_P_MI	UNT to Frya Run	Watercourse-channel and watercourse floodway	Perennial	479	2	1.064	III	-	HQ-CWF, MF
75.2	042418_WA_1000_P_MI	UNT to Frya Run	Watercourse floodway	Perennial	-	-	0.122	III	-	HQ-CWF, MF
75.7	111314_JC_1003_E_MI	UNT to Cooks Creek	Watercourse-channel and watercourse floodway	Ephemeral	211	3	0.248	III	-	EV, MF



Milepost ²	Watercourse ID ^{3,4}	Watercourse Name	Resource Type ⁵	Watercourse Type ⁶	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway acreage within the Study Corridor (acre)	PFBC Wild Trout Water ⁷	PFBC Trout Stocked Water ⁸	Chapter 93 Existing or Designated Use ⁹
75.7	111314_JC_1002_I_MI	UNT to Cooks Creek	Watercourse-channel and watercourse floodway	Intermittent	485	5	1.112	III	-	EV, MF
75.7	111314_JC_1001_I_MI	UNT to Cooks Creek	Watercourse-channel and watercourse floodway	Intermittent	236	8	0.583	III	-	EV, MF
Hellertown Lateral										
0.3	062218_WA_1002_P_IN	Bull Run	Watercourse-channel and watercourse floodway	Perennial	374	30	0.857	III	-	CWF, MF

- Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
 2. All route deviations implemented after the FERC Certificate Application 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.
 3. In instances where a watercourse is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Watercourse ID.
 4. Watercourse ID: P = perennial, I = intermittent, E = ephemeral, MA = major, IN = intermediate, MI = minor, C = canal, D = ditch
 5. Resource type is defined as watercourse channel (riverine) or watercourse floodway consistent with the classification presented in EA Instructions Section B.2.
 6. Ditches identified within the Project area were included as ephemeral waterbody crossings. Canals and lakes identified with the Project area were included as perennial waterbody crossings.
 7. Sources: PFBC Stream Sections that Support Wild Trout Production, dated 7/2019 and PFBC Class A Wild Trout Streams, dated 7/2019. Available at www.pasda.psu.edu. I = Class A Trout Water, II = Wilderness Trout Stream, III = Naturally Reproducing Trout Stream.
 8. Sources: PASDA Stocked Trout Waters (Flowing Waters), dated 2019 and PASDA Trout Stocked Streams, dated 2019. Available at www.pasda.psu.edu.
 9. Sources: PADEP Streams Chapter 93 Existing Use, dated 3/2019 and PADEP Streams Chapter 93 Designated Use, dated 3/2019. If a stream has an existing use, the designated use has been replaced with that value. Available at www.pasda.psu.edu.



Wetlands

As defined under Section 404 of the Clean Water Act (CWA; 33 Code of Federal Regulations [CFR] 328), wetlands are 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. PennEast identified, located, classified and delineated wetland resources within and adjacent to the Project area through field surveys conducted from 2014 to 2019. Jurisdictional wetlands crossed by the Project in Pennsylvania were field delineated in accordance with the USACE *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (USACE; 2011, 2012a-b).

The United States Fish and Wildlife Service (USFWS) wetland classification system described by Cowardin, et al. (1979) was used to classify the wetlands that would be affected by the Project. The wetlands in the Project area were identified as palustrine forested (PFO), palustrine scrub-shrub (PSS), palustrine emergent (PEM), or a combination of these three cover types. Construction of the proposed Project in Northampton County will result in 66 wetland crossings.

Exceptional Value Wetlands

The State of Pennsylvania has two major classifications of wetlands –EV and Other. The designation of EV wetlands is based on specific characteristics or uses. EV Wetlands are a category of wetlands that deserve special protection. In accordance with Pennsylvania Code 025 §105.17, EV wetlands are to exhibit one or more of the following five characteristics detailed in Sections 105.17(1)(i) through 105.17(1)(v):

- (i) Wetlands which serve as habitat for fauna or flora listed as “threatened” or “endangered” under the Endangered Species Act of 1973 (7 United States Code Annotated [USCA]. § 136; 16 USCA § § 4601-9, 460k-1, 668dd, 715i, 715a, 1362, 1371, 1372, 1402 and 1531—1543), the Wild Resource Conservation Act (32 P. S. § § 5301—5314), 30 Pa.C.S.(relating to the Fish and Boat Code) or 34 Pa.C.S. (relating to the Game and Wildlife Code).
- (ii) Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified under subparagraph (i) and that maintain the habitat of the threatened or endangered species within the wetland identified under subparagraph (i).
- (iii) Wetlands that are located in or along the floodplain of the reach of a wild trout stream or waters listed as exceptional value under Chapter 93 (relating to water quality standards) and the floodplain of streams tributary thereto, or wetlands within the corridor of a watercourse or body of water that has been designated as a National wild or scenic river in accordance with the Wild and Scenic Rivers Act (WSRA) of 1968 (16 USCA § § 1271—1287) or designated as wild or scenic under the Pennsylvania Scenic Rivers Act (32 P. S. § § 820.21—820.29).
- (iv) Wetlands located along an existing public or private drinking water supply, including both surface water and groundwater sources, that maintain the quality or quantity of the drinking water supply.
- (v) Wetlands located in areas designated by the Department as “natural” or “wild” areas within State Forest or Park lands, wetlands located in areas designated as Federal wilderness areas under the

Wilderness Act (16 USCA § § 1131—1136) or the Federal Eastern Wilderness Act of 1975 (16 USCA § 1132) or wetlands located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935 (16 USCA § § 461—467).

Using the definitions above, PennEast evaluated the classification of each wetland that was delineated within the 400-foot-wide survey corridor.

- (i) PennEast consulted with agencies that regulate threatened and endangered (T&E) species. These agencies requested targeted surveys for several species that utilize wetlands as habitat, including: bog turtle (*Glyptemys muhlenbergii*, federal endangered), eastern redbelly turtle (*Pseudemys rubriventris*, state threatened), northeastern bulrush (*Scirpus ancistrochaetus*, federal endangered), northern cricket frog (*Acris crepitans*, state endangered), Collin’s sedge (*Carex collinsii*, state endangered), bog sedge (*Carex paupercula*, state threatened), variable sedge (*Carex polymorpha*, state endangered), and sweetgale (*Myrica gale*, state threatened), white-fringed orchid (*Platanthera blephariglottis*, proposed state endangered and sensitive), screw-stem (*Bartonia paniculata*, state proposed rare), rough-leaved aster (*Eurybia radula*, state proposed threatened), and creeping snowberry (*Gaultheria hispidula*, state rare). Within Northampton County, surveys were conducted for bog turtle and northeastern bulrush. A protected species was observed in some wetlands. Therefore, several EV wetlands in Northampton County met this parameter as denoted by “(i)” in Table NO-L2-4 below.
- (ii) In consultation with federal and state agencies that regulate T&E species and through T&E species surveys, several wetlands that are hydrologically connected to and maintaining the habitat of T&E species were identified within Northampton County. These wetlands are denoted by “(ii)” in Table NO-L2-4 below.
- (iii) The Project crosses multiple wild trout streams and tributaries thereto. The Project also crosses a few EV watercourses and their tributaries. PennEast evaluated each delineated wetland to determine if it was located within the floodplain of a wild trout stream or EV stream. In most instances, wetlands within a wild trout or EV watershed were categorized as EV. However, in some instances in these watersheds, no watercourses were located near a wetland, so it was classified as “other”. Wetlands that were not in wild trout or EV watersheds were also classified as “other” wetlands. Therefore, several EV wetlands in Northampton County met this parameter as denoted by “(iii)” in Table NO-L2-4 below.
- (iv) As discussed in Section S2.A.5, PennEast used desktop analysis, consulted with public water suppliers, and contacted landowners to determine the locations of public or private drinking water supplies. Although several private wells were identified near the Project workspace in Northampton County, only one was located within 50 feet of a wetland. PennEast has assumed that based on the proximity of the wetland to the water well, the wetland may maintain the quality or quantity of the drinking water supply. Therefore, one EV wetland in Northampton County met this parameter as denoted by “(iv)” in Table NO-L2-4 below.
- (v) The Project does not cross and wild or scenic rivers, nor is the Project located in any “natural” or “wild areas” within state forests or park lands, areas designated as federal wilderness areas, or areas designated as National Natural Landmarks.



Table NO-L2-4 below provides an overview of the wetland delineated size and Pennsylvania Code, Title 25, Chapter 025 §105 wetland classification.

**Table NO-L2-4
Size and Classifications of Impacted Wetlands in Northampton County¹**

Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵
PennEast Mainline Pipeline			
52.4R3	040517_GM_1001_PFO	0.087	Other
52.4R3	040517_GM_1001_PEM	0.002	Other
52.5R3	040617_GM_1001_PFO	0.06	Exceptional (iii)
52.5R3	040617_GM_1001_PEM	0.025	Exceptional (iii)
52.5R3	052918_WA_004_PFO	0.429	Exceptional (ii, iii)
52.5R3	052918_WA_005_PEM	0.011	Exceptional (ii, iii)
52.5R3	052918_WA_003_PFO	0.725	Exceptional (ii, iii)
52.6R3	052918_WA_007_PUB	0.062	Exceptional (ii, iii)
52.6R3	052918_WA_008_PUB	0.121	Exceptional (ii, iii)
52.7R3	080917_WA_003_PEM	0.031	Exceptional (ii, iii)
52.7R3	080917_WA_002_PEM - 1	0.606	Exceptional (i, iii)
52.7R3	080917_WA_002_PEM - 2	0.606	Exceptional (i, iii)
52.8R3	080917_WA_002_PEM - 3	0.606	Exceptional (i, iii)
52.8R3	080917_WA_002_PSS	0.217	Exceptional (i, iii)
52.8R3	110217_WA_001_PSS	0.107	Exceptional (i, iii)
52.9R3	110217_WA_005_PFO - 1	1.129	Exceptional (i, iii)
52.9R3	110217_WA_005_PFO - 2	1.129	Exceptional (i, iii)
52.9R3	110217_WA_005_PFO - 3	1.129	Exceptional (i, iii)
52.9R3	110217_WA_006_PEM	0.299	Exceptional (ii, iii)
52.9R3	110217_WA_007_PEM	0.086	Exceptional (ii, iii)
53.1R3	110217_WA_008_PEM	0.088	Other
53.2R3	080917_WA_001_PEM - 1	0.918	Exceptional (iii)
53.3R3	080917_WA_001_PEM - 2	0.918	Exceptional (iii)
53.3R3	050217_MB_1002_PEM	0.051	Exceptional (iii)
53.4R3	050217_MB_1004_PFO	0.333	Exceptional (iii)
53.4R3	050217_MB_1001_PEM	0.173	Exceptional (iii)
55.9	081815_MK_042_PEM - 1	0.560	Exceptional (iii)
56	062218_WA_001_PFO	2.310	Exceptional (iii)
56	062218_WA_001_PEM - 1	0.228	Exceptional (iii)



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵
56	062218_WA_001_PEM - 2	0.228	Exceptional (iii)
56.6	052218_WA_002_PEM	0.211	Exceptional (iii)
56.6	101717_AB_1001_PEM	0.004	Exceptional (iii)
56.7	050417_GM_1003_PEM	0.009	Exceptional (iii)
56.7	050417_GM_1002_PEM	0.106	Exceptional (iii)
58.5	052218_WA_003_PEM	0.159	Exceptional (iii)
59.2	090414_DB_008_PEM	0.085	Exceptional (iii)
60.6	090314_DB_004_PEM	0.119	Exceptional (iii)
62.8R3	041119_DHB_001_PEM	0.391	Exceptional (iii)
64.3R2	042815_JC_1003_PEM	0.136	Other
72.1	092614_GO_002_PFO - 1	1.566	Exceptional (iii)
72.2	092614_GO_002_PFO - 2	1.566	Exceptional (iii)
72.4	040318_WA_0001_PSS	0.422	Exceptional (iii)
72.4	040318_WA_0001_PEM	0.249	Exceptional (iii)
72.4	031918_WA_001_PSS	0.748	Exceptional (iii, iv)
72.6	051415_JC_1001_PEM	0.010	Exceptional (iii)
72.6	012116_GM_1001_PFO	0.117	Exceptional (iii)
72.7	042815_JC_1001_PFO - 1	3.538	Exceptional (iii)
72.8	042815_JC_1001_PFO - 2	3.538	Exceptional (iii)
73.1	031716_NJ_002_PSS - 1	0.606	Exceptional (iii)
73.2	031716_NJ_002_PSS - 2	0.606	Exceptional (iii)
73.1	031716_NJ_002_PEM	0.833	Exceptional (iii)
73.6R2	042117_GM_1001_PFO	0.207	Exceptional (iii)
73.6R2	042418_WA_008_PFO	0.277	Exceptional (iii)
73.7R2	042418_WA_006_PFO	0.115	Exceptional (iii)
74.3	042518_WA_001_PSS	0.094	Other
74.7	072319_MU_1003_PEM	0.039	Other
74.9	062415_BT_1002_PEM	0.737	Exceptional (iii)
75.1	122016_LZ_1002_PEM	0.268	Other
75.1	042418_WA_001_PSS - 1	0.859	Other
75.1	042418_WA_001_PSS - 2	0.859	Other
75.1	042418_WA_001_PEM	0.085	Other
75.1	042418_WA_002_PSS	0.345	Exceptional (iii)
75.1	042418_WA_002_PEM	0.059	Exceptional (iii)
75.2	042418_WA_003_PEM	0.426	Other



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵
75.7	111314_JC_003_PFO	0.191	Exceptional (iii)
Access Roads			
55.9	081815_MK_042_PEM - 2	0.560	Exceptional (iii)

Notes:

1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application 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.
3. 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.
4. Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub
5. Resource Value Definitions: Pennsylvania Exceptional Value Wetland as defined by PA Code §105.17 (relating to special criteria for projects affecting important wetlands). Criteria are:
 - (i) Serves as habitat for fauna or flora listed as "threatened" or "endangered"
 - (ii) Is hydrologically connected to or located within a 1/2-mile from habitat for fauna or flora listed as "threatened" or "endangered" and wetland dependent;
 - (iii) Located in or along the floodplain of the reach or tributaries of a wild trout stream or waters listed as exceptional value;
 - (iv) Located along an existing public or private drinking water supply.

S2.C Federal and State Threatened and Endangered Species Habitat

On behalf of PennEast, AECOM has consulted with the USFWS, National Marine Fisheries Service (NMFS), PGC, PFBC, and PADCNR to identify the potential presence of federally and state listed T&E species as well as species of special concern and significant habitats within the vicinity of the Project.

Table NO-L2-5 below lists the species identified through consultations with the aforementioned federal and state agencies as threatened, endangered, rare, candidate, or of concern in Northampton County. As requested in the PADEP's EA Form Instructions, PennEast submitted a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the USFWS, PFBC, PGC and PADCNR for the PennEast Pipeline Project. The results of the Large Project Review are included in Table NO-L2-5 below.

Table NO-L2-5
Federally and State Listed Species Potentially Occurring Within the Action Area Northampton County

Species Common Name	Scientific Name	Federal Status	State Status	Survey Status	Reporting Status	Status of State/Federal Review	Final State/Federal Clearance/Concurrence Issued
Indiana bat	<i>Myotis sodalis</i>	Endangered	Endangered	Surveys completed August 2017	Final survey report submitted April 2018	Concurrence via informal consultation received along with Biological Opinion – November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Endangered	Surveys completed August 2017	Final survey report submitted April 2018	Biological Opinion issued November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Bog turtle	<i>Glyptemys muhlenbergii</i>	Threatened	Endangered	Surveys completed summer 2019	Final survey reports submitted September 2019	Biological Opinion issued November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO. PennEast submitted a state-level Biological Assessment to the PFBC for review on July 18, 2019. PennEast is anticipating issuance of a Special Take Permit in Fall 2019.	Amended BO issued July 29, 2019 Anticipating issuance of PFBC Special Take Permit
Northeastern bulrush	<i>Scirpus ancistrochaetus</i>	Endangered	Endangered	Surveys completed September 2018	Final survey report to be submitted by Fall 2018	Concurrence via informal consultation received along with Biological Opinion – November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Timber rattlesnake	<i>Crotalus horridus</i>	Not Listed	Not Listed ¹	Surveys completed May 2017	Final survey report submitted August 2016	PFBC review complete for this species	PFBC concurrence received October 11, 2018
Allegheny woodrat	<i>Neotoma magister</i>	Not Listed	Threatened	Surveys completed June 2018	Final survey report submitted October 2018	PGC review complete for this species	PGC concurrence received January 9, 2019
Eastern small-footed bat	<i>Myotis leibii</i>	Not Listed	Threatened	Surveys completed July 2018	Final survey report submitted October 2018	PGC review complete for this species	PGC concurrence received January 9, 2019

Notes:

1. Formerly PA Candidate, delisted in 2016



S2.C.1 Pennsylvania Natural Diversity Inventory Receipts

Correspondence between PennEast, USFWS, NMFS, PADCNR, PFBC, and PGC is included in JPA Section G-1. Correspondence and reports that identify the specific locations of protected species has been redacted and is included in a separate, privileged volume in JPA Section G-2.

S2.C.2 Pennsylvania Natural Diversity Inventory Potential Conflicts

PennEast has completed all threatened and endangered species surveys in Northampton County. The species that may be impacted by the Project in Northampton County include northern long-eared bat (*Myotis septentrionalis*, federal threatened), bog turtle, eastern small-footed bat (*Myotis leibii*, state threatened), Allegheny woodrat (*Neotoma magister*, state threatened) and timber rattlesnake (*Crotalus horridus*, delisted). A summary of the surveys conducted and PNDI resolutions for these species is included below.

The PADCNR, PGC, and PFBC have provided clearance letters for the Project dated August 24, 2018, January 9, 2019, and October 11, 2018, respectively. These letters are provided in JPA Section G-1. On November 28, 2017, the USFWS issued a Biological Opinion (BO) for impacts that the Project may have on the northern long-eared bat and bog turtle. In its cover letter to the FERC, the USFWS stated that the Project is not likely to adversely affect the dwarf wedgemussel (*Alasmidonta heterodon*, federal endangered), Indiana bat (*Myotis sodalis*, federal endangered), or the northeastern bulrush. FERC has since re-initiated consultation with the USFWS to modify the 2017 BO, and the USFWS issued an amended BO on July 29, 2019. In the revised BO, the USFWS determined that the modifications will not result in affects above what was analyzed in the November 28, 2017, Opinion. The amended BO concludes formal consultation regarding the Project between the USFWS and FERC.

PennEast requests that the PADEP utilize a sequential review of the PNDI coordination in accordance with the PADEP's *Policy for PNDI Coordination during Permit Review and Evaluation* (Document Number 021-0200-001), which allows for a concurrent review of the permit application while the permit applicant completes PNDI coordination.

Northern Long-Eared Bat

In its BO, the USFWS concluded that tree removal within 0.25 mile of northern long-eared bat hibernacula is not likely to adversely affect the species, and vibrations generated by heavy machinery are not anticipated to result in micro-climatic or structural changes to hibernacula. However, the USFWS also concludes that tree removal within 150 feet of maternity roosts is likely to adversely affect northern long-eared bat individuals with maternity colonies close to the Project. Tree removal will occur outside of the restricted pup season window, so this take is not prohibited by the 4(d) rule. To minimize impacts to the species, PennEast will implement the following conservation measures in Northampton County:

- PennEast will only clear trees ≥ 5 inches diameter at breast height (dbh) between November 1 and March 31.



- PennEast will only clear trees ≥ 3 inches dbh between November 15 and March 31 within known fall swarming habitat areas.
- PennEast will not blast within 0.25-mile of known northern long-eared bat hibernacula.
- PennEast will work with the USFWS to conduct vibration, and/or temperature and humidity monitoring within subterranean features found at Tunnel 34 prior to, during, and after construction provided that landowner access is granted.
- Prior to construction, PennEast will file with the FERC Secretary, for review and written approval by the Director of Office of Energy Projects, a list of locations by milepost where, in accordance with the BO, the USFWS is requiring tree clearing restrictions that are specifically applicable to federally listed bat species.

Bog Turtle

In the USFWS's BO, the USFWS concluded that project sub-activities including use of vehicles and heavy machinery, impacts of sediment disturbance, watercourse crossings at tributaries that feed into bog turtle wetlands, rock blasting near bog turtle wetlands, access road, and tree/vegetation removal are likely to adversely affect the bog turtle. To minimize impacts to the species, PennEast will implement the following conservation measures:

- PennEast committed to avoid and minimize disturbance to wetlands with known or presumed bog turtle presence, wherever feasible, by deviation, workspace adjustment, or trenchless crossing method.
- A Recognized Qualified Bog Turtle Surveyor (RQBTS) will be employed prior to construction and during periods of active construction. The RQBTS will have the authority to stop work at any time. Work will cease immediately if a bog turtle is encountered at any time, and the USFWS will be immediately notified.
- If the RQBTS is on-site and determines that the proposed method of crossing a particular wetland will result in unanticipated impacts to bog turtles, given the wetlands site-specific characteristics or potential for bog turtle presence, the RQBTS will consult with PennEast and the USFWS immediately for further direction.
- Project contractors will receive site-specific environmental training related to the environmental review process, minimizing wetland impacts, species of concern, bog turtle habitat, and special protections for specific watershed areas (this is typically done by the RQBTS).
- Construction activities near areas that could support bog turtles will be confined by the installation of habitat exclusion barriers designed to keep turtles from entering the limit of disturbance outside of the wetland. This barrier will consist of backfilled 24-inch-high silt fence without voids. This barrier will be installed manually under the supervision of a RQBTS, in areas of soft soils and muck, and by equipment in uplands and areas containing 3-18 inch firm soils. Habitat exclusion barriers will be removed by hand immediately upon completion of all construction activities.



- Prior to construction, a RQBTS will oversee hand-clearing and removal of vegetation along the access path, the installation of the habitat exclusion barrier, and the placement of timber matting within the habitat exclusion barrier.
- Timber mats and equipment will be either new or pressure-washed of free-standing soil and vegetative materials prior to arrival on-site. This minimizes the potential impacts that could occur from the introduction of invasive plants, contaminants, or bog turtle pathogens or that can make their habitats unsuitable.
- Any matted wetland crossings will be completed in a manner that does not lower the water table or alter the hydrological characteristics of the wetland.
- Any HDD work proposed for crossing a wetland or waterbody with known, or presumed, bog turtle presence will take place outside of the winter hibernation months (October 15 to March 31), to avoid any potential subterranean disturbance that may occur during an inadvertent return of drilling fluid.
- At the known bog turtle wetland crossing in Northampton County, PA, PennEast will have a RQBTS on site before and during the trenched crossings, and PennEast will complete the crossing between April 1 and October 15, during a time when bog turtles are assumed to be active. This will avoid potential impacts to hibernating turtles at the crossing location.

The FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) will be adhered to for all activities in wetlands, including but not limited to signage, restrictions on fueling activities and repairs, and wetland restoration measures. The RQBTS will forward the results of pre-construction surveys, construction monitoring, Project timelines, and photographic documentation of site restoration to the USFWS and FERC. The Service will be contacted immediately if bog turtles are observed or if take occurs.

PennEast has also submitted a state-level Biological Assessment to the PFBC which addresses an occupied bog turtle wetland within Northampton County. PennEast anticipates receiving a Special Take Permit from the PFBC in the fall of 2019.

Eastern Small-Footed Bat

PennEast received concurrence from the PGC regarding the eastern small-footed bat on January 9, 2019. No occupied or presumed occupied habitat for the eastern small-footed bat is expected to be impacted by the Project in Northampton County.

Allegheny Woodrat

PennEast received concurrence from the PGC regarding the Allegheny woodrat on January 9, 2019. No occupied or presumed occupied habitat for the Allegheny woodrat is expected to be impacted by the Project in Northampton County.



Timber Rattlesnake

Portions of the Project in Northampton County are within the range of the timber rattlesnake. Avoidance and minimization measures for the timber rattlesnake will include the re-creation of impacted gestation habitat in accordance with PFBC guidelines and the avoidance of occupied dens.

S2.D Aquatic Resource Characterization

S2.D.1 Riverine Resources

The watercourse information contained within Table NO-L2-6 has the gradient class for each delineated watercourse in Northampton County as well as the watershed size as defined in the Pennsylvania Natural Heritage Program's (PNHP's) Aquatic Community Classification Project Stream Reach Watersheds data (PNHP 2018) and a summary of the results from the PA Riverine Condition Level 2 Rapid Assessment Protocol (L2RAP). Copies of the assessment area mapping and data sheets are provided in Appendix NO-L-2D. The Riverine Assessment Area, Riparian Vegetation, and Riparian Zone of Influence utilized to complete PA Riverine Condition L2RAP were based on the delineated watercourse boundaries identified pre-construction.

The following section contains information pertaining to the riverine resource types and conditions in Northampton County as they relate to their inherent functions including, but not limited to, those associated with hydrologic, biogeochemical and habitat attributes as well as any applicable recreational uses.

The portion of the Project area in Northampton County is located within the Indian Creek, Hokendauqua Creek, Monocacy Creek, East Branch Monocacy Creek, Shoeneck Creek, Bushkill Creek, Nancy Run, Lehigh River, Bull Run, East Branch Saucon Creek, Frya Run, and Cooks Creek watersheds. These watersheds are all located within the Delaware River basin and support cold water, cool water, and warm water aquatic communities.

The watercourses associated with these aquatic communities typically range from smaller, high-gradient, headwater and mid-reach watercourses to low gradient, medium to large-sized watercourses. These watersheds range in size from approximately 18 to 128 square miles (mi²). The surrounding land uses in these watersheds consist primarily of agriculture with some forested, undeveloped land, and residential, with few urban areas. Water quality tends to fluctuate from high to medium in these watercourses with alkalinity and conductivity values ranging from low to relatively high and pH levels in the neutral range. Typical fish species found in these watercourses are comprised of brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), pearl dace (*Margariscus margarita*), blacknose dace (*Rhinichthys atratulus*), central stoneroller (*Campostoma anomalum*), northern hogsucker (*Hypentelium nigricans*), creek chub (*Semotilus atromaculatus*), and white sucker (*Catostomus commersoni*). Common aquatic macroinvertebrate taxa found in these waters include species from the Ephemeroptera, Plecoptera, and Trichoptera orders. According to the PFBC, the following watercourses within the Project area in Northampton County are listed as supporting natural trout reproduction: Indian Creek, Hokendauqua Creek, Monocacy Creek, East Branch Monocacy Creek, Shoeneck Creek, Bushkill Creek, Nancy Run, Bull Run, East Branch Saucon Creek, Frya Run, and Cooks Creek. The PFBC lists the following watercourses as Stocked Trout Waters



Indian Creek, Hokendauqua Creek, Monocacy Creek, and Bushkill Creek. Additionally, the section of Monocacy Creek within the Project area is listed by the PFBC as a Class A Wild Trout Stream. As such, these watercourses provide the potential for trout fishing.

Appropriate nesting, spawning, rearing, resting, migration, feeding, and escape cover appear to be provided for the aquatic organisms within the larger watercourses identified within the Project area in Northampton County. Fin fish were observed within the majority of the identified perennial watercourses. Macroinvertebrate taxa were observed primarily within the perennial watercourses of the Project area in Northampton County. The substrate of the identified watercourses most often consisted of cobble and gravel; with boulder, sand, silt, and clay present. Course plant material, such as wood, was observed within the majority of the watercourses. These features can provide microhabitat for aquatic organisms. Resting areas were found within the moderate gradient areas of the watercourses (e.g., pools and runs). Migration within the Project area watercourses is possible but was not observed during field investigations. Food sources appeared to be derived from both terrestrial and aquatic vegetation and invertebrates. Natural flushing occurs within the perennial watercourses as sediments and other particles are deposited along the banks and within the channels. Due to the seasonal flow of intermittent watercourses and periodic flow of the ephemeral watercourses, these features are not regularly flushed.

The flow patterns upstream and downstream of the Project area watercourses are a slightly sinuous channel type. The watercourses within the Project area in Northampton County range from high to low gradient and groundwater and overland runoff support flow for the identified intermittent and perennial watercourses. The identified watercourses carry surface water runoff and influence groundwater through the streambed.

The flood-prone areas of the Project area in Northampton County were observed to be generally functional. Flood-prone areas reduce the force, height, and volume of floodwaters to downstream areas by acting as a floodwater storage area. The flood-prone areas of the Project area in Northampton County were observed to be dominated by both native and non-native shrub and herbaceous vegetative species. Vegetation within flood-prone areas helps to slow runoff, trap sediments, and increase absorption of flood waters. The intact riparian corridors help prevent sedimentation and erosion.

The most obvious source of pollution observed within the Project area in Northampton County was roadway and agricultural runoff. The watercourses within the Project area were adjacent to vegetated riparian corridors, which limited the effects of these pollution sources.

The watercourses within the Project area in Northampton County will either be crossed via open cut method, conventional bore, or HDD method. The watercourses crossed via open trench method will be restored to their original contours following construction, which is typically within two days. A 75-foot-wide limit of disturbance will typically be cleared around watercourses located in forested areas. Following restoration, a 30-foot-wide permanent ROW will be maintained for the life of the pipeline. No trees will be permitted to grow within that width. The watercourses crossed via HDD will have no above-ground disturbance.



**Table NO-L2-6
Characterization of Impacted Riverine Resources in Northampton County¹**

Milepost ²	Watercourse Identifier ^{3,4}	Gradient Class ⁵	Watershed Size ⁵	PA Riverine Condition L2RAP Score
PennEast Mainline Pipeline				
52.7R3	080917_WA_1002_P_MI - 1	2	2	0.67
52.7R3	080917_WA_1002_P_MI - 2	2	2	0.67
52.8R3	080917_WA_1002_P_MI - 3	2	2	0.67
52.9R3	110217_WA_1003_P_MI	2	2	0.55
52.9R3	110217_WA_1002_I_MI	2	2	-
53.2R3	080917_WA_1001_I_MI	2	2	0.63
53.3R3	050217_MB_1002_I_MI	2	2	0.76
53.4R3	050217_MB_1001_P_IN	2	2	0.62
55.7	102815_WA_1001_E_MI	2	2	0.7
55.9	051215_JC_1002_P_IN	2	2	0.66
55.9	051215_JC_1001_E_MI	2	2	0.44
56	051215_JC_1003_I_MI	2	2	0.47
56	062218_WA_1000_P_MI	2	2	0.75
56.6	050417_GM_1001_I_MI	2	1	-
56.7	050417_GM_1002_P_MI	2	1	0.54
56.7	050417_GM_1003_P_IN	2	1	0.87
58R2	071917_MB_1001_I_MI	3	1	0.35
58.1R2	052218_WA_1001_E_MI	3	1	0.16
58.5	052218_WA_1002_P_MI	3	1	0.68
58.5	052218_WA_1003_P_MI	3	1	0.77
59	090314_DB_1011_E_MI	3	1	0.47
59.2	090414_DB_1012_I_MI	3	1	0.85
59.2	090414_DB_1013_I_MI	3	1	0.88
60.3	051215_JC_1005_P_IN	2	2	0.81
60.6	090314_DB_1005_E_MI	1	1	0.63
60.7	090314_DB_1007_E_MI	1	1	0.88
60.7	090314_DB_1006_I_MI	1	1	0.87
61.5R3	111214_JC_1004_P_IM	2	2	0.81
62.4R3	102715_WA_1002_P_MI	2	2	0.46
62.8R3	051415_JC_1001_I_MI	2	2	0.24
63.5	051415_JC_1002_P_IN	2	2	0.6
70.6R3	010615_JC_1000_E_MI	1	4	0.68
70.7R3	010615_JC_1001_E_MI	1	4	0.38



Milepost ²	Watercourse Identifier ^{3,4}	Gradient Class ⁵	Watershed Size ⁵	PA Riverine Condition L2RAP Score
70.9	061416_GM_1001_P_IN	1	4	0.49
71	031918_WA_1004_P_MA	1	4	0.78
71.4	012116_GM_1001_E_IN	1	4	0.45
71.7	010615_JC_1002_E_MI	1	4	0.52
72.1	040318_WA_1000_P_MI	1	4	0.61
72.1	092614_GO_1001_P_MI	1	4	0.59
72.4	040318_WA_1001_I_MI	1	4	0.79
72.4	031918_WA_1003_I_MI	1	4	0.73
72.5	031918_WA_1000_P_MI	1	4	0.64
72.5	051415_JC_1006_E_MI	1	4	0.68
72.5	051415_JC_1005_P_IN	1	4	-
72.6	012016_GM_1001_I_MI	1	4	0.81
72.6	102715_WA_1001_P_MI - 1	1	4	0.81
72.7	102715_WA_1001_P_MI - 2	1	4	0.81
72.7	012016_GM_1003_I_MI	1	4	0.69
72.7	012016_GM_1002_I_MI	1	4	0.85
72.7	102715_WA_1001_I_MI	1	4	0.84
72.7	102715_WA_1002_I_MI	1	4	0.71
72.8	042815_JC_1005_I_MI	1	4	0.8
73	042815_JC_1001_E_MI	1	4	0.6
73.6R2	042117_GM_1003_P_MI	3	2	0.96
73.6R2	042117_GM_1001_P_MI	3	2	0.78
73.6R2	042418_WA_1005_P_MI	3	2	0.8
73.7R2	042418_WA_1004_P_MI	3	2	0.8
73.7R2	042418_WA_1003_P_MI	3	2	0.78
73.7R2	042418_WA_1002_I_MI - 2	3	2	0.82
73.7R2	042418_WA_1002_I_MI - 1	3	2	0.82
74.6	091814_MK_1009_P_IM	3	2	0.47
74.9	062415_BT_1001_P_MI	3	2	0.39
74.9	062415_BT_1002_I_MI	3	2	0.61
75.1	122016_LZ_1001_P_MI	3	2	0.55
75.2	042418_WA_1000_P_MI	3	2	-
75.7	111314_JC_1003_E_MI	1	3	0.77
75.7	111314_JC_1002_I_MI	1	3	0.7
75.7	111314_JC_1001_I_MI	1	3	0.65

Hellertown Lateral



Milepost ²	Watercourse Identifier ^{3,4}	Gradient Class ⁵	Watershed Size ⁵	PA Riverine Condition L2RAP Score
0.3	062218_WA_1002_P_IN	1	4	0.65

Notes:

1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application 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.
3. In instances where a watercourse is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Watercourse ID.
4. Watercourse ID: P = perennial, I = intermittent, E = ephemeral, MA = major, IN = intermediate, MI = minor, C = canal, D = ditch
5. Source: PNHP Aquatic Community Classification Project Stream Reach Watersheds available at http://www.naturalheritage.state.pa.us/Aquatic_GIS.aspx

Riparian Property

Properties upstream and downstream of the Project area in Northampton County include existing roadway, agricultural land, forest land, and industrial land. These land uses should not have any further impact on the aquatic habitat within the Project area. Upstream and downstream properties will not be affected during the watercourse and wetland crossings. The areas that are to be open cut for pipeline installation will be restored to original grade as soon as practicable, therefore limiting the open exposure of the trench. This activity will be performed under appropriate weather conditions, and flow will be maintained during construction. The proposed Project will not result in the increase, diminution, or direction of flow; therefore the property rights of landowners upstream, downstream, or adjacent to the Project would not be affected by the Project.

S2.D.2 Wetland Resources

Table NO-L2-7 includes the HGM classification, Palustrine Community Classification, and Chapter 105 Wetland Classification for each impacted wetland in Northampton County, as well as a summary of the results from the PA Wetland Condition L2RAP. Copies of the assessment area mapping and data sheets are provided in Appendix NO-L-2E. The Assessment Area and 100- and 300-foot Zones of Influence utilized to complete the PA Wetland Condition L2RAP were based on the delineated wetland boundaries identified pre-construction.

In addition to the L2RAP, a functional value assessment was conducted for each wetland delineated within the Project Study Area utilizing the USACE's *The Highway Methodology Workbook: Supplement*. (USACE, 1999). The completed forms are located in Appendix NO-L-2F.

The wetlands identified within the Study Area in Northampton County consisted primarily of PEM, PSS and PFO wetlands with various wetland complexes consisting of combinations of these vegetation cover types. The landform/geomorphic settings of these wetlands included hillside seep/springs, isolated depressions, and floodplains. The most common primary indicators of hydrology were Saturation (A3) and Oxidized Rhizospheres along Living Roots (C3). The most common secondary indicators observed were

Drainage Patterns (B10) and Geomorphic Position (D2). The primary sources of hydrology differed between wetland types. Groundwater primarily provided hydrology to the hillside seep wetlands. The hydrology of the floodplain wetlands was provided by floodwaters from an adjacent watercourse. The hydrology of the isolated wetlands was provided by surface water runoff collection from surrounding uplands.

The most common dominant tree species observed were red maple (*Acer rubrum*) and eastern hemlock (*Tsuga canadensis*). The most common dominant sapling/shrub species observed were black willow (*Salix nigra*), gray dogwood (*Cornus racemosa*), and highbush blueberry (*Vaccinium corymbosum*). The most common herbaceous plant species observed were flat-top goldenrod (*Euthamia graminifolia*), jewelweed (*Impatiens capensis*), common rush (*Juncus effusus*), and sensitive fern (*Onoclea sensibilis*).

Wetland soils varied by wetland; however, some generalizations can be made. The most common matrix hues were 7.5YR and 10YR, with low chroma (≤ 2) and values ranging between 2 and 4. Soils often met the criteria for hydric soil indicators Depleted Matrix (F3) or Redox Dark Surface (F6). The most common soil texture was silt loam.

The wetlands identified within the Project area in Northampton County were located primarily within forest land and agricultural land. The Project is primarily crossing these resources in the forested areas where the riparian corridors are mainly intact and did not show evidence of sedimentation or erosion. These vegetated wetlands within the Project area in Northampton County have the ability to filter overland, storm, and flood flows.

Natural recharge for ground and surface waters appears to be present within the majority of the Project area wetlands in Northampton County. The hydrology of the identified wetlands was noted to be influenced by flooding when located adjacent to watercourses. These wetlands are influenced by the water levels of the adjacent watercourses and are able to store flood waters and allow for absorption. The combined effect of these functions results in a reduction of peak flows and downstream flooding.

The most obvious sources of pollution observed within the Project area in Northampton County were roadway and agricultural runoff. Wetlands were located within the floodways of several of the watercourses. These areas contributed to pollution prevention by filtering, detaining, and/or transforming sediment, toxins, litter and/or nutrients carried in the runoff.



Table NO-L2-7
Characterization of Impacted Wetland Resources in Northampton County¹

Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
PennEast Mainline Pipeline						
52.4R3	040517_GM_1001_PFO	0.087	Other	FLg	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.9
52.4R3	040517_GM_1001_PEM	0.002	Other	FLg	(HG) Reed Canary-grass Floodplain Grassland	0.9
52.5R3	040617_GM_1001_PFO	0.06	Exceptional (iii)	R3c	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.79
52.5R3	040617_GM_1001_PEM	0.025	Exceptional (iii)	R3c	(HG) Mixed Forb-Graminoid Wet Meadow	0.79
52.5R3	052918_WA_004_PFO	0.429	Exceptional (ii, iii)	FLg	(WLG) Red Maple-Sedge Palustrine Woodland	0.93
52.5R3	052918_WA_005_PEM	0.011	Exceptional (ii, iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.9
52.5R3	052918_WA_003_PFO	0.725	Exceptional (ii, iii)	SLtg	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.89
52.6R3	052918_WA_007_PUB	0.062	Exceptional (ii, iii)	R2ch	(HG) Mixed Forb Marsh	0.87
52.6R3	052918_WA_008_PUB	0.121	Exceptional (ii, iii)	R2ch	(HG) Mixed Forb Marsh	0.89
52.7R3	080917_WA_003_PEM	0.031	Exceptional (ii, iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.89



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
52.7R3	080917_WA_002_PEM - 1	0.606	Exceptional (i, iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.89
52.7R3	080917_WA_002_PEM - 2	0.606	Exceptional (i, iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.89
52.8R3	080917_WA_002_PEM - 3	0.606	Exceptional (i, iii)	DFC	(HG) Mixed Forb Marsh	0.89
52.8R3	080917_WA_002_PSS	0.217	Exceptional (i, iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.89
52.8R3	110217_WA_001_PSS	0.107	Exceptional (i, iii)	R2	(SLG) Black Willow Floodplain Thicket	0.82
52.9R3	110217_WA_005_PFO - 1	1.129	Exceptional (i, iii)	R3C	(WLG) Red Maple-Highbush Blueberry Palustrine Wetland	0.92
52.9R3	110217_WA_005_PFO - 2	1.129	Exceptional (i, iii)	R3C	(WLG) Red Maple-Highbush Blueberry Palustrine Wetland	0.92
52.9R3	110217_WA_005_PFO - 3	1.129	Exceptional (i, iii)	R3C	(WLG) Red Maple-Highbush Blueberry Palustrine Wetland	0.92
52.9R3	110217_WA_006_PEM	0.299	Exceptional (ii, iii)	R3C	(HG) Mixed Forb-Graminoid Wet Meadow	0.85
52.9R3	110217_WA_007_PEM	0.086	Exceptional (ii, iii)	R2c	(HG) Reed Canary-grass Floodplain Grassland	0.86
53.1R3	110217_WA_008_PEM	0.088	Other	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.77



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
53.2R3	080917_WA_001_PEM - 1	0.918	Exceptional (iii)	R3C	(HG) Mixed Forb-Graminoid Wet Meadow	0.85
53.3R3	080917_WA_001_PEM - 2	0.918	Exceptional (iii)	R3C	(HG) Mixed Forb-Graminoid Wet Meadow	0.85
53.3R3	050217_MB_1002_PEM	0.051	Exceptional (iii)	R4	(SG) Skunk Cabbage-Golden Saxifrage Seep	0.9
53.4R3	050217_MB_1004_PFO	0.333	Exceptional (iii)	R4	(FG) Red Maple-Black Ash Palustrine Forest	0.98
53.4R3	050217_MB_1001_PEM	0.173	Exceptional (iii)	R4	(SG) Skunk Cabbage-Golden Saxifrage Seep	0.96
55.9	081815_MK_042_PEM - 1	0.56	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.79
56	062218_WA_001_PFO	2.310	Exceptional (iii)	SLtn	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.87
56	062218_WA_001_PEM - 1	0.228	Exceptional (iii)	SLtn	(HG) Mixed Forb-Graminoid Wet Meadow	0.87
56	062218_WA_001_PEM - 2	0.228	Exceptional (iii)	SLtn	(HG) Mixed Forb-Graminoid Wet Meadow	0.87
56.6	052218_WA_002_PEM	0.211	Exceptional (iii)	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.77
56.6	101717_AB_1001_PEM	0.004	Exceptional (iii)	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.78
56.7	050417_GM_1003_PEM	0.009	Exceptional (iii)	DFH	(HG) Reed Canary-grass Floodplain Grassland	0.81



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
56.7	050417_GM_1002_PEM	0.106	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.87
58.5	052218_WA_003_PEM	0.159	Exceptional (iii)	R2	(SG) Skunk Cabbage-Golden Saxifrage Seep	0.97
59.2	090414_DB_008_PEM	0.085	Exceptional (iii)	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.94
60.6	090314_DB_004_PEM	0.119	Exceptional (iii)	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.88
62.8R3	041119_DHB_001_PEM	0.391	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.73
64.3R2	042815_JC_1003_PEM	0.136	Other	DFA	(HG) Cattail Marsh	0.76
72.1	092614_GO_002_PFO - 1	1.566	Exceptional (iii)	SLs	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.83
72.2	092614_GO_002_PFO - 2	1.566	Exceptional (iii)	SLs	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.83
72.4	040318_WA_0001_PSS	0.422	Exceptional (iii)	R4	(SLG) Willow-Indian Grass Floodplain Shrub Wetland	0.86
72.4	040318_WA_0001_PEM	0.249	Exceptional (iii)	R4	(HG) Reed Canary-grass Floodplain Grassland	0.86
72.4	031918_WA_001_PSS	0.748	Exceptional (iii, iv)	R4	(SLG) Circumneutral Mixed Shrub Wetland	0.89



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
72.6	051415_JC_1001_PEM	0.010	Exceptional (iii)	DFA	(HG) Mixed Forb-Graminoid Wet Meadow	0.92
72.6	012116_GM_1001_PFO	0.117	Exceptional (iii)	DFH	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.94
72.7	042815_JC_1001_PFO - 1	3.538	Exceptional (iii)	DFH	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.83
72.8	042815_JC_1001_PFO - 2	3.538	Exceptional (iii)	DFH	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.83
73.1	031716_NJ_002_PSS - 1	0.606	Exceptional (iii)	DFH	(SLG) Circumneutral Mixed Shrub Wetland	0.79
73.2	031716_NJ_002_PSS - 2	0.606	Exceptional (iii)	DFH	(SLG) Circumneutral Mixed Shrub Wetland	0.79
73.1	031716_NJ_002_PEM	0.833	Exceptional (iii)	DFH	(HG) Mixed Forb-Graminoid Wet Meadow	0.79
73.6R2	042117_GM_1001_PFO	0.207	Exceptional (iii)	SLs	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	1
73.6R2	042418_WA_008_PFO	0.277	Exceptional (iii)	SLs	(SG) Skunk Cabbage-Golden Saxifrage Seep	0.95
73.7R2	042418_WA_006_PFO	0.115	Exceptional (iii)	SLs	(FG) Red Maple-Black Ash Palustrine Forest	0.9
74.3	042518_WA_001_PSS	0.094	Other	SLs	(SLG) Circumneutral Mixed Shrub Wetland	0.86



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
74.7	072319_MU_1003_PEM	0.039	Other	FLn	(HG) Reed Canary-grass Floodplain Grassland	0.84
74.9	062415_BT_1002_PEM	0.737	Exceptional (iii)	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.81
75.1	122016_LZ_1002_PEM	0.268	Other	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.72
75.1	042418_WA_001_PSS - 1	0.859	Other	SLs	(SLG) Circumneutral Mixed Shrub Wetland	0.88
75.1	042418_WA_001_PSS - 2	0.859	Other	SLs	(SLG) Circumneutral Mixed Shrub Wetland	0.88
75.1	042418_WA_001_PEM	0.085	Other	SLs	(HG) Reed Canary-grass Floodplain Grassland	0.88
75.1	042418_WA_002_PSS	0.345	Exceptional (iii)	R4	(SLG) Circumneutral Mixed Shrub Wetland	0.84
75.1	042418_WA_002_PEM	0.059	Exceptional (iii)	R4	(HG) Reed Canary-grass Floodplain Grassland	0.84
75.2	042418_WA_003_PEM	0.426	Other	SLs	(HG) Mixed Forb-Graminoid Wet Meadow	0.78
75.7	111314_JC_003_PFO	0.191	Exceptional (iii)	SLs	(SG) Skunk Cabbage-Golden Saxifrage Seep	0.88
Access Roads						
55.9	081815_MK_042_PEM - 2	0.560	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.79



Milepost ²	Wetland ID ^{3,4}	Delineated Size (acres)	Chapter 105 Wetland Classification ⁵	HGM Classification ⁶	Palustrine Community Classification ⁷	PA Wetland Condition L2RAP Score
-----------------------	---------------------------	-------------------------	---	---------------------------------	--	----------------------------------

Notes:

1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application 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.
3. 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.
4. Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub
5. Resource Value Definitions: Pennsylvania Exceptional Value Wetland as defined by PA Code §105.17 (relating to special criteria for projects affecting important wetlands). Criteria are:
 - (i) Serves as habitat for fauna or flora listed as "threatened" or "endangered"
 - (ii) Is hydrologically connected to or located within a 1/2-mile from habitat for fauna or flora listed as "threatened" or "endangered" and wetland dependent;
 - (iii) Located in or along the floodplain of the reach or tributaries of a wild trout stream or waters listed as exceptional value;
 - (iv) Located along an existing public or private drinking water supply.
6. HGM Classification Key: DFA = Depression temporary, DFC = Depression seasonal, FLg = Flat organic soil, R2 = Riverine lower perennial, R2c = Riverine floodplain complex, R3 = Riverine upper perennial, R3c = Riverine headwater complex, R4 = Riverine intermittent, SLt = Topographic slope
7. Palustrine Community Classification Key: FG = Forest Group , HG = Herbaceous Group , SLG = Shrubland Group , WLG = Woodland Group



Functions and Values

The USACE’s *Highway Methodology Workbook Supplement, Wetlands Function and Values A Descriptive Approach*, (September 1999) was utilized by PennEast to evaluate the functions and values of all wetland areas crossed by the proposed Project. The document provides guidance to permit applicants, consultants, and USACE project managers on how to identify and display wetland functions and values and is generally acceptable to the PADEP and the USACE. The document is a supplement to the Highway Methodology Workbook published by the Regulatory Branch in 1993, which defines procedures to integrate Section 404 permit requirements with highway planning and engineering and the National Environmental Policy Act (NEPA). The evaluation of wetland functions and values is an integral part of the overall phased approach of the Highway Methodology. The USACE defines functions as self-sustaining properties of a wetland ecosystem that exist in the absence of society and values as benefits that derive from either one or more functions and the physical characteristics associated with a wetland.

A Wetland Function-Value Evaluation Form was used to assess the functions/values of the impacted wetlands (Table NO-L2-8). In accordance with the method, eight functions (groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline stabilization, and wildlife habitat), and five values (recreation, educational/scientific value, uniqueness/heritage, visual quality/aesthetics, and threatened/endangered species habitat) were assessed for each impacted wetland. Copies of the Wetland Function-Value Evaluation Forms for Northampton County can be found in Appendix NO-L-2F, and a summary table of the ecological functions served by each wetland delineated within the Project workspace Northampton County has been included below.

**Table NO-L2-8
 Functions and Values of Impacted Wetland Resources in Northampton County¹**

Milepost ²	Wetland ID ^{3,4}	Function/Value
PennEast Mainline Pipeline		
52.4R3	040517_GM_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
52.4R3	040517_GM_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal
52.5R3	040617_GM_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat, Recreation
52.5R3	040617_GM_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat, Recreation
52.5R3	052918_WA_004_PFO	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat



Milepost ²	Wetland ID ^{3,4}	Function/Value
52.5R3	052918_WA_005_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
52.5R3	052918_WA_003_PFO	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
52.6R3	052918_WA_007_PUB	Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export
52.6R3	052918_WA_008_PUB	Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export
52.7R3	080917_WA_003_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
52.7R3	080917_WA_002_PEM - 1	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal
52.7R3	080917_WA_002_PEM - 2	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal
52.8R3	080917_WA_002_PEM - 3	Groundwater Recharge/Discharge
52.8R3	080917_WA_002_PSS	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal
52.8R3	110217_WA_001_PSS	Floodflow Alteration, Sediment/Toxicant Retention
52.9R3	110217_WA_005_PFO - 1	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
52.9R3	110217_WA_005_PFO - 2	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
52.9R3	110217_WA_005_PFO - 3	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
52.9R3	110217_WA_006_PEM	Sediment/Toxicant Retention, Nutrient Removal
52.9R3	110217_WA_007_PEM	Sediment/Toxicant Retention, Nutrient Removal
53.1R3	110217_WA_008_PEM	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal
53.2R3	080917_WA_001_PEM - 1	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Endangered Species Habitat
53.3R3	080917_WA_001_PEM - 2	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Endangered Species Habitat
53.3R3	050217_MB_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization
53.4R3	050217_MB_1004_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Endangered Species Habitat



Milepost ²	Wetland ID ^{3,4}	Function/Value
53.4R3	050217_MB_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization
55.9	081815_MK_042_PEM - 1	Groundwater Recharge/Discharge, Visual Quality/Aesthetics
56	062218_WA_001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
56	062218_WA_001_PEM - 1	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
56	062218_WA_001_PEM - 2	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
56.6	052218_WA_002_PEM	Groundwater Recharge/Discharge
56.6	101717_AB_1001_PEM	Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal
56.7	050417_GM_1003_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
56.7	050417_GM_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
58.5	052218_WA_003_PEM	Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
59.2	090414_DB_008_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Wildlife Habitat, Recreation
60.6	090314_DB_004_PEM	Groundwater Recharge/Discharge, Floodflow Alteration
62.8R3	041119_DHB_001_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
64.3R2	042815_JC_1003_PEM	Sediment/Toxicant Retention, Nutrient Removal
72.1	092614_GO_002_PFO - 1	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
72.2	092614_GO_002_PFO - 2	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
72.4	040318_WA_0001_PSS	Groundwater Recharge/Discharge, Production Export, Wildlife Habitat
72.4	040318_WA_0001_PEM	Groundwater Recharge/Discharge, Production Export, Wildlife Habitat



Milepost ²	Wetland ID ^{3,4}	Function/Value
72.4	031918_WA_001_PSS	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Wildlife Habitat
72.6	051415_JC_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Uniqueness/Heritage
72.6	012116_GM_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Uniqueness/Heritage
72.7	042815_JC_1001_PFO - 1	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Uniqueness/Heritage
72.8	042815_JC_1001_PFO - 2	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Uniqueness/Heritage
73.1	031716_NJ_002_PSS - 1	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Recreation
73.2	031716_NJ_002_PSS - 2	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Recreation
73.1	031716_NJ_002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat, Recreation
73.6R2	042117_GM_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
73.6R2	042418_WA_008_PFO	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
73.7R2	042418_WA_006_PFO	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
74.3	042518_WA_001_PSS	Groundwater Recharge/Discharge, Production Export, Wildlife Habitat
74.7	072319_MU_1003_PEM	Nutrient Removal
74.9	062415_BT_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal



Milepost ²	Wetland ID ^{3,4}	Function/Value
75.1	122016_LZ_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
75.1	042418_WA_001_PSS - 1	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
75.1	042418_WA_001_PSS - 2	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
75.1	042418_WA_001_PEM	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
75.1	042418_WA_002_PSS	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
75.1	042418_WA_002_PEM	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
75.2	042418_WA_003_PEM	Groundwater Recharge/Discharge
75.7	111314_JC_003_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat
Access Roads		
55.9	081815_MK_042_PEM - 2	Groundwater Recharge/Discharge, Visual Quality/Aesthetics

Notes:

1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application 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.
3. 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.

Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub

S2.D.3 Lacustrine Resources

There are no lacustrine resources within the Project workspace in Northampton County.



References

- Appalachian Trail Conservancy (ATC). 2015. About the Trail. Available at: <https://www.appalachiantrail.org/home/explore-the-trail>.
- Cowardin, L.M., Charter, V., Golet, F.C., LaRoe, E.T., 1979, Classification of Wetlands and Deepwater Habitats of the United States, Report No. FWS/OBL-97/31, U. S. Department of the Interior, Fish and Wildlife Service, Washington District of Columbia.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Environmental Data Resources, Inc. (EDR). 2015. EDR DataMap Environmental Atlas Project Reports. February 12, 2015.
- Federal Energy Regulatory Commission. 2018. Order Issuing Certificates re PennEast Pipeline Company, LLC under CP15-558. January 19. Available online at: <https://www.ferc.gov/CalendarFiles/20180119195524-CP15-558-000.pdf>
- North Carolina Division of Water Quality. 2005 Identification Methods for the Origins of Intermittent and Perennial streams, Version 3.1. Accessed at http://www.dot.ga.gov/doingbusiness/PoliciesManuals/roads/Environmental/Ecology/ECO_North_Carolina_Stream_ID_Manual.pdf.
- Pennsylvania Department of Conservation and Natural Resources (PADCNR). 2018a. Hickory Run State Park. Available at: <http://www.PADCNR.state.pa.us/stateparks/findapark/hickoryrun/>. Accessed on April 17, 2018.
- Pennsylvania Department of Conservation and Natural Resources (PADCNR). 2018b. Weiser State Forest. Available at: <http://www.PADCNR.pa.gov/StateForests/FindAForest/Weiser/Pages/default.aspx>. Accessed on July 14, 2018.
- Pennsylvania Department of Environmental Protection (PADEP). July 16, 2012. Email Letter from B. Mackowski to J. Coffman (URS).
- PADEP. 2019a. Public Water Supplier's (PWS) Service Areas. Published 07/02/2019. Available online at: <https://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=1090>. Accessed 07/23/2019.
- PADEP. 2019b. Water Resources. Published 07/2019. Available online at: <https://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=289>. Accessed 07/23/2019.
- Pennsylvania Geological Survey, 2019, Pennsylvania groundwater information system (PaGWIS): Pennsylvania Geological Survey, 4th ser., SQL database (07/24/2019), <http://www.dcnr.state.pa.us/topogeo/groundwater/pagwis/records/index.htm>).



Pennsylvania Game Commission (PGC). 2014. State Game Lands 168 Sportsmen’s Recreation Map.
Available at: http://gohuntpa.org/SGL/SGL_168.pdf. Accessed on July 17, 2018.

United States Army Corps of Engineers, 1999. Highway Methodology Workbook Supplement, Wetlands Function and Values A Descriptive Approach. NAEEP-360-1-30a. Available at <http://www.nae.usace.army.mil/Portals/74/docs/regulatory/Forms/HighwaySupplement6Apr2015.pdf>.

United States Army Corp of Engineers (USACE). 2014. Corps Lakes Gateway: Francis E Walter Dam. Last Revised: May, 2014. Available at: <http://corpslakes.usace.army.mil/visitors/projects.cfm?Id=E573825>. Accessed on April 17, 2018.