Federal Energy Regulatory Commission
Office of Energy Projects

November 2017

DTE Midstream Appalachia, LLC **Docket No. CP17-409-000**

Birdsboro Pipeline Project

Environmental Assessment

Washington, DC 20426

Cooperating Agencies

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas Branch 3
DTE Midstream Appalachia, LLC
Birdsboro Pipeline Project
Docket Nos. CP17-409-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this Environmental Assessment (EA) of the Birdsboro Pipeline Project (Project) proposed by DTE Midstream Appalachia, LLC (DTE) in the above-referenced docket. DTE requests authorization to construct, operate, and maintain new natural gas facilities in Berks County, Pennsylvania, consisting of 13.2 miles of 12-inch-diameter pipeline, a new meter station, and appurtenant facilities.

The EA assesses the potential environmental effects of the construction and operation of the Project in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA). The FERC staff concludes that approval of the Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Army Corps of Engineers and U.S. Environmental Protection Agency participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law and/or have special expertise with respect to resources potentially affected by a proposal.

The FERC staff mailed copies of the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the Project area. In addition, the EA is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link.

A limited number of copies of the EA are also available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Any person wishing to comment on the EA may do so. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that your comments are properly recorded and considered prior to a Commission decision on the proposal, it is important that the FERC receives your comments in Washington, DC on or before **December 15, 2017.**

For your convenience, there are three methods you can use to submit your comments to the Commission. In all instances, please reference the Project docket number (CP17-409-000) with your submission. The Commission encourages electronic filing of comments and has dedicated eFiling expert staff available to assist you at 202-502-8258 or FercOnlineSupport@ferc.gov.

(1) You may file your comments electronically by using the eComment feature, which is located on the Commission's website at www.ferc.gov under the link to Documents and Filings. An eComment is an easy method for interested persons to submit text-only comments on a project;

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

(3) You may file a paper copy of your comments at the following address:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Although your comments will be considered by the Commission, simply filing comments will not serve to make the commentor a party to the proceeding. Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (Title 18 Code of Federal Regulations Part 385.214).[1] Only intervenors have the right to seek rehearing of the Commission's decision. Affected landowners and parties with environmental concerns may be granted intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding that would not be adequately represented by any other parties. **You do not need intervenor status to have your comments considered.**

Additional information about the Project is available from the Commission's Office of External Affairs, at **1-866-208-FERC (3372)** or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP17-409). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at 1-866-208-3676, or for TTY, contact 1-202-502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

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

[1] Interventions may also be filed electronically via the Internet in lieu of paper. See the previous discussion on filing comments electronically.

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BIRDSBORO PIPELINE PROJECT

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
APE	area of potential effect
ASA	agricultural security area
ATWS	additional temporary workspace
AQCR	Air Quality Control Region
BCDA	Berks County Department of Agriculture
Birdsboro Power	Birdsboro Power, LLC
Certificate	Certificate of Public Convenience and Necessity
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
COE	U.S. Army Corps of Engineers
Columbia	Columbia Gas Transmission
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
dB	decibel
dBA	decibels on the A-weighted scale
Unanticipated Discovery Plan	*Unanticipated Discoveries Plan and Human Remains Policy*
DOT	U.S. Department of Transportation
DTE	DTE Midstream Appalachia, LLC
E&SCP	Erosion and Sediment Control Plan
EA	environmental assessment
EI	environmental inspector
EIA	U.S. Energy Information Administration
EIS	environmental impact statement
EIR	environmental information request
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FR	Federal Register
FRPP	Farm and Ranch Lands Protection Program
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GPR	ground penetrating radar

GWP	global warming potential
HCA	high consequence area
HDD	horizontal directional drill
HUC	hydrologic unit code
K2	K2 Consulting Services
L_{dn}	day-night sound level
Lehigh	Lehigh Cement Co. LLC
L_{eq}	equivalent sound level
LNG	liquefied natural gas
MAOP	maximum allowable operating pressure
MLV	mainline valve
MMcf/d	million cubic feet per day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NGA	Natural Gas Act
NHA	Natural Heritage Area
NHPA	National Historic Preservation Act
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Planned Birdsboro Pipeline Project and Request for Comments on Environmental Issues, and Notice of Public Scoping Session*
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
N_2O	nitrous oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NWI	National Wetlands Inventory
OEP	Office of Energy Projects
PAC	Pennsylvania Administrative Code
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PennDOT	Pennsylvania Department of Transportation
PGDC	Pennsylvania Geospatial Data Clearinghouse
PEM	palustrine emergent
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested

PGC	Pennsylvania Game Commission
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	The FERC *Upland Erosion Control, Revegetation, and Maintenance Plan*
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
PNHP	Pennsylvania Natural Heritage Program
Procedures	The FERC *Wetland and Waterbody Construction and Mitigation Procedures*
Project	Birdsboro Pipeline Project
PSS	palustrine scrub-shrub
RQD	rock quality designation
RR	Resource Report
Secretary	Secretary of the Federal Energy Regulatory Commission
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SWPA	source water protection area
TETCO	Texas Eastern Transmission Company
THPO	Tribal Historic Preservation Officer
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company
U.S.	United States
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VOC	volatile organic compounds

A. PROPOSED ACTION

1. Introduction

On May 1, 2017, DTE Midstream Appalachia, LLC (DTE) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP17-409-000. DTE is seeking a Certificate of Public Convenience and Necessity (Certificate) under Section 7(c) of the Natural Gas Act (NGA) to construct and operate approximately 13.2 miles of 12-inch-diameter natural gas transmission pipeline in Berks County, Pennsylvania. This Birdsboro Pipeline Project (Project) would also involve construction of a new meter station and appurtenant facilities. The Project would provide approximately 79 million cubic feet per day (MMcf/d) (79,000 dekatherms per day) of firm transportation service from an interconnect with the Texas Eastern Transmission Company (TETCO) pipeline system to the Birdsboro Power Facility in Birdsboro, Pennsylvania. Prior to filing its application, DTE participated in the Commission's pre-filing review process under Docket No. PF17-1-000.

We[1] prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500-1508), and the Commission's implementing regulations under 18 CFR 380.

The FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the NGA, and the lead federal agency for preparation of this EA, in accordance with NEPA (40 CFR 1501), the Energy Policy Act of 2005, and the May 2002 Interagency Agreement with other federal agencies.[2] Consistent with NEPA (40 CFR 1501.6) and their respective responsibilities and regulations, the United States (U.S.) Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) participated as cooperating agencies in the preparation of this EA. Cooperating agencies have jurisdiction by law or special expertise with respect to the environmental impacts associated with DTE's proposal.

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1 "We," "us," and "our" refer to the environmental staff of the Office of Energy Projects.

2 May 2002 *Interagency Agreement on Early Coordination of Required Environmental and Historic Preservation Reviews Conducted in Conjunction With the Issuance of Authorizations to Construct and Operate Interstate Natural Gas Pipelines Certificated by the Federal Energy Regulatory Commissio*n, signed by the FERC, CEQ, Advisory Council on Historic Preservation, U.S. Department of Agriculture, U.S. Department of the Army, U.S. Department of Commerce, U.S. Department of Energy, Environmental Protection Agency, U.S Department of the Interior, and U.S. Department of Transportation.

The assessment of environmental impacts is an integral part of FERC's decision on whether to issue DTE a Certificate to construct and operate the proposed facilities. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that would result from the proposed action;
- assess reasonable alternatives to avoid or minimize adverse effects to the environment; and
- identify and recommend mitigation measures, as necessary, to minimize environmental impacts.

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

2. Purpose and Need

DTE states that the purpose of its proposed pipeline is to provide firm natural gas transportation capacity from a receipt point on the TETCO pipeline system to a new, 485-megawatt natural gas-fired power plant (the Birdsboro Power Facility), in Birdsboro, Pennsylvania. DTE and Birdsboro Power, LLC (Birdsboro Power) have signed a Precedent Agreement for 100 percent of the pipeline capacity to be delivered to the Birdsboro Power Facility. In accordance with its contract with Birdsboro Power, DTE proposes to place its pipeline into service in June 2018.

Under Section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

3. Scope of the Environmental Assessment

The topics addressed in this EA include geology, soils, groundwater, surface water, wetlands, vegetation, aquatic resources, wildlife, threatened and endangered species, land use, visual resources, socioeconomics, cultural resources, air quality, noise, reliability and safety, cumulative impacts, and alternatives. The EA describes the affected environment as it currently exists, discusses the environmental consequences of the Project, and compares the Project's potential impact with that of various alternatives. The EA also presents our recommended mitigation measures.

4. Public Review and Comment

On October 28, 2016, the Commission granted DTE's request to use the FERC's pre-filing process in Docket No. PF17-1-000. The pre-filing process was established to encourage early involvement by citizens, government entities, non-governmental organizations, and other interested parties in the development of planned natural gas transmission projects. During the pre-filing process, FERC staff worked with DTE, cooperating agencies, and interested stakeholders to identify and resolve Project-related issues. DTE hosted one open house to inform stakeholders about the Birdsboro Pipeline Project and provide an opportunity for stakeholders to ask questions and express concerns. The open house meeting was held on December 14, 2016 in Oley, Pennsylvania and about 130 people were estimated to be in attendance. FERC staff attended the open house meeting and conducted site visits in the Project area.

On January 18, 2017, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Planned Birdsboro Pipeline Project, and Request for Comments on Environmental Issues, and Notice of Public Scoping Session* (NOI). The NOI was published in the Federal Register (FR) and was mailed to 436 interested parties, including federal, state, and local government representatives and agencies; elected officials; affected landowners; environmental and public interest groups; potentially interested Indian tribes; other interested parties; and local libraries, newspapers, and television stations. The NOI also established a scoping period and requested that the public provide written comments on specific concerns about the Project or issues that should be considered during the preparation of the EA. The scoping period ended on February 17, 2017.

In response to the NOI, the Commission received 48 comment letters prior to and during the public scoping period. After the end of the scoping period and up until production of this EA, we received another 39 comment letters that we have considered. FERC conducted one scoping session for the public to participate in our analysis by providing written or oral comments on environmental issues to be included in the EA. The scoping session was held on February 2, 2017 in Oley, Pennsylvania. About 65 individuals attended and 20 individuals elected to provide comments at the scoping session. A transcript of these comments is part of the Commission's public record and is available for viewing on the FERC internet website (http://www.ferc.gov).[3]

[3] Go to "Documents & Filing" and click on the "eLibrary" link, select "General Search," enter the docket number excluding the last three digits (i.e., PF17-1), and the date range (February 2017). The scoping session transcript can be found under Accession No. 20170202-4009. The pre-fling process concluded on May 1, 2017, following DTE's filing of its formal application and the FERC's issuance of the Notice of Application. The proceedings for the Project are currently being conducted under Docket No. CP17-409-000.

Several commentors requested that the scoping period be extended and stated that insufficient public notice or available meeting dates were provided for the scoping session. Regarding the extension of the scoping period, we have reviewed all comment letters submitted prior to issuance of this EA, regardless of whether comments were received during or after the scoping period. As indicated in the NOI, the public session was just one of four methods identified to provide comments. Consequently, the concerns expressed at the session have been addressed.

The environmental comments received in response to the NOI are summarized below and are further addressed, as applicable, in the relevant sections of this EA as summarized in table A-1.

Commentors question the need for the Project, express opposition to fossil fuels in favor of renewable energy, and raise concerns regarding health risks associated with air emissions and other potential impacts from the non-jurisdictional Birdsboro Power Facility. Commentors also question the need for the Birdsboro Power Facility, and raise concerns regarding cumulative impacts of the Birdsboro Pipeline Project, Birdsboro Power Facility, shale gas exploration and production (including impacts from hydraulic fracturing), and other infrastructure projects.

Because the purpose of the Project is to transport 79 MMcf/d of natural gas to the Birdsboro Power Facility, the use of renewable energy sources could not function as a substitute for the Project. The use of renewable energy is a reasonable alternative for production of electricity, rather than the transportation of fuels.

The Birdsboro Power Facility is not under the Commission's jurisdiction; therefore, comments that question the need for the Birdsboro Power Facility are outside the scope of this EA and are not considered or evaluated further. However, we have considered the impacts of this non-jurisdictional project in the cumulative impacts analysis included in section B.10. Exploration and development of natural gas supplies, including the use of hydraulic fracturing techniques are not regulated by the FERC, and those activities are also outside the scope of this EA.

Commentors question whether local governments have siting authority regarding the Project. As discussed in section A.1, FERC is the lead federal agency with siting authority under the NGA, which supersedes the authority of local governments or county zoning requirements. Commentors also question whether eminent domain would be applicable to the Project. Commission staff urges the applicant to obtain easements through mutual agreements with landowners. However, in the event the Project is issued a Certificate by the Commission, and agreements are not reached, the applicant could exercise eminent domain authority under Section 7(h) of the NGA. As of a June 14, 2017 filing, DTE indicated it had acquired 100 percent of the property rights necessary to construct and operate the Project.

Table A-1 Environmental Issues Identified During the Public Scoping Process	
Issue	**EA Section Addressing Issue**
Air quality, greenhouse gases, climate change (including methane and fugitive emissions)	sections B.8.1 and B.10.9
Alternatives (including alternative and collocated pipeline routes)	section C
Aquatic resources (including temperature impacts)	section B.3.2
Blasting at the active quarry, and effects of blasting on the proposed pipeline	section B.1.1
Cultural resources (including the Oley Township Historic District)	section B.7
Cumulative impacts (including those associated with the non-jurisdictional Birdsboro Power Facility)	section B.10
Geology (including karst, horizontal directional drill constructability, blasting, steep terrain, and acid-producing rock)	section B.1.1
Land use, recreation, and visual impacts (including impacts on agricultural land, conservation areas and lands enrolled in easement programs, and scenic rivers)	section B.5
Noise	section B.8.2
Safety (including high consequence areas)	section B.9
Strain on local public and emergency services	section B.6.4
Socioeconomic impacts (including impacts on property values and environmental justice communities)	section B.6
Soils (including compaction, temperature changes, and impacts on soil fertility)	section B.1.2
Surface water, groundwater, and wetlands (including water quality, riparian buffers, and floodplains)	section B.2
Vegetation and wildlife (including migratory birds, Natural Heritage Areas, forest fragmentation, revegetation, and invasive species)	section B.3
Threatened and endangered species	section B.4
Utilities (including existing pipelines and road and railway crossings)	section A.8.2

Commentors state that previous pipeline and infrastructure projects in the area have not restored wetlands and waterbody banks to pre-construction conditions per their project-specific commitments. As described in section A.8 of the EA, DTE would construct, operate, and maintain the Project in accordance with all applicable federal and state permit requirements, regulations, and environmental guidelines in order to ensure adequate protection of environmental resources.

Commentors also question whether the pipeline right-of-way would be a target for future expansion or new pipelines, and abandonment in the event the Project is no longer in use. In addition, the Delaware Riverkeeper Network expresses concern that DTE plans future expansion and intends to improperly segment its Project. Reasonably foreseeable future projects in the Project area are addressed in section B.10. The Project involves discrete volumes of natural gas, specifically sized to meet DTE's contracted transportation needs. DTE has stated that it does not have future plans for expansion of the Project. DTE would be required to submit another application for future facilities and would be subject to the requirements of Section 7(c) of the NGA for expansion of its facilities. Abandonment of the Project would be subject to regulation under Section 7(b) of the NGA, and would be conducted in compliance with applicable regulations.

The Delaware Riverkeeper Network also comments that an environmental impact statement (EIS) should be prepared for this Project to address direct and indirect impacts, including an analysis of downstream emissions of greenhouse gases (GHG). The Marcellus Shale Coalition provides comments in support of the Project, and identifies socioeconomic benefits and benefits from reduced carbon dioxide (CO_2) emissions associated with the displacement of coal by natural gas for electric generation. The EA appropriately considers and discloses the environmental impacts of the Project, and supports a finding of no significant impact. Therefore, an EIS is not required for this Project.[4] GHGs are addressed in sections B.8.1 and B.10 of this EA.

Federal and state agencies including the EPA, COE, the Pennsylvania Department of Environmental Protection (PADEP), and the Pennsylvania Game Commission (PGC) provided comments during scoping and/or as a cooperating agency as applicable. In addition to specific comments addressed below, these agencies also identify multiple environmental issues discussed throughout this EA as summarized in table A-1.

The PADEP recommends that DTE work with PADEP staff to obtain the appropriate permits and approvals required for the Project. Required permits and approvals for the Project are identified in table A-6.

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[4] The CEQ regulations state, where an EA concludes in a finding of no significant impact, an agency may proceed without preparing an EIS. *See* 40 C.F.R. §§ 1501.4(e), 1508.13 (2011).

The EPA comments that the EA should clearly identify the Project purpose and need. The purpose of the Project is briefly stated (in accordance with 40 CFR 1502.13) in section A.2. above. The Commission will more fully discuss Project need in its Order. The EPA also comments that the EA should address whether the Project can be collocated with existing utilities to reduce impacts, as nearby existing or proposed rights-of-way can be utilized or collocated to avoid and reduce the total environmental impact. Although about 10.6 percent, or 1.4 miles, of the pipeline would be collocated with, or parallel but offset from, existing rights-of-way, the Project crosses predominantly agricultural lands, which minimizes the total environmental impact. The EPA requests that interactive online mapping should be made available for the Project. During the open house meeting and our scoping session, DTE provided interactive computer mapping of the Project for public review. Appendix A of this EA includes Project maps.[5]

The COE comments that the EA should identify potential wasting sites (dredged material disposal sites) that would be used for excess dredged or fill material resulting from the Project. Although DTE has not specified the disposal areas that would be used if excess stream materials are present after backfilling the trench, any site used would have an approved project-specific Erosion and Sediment Control Plan (E&SCP), and disposal of materials must be in compliance with applicable regulations and permits under the Clean Water Act (CWA) and Rivers and Harbors Act.

5. Proposed Facilities

The Birdsboro Pipeline Project would include the following facilities, all of which would be located in Berks County, Pennsylvania:

- about 13.2 miles of new 12-inch-diameter pipeline;
- a new meter station adjacent to the TETCO right-of-way at milepost (MP) 13.2, including two taps onto the TETCO pipeline system and pig[6] launching facilities (the TETCO Meter Station);
- a new pig receiver facility at MP 0.0;
- four mainline valve (MLV) sites;
- temporary and permanent access roads; and
- contractor yards/staging areas.

[5] Project maps are available through the company website at https://dtemidstream.com/location/birdsboro-pipeline/.

[6] A "pig" is a device to clean or inspect the pipeline. A pig launcher/receiver is an aboveground facility where pigs are inserted or retrieved from the pipeline.

The general location of the Project is shown in figure 1 below, and U.S. Geological Survey (USGS) 7.5-minute quadrangle topographic maps are included in appendix A.

The maximum allowable operating pressure (MAOP) of the pipeline would be 1,050 pounds per square inch gauge. Table A-2 identifies the townships crossed by the proposed pipeline route, by milepost. In addition to the pipeline, DTE would install a cathodic protection[7] system along the pipeline. The groundbeds necessary for cathodic protection would include one aboveground rectifier pole adjacent to each groundbed. DTE has indicated that the final design of its cathodic protection system is contingent on the close interval surveys that would be conducted upon installation of the pipeline. Once designed, DTE would conduct all necessary permitting activities prior to the cathodic protection system installation, and would be required to file information on the cathodic protection system for Commission review and approval prior to use. DTE has also proposed the use of 10 temporary and 4 permanent access roads during construction and operation of the Project, and 7 contractor yards/staging areas.

The TETCO Meter Station would be located at MP 13.2 in Rockland Township. It would include a pig launcher onto the TETCO pipeline, as well as two taps to provide redundancy for reliable fuel supply. No additional compression is planned for the TETCO mainline as a result of the proposed Project. DTE would own and operate all equipment at this meter station. DTE also proposes to install one pig receiver at MP 0.0 and four MLVs along the pipeline route.

6. Land Requirements

Constructing the Project, including the use of additional temporary workspace (ATWS), contractor yards/staging areas, access roads, and aboveground facilities, would affect 155.2 acres of land. Following construction, about 77.7 acres of temporary workspace would be restored to pre-construction conditions and uses. The remaining 77.5 acres, including the permanent pipeline easement and aboveground facility sites, would be retained for operation of the Project. Table A-2 provides acreage requirements for each of the Project facilities.

[7] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline through the use of an induced current and/or a sacrificial anode (like zinc) that corrodes at a faster rate to reduce corrosion. A rectifier is a device that converts alternating current, which periodically reverses direction, to direct current, which flows in only one direction.

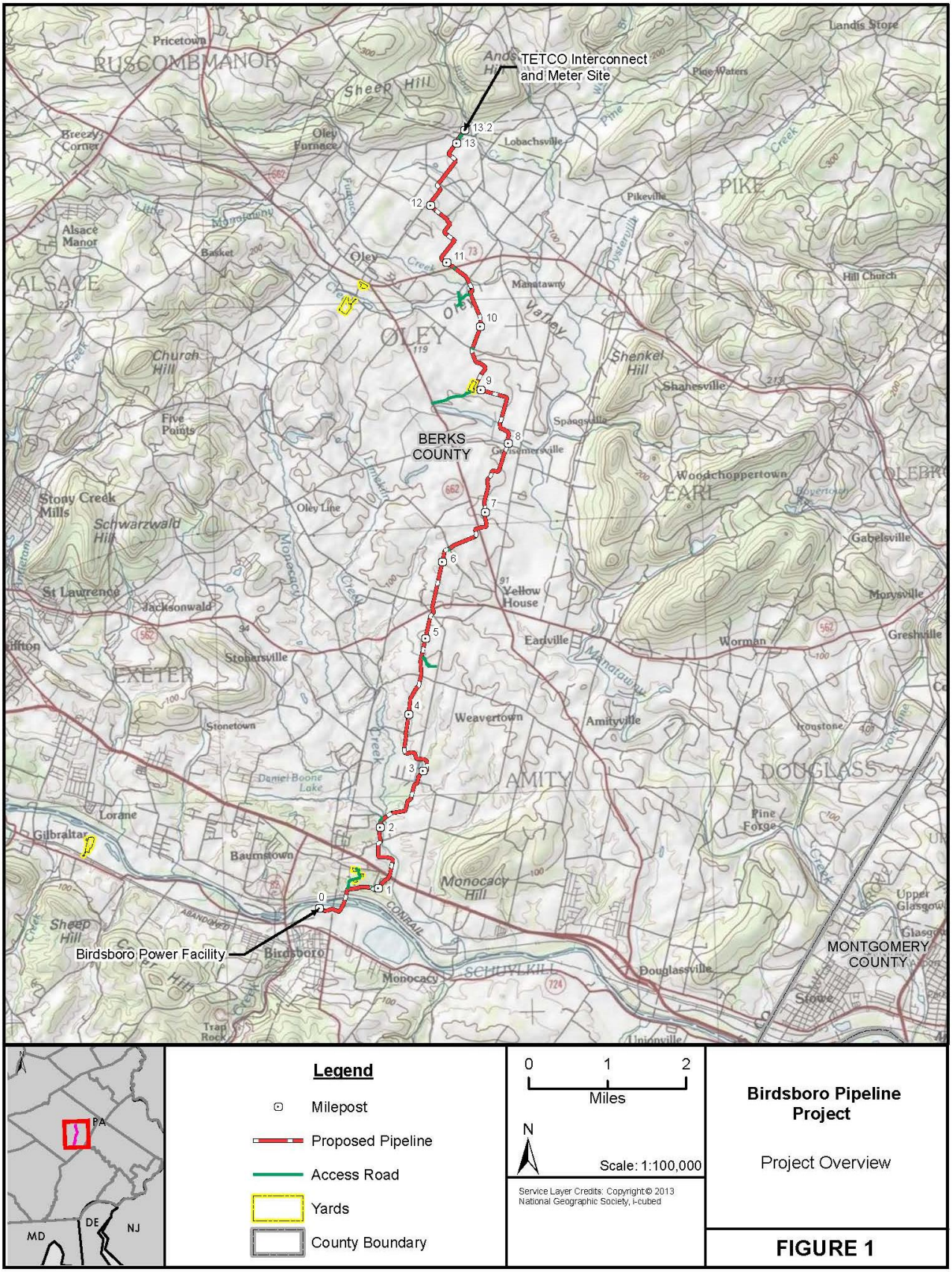

TETCO Interconnect and Meter Site
Birdsboro Power Facility
BERKS COUNTY
MONTGOMERY COUNTY
Legend
Milepost
Proposed Pipeline
Access Road
Yards
County Boundary
0 1 2
Miles
N
Scale: 1:100,000
Service Layer Credits: Copyright© 2013 National Geographic Society, i-cubed
PA
MD
DE
NJ
Birdsboro Pipeline Project
Project Overview
FIGURE 1

Table A-2
Proposed Facilities for the Project

Facility	Approximate Milepost	Township	Land Affected During Construction (acres)[a]	Land Affected During Operation (acres)[a]
Birdsboro Pipeline				
Pipeline	0.0 - 0.2	Borough of Birdsboro[b]	106.7	75.0
	0.2 - 0.4	Union		
	0.4 - 5.5	Amity[b]		
	5.5 - 13.1	Oley		
	13.1 - 13.2	Rockland		
ATWS	N/A	N/A	8.2	0.0
Access roads[c]	N/A	N/A	6.3	0.0[c]
Contractor yards / staging areas	N/A	N/A	31.5	0.0
Aboveground Facilities				
Pig receiver	0.0	Borough of Birdsboro[b]	0.2	0.2
TETCO Meter Station and pig launcher	13.2	Rockland	2.3[d]	2.3
Other Appurtenant Facilities[e]				
MLV	0.8	Amity[b]	<0.1	<0.1
MLV	6.2	Oley	<0.1	<0.1
MLV	9.7	Oley	<0.1	<0.1
MLV	10.9	Oley	<0.1	<0.1
Project Total	--	--	**155.2**	**77.5**

[a] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[b] These municipalities are included in the Phase II permitting for the National Pollutant Discharge Elimination System (Municipal Separate Storm Sewer Systems) and stormwater would be controlled through implementation of DTE's E&SCP.

[c] DTE is proposing to construction four new permanent access roads that would be graveled and wholly located within the operational right-of-way for the pipeline.

[d] DTE is proposing a 0.8-acre ATWS (ATWS-45) adjacent to the TETCO Interconnect.

[e] Work associated with the installation of MLVs would occur wholly within the operational right-of-way for the pipeline.

6.1 Pipeline Facilities

The construction right-of-way for the 12-inch-diameter pipeline would typically be 75-feet-wide in upland areas and 50-feet-wide at wetland and waterbody crossings, but would vary for site-specific conditions. In some locations, DTE would further reduce the pipeline right-of-way to avoid or minimize impacts on sensitive resources. After construction, the permanent right-of-way would be 50-feet-wide. Figure 2 provides a typical construction diagram for the Project. The four proposed MLVs would be located within the permanent right-of-way, each on a 20-foot by 35-foot area covered by gravel and surrounded by a fence. Additional land would be required for installation of cathodic protection; however, as discussed in section A.5, the acreage that would be affected by groundbeds has not yet been determined.

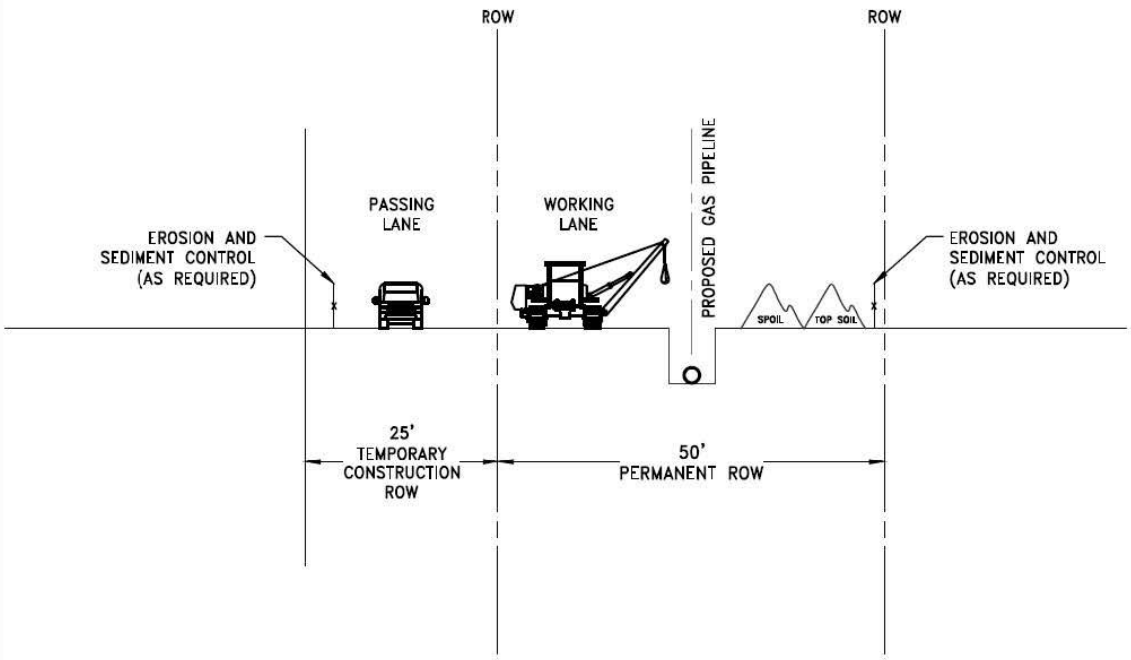
DTE would require ATWS outside the construction right-of-way for road, wetland, and waterbody crossings; at horizontal directional drill (HDD) entry and exit points; for storage of segregated topsoil; for storage of construction materials; for equipment movement; and for other site-specific constraints (see appendix B). DTE would generally locate ATWS a minimum of 50 feet from waterbody and wetland edges, as required by FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), except where a reduced set-back is necessary for site-specific reasons (see appendix C).

Although DTE has identified areas where ATWS would be required, additional or alternative ATWS could be identified in the future because of changes in construction requirements at specific sites. DTE would be required to file information on each of those areas for Commission review and approval prior to use, unless otherwise allowed by FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) [8] (minor field realignments and workspace shifts requested by the landowner that do not affect other landowners or sensitive resources). DTE would restore all ATWS to pre-construction conditions, and allow those areas revert to previous uses following construction.

6.2 Aboveground Facilities

DTE would construct the TETCO Meter Station at the terminus of the pipeline (MP 13.2), which would include pig launching facilities. The pig receiver and each of the four MLVs would be located within the permanent pipeline right-of-way.

[8] A copy of the FERC Plan is available at www.ferc.gov/industries/gas/enviro/plan.pdf.



TYPICAL ROW CROSS SECTION

Birdsboro Pipeline Project
Typical Pipeline Construction Diagram

Figure 2

6.3 Contractor Yard/Staging Areas

DTE has identified one contractor yard and six staging areas that would be used for the storage of pipe and contractor materials; these areas are located off the proposed right-of-way (see table A-3). After construction, these facilities would be restored to pre-construction conditions.

Table A-3
Contractor Yard / Staging Areas for the Project

Facility	Location (nearest milepost)	Size (acres)	Current Land Use
Contractor Yard[a]	9.1 - 9.2	4.9	Industrial / Commercial / Open land / Forest
Staging Area 1	1 mile west-southwest of 11.1	2.9	Industrial / Commercial
Staging Area 2	1 mile west-southwest of 11.1	11.3	Industrial / Commercial
Staging Area 3	3 miles west of 0.0	9.1	Industrial / Commercial
Staging Area 4	0.1 mile north of 0.6	1.2	Open land
Staging Area 5	0.1 mile north of 0.6	0.5	Open land
Staging Area 6	0.2 mile north of 0.6	1.7	Open land

[a] This yard is within the property boundary of a surface quarry. Sparse trees (less than 0.1 acre) would be cleared.

6.4 Access Roads

Existing public and private roads would be used to the extent feasible to access the pipeline right-of-way and aboveground facilities. DTE has identified 14 access roads, including 10 temporary access roads for use during construction and 4 permanent access roads for use during construction and operation (see table A-4). Of the 14 access roads, 8 are existing roads, which may be modified, and 6 are proposed new roads for the Project. All temporary access roads would be returned to pre-construction conditions after use unless otherwise requested by the landowner. The four new permanent access roads would be within the permanent right-of-way within agricultural land to access the TETCO Meter Station or an MLV. All permanent access roads would be left in their improved (graveled) state and maintained for the life of the Project.

Table A-4
Access Roads Proposed for Use on the Project

Access Road	Nearest Milepost	Construction Status	Existing or New	Modifications[a]	Affected Land Use	Length (feet)	Area (acres)[b]
AR-1a[c]	0.6	Temporary	Existing	Gravel as needed	Residential / Forest / Open	1,493	1.0
AR-1b[c]	0.6	Temporary	New	Proposed new / temporary with gravel	Forest	428	0.3
AR-1[c]	0.6	Temporary	Existing	Widen / gravel as needed	Residential	263	0.1
AR-2	0.9	Temporary	New	Proposed new / temporary with gravel	Industrial / Commercial / Open	32	<0.1
AR-3	2.1	Temporary	Existing	Widen / gravel as needed	Residential / Open	242	<0.1
AR-4	4.8	Temporary	Existing	Widen / gravel as needed	Industrial / Commercial / Agricultural	1,377	0.9
AR-5	6.2	Permanent	New	Proposed new / permanent with gravel	Agricultural	93	N/A
AR-6	9.1	Temporary	Existing	Widen / gravel as needed	Industrial / Commercial	2,825	2.0
AR-7	9.70	Permanent	New	Proposed new / permanent with gravel	Agricultural	101	N/A
AR-8	10.4	Temporary	Existing	Widen / gravel as needed	Industrial / Commercial	1,363	0.8
AR-8a	10.4	Temporary	Existing	Widen / gravel as needed	Industrial / Commercial	527	0.7
AR-8b	10.4	Temporary	Existing	Widen / gravel as needed	Industrial / Commercial	262	0.4
AR-9	10.9	Permanent	New	Proposed new / permanent with gravel	Agricultural	100	N/A
AR-10	13.1	Permanent	New	Proposed new / permanent with gravel	Agricultural	686	N/A

[a] Where proposed, roads may be widened to 30 feet.
[b] N/A = not applicable; these are new roads that would be constructed within the permanent right-of-way.
[c] AR-1, AR-1a, and AR-1b are segments of one access road that would require separate modifications.

7. Construction Schedule and Workforce

DTE anticipates that construction of the pipeline would commence in winter of 2018, subject to receipt of necessary permits and regulatory approvals. DTE is proposing to divide Project construction into no more than three concurrently operating "spreads" (construction areas with separate crews):

- spread 1: conventional pipeline construction from MP 0.0 to MP 6.6;
- spread 2: conventional pipeline construction from MP 6.6 to MP 13.2; and
- spread 3: HDD construction at four locations along the pipeline route.

Additional detail on HDD construction is provided in section A.8.2. Construction would require a total estimated peak temporary work force of about 120 people; no new operational staff would be required. DTE's projected in-service date is during the summer of 2018.

8. Construction, Operations, and Maintenance Procedures

The Project would be designed, constructed, operated, and maintained in accordance with applicable requirements defined by U.S. Department of Transportation (DOT) regulations in 49 CFR 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; the Commission's Siting and Maintenance Requirements at 18 CFR 380.15; and other applicable federal and state safety regulations. Among other design standards, Part 192 specifies pipeline material and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Generally, the pipeline would be installed using conventional overland construction techniques, where each of the construction spreads (crews) proceeds in one continuous operation, with the entire process coordinated to minimize the total amount of time a tract of land is disturbed. DTE has committed to implement the measures outlined in FERC's Plan and our Procedures.[9] The FERC Plan and Procedures are a set of construction and mitigation measures developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. DTE requested a waiver from sections V.B.2.a and VI.B.1.a of our Procedures to allow workspace within 50 feet of waterbodies and wetlands at 16 locations (see appendix C); we have reviewed these modifications and find them acceptable. DTE would implement its Procedures (FERC Procedures with modifications) during construction of the Project. In addition,

[9] A copy of the FERC Procedures is available at www.ferc.gov/industries/gas/enviro/procedures.pdf.

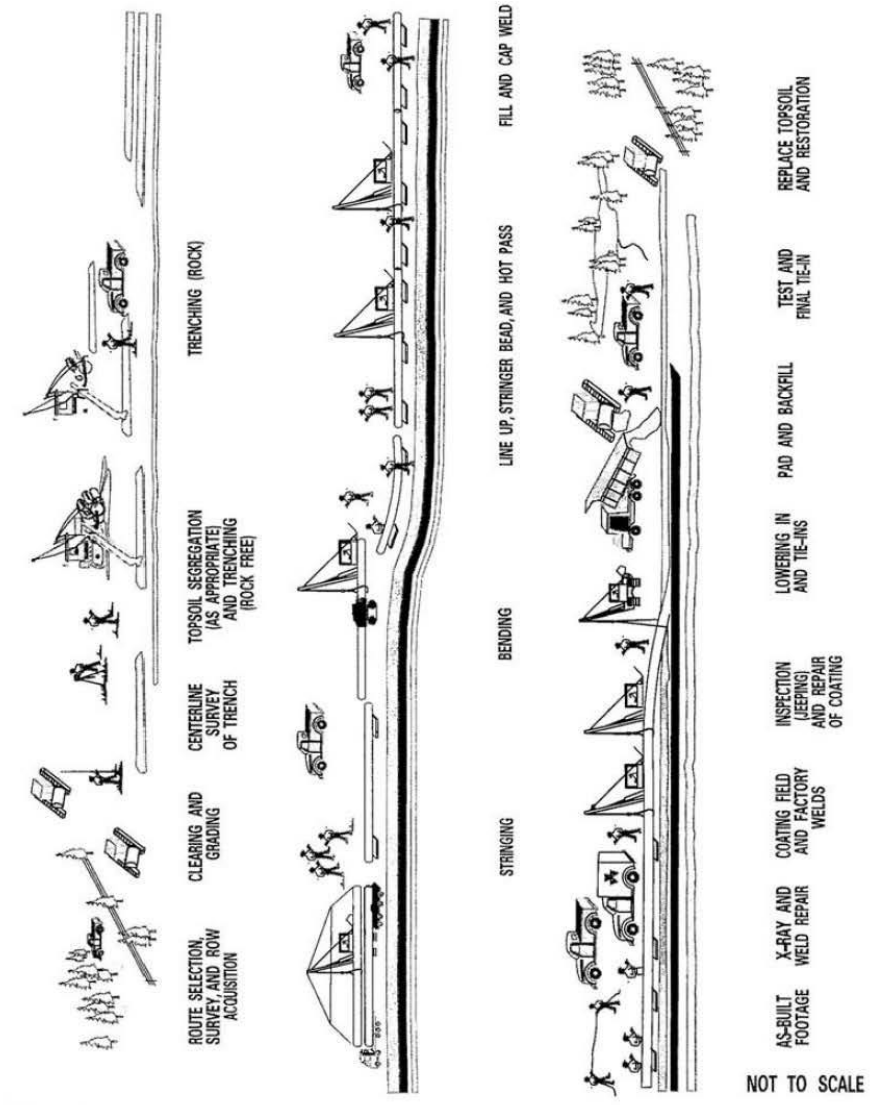
DTE has developed an E&SCP that incorporates measures from the FERC Plan and DTE's Procedures, along with additional mitigation measures. The E&SCP would be approved by the Berks County Conservation District, which administers the Nonpoint Discharge Elimination System Permit Program in conjunction with the PADEP.

DTE would also implement additional construction, restoration, and mitigation plans for the Project, including its Spill Prevention, Control, and Countermeasures (SPCC) Plan; Fugitive Dust Plan; Winter Construction Plan; Inadvertent Return Contingency Plan; Unanticipated Discoveries Plan and Human Remains Policy (Unanticipated Discovery Plan); Noxious Weed/Invasive Plant Species Control and Mitigation Plan; Karst Mitigation Plan; and Plan for Unanticipated Discoveries of Paleontological Resources. These plans were included in DTE's application, and are available for review on our website (under Docket No. CP17-409-000).[10] We have reviewed these construction and mitigation plans and have found them acceptable.

8.1 General Pipeline Construction Procedures

General pipeline construction activities are depicted in figure 3 below. Prior to construction, DTE would stake the pipeline centerline and the limits of the construction right-of-way, ATWS areas, highway and railroad crossings, access roads, and environmentally sensitive areas. DTE is also coordinating with landowners to identify irrigation or drainage systems, and would coordinate with the State One-Call system to have existing underground utilities identified and flagged to minimize the potential for accidental damage during pipeline construction.

[10] DTE's Mitigation Plans are available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP17-409 and the applicable Accession No. and date range (as indicated by the Accession No.). The SPCC, Fugitive Dust, and Winter Construction Plans are available at Accession No. 20170501-5363. The Inadvertent Return Contingency; Unanticipated Discovery; and Noxious Weed/Invasive Plant Species Control and Mitigation Plans are available at Accession No. 20170703-5208. The E&SCP is available at Accession No. 20170809-5129. The Karst Mitigation Plan is available at Accession No. 20170907-5189. The Plan for Unanticipated Discoveries of Paleontological Resources is available at Accession No. 20170926-5100.



Birdsboro Pipeline Project
Typical Pipeline
Construction Sequence

Figure 3

After marking the construction areas, clearing crews would clear workspaces of vegetation and obstructions, such as stumps, logs, and large rocks using bulldozers and excavators. Stumps may also be ground in place. Cleared non-wetland vegetation and stumps would be chipped, stacked, or otherwise handled per individual landowner agreements and applicable regulations and ordinances. DTE has also indicated that it may bury stumps or excess surface rock within the construction right-of-way during restoration; however, section V.A.6 of our Plan states that all construction debris must be removed from work areas unless the landowner or land managing agency approves leaving the materials onsite for beneficial reuse, stabilization, or habitat restoration. As we generally do not find the burial of such materials to be beneficial, we do not approve the burial of these materials within the right-of-way (see section B.1.2).

Temporary soil erosion and sedimentation control devices would be installed as needed in accordance with our Plan and DTE's E&SCP, and maintained throughout construction and restoration of the Project. Existing fences would be cut and braced as needed along the right-of-way. Crews would install or relocate temporary fencing, safety fencing, or gates as needed and in accordance with permits and landowner agreements. Following clearing, the construction right-of-way and ATWS areas would be graded using bulldozers, where necessary, to provide a level work surface.

Trenching would be conducted with a backhoe or ditching machine. Large stones or bedrock would be broken using conventional rock-trenching methods, such as with track-mounted mechanical rippers. Blasting is not currently proposed (see section A.8.2). Excavated soils would be stockpiled along the right-of-way on one side of the trench (the "spoil side") opposite from the construction traffic and pipe assembly area ("working side"). In agricultural, residential, and non-saturated wetland areas, subsoil would be stored adjacent to the trench within the construction right-of-way limits and maintained separately from topsoil piles.

Typically, the trench would be excavated at least 24 inches wider than the diameter of the pipe (about 36 inches wide for a 12-inch-diameter pipe). The trench would be excavated to a sufficient depth (typically 60 inches) to allow a minimum of 4 feet of soil cover between the top of the pipe and the final graded land surface after construction. Pipeline cover may be greater at road, stream, wetland, and railroad crossings. The depth of cover would be a minimum of 2 feet in areas of consolidated rock.

Individual sections of pipe would be trucked to the construction right-of-way and strung along the trenchline in a single, continuous line. Typically, a segment of pipe (joint) is about 40-feet-long and would be mill- or yard-coated. Sideboom tractors would be used to off-load pipe from the trailers. A track-mounted, hydraulic pipe-bending machine would be used to tailor the shape of the pipe to conform to the contours of the terrain. Specific pieces of pipe would be pre-fabricated, factory bent or shaped, and trucked to the right-of-way.

The pipe segments would then be placed on temporary supports and welded together. All pipe welds would be coated or wrapped to prevent corrosion. The coating would be visually and mechanically inspected for defects, and repaired if necessary, prior to lowering the pipe into the trench.

Prior to lowering in the pipe, the trench would be inspected to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. Where terrain is sloping or at the crossing of environmentally sensitive resources (wetland and stream crossings), DTE would install trench breakers, using materials such as concrete mix, foam, or sand-filled bags to prevent water flow from establishing in the subsurface through the trenchline.

The pipe would then be lifted from the temporary supports and lowered into the trench using sideboom tractors. Once the pipe has been lowered in, the trench would be backfilled with previously excavated materials. If excavated materials are not suitable (e.g., too rocky), the pipeline would be covered with more suitable clean fill in accordance with the PADEP's Management of Fill Policy (#258-2182-773), or protected (wrapped) with a rock shield. Topsoil would not be used to pad the pipe. Subsoil would be used to fill the bottom of the trench, with segregated topsoil replaced after the subsoil.

After backfilling, pipeline segments would be hydrostatically tested in sections to ensure the system is free from leaks and meets safety requirements at operating pressures. Municipal water would be trucked to the right-of-way for use in hydrostatic tests. No chemicals would be added to the test water prior to use. The water in the pipe segments would be pressurized and held for a minimum of 8 hours and the test would be conducted in accordance with 49 CFR 192 and applicable permit conditions. Any leaks detected would be repaired and the pipe segment retested. Upon completion of hydrostatic testing, the water would be contained and hauled offsite for disposal at an approved facility. Refer to section B.2.2 of this EA for additional information on hydrostatic testing.

Final cleanup would begin after backfilling and as soon as weather and site conditions permit. DTE would make every attempt to complete final cleanup (including removal of construction debris, replacement of topsoil where applicable, final grading, and installation of permanent erosion control devices) within 20 days after the trench is backfilled. In residential areas, cleanup and restoration would take place within 10 days of backfilling. When final cleanup would be prevented by winter conditions, DTE would implement its Winter Construction Plan, which includes measures to temporarily stabilize the right-of-way and avoid erosion until spring thaw conditions (see section A.8.2).

DTE would implement restoration practices in accordance with our Plan, its Procedures and E&SCP, and applicable permit requirements. Areas disturbed by construction would be graded, typically by large equipment such as bulldozers, to match original contours and surrounding drainage patterns, except at those locations where permanent changes in drainage would be required to prevent erosion, scour, and possible

exposure of the pipeline. A slight crown at the top of the trench may be left to allow for settling. Excess soil may be spread evenly within uplands in the right-of-way in accordance with landowner and agency requirements.

Permanent erosion and sediment control measures, such as water bars on steep slopes, would be installed. Fences, gates, driveways, and roads disturbed by pipeline construction would be restored to pre-construction conditions or better. Markers showing the location of the pipeline would be installed at fence and road crossings to identify DTE as the owner and convey emergency information in accordance with applicable government regulations, including DOT safety requirements.

In most upland locations, excluding actively cultivated cropland, areas disturbed by construction would be revegetated with an appropriate seed mixture (via mechanical hopper type seeder) and mulch would be applied as appropriate to avoid erosion. DTE includes the use of PADEP-approved seed mixes in its E&SCP.

8.2 Special Pipeline Construction Procedures

Waterbody Crossings

DTE proposes to cross streams using open cut, dam-and-pump, flume, cofferdam, HDD, and conventional bore crossing methods. DTE would adhere to the measures specified in its E&SCP, as well as any additional requirements that may be specified in federal or state waterbody crossing permits. DTE would also segregate the top layer of streambed material during excavation through waterbodies, replace the excavated spoil in the trench in the order that it was removed after construction was completed, and restore the streambed and banks to their pre-construction contours.

Open Cut Method

An open cut crossing method is proposed at waterbodies that are dry or have no perceptible flow at the time of crossing. This method is typically conducted with backhoe-type excavators operating from the banks of the waterbody. Spoil excavated from the trench would be placed at least 10 feet upland from the bank (where possible) for use as backfill. A prefabricated segment of pipeline would then be placed into the trench using sideboom tractors. Concrete coating or set-on weights would be utilized, as necessary, to provide negative buoyancy for the pipeline. Once the trench is backfilled, the banks would be restored to pre-construction contours and stabilized. Per DTE's Procedures and E&SCP, stabilization measures would include seeding, installation of erosion control blankets, or installation of riprap materials that are in compliance with the COE permit terms and conditions, as appropriate. If conditions changed during construction such that perceptible flow was present, or likely to become present, DTE would implement either the dam-and-pump, flume, or cofferdam method, as described below.

Dam-and-Pump Crossing Method

A dam-and-pump crossing diverts or isolates flow during pipe installation. The dam-and-pump method involves installing temporary dams upstream and downstream of the proposed waterbody crossing, typically using sandbags. Following dam installation, pumps with hoses would be used to transport the streamflow around the construction work area and trench. Additional pumps would be used to dewater the area between the dams; water from the excavation area would be filtered prior to discharge back to the stream. Intake screens would be installed at the pump inlets to prevent or limit entrainment of aquatic life, and energy-dissipating devices would be installed at the pump discharge point to minimize erosion and streambed scour. Trench excavation and pipe installation would then commence through the dewatered and relatively dry portion of the waterbody channel. After the pipe installation, the backfilling of the trench, and the restoration of the stream banks, the temporary dams would be removed and flow through the construction work area would be restored.

Flume Crossing Method

The flume method is similar to the dam-and-pump method of crossing but uses flumes instead of pumps to maintain water flow and fish passage during pipeline construction. During a typical flume crossing, water would be diverted across the trenching area through one or more flume pipes of suitable diameter to convey the maximum water flow. Temporary sandbag and plastic sheeting dams would be used to support and seal the ends of the flume and to direct stream flow into the flume and over the construction area. These temporary dams at both the upstream and downstream sections of the flume would create a containment area where turbid water would be confined. The water would then be pumped out through an upland dewatering structure to create a dry work area for trench excavation and pipe installation. Immediately after backfilling, bottom recontouring, and restoration of stream banks, the flume and temporary dams would be removed and flow through the construction work area would be restored.

Cofferdam Method

The cofferdam crossing method diverts water from one portion of the stream at a time to accommodate a dry crossing. Using sandbags, inflatable bladders, steel plates, or other impermeable barriers, water is temporarily diverted from one side of the stream to establish a dry side and a wet side. The pipeline is then installed in segments; the first segment is installed on the dry side as described with the dam-and-pump method, then the stream bottom and bank are restored to pre-construction conditions, and erosion and sediment controls are installed before reestablishing water flow. The barriers are then moved to the opposite site of the waterbody and the process is repeated.

HDD Crossing Method

DTE proposes to use the HDD method of construction at four locations (see table A-5). The HDD method involves drilling a pilot hole under the waterbody, or targeted feature, then enlarging that hole through successive reaming until the hole is large enough to accommodate the pipe. Throughout the process of drilling and enlarging the hole, a slurry (drilling mud) made of materials such as bentonite clay and water would be circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and hold the hole open. Pipe sections long enough to span the entire crossing would be staged and welded along the construction work area and then pulled through the drilled hole. This crossing method requires ATWS for the HDD entry and exit points, but generally avoids impacts on the feature being crossed. DTE does not anticipate clearing vegetation between the entry and exit pits for placement of the HDD guide wire; however, if necessary, minimal vegetation within a 2-foot-wide path would be hand-cleared. Foot traffic would be required to lay the guide wire between the entry and exit pits and during drilling operations to monitor for potential return of drilling mud to the surface, known as an inadvertent return. DTE has completed geotechnical analyses of each proposed HDD and determined that each has a low probability for inadvertent returns.[11] However, DTE prepared an Inadvertent Return Contingency Plan that includes measures to prevent, contain, and mitigate any inadvertent returns from HDD activities.

Table A-5
Summary of Horizontal Directional Drill Locations for the Project

HDD Number	Begin Milepost	End Milepost	Length (feet)	Primary Features Avoided
HDD-1	0.3	0.6	1,425.6	Schuylkill River
HDD-2	2.1	2.2	792.0	Monocacy Creek, two wetland complexes, Valley Road
HDD-3	4.0	4.2	950.4	Unnamed Tributary to Monocacy Creek, a wetland complex
HDD-4	10.5	10.7	844.8	Little Manatawny Creek, three wetland complexes, Bertolet Mill Road

[11] Geotechnical analyses were included in Resource Report 6 attached to DTE's application to the FERC, and are available for public review on our website (www.ferc.gov) in our eLibrary system under Docket No. CP17-409-000; Accession No. 20170501-5361. DTE's determination of inadvertent return probability can be found at Accession No. 2017-0720-3029.

Conventional Bore Crossing Method

DTE proposes to cross one waterbody by conventional bore, which would eliminate impacts on its bed and banks. Bored crossings consist of excavating a pit on each side of the feature to be crossed, placing boring equipment within the pits, boring a hole under the feature, and pulling a section of pipe through the hole. Dewatering the bore pits would be similar to dewatering the trench, as described above for the dam-and-pump and flume crossing methods.

Wetland Crossings

DTE would reduce its typical construction right-of-way width to 50 feet (or less) through wetlands. Wetland boundaries would be delineated and marked in the field prior to construction activities. Wetlands would be crossed via open cut or HDD methods. HDD crossing methods would be the same as those described above for waterbodies. At open cut wetland crossings, woody vegetation within the construction right-of-way would be cut off at ground level and removed from the wetlands, generally leaving the root systems intact; the pulling of tree stumps and grading activities would be limited to the area directly over the trenchline unless it is determined that safety-related construction constraints require otherwise. DTE would install temporary sediment control devices as necessary after initial disturbance of wetlands or adjacent upland areas to prevent sediment flow into wetlands. These devices would be maintained until revegetation of the wetlands is complete. Construction equipment operating in wetland areas would be limited to that needed to clear the right-of-way, dig the trenches, install the pipeline, backfill the trenches, and restore the right-of-way. In addition, DTE would install trench plugs to maintain wetland hydrology and use timber mats in saturated wetlands where rutting could occur.

Where soils are stable and are not saturated at the time of crossing, the pipeline would be installed using methods similar to those in uplands. Up to 12 inches of topsoil would be stripped from the area directly over the trenchline (except in areas of standing water or in saturated conditions) and stockpiled separately from the subsoil. Following pipeline installation, DTE would backfill the trench with subsoil then topsoil, and install permanent erosion control measures in accordance with its Procedures and E&SCP. Wetlands would typically be allowed to revegetate naturally; however, DTE would seed wetlands with annual rye grass or wetland seed mixtures as required by applicable permits for temporary erosion control.

Saturated wetlands include those with either standing water or completely saturated soils at the time of construction. Topsoil segregation is generally not practical in saturated wetlands, and saturated wetlands would be crossed using timber mats to avoid rutting. Where wetland soils are sufficiently saturated and/or inundated, the pipeline may be installed using the push-pull technique. The push-pull technique involves stringing and welding the pipeline outside of the wetland and excavating the

trench through the wetland using a backhoe supported by equipment mats or pontoons. The water that seeps into the trench is used to "float" the pipeline into place. After the pipeline is in place, the floats are removed, allowing the pipeline to sink into the bottom of the trench. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, the trench is backfilled.

Some staging areas may be required adjacent to wetlands for the assembly and fabrication of the pipeline to perform a wetland crossing. These ATWSs would be located at least 50 feet from the edge of the wetland except in cases where this is not feasible (for example, near HDD entry and exit locations and road crossings). In these cases, DTE has requested modifications to the FERC Procedures that would allow a setback less than 50 feet from wetlands (see appendix C). One wetland is located within a contractor yard proposed for use; DTE would install construction fencing around the wetland and would avoid impacts on the wetland.

Road and Railroad Crossings

The Project would cross 26 local, state, and federal roads using open cut methods, conventional bore, or HDD (see appendix D). All five dirt/gravel roads, as well as nine asphalt roads, would be crossed by open cut methods and the pipeline would be buried at least 4 feet below the road surface. Each of these roads would be restored to pre-construction conditions or better. To minimize impacts at open cut road crossings, DTE would temporarily detour traffic using appropriate signage. Where no reasonable detour is available, DTE would keep at least one lane open until closure is essential for pipeline installation. When a roadway is inaccessible or open cut, construction would be paused and/or a steel plate would be laid down to accommodate through traffic. Road closures would be arranged in coordination with the appropriate transportation authority. Of the remaining road crossings, 10 would be crossed by conventional bore and 2 paved roads would be crossed by HDD. One railroad would be crossed by HDD.

Existing Utility Crossings

The proposed pipeline would cross 35 existing utility lines (see appendix E), the majority of which are overhead electric lines. Prior to construction, DTE would utilize the Pennsylvania One-Call system to locate known utilities and to ensure no other existing pipelines or other utilities are buried underground. If buried pipelines or utilities are identified through the One-Call system, or evidence of an existing utility is otherwise identified, DTE would scan the right-of-way with passive inductive locating equipment to precisely locate the pipelines prior to grading. Excavations within 3 feet of existing pipelines would be conducted by hand and the pipeline would typically be installed with at least 18 inches beneath the existing line to maintain a safe separation between the pipelines during construction and operation. Pipeline operators would be identified prior to construction and consulted regarding pipeline protection measures. Operators would

also be given adequate notice of the crossing and the opportunity to be present during construction in the vicinity of their pipeline. In the event that an existing utility was damaged during construction, DTE would notify the owner of the utility and would stop work, if necessary due to safety concerns, in the vicinity of the utility until the facility could be repaired.

Agricultural Areas

Construction through agricultural areas would be conducted in a manner similar to conventional pipeline construction; however, DTE would segregate topsoil from subsoil. The full depth of topsoil in shallow soils, or at least 12 inches of topsoil in deep soils, would be segregated from subsoil in agricultural areas over the full right-of-way width. DTE would store topsoil and subsoil in separate windrows along the construction right-of-way to prevent soil mixing. DTE has included an additional 25 feet of ATWS in agricultural lands to accommodate topsoil segregation across the full construction right-of-way. During backfill operations, subsoil would be used to initially backfill the trench, and then the topsoil would be reapplied to the top of the trench and the graded right-of-way. Excess rock would be removed from at least the top 12 inches of soil, such that the size, density, and distribution of rock would be similar to adjacent, undisturbed areas.

In cultivated agricultural land, DTE would bury the pipeline at a depth of 4 feet. DTE has identified drain tiles for portions of the Project area and continues to work with landowners to identify any additional drainage and irrigation systems that would be crossed by the Project and to develop site-specific measures to minimize impacts on these systems. In the event of damage by Project-related activities, DTE would work with the landowner to repair or replace these systems.

Seeding would not be conducted in cultivated croplands unless requested by the landowner. Revegetation of agricultural lands would be considered successful when, upon visual survey, crop growth and vigor were similar to adjacent undisturbed portions of the same field. DTE would visually inspect agricultural areas during the first and second growing seasons, at a minimum, to monitor revegetation success. DTE would work with landowners regarding any damages or loss to their productivity.

Residential Areas

DTE has identified all residences and associated structures within 50 feet of construction workspace and would implement measures to minimize impacts on them. After construction, final grading would be conducted within 10 days of backfilling the trench. All turf, ornamental shrubs, and specialized landscaping would be restored in accordance with landowner request. See section B.5.2 for additional information on construction in residential areas.

Blasting

DTE does not anticipate blasting during construction of the Project. DTE would avoid the need for any blasting by breaking large stones or bedrock in the trench using conventional rock-trenching methods. In the event that blasting becomes necessary, DTE would submit a blasting plan for FERC review and approval. Any excess fill during rock-trenching would be disposed of in accordance with our Plan, DTE's E&SCP, and PADEP's Management of Fill Policy

Winter Construction

During construction in winter conditions, DTE would implement measures in its Winter Construction Plan, including methods of snow handling and removal. Snow removal would be limited to construction work areas. DTE would complete topsoil segregation prior to frozen soil conditions, where practicable. When removing topsoil in frozen soil conditions, DTE would limit topsoil removal to equipment or methods that can accurately segregate soil layers. When final cleanup would be prevented by winter conditions, DTE would implement measures to temporarily stabilize the right-of-way and avoid erosion until spring thaw conditions.

8.3 Aboveground Facility Construction Procedures

Aboveground facilities would be constructed in accordance with all applicable federal and state regulations. Generally, construction of aboveground facilities would begin with clearing and grading of the construction workspace, and excavation would be conducted where necessary to accommodate new foundations. Subsequent activities would include preparing foundations, installing underground piping, installing aboveground piping and machinery, testing the piping and control equipment, and cleaning and stabilizing the work area. Aboveground facilities would be fenced, and areas around buildings, meters, piping, and associated equipment would be covered with crushed rock or similar material. Any areas not covered with rock or paving would be seeded with a compatible grass and would be maintained as herbaceous cover. The buried piping between the pigging facility and the corresponding meter station would be constructed and restored in the same way as described for the pipeline.

8.4 Environmental Compliance Inspection and Monitoring

Prior to construction, DTE would conduct environmental training for the appropriate construction personnel. Construction contractors would receive environmental training applicable to their job duties and construction management and environmental inspectors (EI) would receive all Project-specific information. The training program would focus on our Plan; DTE's Procedures and E&SCP; Project-specific Certificate and other permit conditions; regulatory requirements, such as those pertaining to endangered species, cultural resources, or wetlands; and other Project-

specific mitigation plans. DTE would employ at least one EI for each construction spread during construction and restoration; all EIs generally report to the applicant's Chief Inspector. EIs would have the authority to stop activities that violate the Project's environmental conditions and to order appropriate corrective action. If the violations were serious or pervasive, an EI could also shut down the entire Project until further training and the appropriate corrective actions were conducted.

DTE would conduct post-construction monitoring to document restoration and revegetation of the right-of-way and other disturbed areas. DTE would monitor wetlands for a period of 3 years or until revegetation is successful in accordance with its E&SCP and Procedures. DTE would monitor upland areas after the first and second growing seasons following restoration or until revegetation is successful in accordance with its E&SCP and our Plan. DTE would also submit quarterly monitoring reports to the FERC to document the status of revegetation in disturbed areas. These reports would describe the results of post-construction inspections, any problem areas, and corrective actions taken.

Monitoring would cease if an area meets performance standards at the end of the second year (or in any subsequent year). DTE would also file with FERC a wetland revegetation monitoring report 3 years after the completion of construction, and would continue to file monitoring reports on an annual basis thereafter until revegetation efforts are considered successful.

In addition, FERC staff would inspect the Project throughout construction to independently verify compliance with the Commission's Order. FERC staff would continue to monitor and inspect the vegetation along the Project route until restoration and revegetation are deemed successful.

8.5 Operations and Maintenance

DTE would periodically inspect the pipeline from the air and/or on foot, in accordance with applicable regulatory requirements, to identify potential concerns that may affect the safety and operation of the pipeline. If pipeline patrols or vegetation maintenance identify areas on the right-of-way where erosion is occurring, DTE would repair existing erosion control devices or install additional devices as necessary.

To maintain accessibility to the right-of-way and accommodate pipeline integrity surveys, vegetation along the permanent pipeline right-of-way would be cleared periodically, using mechanical mowing or cutting where necessary. Routine vegetation maintenance in uplands would not be conducted more frequently than every 3 years, with the exception of a 10-foot-wide corridor centered on the pipeline that would be maintained yearly in an herbaceous state to allow for periodic corrosion and leak surveys. Routine vegetation maintenance would be conducted in accordance with timing

restrictions established for the protection of migratory birds and as approved by the U.S. Fish and Wildlife Service (FWS; see section B.3.4).

Active cropland would be allowed to revert to pre-construction use for the full width of the right-of-way. In wetlands, a 10-foot-wide corridor centered over the pipeline could be maintained in an herbaceous state and trees within 15 feet of the pipelines with roots that may compromise the pipeline integrity may be selectively cut and removed from the right-of-way.

DTE personnel also would perform regular operation and maintenance activities on equipment at the pigging facility, meter station, and MLVs. These activities would include calibration, inspection, and scheduled routine maintenance. Operational testing would be performed on safety equipment to ensure proper functioning, and problems would be corrected.

9. Non-Jurisdictional Facilities

Under Section 7 of the NGA, and as part of its decision regarding whether or not to approve the facilities under its jurisdiction, the Commission is required to consider all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. These non-jurisdictional facilities may be integral to a project (for instance, a natural gas-fueled power plant at the end of a jurisdictional pipeline) or they may be minor, non-integral components of the jurisdictional facilities that would be constructed and operated because of a project.

Birdsboro Power's Birdsboro Power Facility is a new natural gas-fired combined cycle electric generation facility designed to generate up to 485 megawatts of electrical power. The Birdsboro Power Facility will be located on lands previously disturbed for a steel mill. Construction of the new power plant is expected to begin in 2017, and the facility is expected to be operational in April 2019. The Birdsboro Power Facility is subject to state and local permitting requirements. Many permits and approvals, including federal and state clearances for special status species, as well as local land development plans, have been obtained. Available information regarding the impacts associated with construction and operation of the power plant is disclosed and considered in section B.10 of this EA (cumulative impacts).

10. Permits and Approvals

As discussed, in section A.1, the EPA and COE participated as cooperating agencies in the preparation of this EA. The EPA has delegated water quality certification, under Section 401 of the CWA, to PADEP. The EPA also oversees the issuance of a National Pollutant Discharge Elimination System permit by the Berks

County Conservation District, under Section 402 of the CWA, for point-source discharge of used water into waterbodies.

The COE has authority pursuant to Section 404 of the CWA, which governs the discharge of dredged or fill material into waters of the U.S., and Section 10 of the Rivers and Harbors Act, which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Table A-6 provides a list of federal and state permits related to construction and operation of the Project.

Table A-6
Environmental Permits, Approvals, and Consultations for the Project

Agency	Permit / Approval / Consultation	Status
Federal		
FERC	Certificate of Public Convenience and Necessity	Application in review.
COE, Philadelphia District	CWA Section 404; Section 10 of the River and Harbors Act Authorization	Application submitted on April 13, 2017; modification to be submitted in the fourth quarter of 2017
FWS	Endangered Species Act, Section 7 Consultation	DTE Initiated informal consultation in July, 2016. FERC consultation is ongoing.
	Migratory Bird Treaty Act	Consultation initiated in July 2016. Report submitted March 24, 2017; FWS responded August 4, 2017.
Advisory Council on Historic Preservation	Opportunity to Comment under Section 106 of the National Historic Preservation Act (NHPA)	Pending Determination of Adverse Effects.
State		
PADEP	Chapter 105 Water Obstruction and Encroachment Permit (Joint Permit)	Application submitted on April 13, 2017; modifications to be submitted October 2017.
	Submerged Lands License Agreement	Application submitted on April 18, 2017. Approved on September 1, 2017.
	Section 401 Water Quality Certification	Application submitted on June 23, 2017; modifications to be submitted fourth quarter 2017, if necessary.
Pennsylvania Game Commission	Threatened and Endangered Species Consultation and Clearance	Initiated consultation in June 2016. Report submitted on October 11, 2016; modifications to be submitted fourth quarter 2017.
Pennsylvania Fish and Boat Commission (PFBC)	Threatened and Endangered Species Consultation and Clearance	Initiated consultation in July 2016. PFBC provided concurrence on April 25, 2017. Concurrence on Project modifications provided October 17, 2017.

Table A-6 (continued) Environmental Permits, Approvals, and Consultations for the Birdsboro Pipeline Project		
Agency	**Permit / Approval / Consultation**	**Status**
State (continued)		
Pennsylvania Department of Conservation and Natural Resources (PADCNR)	Threatened and Endangered Species Consultation and Clearance	Initiated consultation in June 2016. PADCNR provided concurrence of initial consultation on November 2, 2016. Concurrence on Project modifications provided October 13, 2017.
Pennsylvania Historical and Museum Commission (State Historic Preservation Office [SHPO])	NHPA, Section 106 Consultations	Initial Determination of Effects Report for historical resources submitted on April 28, 2017. Initial Archaeological Report submitted on March 27, 2017; the SHPO agreed that no further archeological work on September 19, 2017. A supplemental report for additional storage yards will be submitted in fall 2017.
Pennsylvania Department of Transportation	Highway Occupancy Permits	Anticipate submittal of the application in the fall of 2017.
Delaware River Basin Commission	Coordination and Permit	Application submitted in March 2017 and approved on September 13, 2017.
County		
Berks County Conservation District	Erosion and Sediment Control General Permit (ESCGP-2) - under the National Pollutant Discharge Elimination System Program	Application submitted in April 2017; modifications to be submitted November 2017.

B. ENVIRONMENTAL ANALYSIS

This analysis generally describes temporary, short-term, long-term, and permanent impacts and effects caused by the Project's construction and operation. A temporary effect generally occurs during construction with the resource returning to pre-construction condition immediately after restoration or within a few months. A short-term effect could continue for up to 3 years following construction. Long-term effects would last more than 3 years, but the affected resource would eventually recover to pre-construction conditions. A permanent effect would result from an activity that modifies a resource to the extent that it would not return to pre-construction conditions. In the following sections, we address direct and indirect effects collectively, by resource. Section B.10 of this EA analyzes the Project's contribution to cumulative impacts.

1. Geology and Soils

1.1 Geology

The Project would be located within the Gettysburg-Newark Lowland section of the Piedmont province (MP 0.0 to 5.4), the Great Valley section of the Ridge and Valley province (MP 5.4 to 13.2), and the Reading Prong section of the New England province (MP 13.2). The Gettysburg-Newark Lowland section is characterized by rolling low hills and valleys developed on sedimentary rock with elevations ranging from 20 to 1,355 feet above sea level (Pennsylvania Department of Conservation and Natural Resources [PADCNR] 2017a). Bedrock in the Gettysburg-Newark Lowland section crossed by the Project consists of Limestone Fanglomerate (limestone and dolomite fragments in quartz matrix) and Brunswick Formation (shale, mudstone, and siltstone) (PADCNR 2017b).

The Great Valley section is characterized by broad lowlands with gently undulating hills eroded into shales and siltstones on the north side of the valley and a flatter landscape developed on limestones and dolomites on the south side. Elevations range from 140 to 1,100 feet above sea level (PADCNR 2017a). Bedrock in the Great Valley section that would be crossed by the Project consists primarily of interbedded and shaly limestones, shales, and slates of the Beekmantown Group, the Martinsburg Formation, the Jacksonburg Formation, and the Annville Formation (PADCNR 2017b).

The Reading Prong section is characterized by rounded low hills and ridges surrounded by lowlands. Elevations range from 140 to 1,364 feet above sea level (PADCNR 2017a). Bedrock in the Reading Prong section that would be crossed by the Project consists of hornblende gneiss and labradorite of the Hornblende gneiss unit (PADCNR 2017b).

Surficial geologic materials in the Project area consist primarily of cherty clay, loamy and silty sand to silty clay residuum. Glacial deposits were not identified along the Project route (PADCNR 2017b). The presence of karst terrain is discussed below.

The EPA expressed concerns regarding exposure of acid-producing rock during pipeline construction. A review of a PADCNR map of Pennsylvania indicates that no geologic units containing potential acid-producing minerals would be crossed by the Project (PADCNR 2006).

Paleontological Resources

Paleontological resources are the fossilized remains of prehistoric plants and animals, as well as the impressions left in rock or other materials. Common fossils in Pennsylvania rocks include corals, bryozoans, brachiopods, mollusks, arthropods, echinoderms, and plants (Hoskins 1999). There are no federal laws or regulations that protect paleontological resources on private lands. Although no previously recorded significant paleontological sites have been identified within the Project area, late Triassic-age dinosaur tracks have been identified in the Gettysburg-Newark lowland section that would be crossed by the Project (Paleobiological Database 2017). To minimize the potential for impacts on paleontological resources, DTE would implement its Plan for Unanticipated Discoveries of Paleontological Resources, which includes the procedures that would be implemented if any such resources were encountered during construction, including stopping work within 100 feet of the find until a paleontologist has been consulted. Therefore, we conclude the Project would not adversely affect paleontological resources.

Mineral Resources

The construction and operation of the Project over mineral resources could affect the present and future extraction of those resources. The primary mineral resources in Pennsylvania include coal reserves, natural gas, and petroleum products (U.S. Energy Information Administration [EIA] 2016). Pennsylvania is also one of the top 10 producing states for aggregate/crushed stone, which usually involves limestone/dolomite, sandstone, and argillite (PADEP 2017a).

Information regarding coal mining activities in the Project area was obtained from the Pennsylvania Geospatial Data Clearinghouse ([PGDC] 2015). No mining permits, or active, inactive, or abandoned coal mines were identified within 0.25 mile of the Project.

Based on data from the PADEP Oil and Gas Mapping and eMapPA websites, there are no active or inactive oil and gas wells located within 0.25 mile of the Project (PADEP 2017b,c). Further, no planned oil and gas wells were identified in the Project area based on a review of permits (PADEP 2017d). The Project would not cross any known gas storage facilities (EIA 2015).

Information regarding industrial mineral mining activities and locations in the Project area was obtained from the PGDC (PGDC 2015). One active surface quarry was identified within 0.25 mile of the Project. The Lehigh Cement Co. LLC (Lehigh) mineral

mining operation, which mines and crushes limestone for cement, would be crossed by the pipeline near MP 9.2. As requested by the landowner, DTE adjusted the original pipeline route to traverse the eastern quarry property line. In addition, one contractor yard and an access road (AR-6) would be located within the quarry boundaries. DTE would coordinate pipeline construction with the quarry to minimize potential impacts on mining activities.

Multiple public comments expressed concern regarding the potential for active blasting at the quarry to result in impacts on the proposed pipeline. In response to the public comments, DTE conducted a study of potential impacts on the pipeline from active blasting at the quarry. Using various blasting configurations based on the maximum criteria in Lehigh's blasting permit, 7 of the 8 configurations assessed indicated that the closest distance blasting could occur that limits total stress to allowable levels would be 130 feet. The final blasting configuration indicated that blasting could occur within 40 feet of the pipeline without exceeding the stress limit. The actual distance required between the pipeline and any future blasting would be based on the specific blasting plans to be used by Lehigh.

In correspondence with DTE, Lehigh has indicated that it has no future plans to blast within 800 feet of the proposed pipeline route. However, Lehigh and DTE will coordinate on any future blasting to ensure that it would be conducted in accordance with all applicable rules and regulations, as well as DTE's corporate safety policy requirements and operational plans. Lehigh would adhere to existing applicable guidance (PADEP document 562-2112-503) and regulations (25 Pennsylvania Administrative Code [PAC] §211.182), which indicate that any blasting Lehigh may engage in within 200 feet of the proposed pipeline would not result in unsafe conditions. State regulations (25 PAC §211.182(a)) require that "blasts shall be designed and conducted so that they provide the greatest relief possible in a direction away from the utility line and to keep the resulting vibration and actual ground movement to the lowest possible level." In PADEP's policy statement titled "*Blasting Near Utility Lines on Mining and Construction Sites and Bituminous Coal Mining Within the Right-of-Way or Easement of Utility Lines*" effective September 3, 2011, PADEP sets forth prior notification requirements and requires, where the permittee does not obtain a written agreement with the underground utility owner (here, DTE), that blasts must be designed to keep the resulting vibrations within 4.0 inches per second, unless otherwise approved by the PADEP. DTE states that this level of vibration has been verified as safe for the proposed pipeline as explained in DTE's Blast Report.

Geologic Hazards

Geologic hazards are natural physical conditions that, when active, can result in damage to land and structures, or injury to people. Potential geologic hazards can be related to seismic activities, such as earthquakes and fault rupture. Other potential geologic hazards may include soil liquefaction, landslides, and subsidence (including

potential karst areas). The pipeline alignment was evaluated with respect to those geologic processes that have potential for occurrence.

Seismic Hazards

The Project occurs within a region of low historical earthquake activity. A review of earthquakes over the last 50 years identified 64 events within 50 miles of the Project, all with Richter scale magnitudes of 4.6 or less. On average, these earthquakes were more than 12 miles from the Project area. The closest event to the Project was about 4.3 miles away and occurred in November of 2003 with a magnitude of 2.4. This is described on the Mercalli Intensity Scale as typically not felt except by very few under especially favorable conditions (USGS 2017a,b). According to the ground shaking intensity maps from the USGS, the Project would be located in an area with a Modified Mercalli Intensity of IV, which is described as light, felt indoors by many, but outdoors by few (USGS 2017c).

In addition, according to the USGS Quaternary Fold and Fault database, no Quaternary-Period faults would be crossed or encountered by the Project facilities (USGS 2014a). Therefore, the potential for seismic activity due to faults in the Project area is minimal. Further, modern pipeline systems have not sustained damage during seismic events except due to permanent ground deformation, or traveling ground-wave propagation greater than or equal to a modified Mercalli Intensity of VIII (similar to a Richter scale magnitude around 6.8 to 7.0) (O'Rourke and Palmer 1996, USGS 2017d). Modern pipelines exhibit elastic behavior and have greater ability to conform to ground movements from vibration and slippage. As such we conclude that the potential for impacts on the Project from seismicity or surficial ground rupture would be low. Similarly, because the Project area has a low potential for strong prolonged ground shaking associated with seismic events, the soil liquefaction potential is low.

Landslides

Landslides involve the downslope mass movement of soil, rock, or a combination of materials on an unstable slope. The Project is located in an area that has a low susceptibility to landslides (PADCNR 2015). Steep slopes cause loose, unconsolidated sediments to collect, resulting in landslides. Potential causes of landslides related to Project construction include vibrations from machinery or traffic, alterations to slope morphology caused by earthwork, the addition of new loads on an existing slope, the removal of deep-rooted vegetation that binds shallow soils to bedrock, or changes in water volume infiltrating into the soil as a result of construction. In areas with steep slopes, soils may be unstable and present erosion management problems when disturbed, often requiring erosion and sedimentation control measures during pipeline construction and operation. Landslide incidences may be more frequent in areas of steep slopes. No areas of the pipeline route were identified to traverse slopes greater than 30 percent.

Subsidence

Ground subsidence is a lowering of the land-surface elevation that results from changes that take place underground. Subsidence can range from small, localized areas of collapse to a broad, regional lowering of the ground surface. Common causes of land subsidence include the dissolution of limestone in areas of karst terrain, and the collapse of underground mines. Subsidence could also be caused by pumping water, oil, and gas from underground reservoirs.

Karst features, including sinkholes, caves, and caverns, form as a result of long-term dissolution of soluble bedrock. These include carbonate rocks, including limestone, dolomite, and gypsum. The USGS Digital Map Compilation and Database for karst in the United States was used to determine areas where karst features exist, or could exist, in areas crossed by the Project (USGS 2014b). Table B-1 presents bedrock formations with the potential to form karst features that would be crossed by the Project.

Table B-1
Bedrock Areas Subject to Karst Formation

Begin Milepost	End Milepost	Formation	Rock Type
4.8	5.5	Limestone Fanglomerate	Limestone / Dolomite
5.5	5.7	Beekmantown Group	Limestone / Dolomite / Chert
5.7	6.1	Jacksonburg Formation	Limestone / Shale
6.3	8.2	Beekmantown Group	Limestone / Dolomite / Chert
8.2	8.4	Annville Formation	Limestone
8.4	8.6	Jacksonburg Formation	Limestone / Shale
8.6	11.3	Beekmantown Group	Limestone / Dolomite / Chert
12.5	13.2	Beekmantown Group	Limestone / Dolomite

Source: USGS 2014b.

Based on desktop review of PADCNR historic data, 1 sinkhole and 21 surface depressions were identified within the pipeline right-of-way between MP 5.5 and 13.1, with 4 additional sinkholes and numerous additional surface depressions identified within 300 feet of the pipeline centerline (PADCNR 2017b). No karst features were identified in the vicinity of the TETCO Meter Station. DTE has contacted USGS and PADCNR regarding the degree of karst development along the pipeline route. Although correspondence from USGS is pending, PADCNR input was considered in DTE's karst evaluations.

Based on the desktop assessment, DTE conducted additional, phased site investigations, including the use of ground-penetrating radar (GPR), microgravity, resistivity, and/or geotechnical boring. GPR investigations were conducted over about

5.5 miles of the pipeline route, in areas with the highest abundance of historical karst features to identify possible karst features (e.g., dips in the bedrock, soil draping, and fractures). At three locations where GPR and other factors identified areas of concern (the surface quarry near MP 9.2 and the valleys at MP 10.7 and 12.5), DTE conducted further studies in the form of microgravity and resistivity investigations and geotechnical borings. Thirteen geotechnical borings were conducted at the surface quarry based on the results of microgravity/resistivity. No evidence of voids, fractures, or solution features were identified in any of the borings. Microgravity analysis was conducted near MP 10.7 (HDD-4) to further investigate the initial results of geotechnical borings. The combined analysis indicated that no solution features consistent with karst topography were present. Five total geotechnical borings were conducted near wetland GF1 at MP 12.5. Although no solution features were identified, the presence of an historic fault, evidenced by an abrupt change in the occurrence of bedrock along the bore path, the presence of fault gauge material identified in one of the geotechnical borings, as well as slickensides on bedrock surfaces (indicative of frictional bedrock movement), resulted in DTE changing its originally proposed crossing method from an HDD to a traditional open cut crossing at this location. DTE conducted geotechnical investigations at the four remaining proposed HDD crossings and determined that each was suitable for HDD construction and would have a low risk of inadvertent returns

Due to the potential for karst features to form in the Project area, DTE developed a Karst Mitigation Plan, which includes general measures that would be implemented during construction through karst terrain. These measures include: diversion of surface water run-off, measures to reduce the potential for direct precipitation to pond within the open trench, and measures to reduce the potential for surface water infiltration following pipeline installation. In addition, DTE would monitor the right-of-way during construction and operations through karst areas and, if evidence of subsidence were noticed, would implement corrective actions as directed by a geotechnical engineer or engineering geologist. Further, the pipeline would be constructed of thick-walled, self-supporting steel pipe with small vertical loads and a minimum spanning ability of 8 feet during construction (considered the most conservative/heaviest case where the pipe is filled with hydrostatic test water and covered with 4 feet of soil). During operations, the anticipated spanning ability would be 78 feet, accounting for the lighter weight of the pipe contents (natural gas instead of test water) and the lack of soil overburden, which would be pulled into any sinkhole opening beneath the pipe.

In response to our request, DTE has also submitted its Karst Mitigation Plan to the PADCNR for review and comment; however, documentation of PADCNR's review of the plan has not yet been provided; therefore, **we recommend that**:

- **<u>Prior to construction</u>, DTE should file with the Secretary of the Commission (Secretary), for review and approval by the Director of the Office of Energy Projects (OEP), an updated Karst Mitigation Plan that considers any PADCNR concerns or comments.**

As mentioned above, one of the proposed HDDs (HDD-4 at MP 10.5) was determined to be underlain by carbonate bedrock. However, the phased site investigations did not identify any concerns with the completion of this HDD since no solution features were identified.

To further minimize the potential for an inadvertent return at HDD-4, DTE would excavate loose materials at the surface of the entry pit, such that the drill would begin directly in the bedrock, and at the exit pit, such that the drilling fluid would be directed to the HDD pit. The bedrock underlying HDD-4 was also assessed for its rock quality designation (RQD), which indicates the degree of weathering and fractures in a rock mass. RQDs higher than 50 percent indicate fair rock quality with fewer fracture. Three geotechnical borings were captured for HDD-4, including locations near the entry and exit pits, as well as near the center of the drill, adjacent to a wetland complex. The average RQD of the three borings ranged from 51 to 61 percent, indicating that the bedrock is of sufficient hardness/quality to minimize the potential for an inadvertent release.

Because DTE's geotechnical investigations of the proposed pipeline through areas of historic karst features did not identify any current threats to the pipeline, and because of the mitigation measures that DTE would implement in its Karst Mitigation Plan during construction and operations (including any modifications based on our recommendation), we have determined that there would be no significant impacts due to construction or operation of the proposed pipeline within karst terrain.

As discussed above, there are no active or abandoned subsurface mines within 0.25 mile of the Project, and as such, there is no potential for land subsidence due to mine collapse in the Project area.

Hazards can be induced from quarry dewatering or large capacity groundwater withdrawal. Lehigh's active surface mine quarry was identified at MP 9.2. Lehigh is currently permitted to mine to a maximum of 135 feet mean sea level without further PADEP approval. Additional mining depths would require updated groundwater reporting (groundwater elevation, quarry pumping data, well complaints/losses, and sinkhole development) and modeling (simulations assessing the effects of deepening the quarry and lowering groundwater levels). No dewatering activities are currently ongoing at the quarry and any future dewatering would occur in accordance with their PADEP permits and permit conditions.

Flash Flooding

About 1.6 miles of the proposed pipeline and the pig receiver at MP 0.0 would be located within the Federal Emergency Management Agency (FEMA) 100-year floodplain. According to FEMA, these floodplains have a 1 percent annual chance of a flood event. However, DTE would design the pig receiver to minimize effects from high velocity flows associated with any flooding event. No other facilities would be located in floodplains. We conclude that the Project facilities would not discernably alter the flood storage the capacity of affected floodplains.

Bank erosion and/or scour from flash flooding could result in exposure of the pipeline or cause the pipeline to become unsupported. Prior to construction, DTE would inspect banks to determine the need for bank stabilization. DTE modeled scour depths at the 11 waterbodies that would be crossed by open cut methods (see appendix F); the greatest potential for scour was conservatively estimated to be 3.3 feet, and would not reach the minimum depth of pipeline burial 4 feet (see section B.2.2). During operation, DTE would inspect the pipeline right-of-way periodically for signs of erosion.

Blasting

Blasting is sometimes required for pipeline projects located in areas with shallow bedrock. Although shallow bedrock would be encountered along 30.3 percent of the Project, blasting is not currently anticipated. In areas of shallow bedrock, DTE would avoid blasting by breaking apart large stones or bedrock using conventional rock-trenching methods such as rock trenchers, hydraulic hoe hammers, and ripper teeth. In the event that blasting becomes necessary, DTE would submit a blasting plan to the FERC for review and approval.

Ground excavation would be generally limited to trenching and facility installation during construction; no additional ground would be excavated during operation of the Project and therefore no operational impacts on geologic resources would be expected. With strict adherence to the mitigation measures identified and ongoing consultations with federal and state entities regarding karst terrain, impacts on geologic resources are not anticipated to be significant.

1.2 Soils

Soil information and tables for the Project were developed using the U.S. Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA-NRCS 2016). Dominant soil orders include Alfisols, Inceptisols, and Ultisols, which are moderately deep to very deep, moderately well drained to somewhat excessively drained, and loamy or loamy-skeletal soils (USDA-NRCS 2006). These soil orders are formed in residuum on hills, upland divides, ridges, footslopes and in drainage ways. Potential impacts on soils from the Project are

generally associated with soil limitations and certain soil characteristics, as described below. An additional soil-related issue considered in the analysis was soil contamination.

Soil Limitations

Soils were grouped and evaluated according to characteristics that could affect construction or increase the potential for soil impacts. These characteristics include: prime farmland; compaction-prone soils; highly erodible soils; the presence of stones and shallow bedrock; and low revegetation potential

U.S. Department of Agriculture Designated Farmland Soils

The USDA-NRCS defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. Unique farmland is land, other than prime farmland, that is used for production of specific high-value food and fiber crops. Soils that do not meet all of the requirements to be considered prime or unique farmland may be considered farmland of statewide or local importance if soils are capable of producing a high yield of crops when treated or managed according to accepted farming methods (USDA-NRCS 2015). About 119.2 acres (84 percent) of land affected by the Project is classified as prime or statewide important farmland (see table B-2). No farmlands designated as unique or locally important are present in Berks County. Designated agricultural easements are discussed in section B.5.4.

Agricultural land affected by the Project would be restored to its original use with the exception of aboveground facilities, MLVs, and permanent access roads. The TETCO Meter Station would permanently convert 2.3 acres of prime farmland to developed land. In addition, MLVs and new permanent access roads would convert about 0.4 acre of prime farmland to developed land within the permanent right-of-way.

No state farmland would be permanently affected by aboveground facilities. Topsoil would be segregated from the subsoil and would be replaced in the proper order during backfilling to help ensure post-construction revegetation success. In accordance with our Plan, a minimum of 12 inches of topsoil would be segregated in deep soils and the entire topsoil layer, where possible, would be segregated in areas where less than 12 inches of topsoil is present. As the depth of topsoil in the Project area can extend to depths of at least 14 inches deep, DTE has indicated that it would segregate greater depths of topsoil if requested by the landowner. Any compaction caused by construction of the Project would be minimized or remediated as discussed below.

Table B-2
Soil Characteristics and Limitations for the Construction Areas Associated with the Project[a]

Facility	Prime or Statewide Important Farmland[b]	High Compaction Potential[c]	Highly Water Erodible Soils[d]	Depth of Bedrock <5 Feet[e]	Stony / Rocky Soils[f]	Low Revegetation Potential[g]
Pipeline right-of-way	93.8	11.8	16.3	38.4	28.6	10.9
ATWS	4.8	1.1	2.3	3.7	4.0	2.2
Access roads[h]	3.9	0.3	2.5	1.2	1.0	0.5
Contractor yards / staging areas	14.5	0.4	5.1	3.8	1.9	1.9
Aboveground facilities[h,i]	2.3	0.0	0.1	0.0	1.0	0.0
Project Total	**119.2**	**13.7**	**26.3**	**47.1**	**36.5**	**15.5**
Percent of Project area[j]	**76.8**	**8.8**	**16.9**	**30.3**	**23.5**	**9.9**

[a] Numbers are reported in acreages. Total acreage does not equal the total impact acreage for the Project as not all soils are classified with limitations and certain soils are classified as having multiple limitations.

[b] As designated by the USDA-NRCS.

[c] As designated by the USDA-NRCS. Compaction prone soils were predicted using soils that had moderate and greater compaction potentials and that had drainage classification ratings of somewhat poor, poor, and very poor.

[d] Includes those soils that were rated as having a higher potential for erosion by water according to the USDA-NRCS Web Soil Survey. Highly erodible soils by water were predicted using land in capability classifications 4E through 8E and/or soils with an average slope greater than or equal to 9 percent.

[e] Includes soils that have lithic bedrock within 60 inches of the soil according to the USDA-NRCS Web Soil Survey (2016) depth to lithic bedrock rating.

[f] Includes soils that have a very gravelly, extremely gravelly, cobbly, stony, bouldery, flaggy, or channery modifier to the textural class.

[g] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively well drained and/or soils with an average slope greater than or equal to 9 percent.

[h] MLV sites and new permanent access roads AR-5, AR-7, AR-9 and AR-10 would be constructed within the 50-foot - wide permanent easement and are included in the pipeline impacts.

[i] Area affected includes the TETCO Meter Station / pig launcher and the pig receiver.

[j] Totals do not equal 100 percent as not all soils are classified with limitations and certain soils are classified as having multiple limitations.

We received several comments regarding the thermal effects of pipeline operation on soil temperature and agricultural productivity. Few studies have addressed the effects of heat from pipelines on crop growth and heating of surrounding soils from gas pipelines. Naeth *et al.* (1993) recorded soil temperatures at various depths ranging from 2 to 42 inches along a 42-inch-diameter natural gas pipeline in mixed-prairie rangeland in Alberta, Canada. During the winter months, soil temperatures above the pipe were higher than undisturbed areas with a soil depth of 24 inches or greater. Mid-summer shallow soil temperatures were high at all locations and appeared to be less affected by the pipe than by the ambient air temperatures (Naeth *et al.* 1993). Another study, conducted in Oregon, evaluated the effects of anthropogenically warmed soils on crop growth (Oregon State University 1974). The study involved pumping heated water (between 73 to 149

degrees Fahrenheit) through pipelines buried at depths of 36 and 20 inches beneath cropland. A wide range in yield responses to soil heating were observed for the thirteen different crops include in the study. Results suggest that if weather conditions, fertilization, irrigation, and other management practices are optimum, soil heating has a limited effect on yields. However, when one or more of these factors is limiting, soil heating becomes more effective with a greater positive response on crop growth. In nearly all cases in the study, soil warming resulted in faster germination and greater growth rates early in the season (Oregon State University 1974).

DTE proposes to bury the pipeline with a minimum cover depth of 4 feet, which would minimize temperature effects on the rooting zone. Based on this burial depth and our review of the available research studies, we do not anticipate the Project would have a significant effect on crop yield due to increases in soil temperature. In addition, DTE is committed to revegetation success and would monitor and report to FERC annually the status of revegetation until it is deemed successful. Revegetation is further discussed in section B.3.1.

Soil Compaction

Soil compaction modifies the structure of soil and, as a result, alters its strength and drainage properties. Soil compaction decreases pore space and water-retention capacity, which restricts the transport of air and water to plant roots. As a result, soil productivity and plant growth rates may be reduced, soils may become more susceptible to erosion, and natural drainage patterns may be altered. Consequently, soil compaction is of particular concern in agricultural areas. The susceptibility of soils to compaction varies based on moisture content, composition, grain size, and density of the soil.

Soils with high compaction potential make up 8.8 percent of the Project footprint, as shown in table B-2. To minimize compaction, DTE would implement its E&SCP in areas where soils are compaction prone, including the use of timber mats in saturated wetlands. In addition, the pipeline has been routed to avoid wetlands, where possible, or reduce the pipeline right-of-way to 50 feet or less in wetland crossings. DTE would also avoid construction during periods of heavy rainfall and snowmelt, to the extent practicable. In agricultural and residential areas, topsoil and subsoil would be tested for compaction and would be decompacted, if necessary, using mechanical methods to restore areas to pre-construction conditions.

Soil Erosion

Soil erosion potential is affected by inherent soil characteristics such as texture, grain size, organic content, slope of the land, and the type and density of vegetative cover. Soils most susceptible to erosion by water typically have bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and are located on moderate to steep slopes. About 16.9 percent of the soils that would be affected by construction of

the Project are considered to be highly susceptible to erosion by water (see table B-2). None of the soils crossed are highly susceptible to erosion by wind. DTE would minimize the potential for erosion and offsite migration of sediments by using temporary erosion control devices, such as the use of silt fencing, filter socks, or temporary slope breakers in accordance with DTE's E&SCP. DTE would leave gaps between spoil and topsoil piles to allow for cross-drainage of stormwater. In addition, flume pipes or diversion berms and ditches may be used in areas where stormwater needs to be directed across the trench and away from the construction right-of-way. Trench plugs, made of earthen material or sand-filled bags, may be used in sloping terrain to prevent water from scouring the bottom of the trenchline. In areas identified as susceptible to erosion, temporary slope and channel lining would be used until vegetation has been established. After construction, erosion control devices would be monitored and maintained until the area had been stabilized or until permanent controls could be installed.

Shallow Depth to Bedrock and Stony/Rocky Soils

Construction through stony/rocky soils or soils with shallow bedrock (those with bedrock less than 5 feet from the surface) could result in the incorporation of stones or bedrock fragments into surface soils, which can interfere with agricultural practices and inhibit revegetation efforts. Stony/rocky soils are present along 23.5 percent of the Project and shallow bedrock is present along 30.3 percent of the Project (see table B-2). As previously discussed, DTE plans to avoid blasting on the Project route by using rock trenchers, hydraulic hoe hammers, and ripper teeth. In areas where topsoil would be segregated (i.e., agricultural and residential areas), excess rock and large stones unearthed during decompaction would be removed from at least the top 12 inches of soil prior to replacing. The size, density, and distribution of rock within the construction work area would be restored such that it would be similar to adjacent, undisturbed areas.

Low Revegetation Potential

Revegetating areas affected by construction of the Project may be more difficult in areas with poor drainage, shallow depth to bedrock, and steep slopes. About 9.9 percent of soils within the Project area were determined to have a low revegetation potential. The potential for successful revegetation for most soils would be high or moderate. DTE would follow the restoration guidelines set forth in its E&SCP, which would be reviewed and approved by the Berks County Conservation District. In addition, DTE would apply fertilizers and install erosion control fabrics where necessary. Topsoil segregation and mitigation for soil compaction mitigation measures would be applied to reduce the introduction of rock into topsoil and to ensure post-construction revegetation success. DTE would adhere to seed mixtures, seeding dates, and liming rates outlined in its E&SCP.

As noted in section A.8.1, DTE has indicated that it may bury stumps or excess surface rock within the construction right-of-way during restoration. However, section V.A.6 of our Plan states that all construction debris must be removed from work areas unless the landowner or land managing agency approves leaving the materials onsite for beneficial reuse, stabilization, or habitat restoration. As we generally do not find the burial of such materials to be beneficial. **we recommend that:**

- **DTE should not bury construction debris (e.g., stumps, brush, excess rock) in the construction right-of-way during restoration, unless specifically approved in writing by the landowner or land managing agency for beneficial reuse, stabilization, or habitat restoration.**

Inadvertent Spills or Discovery of Contaminants

Other potential impacts during construction would include the accidental release of petroleum hydrocarbons or other hazardous materials, as well as the discovery of contaminated soils during trench excavation and grading activities. Soil contamination during construction could result from material spills or trench excavation through pre-existing contaminated areas. In addition, DTE conducted a limited investigation of soils at the HDD pit and associated pipeline near the Birdsboro Power Facility and identified contaminated fill material across the investigation area, to a depth of up to 6 feet. DTE would excavate the contaminated sediments from the 50-foot-wide permanent right-of-way prior to starting construction, excluding the soils under the existing gravel road within the permanent right-of-way. Disposal of contaminated sediments would be in accordance the E&SCP, and the area would be backfilled using certified clean fill.

DTE would implement its SPCC Plan that specifies cleanup procedures in the event of an inadvertent leak or spill. If suspected contaminated soils (such as those that are oil-stained) were identified during trenching operations, work in the area would be halted until the applicable agencies are notified and the extent of contamination is determined.

General Impacts and Mitigation

Construction activities such as clearing, grading, trench excavation, installation, backfilling, and the movement of construction equipment along the right-of-way would impact soil resources. Clearing the right-of-way would remove protective vegetative cover and expose the soil to the effects of wind, rain, and runoff, which increases the potential for soil erosion and sedimentation in sensitive areas. Grading, spoil storage, and equipment traffic can compact soil, reducing porosity, increasing runoff potential, and decreasing vegetative productivity. Trenching of shallow depth to bedrock soils can bring stones or rock fragments to the surface that could interfere with agricultural practices and hinder restoration of the right-of-way. Construction activities could also affect soil fertility and facilitate the dispersal and establishment of weeds. In addition,

contamination due to spills or leaks of fuels, lubricants, and coolant from construction equipment, or inadvertent returns of HDD drilling fluid could adversely affect soils.

DTE would implement our Plan and its Procedures and E&SCP to minimize impacts on soils associated with the Project. Measures to segregate topsoil from subsoil in active cropland, managed pastures, residential areas, wetlands, hayfields, and in other areas at the landowner's request would contribute to post-construction revegetation success, and minimize the loss of crop productivity and the potential for long-term erosion problems. Implementation of DTE's Noxious Weeds/Invasive Plant Species Control and Mitigation Plan would serve to control and minimize the introduction of weeds and invasive plant species in the Project area.

Construction and operation of the proposed aboveground facilities and new permanent access roads would convert about 2.7 acres of prime farmland soils to an industrial/commercial use. This constitutes a permanent, but minor impact due to the availability of areas featuring prime farmland soils in the vicinity of the Project. We conclude that DTE's implementation of our Plan and its Procedures and E&SCP during construction and restoration, as well as its commitment to remediate contaminated soils identified adjacent to the Birdsboro Power Facility, would adequately minimize impacts on soils.

2. Water Resources and Wetlands

2.1 Groundwater Resources

Existing Groundwater Resources

The Project and associated facilities overlie three types of bedrock aquifers within the Piedmont, New England, and Ridge and Valley physiographic provinces. These include: aquifers in early Mesozoic basins, carbonate-rock aquifers, and crystalline-rock aquifers (Trapp and Horn 1997). Aquifers in early Mesozoic sandstones and carbonate rocks are more productive than crystalline-rock aquifers. Recharge is highly variable and is based on local precipitation and runoff which are dependent on topographic relief and land surface available for infiltration (Trapp and Horn 1997).

Aquifers in early Mesozoic basins consist primarily of sandstone and shale. Typical well yields in large diameter wells in the Project area range from about 5 to 80 gallons per minute, and wells greater than 200 feet deep have distinctly higher yields (Trapp and Horn 1997). Carbonate-rock aquifers consist mainly of limestones and dolomites. Well yields in carbonate-rocks depend on the degree of fracturing and development of solution cavities in the rock and generally yield moderate to large volumes of water with well yields in the Great Valley section of the Ridge and Valley province reported to range from 25 to 210 gallons per minute. Crystalline-rock aquifers consist mainly of igneous and metamorphic rocks and generally contain groundwater in

joints and fractures. Well yields in crystalline-rock aquifers are generally low, with averages around 18 gallons per minute (Trapp and Horn 1997). DTE conducted geotechnical investigations at the four proposed HDD crossings; shallow groundwater was encountered between 0.0 and 15.5 feet.

Water quality among the different rock types of the aquifers is similar and is considered suitable for drinking. Groundwater sourced from crystalline rock aquifers in the Project area is primarily used for domestic and industrial/commercial water supply, while water withdrawn from early Mesozoic basins and carbonate rock aquifers is primarily used for public supply. According to the EPA, contaminated groundwater is not present in the Project area (EPA 2015).

Project impacts on groundwater quality are addressed below. The EPA defines a sole or principal source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The Project does not cross sole source aquifers (EPA 2017a).

Water Supply Wells and Seeps

DTE identified four private groundwater wells within 150 feet of the Project (see table B-3). No springs or public water supply wells were identified within 150 feet of the Project.

Table B-3
Groundwater Supply Wells within 150 feet of the Project

Supply Type	Milepost	Distance from Limits of Construction (feet)	Distance from Pipeline Centerline (feet)
Domestic well	0.0	141	181
Domestic well	0.2	71	111
Domestic well	0.3	147	150
Domestic well	0.8	111	146

DTE also reviewed wells and springs underlain by karst bedrock within 500 feet of the Project, and wells and springs within 1,000 feet of any HDD construction that would occur in karst. Four wells were identified within 500 feet of the Project in karst areas (see table B-4). No springs were identified within 500 feet of the Project underlain by karst bedrock and no wells or springs were identified within 500 feet of staging areas, access roads, or aboveground facilities. Four additional wells and two springs were identified within 1,000 feet of HDD-4, which crosses karst terrain.

Table B-4 Groundwater Supply Wells and Springs underlain by Karst Bedrock within the Project Area			
Supply Type	**Milepost**	**Distance from Limits of Construction (feet)**	**Distance from Pipeline Centerline (feet)**
Wells within 500 feet of Workspace in Karst			
Domestic Well	7.0	258	320
Not Listed	9.7	321	357
Aquaculture (Pond Well) [a]	10.5	404	460
Domestic Well	12.4	405	425
Wells and Springs within 1,000 feet of an HDD through Karst			
Aquaculture (Pond Well)	10.4	870	1,000
Agricultural	10.4	570	750
Not listed	10.5	595	715
Not listed	10.5	780	910
Spring	10.5	600	670
Spring	10.5	525	580
[a] Well located within 1,000 feet of an HDD through Karst.			

Source Water Protection Areas

A source water protection area (SWPA) is defined as the drainage area around the point where a public water system withdraws water from a groundwater or surface water source. In Pennsylvania, the SWPA program includes the wellhead protection program. The Project would cross the Pennsylvania American Water – Glen Alsace District and Birdsboro Municipal Water Authority service areas (PADEP 2017e). No public water supply wells or wellhead protection areas within the Pennsylvania American Water service area are located in the Project area (Hassinger 2017). The Birdsboro Municipal Water Authority uses surface water for public water supply and does not participate in the wellhead protection program or the locally zoned aquifer protection program (Durso 2016). SWPAs designated to protect surface water sources are addressed in section B.2. Two public water supply wells in the Project vicinity were also identified by DTE based on its conversations with the Oley Municipal Authority, both of which are more than 1,500 feet from the Project. Based on the assessments of DTE and the Oley Municipal Authority, only one of these wells was believed to have a zone of influence (Zone III protection zone) that includes the Project footprint; however, based on Oley Municipal Authority's assessment, the Project poses an acceptably low risk to its groundwater resources.

General Impacts and Mitigation

Construction of the pipeline would generally require the excavation of a trench 5 feet deep to achieve a minimum depth of cover of 4 feet, except in consolidated rock

where a minimum of 2 feet of cover would be required. In areas where the water table is near the surface, shallow groundwater could sustain minor impacts from temporary changes in overland water flow and recharge from clearing and grading of the right-of-way. Average annual groundwater depths for deep groundwater (aquifers) in Berks County have ranged from 127 to 140 feet below land surface from 2004 to 2016 (USGS 2015). Soil compaction from construction could reduce the ability of the soil to absorb water, thereby reducing groundwater recharge. Construction, operation, and maintenance of the facilities would not be expected to have significant or long-term impacts on groundwater resources with implementation of our Plan and DTE's E&SCP.

An inadvertent spill of fuel or hazardous materials during refueling or maintenance of construction equipment could also affect groundwater if not cleaned up appropriately. Contaminated soils could continue to leach contaminants to groundwater long after a spill has occurred. To minimize the risk of potential fuel or hazardous materials spills, DTE would implement its SPCC Plan, which includes spill prevention measures and cleanup methods to reduce potential impacts should a spill occur. In addition, DTE would prohibit refueling and storage of hazardous substances within 200 feet of private water wells and 400 feet of municipal water wells; these activities would also be restricted within 500 feet of private water wells in karst terrain, unless specifically approved by an EI.

DTE would also offer pre-construction and post-construction evaluations of all water wells within 150 feet of the construction area where Project facilities are not in karst terrain, within 500 feet of the construction area when in karst terrain, and within 1,000 feet of HDD-4 workspaces, to affected landowners. In the event that private wells were damaged during construction, DTE would provide affected landowners with a temporary source of potable water until water quality and/or well yield are restored.

If DTE encounters contaminated soil or groundwater during construction, it would stop work, identify the type and extent of contamination, and notify the applicable agencies. DTE conducted a limited investigation of soils at the HDD pit and associated pipeline near the Birdsboro Power Facility and identified contaminated fill material across the investigation area. Perched zones of groundwater were encountered between 16 and 19 feet below ground surface. The investigation determined no special handling of groundwater in the area would be required based on analytical data obtained.

To avoid or minimize potential impacts on groundwater, DTE would comply with its SPCC Plan, Karst Mitigation Plan, E&SCP, and Inadvertent Return Contingency Plan. Therefore, the Project would not result in significant long-term or permanent impacts on groundwater resources in the Project area.

2.2 Surface Water Resources

Existing Surface Water Resources

The Project would be located within four hydrologic unit code (HUC) 12 subwatersheds; the watersheds and approximate locations are provided in table B-5. Between May 2016 and July 2017, DTE completed field surveys of the Project area to identify waterbodies that would be crossed by the Project. Waterbodies are classified as perennial, intermittent, or ephemeral. Perennial waterbodies flow or contain standing water year-round and are typically capable of supporting populations of fish and macroinvertebrates. Intermittent waterbodies flow or contain standing water seasonally and are typically dry for a portion of the year. Ephemeral waterbodies generally contain water only in response to precipitation or spring snowmelt.

Table B-5
Watersheds Crossed by the Project

Hydrologic Unit Code 12 Watershed	Crossing Length (miles)	Drainage Area (acres)
Lower Manatawny Creek (020402030503)	1.1	33,570
Monocacy Creek (02040203610)	6.1	16,495
Sixpenny Creek – Schuylkill River (020402030611)	5.0	19,476
Upper Manatawny Creek (0020402030501)	1.0	15,086

The proposed pipeline route would cross 22 streams, including 10 perennial, 6 intermittent, and 6 ephemeral waterbodies. Further, of the 22 waterbody crossings, 12 are classified as minor (less than 10 feet wide), 8 are classified as intermediate (10 to 100 feet wide), and 2 are classified as major waterbodies (greater than 100 feet). In addition, one existing access road would cross Little Manatawny Creek at MP 10.5 using an existing culvert with no modifications; therefore, no new impacts at this location would occur. Information associated with each waterbody crossing, including name, water quality classification, flow regime, crossing width, and crossing method is provided in appendix F. As discussed in section B.1.1, portions of the pipeline would be within the FEMA 100-year floodplain; however, impacts associated with the pipeline in the floodplain would not result in a discernable loss of flood storage capacity.

Sensitive Waterbody Crossings

The CWA requires that each state review, establish, and revise water quality standards for the surface waters within the state. States develop monitoring and mitigation programs to ensure that water standards are attained as designated. Waters

that fail to meet their designated beneficial use(s) are considered impaired and are listed under a state's 303(d) list of impaired waters. In addition to the Section 303(d) list of impaired waterbodies, sensitive waterbodies include waters that have been specifically designated by the state as high quality or exceptional value waterbodies, wild and scenic rivers, and waters supporting fisheries of special concern.

High Quality and Exceptional Value waterbodies are given special protection in the state of Pennsylvania by the PADEP under PAC Title 25, Chapter 93 and are designated as having high quality aquatic habitats or recreational resources, and that meet water quality or biological parameters. The Project would not cross designated High Quality or Exceptional Value waterbodies. The proposed pipeline route would cross seven fisheries of special concern (Naturally Reproducing Trout Waters and waters containing special status species), which are discussed in section B.3.2. In addition, the Schuylkill River is designated as a Pennsylvania Wild and Scenic River. The Schuylkill River would be crossed by HDD, thereby avoiding or minimizing impacts on the river. The Project would not cross federally-designated wild and scenic rivers.

The Project would cross four stream segments listed as 303(d) impaired waterbodies, including two segments of the Schuylkill River (MP 0.4 and 0.5) and two tributaries of Manatawny Creek (MP 8.1 and 8.3). Both segments of the Schuylkill River are impaired for polychlorinated biphenyls in fish (fish consumption); however, as previously noted, DTE's proposed use of HDD construction methods would avoid or minimize impacts on the river and avoid sediment disturbance, which could entrain contaminants in the water column. The two tributaries of Manatawny Creek are listed as impaired for excessive algal growth and crop-related sedimentation. DTE would cross these two waterbodies using dry-ditch construction methods and would use erosion controls in accordance with its E&SCP to minimize the potential for runoff to waterbodies during construction.

Surface Water Intakes and Source Water Protection Areas

No potable surface water intakes are located within 3 miles downstream of the Project (PADEP 2017f). DTE consulted with the Pennsylvania American Water – Glen Alsace District and the Birdsboro Municipal Water Authority to confirm the Project would not be located within 0.5 mile of any direct-sourced surface water or within 3 miles of any surface water intakes for public water supply. The Project would not cross any surface water SWPAs (Durso 2016, PADEP 2017e).

General Impacts and Mitigation

DTE proposes to cross each waterbody with perceptible flow at the time of crossing using dry (HDD or conventional bore) or dry ditch (dam-and-pump, flume, or cofferdam) methods (see appendix F). Waterbodies that do not have flowing water at the time of construction may be crossed with upland construction methods; however, should

perceptible flow become present during construction, DTE would implement dry ditch crossing methods. Waterbodies would be constructed in accordance with state and federal permits, and DTE's Procedures and E&SCP. Typical waterbody crossing methods are described in section A.8.2.

DTE would limit the construction right-of-way to 50 feet at streams, and would install erosion controls to minimize impacts. DTE would generally install the pipeline with a minimum of 4 feet of cover from the streambed to the top of the pipeline. The HDD crossings would be installed significantly deeper than the minimum requirement (a minimum of 11 feet). Trench spoil would be placed a minimum of 10 feet from the waterbody edge for use as backfill, and temporary erosion controls would be installed to prevent migration of trench spoil into the waterbody.

To minimize the potential for impacts on the pipeline from streambed scour, DTE analyzed the maximum scour depth for dry-ditch crossings. The estimated scour depth for waterbodies ranged from 0.4 to 3.3 feet. As shown in appendix F, seven waterbodies could occur in areas with potentially shallow bedrock. DTE proposes to install the pipeline at a minimum depth of 4 feet beneath all dry-ditch crossings, using excavators with ripper teeth or a hydraulic hammer where necessary.

Pipeline construction could result in temporary impacts on water quality resulting from increased turbidity during construction in or near flowing surface waters. Where waterbodies are crossed via bore or HDD, impacts would generally be avoided; however, if an inadvertent return of HDD drilling fluid occurs within a waterbody, the resulting turbidity could temporarily affect water quality. DTE has assessed the risk of an inadvertent return at each of the four HDD locations and has determined that each would have a low risk of returns. In addition, DTE would also implement the measures in its Inadvertent Return Contingency Plan, which addresses measures for prevention, detection, and mitigation for inadvertent returns. DTE would use water from municipal sources for HDD construction, thereby avoiding impacts on surface water resources from water withdrawals. In addition, DTE's adherence to measures within its SPCC Plan, including locating hazardous material storage and equipment refueling activities at least 100 feet from waterbodies, would reduce the potential for hazardous materials to enter waterbodies.

During final restoration, DTE would seed stream banks and riparian areas in accordance with applicable agency requirements and its E&SCP. Where flow conditions would not allow for stabilization via revegetation, DTE would implement additional measures, such as the use of rip rap, to stabilize waterbody banks.

Where temporary access road AR-4 would be adjacent to an intermittent stream, DTE would not widen or modify the access road. No aboveground facilities would be located in waterbodies.

Implementation of DTE's E&SCP, and applicable permit conditions, would minimize and mitigate impacts on surface waters, including sensitive surface waters. Therefore, we conclude that the Project would not have a significant impact on surface waters.

Water Usage

As discussed in section A.8.1, DTE would hydrostatically test the pipeline using municipal water. DTE would also use municipal water for the drilling mud required for HDD construction and for fugitive dust suppression. In total, DTE would use approximately 428,000 gallons of water for hydrostatic testing, HDD activities, and fugitive dust. Table B-6 presents the withdrawal locations, sources, and estimated quantities of water utilized for the Project.

Table B-6
Water Use for the Project

Water Use	Water Needed if Entire Pipeline Filled (gallons)	Water Source	Discharge Location
HDD	5,000	Reading Water Authority[a]	Approved disposal facility
Hydrostatic testing	420,000	Reading Water Authority[a]	Approved disposal facility
Dust suppression[b]	3,000	Reading Water Authority[a]	Various Project workspaces
Total	428,000	--	--

[a] The Reading Water Authority is a municipal water source.

[b] Water used for dust suppression would be discharged in upland areas where dust is deemed to be a nuisance by the EI.

Municipal water used for hydrostatic testing and for HDD construction would be collected after use and discharged at a licensed disposal facility (see table B-6). Municipal water would also be used to control fugitive dust, as deemed appropriate by the EI and in accordance with DTE's Fugitive Dust Plan. Given that DTE has committed to the use of municipal water and its offsite disposal, where applicable, we conclude impacts from hydrostatic testing, fugitive dust suppression, and HDD construction would be temporary and minor.

2.3 Wetlands

The COE and EPA jointly define wetlands as "those 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 vegetation typically adapted for life in saturated soil conditions" (COE 1987). Wetlands generally include swamps, marshes, bogs, and similar areas.

Existing Wetland Resources

DTE conducted wetland delineation surveys in May and October 2016 and April and June 2017 in accordance with the COE Wetland Delineation Manual and the Eastern Mountain and Piedmont Region regional supplement (COE 1987, 2012), and as requested in the COE's scoping comments on the Project. The delineation of waters and wetlands was field-verified by representatives of the COE. In addition to the classifications used in this EA, the PADEP classifies wetlands as either Exceptional Value or other. Exceptional Value wetlands are given special protection in the state of Pennsylvania by the PADEP under PAC Title 25, Chapter 93. They include those wetlands that:

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

Wetland types were assigned using the National Wetlands Inventory (NWI) classification system (Cowardin *et al.* 1979). Palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetlands, as well as vernal pools, were documented in the Project area. PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens; representative species documented during DTE's surveys in PEM wetlands include common rush *(Juncus effusus)*, common fox sedge (*Carex vulpinoidea*) and other sedge species, reed canary grass (*Phalaris arundinacea)*, and common reed (*Phragmites australis*). PSS wetlands contain emergent vegetation with woody vegetation less than 20 feet tall; sapling and shrub species observed during surveys in PSS wetlands include multiflora rose (*Rosa multiflora*) and silky dogwood (*Cornus amomum*). PFO wetlands are dominated by hydrophytic tree species at least 20 feet tall, and DTE documented red maple (*Acer rubrum)*, black willow (*Salix nigra*), green ash *(Fraxinus pennsylvanica*), and other tree species during field surveys in PFO wetlands. Vernal pools are unique, seasonal wetland habitats, and are typically small, shallow ephemeral waterbodies with no permanent inlet or outlet. These pools are filled seasonally each spring by rain or surface runoff, and then become dry for a period of time during the summer (COE 2012). Vernal pools documented during field surveys in the Project area were sparsely vegetated and characterized as PEM.

A total of 21 wetlands would be crossed or within the construction workspace for the Project. Appendix G provides the wetland type and state classification of each wetland crossed by the Project; the basic wetland types delineated in the Project area and total impact acreage are summarized in table B-7.

Table B-7 Wetland Impact Summary of the Project		
NWI Classification[a]	**Wetland Area Affected During Construction (acres)[b]**	**Wetland Area Affected During Operation (acres)[b,c]**
Birdsboro Pipeline		
PFO	1.0	0.8
PSS	0.1	<0.1
PEM	1.3	0.4
Project Total	**2.4**	**1.2**

[a] One vernal pool crossed by the Project is within the construction workspace but would be avoided by construction and operation.

[b] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[c] Operational impacts on PEM, PFO, and PSS wetlands account for the 10-foot-wide corridor centered on the pipeline that would be permanently maintained as PEM. In PFO wetlands, the operational impacts include the selective cutting of trees within 15 feet of the centerline with roots that may jeopardize the integrity of the pipeline.

In addition, one wetland is located within the contractor yard near MP 9.1; however, it would be fenced off from construction activities and a 5-foot buffer would be maintained so that no impacts on the wetland would occur. DTE would also fence and avoid Vernal Pool 1, which is located within the construction right-of-way near MP 1.0.

General Impacts and Mitigation

Operation of the pipeline facilities would require right-of-way maintenance that would result in the permanent conversion of 0.8 acre of PFO wetland to PEM/PSS wetland and less than 0.1 acre of PSS wetland to PEM wetland. No access roads are proposed for use in wetlands. However, two existing permanent access roads that abut wetlands are proposed for use with no modifications (including AR-3 near MP 2.1 and AR-4 near MP 4.8). No wetlands would be affected by construction and operation of the aboveground facilities.

The primary impact of Project construction on wetlands would be the potential alteration of wetland vegetation due to the clearing, excavation, rutting, compaction, and mixing of topsoil and subsoil. Construction could also affect water quality within wetlands due to sediment loading or inadvertent spills of fuel or chemicals. Temporary construction impacts on wetlands could include the loss of vegetation; soil disturbance associated with grading, trenching, and stump removal; and changes in the hydrological profile. Impacts on PFO wetlands would also include long-term or permanent conversion to PEM and/or PSS wetland types through tree removal. In the case of conversion of wetland vegetation type, no permanent loss of wetlands would occur, but functional changes to the wetland community are expected.

Impacts on wetlands would be greatest during and immediately following construction. The majority of these effects would be short-term in nature and would cease when, or shortly after, the wetlands are restored and revegetated. Following revegetation, the wetland would eventually transition back into a community similar to that of the pre-construction state. In emergent wetlands, the herbaceous vegetation would regenerate quickly (typically within 1 to 3 years).

The pipeline would be installed in wetlands using the open-cut (including the push-pull technique) and HDD methods described in section A.8.2. DTE would cross about 817 feet of wetlands, including all PFO wetlands designated as Exceptional Value, using HDD construction methods, thereby avoiding direct impacts on the resources. However, if an inadvertent return of HDD drilling fluid were to occur within a wetland, vegetation and hydrology would be temporarily affected. DTE would implement the measures in its Inadvertent Return Contingency Plan, which addresses measures for prevention, detection, required notifications, and mitigation for inadvertent returns (see section A.7.2). DTE would also implement the measures in its SPCC Plan and applicable permit conditions to minimize the potential for spills and contamination in wetlands. Refueling and fuel storage would be restricted within 100 feet of any wetland and would not occur within 300 feet of wetlands containing potential eastern redbelly or bog turtle habitat (see section B.4).

To compensate for the permanent conversion of PFO and PSS wetlands within the operational right-of-way, as requested by the COE and EPA in their scoping comments on the Project, DTE has developed a Project-specific wetland mitigation plan in consultation with the COE and PADEP. The mitigation plan includes enhancement of about 3.7 acres of PEM wetlands to PFO wetlands within the riparian corridor of Bieber Creek in the Bieber Creek NHA (see section B.3.1). DTE's proposed mitigation plan is subject to approval as part of the joint permit application submitted to the PADEP and COE in April 2017. Approval of the joint permit is required prior to beginning construction of the Project.

DTE would minimize wetland impacts by implementing the construction and mitigation measures outlined in its E&SCP and Procedures, and by adhering to applicable permit requirements. In addition, general construction and mitigation measures from DTE's Procedures include:

- limiting construction equipment in wetlands to that needed to clear the right-of-way, excavate the trench, fabricate the pipe, install the pipe, backfill the trench, and restore the right-of-way;

- installing sediment barriers immediately after initial ground disturbance within the right-of-way between wetlands and upland areas, across the entire right-of-way immediately upslope of the wetland boundary, and along the edge of the

right-of-way as necessary to contain spoil within the right-of-way and to protect adjacent off-right-of-way wetland areas;

- minimizing the length of time that topsoil is segregated and the trench is open;
- prohibiting the use of rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the right-of-way;
- using low ground weight equipment or operating equipment on timber riprap on saturated soils or where standing water is present;
- installing trench plugs as necessary to maintain the original wetland hydrology;
- prohibiting the use of lime, fertilizer, or mulch during the restoration of wetlands; and
- limiting vegetation maintenance on the operational right-of-way in wetlands to a 10-foot-wide herbaceous corridor centered over the pipeline and the cutting and removal of trees and shrubs greater than 15 feet in height that are within 15 feet of the pipeline centerline.

With implementation of these minimization and mitigation measures, and because DTE would comply with applicable permits for wetland impacts, we conclude that wetland impacts would not be significant.

3. Vegetation, Aquatic Resources, and Wildlife

3.1 Vegetation

Existing Vegetation Resources

The southern extent of the Project would be located in the Northern Piedmont ecoregion, which is an area of plains, open valleys, and low, rounded hills historically dominated by Appalachian oak forest (EPA 2017b; Woods *et al.* 1999). The northern extent of the route would be within the Northeastern Highlands ecoregion, which consists of low mountains in the Project vicinity; vegetation includes northern hardwood and spruce fir forests (EPA 2017b; Woods *et al.* 1999). The Project would be located across land characterized by the following vegetative communities: agricultural vegetation; forested vegetation; upland shrubs and herbaceous grasses; PFO, PEM, and PSS wetlands (see section B.2.3); and other common vegetation associated with rural housing (see table B-8).

Agricultural vegetation is the largest type of vegetation affected by the Project (about 74 percent) and includes hay, grasses, corn, soybean, and winter wheat.

Table B-8
Construction and Operation Impacts on Vegetation Cover Types in the Project Area[a]

Facility	Agricultural Land		Open Land[b]		Upland Forest		Residential Land		Forested Wetland[c]		Non-Forested Wetland[d]		Total	
	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
Pipeline Facilities														
Pipeline right-of-way[e]	83.2	57.3	3.8	3.4	12.9	9.5	0.9	0.7	1.0	0.8	1.4	0.4	103.2	72.1
ATWS	3.3	0.0	0.7	0.0	1.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	6.6	0.0
Access roads	0.1	0.1	0.4	0.0	0.9	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.8	0.0
Contractor yards / Staging areas	0.0	0.0	6.6	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0
Aboveground Facilities														
TETCO Meter Station	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3
Pig receiver	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
Project Total	**88.9**	**59.5**	**11.5**	**3.4**	**14.9**	**9.5**	**2.9**	**0.7**	**1.0**	**0.8**	**1.4**	**0.4**	**120.5**	**74.4**

Con = Construction; Op = Operation.

[a] The acreage numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[b] Open land includes herbaceous land, scrub-shrub land, and utility rights-of-way.

[c] The maintained footprint for PFO wetlands is 30 feet wide, which accounts for the 10-foot-wide corridor maintained through routine mowing, as well as the selective cutting of trees within 15 feet of the centerline with roots that may jeopardize the integrity of the pipeline. In some areas, the maintenance corridor is less than 30 feet wide.

[d] Non-forested wetlands include PEM and PSS wetlands. The maintained footprint for PEM and PSS wetlands accounts for the 10-foot-wide corridor centered on the pipeline that would be maintained through routine mowing.

[e] Acreages include four new MLVs, which would be located within the permanent right-of-way.

Open land affected by the Project (about 9.5 percent of all vegetation affected) includes areas characterized by upland herbaceous and upland scrub-shrub vegetation, including existing rights-of-way. Representative herbaceous species identified during DTE's field surveys within open land included reed canary grass and large sweet vernal grass (*Anthoxanthum odoratum)*; representative shrub species included autumn olive (*Elaeagnus umbellate)*, multiflora rose, black raspberry (*Rubus occidentalis)*, Allegheny blackberry (*Rubus allegheniensis)*, and spicebush (*Lindera benzoin.)*.

Upland forested vegetation constitutes about 12.5 percent of all vegetation affected. Most forested land in the Project vicinity has been previously disturbed by activities such as agriculture, mining, or logging, which has created early successional forest cover types (Southern Appalachian Bird Conservancy 2014). Early successional forests are composed of young pioneer tree species that lack a closed, mature tree canopy. Tree species documented during field surveys include red maple, shag-bark hickory (*Carya ovata*), and green ash. Other common tree species include oaks (*Quercus spp.*) and Virginia pine (*Pinus virginiana;* Woods *et al.* 1999).

Residential lands in the Project area consist primarily of maintained grasses. Pipeline facilities would impact 2.5 acres of residential land, of which 0.7 acre would be maintained in the permanent right-of-way.

Construction and operation of the proposed TETCO Meter Station would impact 2.3 acres of agricultural land and the new pig receiver would impact less than 0.1 acre of open land. Access roads would impact 0.1 acre of agricultural land, 0.4 acre of open land, 0.9 acre of upland forest, and 0.4 acre of residential land. Use of permanent access roads would result in the conversion of 0.3 acre of agricultural land within the permanent right-of-way.

Vegetation Communities of Special Concern

DTE consulted with the FWS and the PADCNR to determine the presence of sensitive or protected vegetation within the Project area. Federally and state listed threatened and endangered plants were identified as potentially occurring in the Project area, and are further discussed in section B.4. No vegetation communities of special concern were identified in the Project area during either agency consultations or field surveys. However, the Project is within the Schuylkill River National and State Heritage Area which is designated for its unique combination of natural, cultural, historic, and recreational resources, as discussed further in section B.5.4.

The Project also crosses or is in the vicinity of multiple Pennsylvania NHAs. NHAs are designated important natural areas containing plant or animal species of concern, exemplary natural communities, or exceptional native biodiversity (Pennsylvania Natural Heritage Program [PNHP] 2014). NHAs are designated for the protection of sensitive species to include areas of core habitat, which are critical to

preservation of the site and species of concern, as well as supporting landscapes. NHAs in the Project vicinity include the Manatawny Creek NHA, the Furnace Creek NHA, the Oley Valley NHA, and the Bieber Creek NHA. The Monocacy Hill Conservation Area, which was identified in public scoping comments, is located about 0.4 mile from the Project and would not be affected by construction; therefore, it is not addressed further in this EA.

The Project would be located about 1,470 feet west of the core habitat of the Manatawny Creek NHA near MP 7.3. At this location, the Project would cross agricultural land. The Manatawny Creek NHA consists of riparian forests as well as aquatic habitat. The Project would be located about 1,830 feet east of the Oley Valley NHA core habitat near MP 12.0, which is located in a mosaic of agricultural and forested land.

The Project would cross the core habitat of Furnace Creek NHA between MP 10.6 and 10.7. The NHA includes the floodplain of Furnace Creek, which is characterized as deciduous forest with a sparse understory and provides habitat for the state listed endangered cattail sedge. DTE identified populations of cattail sedge during species-specific botanical surveys (see section B.4). However, DTE would implement HDD construction to cross forested wetlands and cattail sedge populations within the Furnace Creek NHA.

The Bieber Creek NHA includes the forested riparian corridor and open wetlands adjacent to the floodplain of Bieber Creek. The NHA provides suitable habitat for four plant species of concern, including bushy bluestem, swamp lousewort, bog bluegrass, and a sedge species (PNHP 2014). The TETCO Meter Station would be located within agricultural land in the supporting landscape for the Bieber Creek NHA and is located within 75 feet of core habitat. During consultation with DTE, the FWS and PADCNR did not identify specific mitigation measures for construction in or adjacent to these NHAs, nor for protection of sensitive plant species, except for those species-specific measures identified in section B.4 for the protection of federally and state listed species.

Given that the core habitat of the Furnace Creek NHA would be crossed via HDD construction methods and that core habitat of the Manatawny Creek, Oley Valley, and Bieber Creek NHAs would not be crossed, no adverse impacts from Project construction are anticipated. DTE's proposed wetland mitigation, if approved as part of DTE's joint permit application, would result in beneficial impacts on the Bieber Creek NHA.

Noxious and Invasive Weeds

Noxious or invasive plant species can out-compete and displace native plant species, thereby negatively altering the appearance, composition, and habitat value of affected areas. Plant species identified as noxious and invasive by the PADCNR were observed within the Project area, including Japanese knotweed (*Fallopia japonica*),

common reed, multiflora rose, reed canary grass, Japanese stilt-grass (*Microstegium vimineum*), and creeping jenny (*Lysimachia nummularia;* PADCNR 2017d).

Impacts and Mitigation

Installing the Project would require the temporary and permanent clearing of vegetation, as described in section A.8. Table B-8, above, summarizes the temporary construction and permanent operational impacts of the Project on each vegetation cover type. Impacts on industrial/commercial, residential, and agricultural land are discussed in section B.5.1; wetland impacts are addressed in section B.2.3.

Impacts on upland or wetland forest vegetation from construction of the Project would be long-term. Re-growth of trees to pre-construction conditions would take 20 to 30 years for many species, such as green ash. Other hardwood species, such as oaks, could take more than 50 years to reach maturity. Upland forest vegetation in the permanent right-of-way would be maintained in an herbaceous state through the operational life of the Project.

The term "edge effect" is commonly used in conjunction with the boundary between natural habitats, especially forests, and disturbed or developed land, such as pipeline corridors. Where land adjacent to a forest has been cleared, creating an open/forest boundary, sunlight and wind penetrate to a greater extent, resulting in tree destabilization from increased wind shear, drying out of the interior of the forest close to the edge, encouraging growth of opportunistic species at the edge, and changing air temperature, soil moisture, and light intensity (Murcia 1995). Fragmentation of forested areas can also result in changes in vegetation (for example, invasion of shrubs along the edge). DTE has designed the Project route to avoid impacts on forested habitat where practicable, and the Project would not cross large areas of pristine, unfragmented forest. Further, DTE would install the pipeline across some areas of forested habitat using HDD construction, thereby minimizing disturbance of forested vegetation and edge effects.

DTE would minimize clearing of forested habitat by constructing most of the Project within agricultural land (72.5 percent of the pipeline length). To minimize impacts on vegetative communities from construction and operation of the Project, DTE would implement measures described in its E&SCP and our Plan, including:

- using existing roads for access to the Project where practicable;
- installing temporary erosion control measures, such as slope breakers, sediment barriers, and mulch;
- visually inspecting agricultural land to ensure that crop growth and vigor in areas affected by construction is similar to those of adjacent portions of the same field, or as otherwise agreed to by the landowner; and

- conducting annual monitoring and reporting to FERC to document the status of revegetation until deemed successful.

For non-forested vegetation types, including agricultural land, open land, and non-forested wetlands, impacts from pipeline construction would generally be short-term and temporary. Agricultural land generally returns to crop production the season following construction. Herbaceous areas would return to their vegetative cover within 1 to 3 years, and scrub-shrub areas would return to their vegetative cover within 3 to 5 years post-construction. To facilitate revegetation, DTE would seed construction workspaces using seed mixes recommended by PADEP in accordance with its E&SCP. Seed mixes will be submitted to the Berks County Conservation District for review and approval.

Following construction, DTE would monitor revegetation success within all construction workspaces. Revegetation would be considered successful if the density and cover of non-nuisance vegetation were similar in density and cover to adjacent undisturbed land, or in accordance with any state or local permit requirements. Further, DTE would conduct an invasive species survey along the entire pipeline route prior to construction and would follow the measures included in our Plan, and its Procedures, E&SCP, and its Noxious Weeds/Invasive Plant Species Control and Mitigation Plan to prevent and control the spread of noxious weeds and invasive plant species. Measures include using certified weed-free mulch, minimizing the time that bare soil is exposed, and cleaning vehicles prior to entering the Project workspaces. Where required, DTE would remove invasive species either by physical removal or use of approved herbicides, in coordination with landowners and applicable laws and regulations. In accordance with DTE's Procedures, herbicides would only be used to control invasive species within 100 feet of (or within) wetlands if approved by applicable agencies. Inspections would take place after the first and second growing seasons and continue until the disturbed areas are adequately restored.

Based on the types and amounts of vegetation affected by the Project and DTE's proposed avoidance, minimization, and mitigation measures to limit Project impacts, we conclude that impacts on vegetation from the Project would not be significant.

3.2 Aquatic Resources

Existing Aquatic Resources

All waterbodies that would be crossed by the Project are freshwater. Freshwater waterbodies in Pennsylvania are classified by the PADEP according to water quality and aquatic communities. Waterbodies in the state of Pennsylvania are classified as: coldwater fisheries, warmwater fisheries, migratory fisheries, and trout stocked. A list of waterbodies crossed by the Project is provided in appendix F. To be classified as a coldwater fishery, the water temperature must be below 70 degrees Fahrenheit; warmwater fisheries are those which have temperatures greater than 75 degrees

Fahrenheit. Warmwater fisheries are designated for maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warmwater habitat. Coldwater fisheries are designated for maintenance or propagation, or both, of fish species including the family Salmonidae, and other flora and fauna indigenous to coldwater habitats (PAC 2017). No commercial fisheries have been identified within the waterbody segments crossed by the Project, but recreational species in the Project area include brown trout, flathead catfish, smallmouth bass, largemouth bass, and sunfish (Pennsylvania Fish and Boat Commission [PFBC] 2017a).

Fisheries of Special Concern

In addition to the general PADEP classifications, select waterbodies are further classified as High-Quality or Exceptional Value and are provided special protection. No waterbodies crossed by the Project have been designated as High Quality or Exceptional Value waters. The PFBC further classifies waterbodies supporting trout populations or providing habitat as Approved Trout Waters (including both stocked trout waters and those waters approved by the state for stocking), Class A Trout Waters, Special Regulation Areas, Stream Sections that Support Natural Reproduction of Trout, and Wilderness Trout Streams. The Project would cross six naturally reproducing trout waters, one of which is also a stocked trout water. These trout waters include five tributaries of Manatawny Creek (at MP 7.0, 8.1, 8.3, 11.2, and 12.5) and Little Manatawny Creek (MP 10.6). Little Manatawny Creek would also be crossed by an existing access road (AR-8 at MP 10.5) that would be used with no improvements and no new impacts on the fishery would occur. No other PFBC-designated fisheries of concern would be affected by the Project (PFBC 2017a, b, c, d). No state or federally listed fish species were identified as potentially occurring in the Project area. According to the National Marine Fisheries Services online essential fish habitat mapper, no essential fish habitat is located within the Project area (National Marine Fisheries Service 2017).

General Impacts and Mitigation

Constructing the pipeline facilities would require 22 waterbody crossings. Although only 10 of the affected streams contain perennial stream flow and are therefore able to provide permanent habitat for fish, all 22 are classified as fisheries by the PFBC. The 12 non-perennial streams could, at best, provide seasonal or temporary fish habitat. Of the stream segments crossed by the pipeline, 6 are classified as coldwater fisheries and 16 are classified as warmwater fisheries. All 22 waterbodies are classified for migratory fisheries and 6 are classified as naturally reproducing trout waters. In addition, existing access road AR-8 would cross Little Manatawny Creek, a perennial coldwater fishery classified as a naturally reproducing trout water. Waterbody crossing methods are listed in appendix F and described in detail in section A.7.2.

To minimize impacts from sedimentation and turbidity in streams crossed by the proposed pipeline, DTE is proposing to install the pipeline using dry-ditch (dam-and-

pump, flume, and cofferdam) and trenchless (HDD) construction methods. In addition, where waterbodies are located in construction workspace but are not crossed by the pipeline centerline, DTE would use timber matting to minimize disturbance to the streambed. In-stream blasting is not anticipated (see Section B.1.1).

DTE would conduct in-water work in designated fisheries in accordance with the timeframes designated by the PFBC. The PFBC restricts in-stream activities in all naturally reproducing trout waters from October 1 through December 31, and restricts in-stream activities in stocked trout waters from March 1 through June 15 (see appendix F). The PFBC has not established construction timing restrictions for warmwater fisheries. On July 3, 2017, PFBC provided Project-specific concurrence with these construction timing restrictions for the Project. The PFBC also indicated that, although waterbody SCH1 (MP 8.1) is a stocked trout water, the Project would cross the waterbody at an adequate distance from trout stocking areas and in-stream activities would not be restricted between March 1 through June 15.

While dry-ditch crossing methods would reduce turbidity and downstream sedimentation during construction, minor aquatic habitat alteration could still occur. Temporary impediments, changes to behavior, temporary loss of habitat, and/or the alteration of water quality (including temperature) could increase the stress rates, injury, and/or mortality experienced by fish. Where the dam-and-pump method is used, DTE would screen the pump intakes to minimize the potential for fish entrainment, injury, and mortality.

DTE's use of HDD construction methods would avoid direct impacts on fisheries during construction at six waterbody crossings, including the Schuylkill River, Monocacy Creek, and Manatawny Creek (see appendix F). However, if an inadvertent return of HDD drilling fluid occurs within a waterbody, the resulting turbidity could impact water quality and impede fish movement, potentially increasing the rates of stress, injury, and/or mortality experienced by fishes. In addition, water quality could be adversely affected by an accidental spill of hazardous material into a waterbody. DTE's adherence to its Procedures and E&SCP, Inadvertent Return Contingency Plan, and SPCC Plan would minimize the potential for these impacts as well as the response time for notification and clean-up. Specific measures to minimize impacts on waterbodies and fisheries are discussed in section B.2.2.

DTE proposes to use existing access road AR-8, which crosses Little Manatawny Creek near MP 10.4, and access road AR-4, which would be adjacent to an intermittent stream near MP 4.8. Since DTE does not propose to widen these roads for use, no impacts on the waterbodies and aquatic resources would occur. No waterbodies would be affected by construction or operation of aboveground facilities.

To minimize impacts on waterbodies and fisheries, DTE would maintain a 25-foot-wide riparian corridor for the for the full width of the permanent right-of-way and

limit vegetative maintenance immediately adjacent to waterbodies to a 10-foot-wide strip centered over the pipeline with selective tree-clearing within 15 feet of the pipeline. Comments received during scoping identified the potential for temperature changes in waterbodies due to the loss of riparian vegetation. The maintenance of a riparian corridor would minimize operational impacts on water temperature due to decreased shade at the pipeline crossing location.

To further minimize impacts on aquatic resources, DTE would implement the following measures from its Procedures and E&SCP, including:

- install and maintain erosion control devices;
- ensure all flow downstream of crossings is appropriately maintained;
- adhere to in-stream construction time-frames specified by the PFBC;
- prevent and respond to equipment fluid spills by implementing its SPCC Plan;
- implement its Inadvertent Return Contingency Plan in the event of inadvertent returns during HDD drilling activities; and
- restore streambeds and banks to pre-construction conditions.

Impacts on aquatic resources from construction and operation of the Project would be temporary and DTE would limit impacts on aquatic resources by implementing its proposed construction methods and avoidance, minimization, and mitigation measures. Therefore, we conclude that impacts on aquatic resources from the Project would not be significant.

3.3 Wildlife Resources

Existing Wildlife Resources

Wildlife habitat types are based on the vegetation cover types within the Birdsboro Pipeline Project area and include agricultural land, forested upland, open upland, and several wetland types. General vegetation cover types are addressed in section B.3.1, and wetlands are addressed in section B.2.3. Each of these vegetation communities provides foraging, cover, and nesting habitat for a variety of wildlife species, as described in table B-9. Developed land (industrial/commercial and residential) also occurs in the Project area; however, it typically provides limited habitat for wildlife.

Table B-9 Common Wildlife Species in the Project Area	
Vegetative Cover Type	**Common Wildlife Species**
Agriculture	Species that use open land may also occur in agricultural land, which provides foraging and resting habitat for numerous habitat generalists.
Open (herbaceous/shrub) upland	Opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), short-tailed shrew (*Blarina brevicauda*), meadow jumping mouse (Zapus hudsonius), white-tailed deer (Odocoileus virginianus), eastern box turtle (*Terrapene carolina carolina*), five-lined skink (*Plestiodon fasciatus*), eastern American toad (*Anaxyrus americanus americanus*), barn swallow (*Hirundo rustica*), red-tailed hawk (*Buteo jamaicensis*), eastern bluebird (*Sialia sialis*), song sparrow (*Melospiza melodia*)
Upland forest	Opossum, eastern gray squirrel (*Sciurus carolinensis*), American black bear (*Ursus americanus*), spring peeper (*Pseudacris crucifer*), eastern box turtle, northern copperhead (*Agkistodon contortrix mokeson*), eastern garter snake (*Thamnophis sirtalis sirtalis*), American robin (*Turdus migratorius*), Baltimore oriole (*Icterus galbula*), eastern bluebird, gray catbird (*Dumetella carolinensis*), wild turkey (*Meleagris gallopavo*), and northern cardinal (*Cardinalis cardinalis*)
PFO wetland	Raccoon (*Procyon lotor*), mink (*Mustela vison*), white-tailed deer, wood frog (*Lithobates sylvatica*), eastern box turtle, eastern gray treefrog (*Hyla versicolor*), prothonotary warbler (*Protonotaria citrea*), wood duck (*Aix sponsa*), black-crowned night heron (*Nycticorax nycticorax*), barred owl (*Strix varia*)
PEM and PSS wetland	Meadow vole (*Microtus pennsylvanicus*), southern bog lemming (*Synaptomys cooperi)*, white-tailed deer, bullfrog (*Rana catesbeiana*), northern water snake (*Nerodia sipedon sipedon*), eastern ribbonsnake (*Thamnophis sauritus*), snapping turtle (*Chelydra serpentina*), red-spotted newt (*Notophthalmus viridescens viridescens*), pickerel frog (*Lithobates palustris*), song sparrow, swamp sparrow (*Melospiza georgiana*), yellow warbler (*Setophaga petechia*), red-winged blackbird (*Agelaius phoeniceus*), herons, wrens, and ducks
References: PNHP 2017a, PGC 2011a, PGC 2011b, PFBC 2017e, PFBC 2017f	

Managed and Sensitive Wildlife Areas

DTE consulted with the FWS, PADCNR, PGC, and PFBC to identify managed or sensitive wildlife habitats in the vicinity of the Project (FWS 2016, PADCNR 2016, PGC 2017b, PFBC 2017g). Agency consultation and review of Pennsylvania geographic information system databases identified no state wildlife management areas or existing or proposed National Wildlife Refuges that would be crossed by the Project. The closest state-owned land is PADCNR's French Creek State Park, which is approximately 1.9 miles from the Project (PADCNR 2017e). The Project also crosses or is in the vicinity of multiple designated Pennsylvania NHAs, which are discussed in section B.3.1.

General Impacts and Mitigation

Construction and operation of the Project would result in short- and long-term impacts on wildlife. Impacts would vary depending on the specific habitat requirements of the species in the area and the vegetative land cover crossed by the proposed pipeline

right-of-way and within aboveground facilities. Potential short-term impacts on wildlife include the displacement of individuals from construction areas and adjacent habitats and the direct mortality of small, less mobile mammals, reptiles, and amphibians that are unable to vacate the construction area. Long-term impacts would include conversion of forested or scrub-shrub habitats to cleared and maintained right-of-way, as well as periodic disturbance of wildlife during operation and maintenance. Altered habitat and periodic disturbance could also increase wildlife mortality, injury, and stress.

Fragmentation of forested areas results in changes in vegetation (e.g. shrubs inhabiting the forest edge) which may limit the movement of species between adjacent forest blocks, increase predation, and decrease reproductive success for some species (Rosenberg *et al*. 1999). However, approximately 10.4 percent of the Project would be constructed adjacent to existing utility rights-of-way, thereby reducing habitat fragmentation and the Project would avoid impacts on forested land where practicable. Forest fragmentation and edge effects are further described in section B.3.1.

DTE proposes to use eight existing access roads, as well as six new access roads, during construction of the pipeline facilities (see table A-4). Of those, 10 would be temporary (8 existing and 2 new access roads). The four new permanent access roads would be located on agricultural land within the permanent right-of-way and would affect about 0.3 acre composed wholly of agricultural land.

DTE would implement impact minimization measures as described in its Procedures and E&SCP. These measures would include:

- revegetating the right-of-way, where applicable, with PADEP-approved seed mixes approved by the Berks County Conservation District;
- not conducting vegetation maintenance over the full width of the permanent right-of-way in wetlands; and
- maintaining a 25-foot-wide buffer of native vegetation along the edge waterbodies.

Although individual mortality of some wildlife species could occur as a result of the Project, the effects of these individual losses on wildlife populations would primarily be temporary and minor. Based on DTE's proposed minimization of impacts on forested habitat, the presence of similar habitats adjacent to and in the vicinity of construction activities, and the implementation of impact avoidance and minimization measures, we conclude that construction and operation of the Birdsboro Pipeline Project would not have population-level impacts or significantly measurable negative impacts on wildlife.

3.4 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S Code [U.S.C.] 703-711); bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.SC. 668-668d). Executive Order (EO) 13186 (66 FR 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS.

EO 13186 was issued, in part, to ensure that environmental analyses of federal actions assess the impacts of these actions/plans on migratory birds. It also states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and it prohibits the take of any migratory bird without authorization from the FWS. On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding (MOU) that focuses on avoiding, minimizing, or mitigating adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the Commission and the FWS. This voluntary MOU does not waive legal requirements under the Migratory Bird Treaty Act, the ESA, the NGA, or any other statue and does not authorize the take of migratory birds. The Project would be within Regions 28 (Appalachian Mountains) and 29 (Piedmont) of the North American Bird Conservation Initiative (Appalachian Mountains Bird Conservation Region Partnership 2005; Southern Appalachian Bird Conservancy 2014).

The primary concern for impacts on migratory birds, including bald eagles, is mortality of eggs and/or young, since immature birds could not avoid active construction. Tree clearing and ground disturbing activities could cause disturbance during critical breeding and nesting periods, potentially resulting in the loss of nests, eggs, or young. In addition, forest fragmentation could increase predation, competition, and reduce nesting and mating habitat for migratory birds (Faaborg *et al.* 1995). DTE has proposed a pipeline route that would minimize impacts on migratory birds by avoiding forested habitat, where practicable.

Although multiple bird species occur in the Project area, no federally listed threatened or endangered bird species are known to occur in the area. In consultation dated July 8, 2016, the FWS recommended that DTE perform both initial vegetation clearing and operational maintenance activities between September 1 and March 31. DTE's E&SCP indicates that clearing activities would occur between September 1 and March 31. However, in March 2017, DTE submitted Project-specific measures to minimize impacts on migratory birds to the FWS, including routing the pipeline outside of forested areas to the extent possible and limiting initial clearing and operational maintenance activities to the period between September 1 and May 1. Along some

segments of the pipeline, clearing would be further restricted for protection of the Indiana bat (see section 4.4.3).

It should be noted migratory birds may begin nesting and breeding activities in the Project area prior to May 1, and DTE has not identified mitigation measures to avoid impacts on migratory birds (e.g., pre-construction nest surveys in suitable habitat). Because DTE has proposed construction and operation timeframes that are less restrictive than the FWS' recommendation and to protect nesting and breeding migratory birds in the Project area, **we recommend that:**

- **DTE should conduct vegetation clearing activities between September 1 and March 31, or file mitigation measures to avoid impacts on migratory birds (e.g., pre-construction nest surveys in suitable habitat) and documentation, for review and approval by the Director of OEP, indicating that clearing outside of this timeframe is acceptable to the FWS.**

The Project is within the range of the bald eagle, which is federally protected under the Bald and Golden Eagle Protection Act. DTE consulted with FWS to identify the locations of known bald eagle nests within the Project area and noted that the nearest known nesting site is about 3,500 feet from the Project. Although no additional records of bald eagle nests were identified nearer to the Project during consultation with the FWS, bald eagles may establish new nests over time. Therefore, in accordance with the *National Bald Eagle Management Guidelines*, DTE would restrict construction within a 660-foot buffer of any identified nest between January 1 and July 31 to avoid disturbance of bald eagles and their young (FWS 2007a). If wintering bald eagles are present in the Project vicinity during construction, they could temporarily avoid areas of active construction, but would be anticipated to return when construction activities are complete.

Based on the characteristics and habitat requirements of wildlife and migratory birds known to occur in the Project area, the amount of similar habitat adjacent to and in the vicinity of the Project, adherence to the *National Bald Eagle Management Guidelines*, DTE's implementation of the measures in our Plan and its Procedures and E&SCP, and our recommendation regarding timing restrictions for clearing of vegetation, we conclude that construction and operation of the Birdsboro Pipeline Project would not have significant impacts on migratory bird populations.

4. Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Special status species include federally listed species protected under the ESA, species proposed or candidates for listing by the FWS, and those species that are state listed as threatened or endangered, or other special status. Section 7(a)(2) of the ESA requires the Commission to ensure

that any action it authorizes, funds, or carries out would not jeopardize the continued existence of federally listed or proposed listed species, or result in the adverse modification or destruction of critical habitat for federally listed and proposed species.

As the lead federal agency for the Birdsboro Pipeline Project, FERC is responsible for the ESA Section 7 consultation process with the FWS. Species classified as candidates for listing under the ESA and/or state regulation do not currently carry regulatory protection but, if applicable, are typically considered during our assessment as they may be listed in the future. Similarly, species protected under state statutes do not carry regulatory protection under the ESA but impacts are reviewed if the applicable agency indicates potential presence in the Project area during consultation.

Informal consultations were conducted by DTE, as our non-federal representative, with the FWS - Pennsylvania Field Office to determine whether any federally listed threatened or endangered species, federal species of concern, or designated critical habitats occur in the Project area. DTE's consultation with the FWS identified potential habitat and known occurrences of threatened and endangered species in the Project area. DTE also conducted species-specific surveys as described below. Table B-10 describes the federally listed species that occur in the Project area, their preferred habitat, and our determination of effect. Federally listed species with a determination of "no effect" as documented in table B-10, are not discussed further. No designated critical habitat occurs in the Project area. DTE also consulted with PADCNR, PGC, and PFBC regarding state listed species and habitats, as discussed in section B.4.2.

Table B-10
Federal Threatened and Endangered Species Potentially Occurring in the Project Area

Species	Federal Status[a]	State Status[a]	Habitat Description	Effect Determination
Reptiles and Amphibians				
Bog turtle (*Glyptemys muhlenbergii*)	T	E	Lives in open, sunny, spring-fed wetland areas with scattered dry areas. Active from April through October. Nests are built during summer, in moss or sedges above the water level adjacent to the wetlands (FWS 2010, PFBC 2016f, FWS 2016).	*May affect, not likely to adversely affect.* Potential habitat was identified during Phase 1 surveys. Potentially occupied habitat would be avoided by implementing HDD construction within FWS-recommended timeframes.
Mammals				
Indiana Bat (*Myotis sodalis*)	E	E	Hibernates in caves and abandoned mines during the winter. Roosts in maternity colonies in spring, summer, and fall located under the exfoliating bark of dead trees in riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities. Forages in forested areas, cleared areas adjacent to forests, and over ponded areas that support abundant flying insects (FWS 2016, FWS 2007b).	*May affect, not likely to adversely affect*. Potential roosting sites and colonies were identified by FWS; impacts on potential habitat would be minimized during construction by avoiding forested habitat, using HDD construction, and implementing construction timing restrictions to clear trees when bats are hibernating.
Northern long-eared bat (*Myotis septentrionalis*)	T	T	Hibernates in caves and abandoned mines during the winter. Roosts singly or in colonies underneath exfoliating bark of dead trees, in cavities, or in crevices of both living and dead trees. Occasionally found using structures as roost sites (for example, barns and sheds). Forages within the understories of forested habitat (FWS 2015, FWS 2016).	*May affect, not likely to adversely affect*. No known maternity roosting sites are located within 150 feet of the Project area. Impacts on potential habitat would be minimized during construction by minimizing crossings of forested habitat, using HDD construction, and implementing construction timing restrictions to clear trees when bats are hibernating.
Plants				
Northeastern bulrush (*Scirpus ancistrochaetus*)	E	E	Grows in wet areas such as in ponds, wet depressions, shallow sinkholes, vernal pools, small emergent wetlands, or beaver-influenced wetlands, and is most commonly found at elevations greater than 1,000 feet above mean sea level (FWS 2016, Cipollini and Cipollini 2011).	*No effect.* The Project is located at elevations lower than 500 feet above mean sea level. Therefore, the northeastern bulrush is not anticipated to occur in the Project area.

[a] E = endangered; T = threatened.

4.1 Federally Listed Species

Bog Turtle

The Project is within the range of the federally threatened and state endangered bog turtle. Potential bog turtle habitat includes wetlands with areas of perennially saturated, deep (3- to 5-inch) mucky soils, and predominantly emergent vegetation (FWS 2006). A wetland found to contain these three characteristics (either together or in separate areas) during habitat surveys (Phase 1) is considered suitable habitat and may require additional (Phase 2) surveys to determine species presence or absence.

In May and June 2016, DTE conducted Phase 1 surveys of wetlands crossed by the Project to identify suitable bog turtle habitat. Two wetlands with the potential to support bog turtles were identified. To determine whether bog turtles occur in the first wetland, FWS recommended that DTE conduct Phase 2 (presence) and Phase 3 (trapping) surveys. DTE completed these surveys during May and June 2017. No bog turtles were identified during presence and trapping surveys of this wetland. On August 2, 2017, the FWS concurred with the field survey results.

The second wetland with the potential to support bog turtles would be crossed via HDD, thereby avoiding direct impacts on potential bog turtle habitat. However, an inadvertent return of drilling fluid during HDD activity could disturb bog turtles, particularly if an inadvertent return were to occur during the hibernation period (November 1 and April 1). DTE conducted geotechnical investigations at the HDD location, and found that the geology is conducive to a successful HDD, with a low potential for inadvertent returns. In addition, DTE would complete all construction across this wetland between April 1 and October 31 to avoid any potential indirect impacts on hibernating bog turtles in the event of an inadvertent return. Should DTE's construction schedule change, such that HDD construction through bog turtle habitat is warranted during the hibernation period, it would consult with the FWS for concurrence prior to initiation of HDD activities. Further, DTE would be required to request approval from OEP staff for use of a modified timing window. DTE would also implement the measures in its Inadvertent Return Contingency Plan, which addresses measures for prevention, detection, required notifications, and mitigation for inadvertent returns, and SPCC plan to prevent and respond to equipment fluid spills.

Refueling and fuel storage would not occur within 300 feet of the wetland containing potential bog turtle habitat. DTE would also implement its HDD Standardized Special Bog Turtle Area Protection Procedures, which include the following mitigation measures:

- provide construction and inspection personnel with species identification information to be used during construction of the Project;

- conduct bog turtle exclusion surveys using a qualified biologist immediately prior to mobilization for construction of the HDD across potential bog turtle habitat; and

- install exclusion fencing around the HDD bore pit following surveys, with daily fence inspections.

The results of the Phase 1 surveys of the second wetland and DTE's proposed mitigation were submitted to the FWS, and consultation is ongoing regarding Project impacts on potentially suitable bog turtle habitat. However, since impacts on the wetland containing potentially suitable bog turtle habitat would be avoided by HDD construction, we have determined that construction and operation of the Project *may affect, but is not likely to adversely affect* the bog turtle.

Indiana Bat

The federally and state listed endangered Indiana bat was identified during the Pennsylvania Natural Diversity Inventory database review and during consultations with PADCNR and FWS. In addition, consultations with the FWS indicated that Indiana bat presence has been established in forested habitats along the northern extent of the Project, where known maternity colonies and/or summer roost sites are present. Secondary roost sites are assumed to be located within all forested habitat in the Project area. No known winter hibernacula occur in Berks County based on consultation with applicable agencies.

Impacts on the Indiana bat could include habitat disturbance due to human activity during construction. Long-term impacts could occur due to the permanent loss of trees and suitable habitat. However, the FWS indicated that if tree clearing were limited to about 40.0 acres or less, the Project would not likely adversely affect the Indiana bat (FWS 2017a). Construction of the Project would result in impacts on about 15.9 acres of forested habitat. However, tree clearing would total less than 1.0 acre within known habitat.

During May 2017, DTE conducted a habitat suitability assessment of the stands of trees identified for removal along the northern extent of the Project in known habitat and identified potentially suitable roosting trees. Since conducting the habitat suitability assessment, DTE has modified the Project and an additional 0.1 acre of forest vegetation would be cleared within the assessment area; however, tree clearing would still total less than 1.0 acre within known habitat. Additionally, in known habitat along the northern extent of the Project, DTE would limit tree clearing to the period between November 15 and March 31 when Indiana bats are hibernating or are concentrated near their hibernacula, to avoid impacts on any roosting Indiana bats (FWS 2007b). Therefore, on August 2, 2017, the FWS indicated that the Project effects would be discountable in areas of known, occupied Indiana bat habitat.

Further, although Indiana bats could occur in forest habitat south of the known habitat, DTE would not clear vegetation on any section of the Project between May 1 and August 31 to prevent potential impacts during the maternity roosting period (typically between early May and early August; FWS 2007b). DTE's timing restrictions for clearing vegetation would also minimize the chance for human activity associated with construction to disturb Indiana bats foraging in the Project area. Further, most construction would be limited to daylight hours when bats are not active. In the chance that Indiana bats are foraging in the Project vicinity, bats would likely avoid areas of active construction and would return to the Project area when construction activity has ceased. Since DTE would avoid and minimize impacts on Indiana bat habitat and would implement timing restrictions to clear vegetation outside the summer roosting period, we have determined that construction and operation of the Project *may affect, but is not likely to adversely affect* the Indiana bat.

Northern Long-Eared Bat

The northern long-eared bat is federally and state listed as threatened due to population declines related to white-nose syndrome (FWS 2017b). The FWS has also established a final rule under Section 4(d) of the ESA that targets the prohibition of incidental take in those areas affected by white-nose-syndrome (e.g., within 150 miles of confirmed white-nose syndrome). Within affected areas, incidental take is prohibited if: it occurs within a hibernaculum; it results from removal of a known, occupied maternity roost; or it results from removal of trees within 150 feet of a maternity roost during the pup season, June 1 through July 31 (FWS 2017c). As the Project is within the range of the northern long-eared bat, as well as within the area affected by white-nose syndrome, Section 4(d) would be applicable to the incidental take of northern long-eared bats (FWS 2016, FWS 2017c). Therefore, in accordance with the FWS' January 5, 2016 IntraService Programmatic Biological Opinion on the final 4(d) rule for the northern long-eared bat, we have included the Northern Long-eared Bat 4(d) Streamlined Consultation Form as appendix H.

Similar to the Indiana bat, Project-related impacts on the northern long-eared bat could include temporary impacts due to habitat disturbance during construction activities. Long-term impacts could occur due to permanent loss of suitable habitat from vegetation clearing for construction and operation. However, the Project is not located within areas of documented northern long-eared bat occurrence. Additionally, DTE would avoid impacts on the northern long-eared bat by minimizing impacts on forested habitat and adhering to the construction timing restrictions that would be implemented for protection of Indiana bats. The FWS has determined that, if tree clearing is limited to about 40.0 acres or less for the entire Project, it would be not likely to adversely affect the northern long-eared bat (FWS 2017a). The Project would result in impacts on 15.9 acres of forested habitat. Further, DTE consulted with FWS and determined that no known

maternity roost sites for the species occur within 150 feet of the Project and no known winter hibernacula are located within Berks County.

Since DTE would avoid and minimize impacts on northern long-eared bat habitat and would clear vegetation when bats are hibernating or are concentrated near their hibernacula, we have determined that construction and operation of the Project *may affect, but is not likely to adversely affect* the northern long-eared bat. Further, as identified in appendix H, we have determined that the Project is compliant with the 4(d) rule, and any incidental take resulting from the Project is not prohibited under Section 4(d) of the ESA.

DTE is still consulting with the FWS regarding federally listed threatened and endangered species that may be present in the Project area as well as recently identified workspaces. The FWS must concur with our determinations of effect for federally listed species to complete the ESA consultation process. To ensure compliance with our responsibilities under Section 7 of the ESA, **we recommend that:**

- **DTE <u>should not begin construction</u> of the Project <u>until</u>:**

  a. **FERC staff completes any necessary ESA Section 7 consultations with the FWS; and**

  b. **DTE has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.**

4.2 State Listed Species

DTE's consultation with the PADCNR, PGC, and PFBC identified potential habitat and known occurrences of threatened and endangered species, and species of concern, in the Project area. DTE also conducted species-specific surveys as described below. Table B-11 describes the state listed species that occur in the Project area, their preferred habitat, and our determination of effect. State listed species with a determination of "no significant effect" are discussed only in table B-11, unless additional discussion was warranted to arrive at our determination.

Table B-11
State Threatened and Endangered Species and Species of Concern Potentially Occurring in the Project Area

Species	Federal Status	State Status[a]	Habitat Description	Effect Determination
Reptiles and Amphibians				
Eastern redbelly turtle (*Pseudemys rubriventris*)	-	T	Lives in large, deep streams, ponds, lakes, and marshes with permanent water, ample basking sites, and aquatic vegetation (PFBC 2016f, PNHP 2017b)	*No significant impact*. Potential habitat was identified during species surveys; however, this habitat would be avoided during construction via HDD and construction windows to avoid hibernating herpetofauna would be implemented.
Eastern spadefoot toad (*Scaphiopus holbrookii*)	-	E	Lives and burrows within sandy or soft loamy soils. Sporadic breeder, breeding in temporary pools when conditions include steep barometric pressure decreases and heavy rainfall (PFBC 2016f).	*No significant impact*. Surveys to identify potential habitat in July 2016 found that no suitable breeding habitat is within the Project area and potentially suitable forested land along the Schuylkill River would not be directly affected by Project construction.
Plants				
Cattail sedge (*Carex pyphina*)	-	E	Requires moist conditions; grows in calcareous bottomlands, swamps, and wet wooded habitats occasionally along flooded streams (PADCNR 2016b, PNHP 2017c).	*No significant impact*. Populations of the species were identified during botanical surveys but would be avoided by HDD. On November 2, 2016, PADCNR indicated that no impact was anticipated.
Showy goldenrod (*Solidago speciose var speciosa*)	-	PT	Grows in moist meadows, rocky woods, thickets, and roadsides on diabase or limestone; flowers in late August – October (PADCNR 2016b).	*No significant impact*. Although present in the vicinity of the Project, no populations of the species were identified during botanical surveys**.**
Bog bluegrass (*Poa paludigena)*	-	T	Grows in swamps, along spring-fed streams, and in wet wooded habitats (PNHP 2017d).	*No significant impact.* On October 13, 2017, PADCNR indicated that no impact was anticipated.
Birds				
Great blue heron (*Ardea herodias*)	-	SOC	Colonial waterbirds that breed in isolated swamps, on islands, and near lakes/ponds bordered by forests. Forage in grasslands and agricultural fields (Cornell University 2017).	*No significant impact*. Although potentially present in the Project vicinity, our recommendation in section B.3.4 to conduct clearing outside of the breeding season for migratory birds (April 1-August 31) or develop and implement appropriate mitigation would minimize or avoid impacts on nesting.

[a] E = endangered; T = threatened; PT= proposed for listing as threatened; SOC = species of concern.

Eastern Redbelly Turtle

This species inhabits relatively large, deep waterbodies including streams, rivers, ponds, lakes, and marshes with permanent water and ample basking sites (PFBC 2016f). Current threats to the eastern redbelly turtle include habitat destruction, reduced water quality, and species competition from non-native turtle species.

To identify potentially suitable habitat for the eastern redbelly turtle in the Project vicinity, DTE conducted surveys in July 2016 within 1,000 feet of the Schuylkill River where PFBC indicated this species could occur. Surveys identified multiple small unnamed tributary headwaters associated the Schuylkill River floodplain, as well as the Schuylkill River, as containing potentially suitable habitat for the eastern redbelly turtle. DTE would cross the Schuylkill River floodplain and Schuylkill River via HDD, avoiding direct impacts on eastern redbelly turtle habitat. Additionally, DTE would complete HDD construction across potential eastern redbelly turtle habitat between April 16 and October 14 to avoid potential indirect impacts on hibernating turtles. Further, DTE would use a qualified biologist to conduct pre-construction surveys and remove and document individuals from the Project workspace, and would install exclusion fencing around the construction workspace in potential eastern redbelly turtle habitat. Refueling and fuel storage would not occur within 300 feet of wetlands containing potential eastern redbelly turtle habitat. In correspondence provided in April and October 2017, the PFBC indicated that it does not foresee the Project having adverse effects on the eastern redbelly turtle, provided that DTE implements these mitigation measures. We concur, and conclude that *no significant impact* on this species would occur.

Showy Goldenrod

Although not currently listed as a state threatened and endangered species, the showy goldenrod is proposed for state listing as threatened (PADCNR 2016). Suitable habitat for this species includes moist meadows, rocky woods, thickets, and roadsides on diabase (a type of igneous rock) or limestone; it has been documented in the Project area within disturbed soils along a railroad right-of-way (PADCNR 2016). In October 2016, DTE conducted botanical surveys along the southern extent of the Project where it encroaches on the buffer of a known showy goldenrod population. No populations of showy goldenrod were identified during botanical surveys. The PADCNR concurred with the survey result on November 2, 2016 and found that no Project-related impacts on the showy goldenrod are anticipated. After PADCNR's concurrence, DTE modified the construction workspace where it intersects with the buffer of the known showy goldenrod population. On October 13, 2017, the PADCNR provided updated correspondence indicating that the Project would not be likely to impact resources under its purview. We concur and conclude that the Project would have *no significant impact* on this species.

5. Land Use and Visual Resources

5.1 Land Use

The proposed pipeline and associated facilities would cross multiple land types in Berks County, Pennsylvania. The majority of the pipeline would cross agricultural land (9.6 miles or 72.5 percent of the Project). Other land types crossed by the Project are classified as forested land (2.0 miles), open land (0.8 mile), industrial/commercial land (0.5 mile), residential land (0.2 mile), and open water (less than 0.1 mile).

In total, the Birdsboro Pipeline Project would affect 155.2 acres of land during construction, including the pipeline construction right-of-way, ATWS, a meter station, contractor yards/staging areas, access roads, MLVs, and a pig receiver. Of the 155.2 acres affected during construction, about 77.7 acres would be restored to pre-construction uses. The remaining 77.5 acres would be maintained for operation of the Project. Table B-12 summarizes the Project's temporary (construction) and permanent (operational) land use impacts. Impacts on open water and wetlands are discussed in sections B.2.2 and B.2.3, respectively.

Agricultural Land

Construction of the Project would impact 88.9 acres of agricultural land, defined by the presence of active or rotated crop production and hay, which is about 57.3 percent of the total acreage that would be affected by construction of the Project. During the construction phase of the proposed pipeline, it is anticipated that at most one growing season would be lost. However, landowners would be compensated for these production losses in accordance with the terms of individual landowner agreements. Following construction, the 57.3 acres within the permanent right-of-way would be restored in accordance with our Plan and DTE's E&SCP so that the full right-of-way could be used for crop production the following season, except where MLVs and permanent access roads would be within the permanent right-of-way (see table A-4). The remaining 2.5 acres associated with the meter station and pig receiver would be permanently lost and converted to industrial/commercial land. Details regarding construction techniques within active croplands are provided in section A.7.2.

Prime farmland and farmland of statewide importance constitute about 64.4 and 19.7 percent, respectively, of all land potentially affected by the Project. These land categories are assigned based on soil composition and are not necessarily used for agricultural purposes. Impacts on prime farmland or farmland of statewide importance are discussed in section B.1.2.

Table B-12
Land Use Affected by Construction and Operation of the Project[a]

Facility	Agricultural Land		Forested Land		Open Land		Residential Land		Industrial / Commercial Land		Open Water		Total	
	Con[b]	Op[b]	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
Pipeline Facilities														
Pipeline right-of-way and ATWS	86.6[c]	57.3[c]	14.9	10.3	5.9	3.8	2.5	0.7	5.0	2.8	0.1[d]	0.1[d]	114.9	75.0
Access roads	0.1	0.0	0.9	0.0	0.4	0.0	0.4	0.0	4.5	0.0	0.0	0.0	6.3	0.0
Contractor yards / staging areas	0.0	0.0	<0.1	0.0	6.6	0.0	0.0	0.0	24.9	0.0	0.0	0.0	31.5	0.0
Aboveground Facilities														
TETCO Meter Station[e]	2.3	2.3	0.00	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	2.3	2.3
Pig receiver	0.0	0.0	0.00	0.0	<0.1	<0.1	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2
Project Total	**88.9**	**59.5**	**15.9**	**10.3**	**12.9**	**3.8**	**2.9**	**0.7**	**34.6**	**3.0**	**0.1**	**0.1**	**155.2**	**77.5**

Con = Construction; Op = Operation.

[a] All numbers are reported in acreages. Non-forested wetlands are included in the open land category and forested wetlands are included in the forested land category. As discussed in section A, additional impacts for groundbed protection areas are unknown at this time.

[b] Construction impact acreages are based on a 50-foot-wide right-of-way with an additional 25 feet of TWS and ATWS, as needed. Operational impact acreages are based on a 50-foot-wide permanent right-of-way.

[c] Impacts associated with MLVs (<0.1 acre total) and four permanent access roads (AR-5, -7, -9, and -10; about 0.3 acre) are included in the pipeline right-of-way acreages as they would be located within the permanent right-of-way.

[d] This acreage represents a 5-foot-wide path over the Schuylkill River to represent the pipeline; however, as the river would be crossed via HDD, no impacts would occur.

[e] Includes the pig launcher to be installed at the station site.

DTE has identified known irrigation or drainage systems on parcels that would be crossed between MP 10.7 and 11.4 and between MP 12.8 and 13.2. Where the pipeline would cross a drain tile, DTE would install the pipeline a minimum of 12 inches below the drain tile. If a drain tile or irrigation system were damaged during construction, temporary repairs may be made and, following active construction, DTE would work the landowner to permanently repair or replace the damaged components, in accordance with our Plan and the terms of individual landowner easements.

After construction, DTE would visually inspect agricultural land after the first two growing seasons to ensure that crop vigor in areas affected by construction is similar to those of adjacent portions of the same field. Annual vegetation maintenance is not typically required on actively cultivated land; therefore, impacts from operational maintenance activities are not expected. With implementation of our Plan and DTE's E&SCP, impacts on agricultural lands would generally be minor and temporary, with the exception of limited permanent conversion associated with aboveground facilities.

Forested Land

Forested land is defined by upland or wetland areas dominated by hardwood trees. A total of 10.2 percent (15.9 acres) of the land that would be affected by construction of the Project is classified as forested land (see table B-12). Operation of the Project would result in the permanent conversion of 10.3 acres of forested land to open land within the permanent right-of-way. After construction, trees and shrubs would be allowed to grow within the temporary construction right-of-way and other temporary workspaces. Impacts on forested land would be long-term and permanent, as it would likely take 20 years or more for mature trees to re-establish within the construction areas and the 10.3 acres required for operation would be permanently converted to open or developed land. Impacts on forested vegetation are discussed in greater detail in section B.3.1 and visual impacts from clearing forested land are discussed in section B.5.5.

Open Land

Project construction would affect 12.9 acres of open land, defined as non-forested upland or wetland open areas, scrub-shrub upland or wetland areas, pasture land, grassland, maintained roadsides, and utility rights-of-way (see table B-12). Approximately 9.1 acres would be temporarily disturbed during construction and allowed to revert to natural conditions after construction. During operation, 3.8 acres would be within the new maintained right-of-way and less than 0.1 acre for the pig receiver at the Birdsboro Power Facility (MP 0.0). Based on the limited acreage of open land subject to permanent maintenance or conversion, impacts on open land would be predominantly short-term and minor.

Industrial/Commercial Land

Industrial/commercial land includes existing industrial and commercial facilities and existing roads. As presented in table B-12, the Birdsboro Pipeline Project would affect a total of 34.6 acres of industrial/commercial land during construction. With the exception of 3.0 acres of industrial/commercial land that would be permanently encumbered by the operational right-of-way and aboveground facilities, the remaining 31.6 acres of affected land would be returned to original conditions after construction. As discussed in section A.8.2, DTE would cross 26 local, state, and federal roads using open cut methods, conventional bore, or HDD.

Open Water

Open water includes those waterbodies that are 100 feet wide or greater. DTE plans to use HDD construction methods for the two proposed crossings of the Schuylkill River (MP 0.4 and 0.5), the only waterbody located along the proposed route that is 100 feet wide or greater. Because the pipeline would be installed via HDD, no impacts on the Schuylkill River are anticipated from construction or operation of the Project. DTE would cross other waterbodies using methods described in section A.5.2.

5.2 Residential Land and Planned Developments

Construction of the proposed pipeline would temporarily affect 2.5 acres of residential land, of which 0.7 acre would be encumbered by the permanent right-of-way during operations. An additional 0.3 acre would be affected during construction and operation through use and improvement of existing access roads in residential land (see table B-12). DTE consulted with Amity, Earl, Exeter, Oley, Pike, Robeson, Rockland, and Union townships in Berks County to identify any planned residential or industrial/commercial developments in the Project area. Each entity indicated that there are no known developments are planned within 0.25 mile of the Project.

A total of 23 buildings are within 50 feet of construction workspaces, most of which are non-residential buildings (see table B-13). One vacant residence is located within 50 feet of the proposed construction work areas at MP 2.1; DTE has coordinated with the landowner and this structure would be removed prior to construction. One residence (MP 1.7) would be located 50 feet from construction work areas and two residences (MP 4.6 and 10.4) would be 50 feet from existing access roads. One asphalt and one gravel driveway would be crossed at MP 0.8 and 4.0, respectively. While DTE is proposing to open cut these driveways, impacts for the business owner and home owner, respectively, would be mitigated by the use of steel plates to maintain access, safety fencing, and DTE's commitment to restore all driveways within a week.

Table B-13
Residences and Buildings Within 50 Feet of the Project

Type of Structure	Nearest Proposed Milepost	Distance to Pipeline Centerline (feet)	Distance to Construction Workspace (feet)
Commercial / Industrial[a]	0.1	90	50
Commercial / Industrial[a]	0.2	45	10
Residential	1.7	65	50
Residential outbuilding	2.1	253	0
Residential outbuilding	2.1	290	0
Residential outbuilding	2.1	265	0
Residential[b]	2.1	83	0
Residential outbuilding	3.7	78	43
Residential outbuilding	4.5	65	50
Residential[c]	4.6	510	50
Agricultural[c]	4.7	353	10
Agricultural[c]	4.7	462	10
Commercial / Industrial[c]	9.1	916	50
Agricultural[c]	10.3	806	5
Agricultural[c]	10.3	819	5
Agricultural[c]	10.3	972	5
Agricultural[c]	10.3	952	5
Agricultural[c]	10.3	1042	5
Agricultural[c]	10.3	1129	5
Agricultural[c]	10.4	755	5
Residential[c]	10.4	954	50
Agricultural[c]	10.4	765	5
Residential outbuilding[c]	13.1	167	50

[a] These structures are vacant.
[b] The residence is vacant and would be removed prior to construction.
[c] Distance from the structure to an existing access road.

At all residences within 50 feet of proposed workspace, DTE would install 100-foot-long barricade fences along the edges of the construction workspace, and backfill and restore landscapes in accordance with our Plan and DTE's E&SCP. All residential areas would be restored to pre-construction conditions where possible or as specified by the landowners. Landowners would continue to have use of the permanent right-of-way within the bounds of the easement agreement. However, no permanent structures would be allowed within the limits of the proposed operational right-of-way.

Temporary construction impacts on residential areas include noise and dust; disturbance or removal of lawns, trees, landscaped shrubs, or similar vegetation; and removal of aboveground structures such as fences or sheds from within the pipeline right-of-way. DTE would minimize construction-related impacts on all residences through landowner notification of approximate timelines of active construction, at least seven days in advance of construction activities, maintaining property access, mitigation of fugitive dust (see section B.8.1), and installation of safety fence around open trench.

5.3 Surface Mining Land

According to a review of PADEP's eFACTS and eMapPA, DTE identified one active surface mine near MP 9.1 (see section B.1.1). DTE adjusted the pipeline route in this area, based on correspondence with the quarry owner, so that the pipeline would cross the quarry property along its eastern boundary. DTE's contractor yard and access road AR-6 would also be located on the quarry property. No additional mining activities were identified within a 0.25-mile radius of the Project. Mineral resources and mining in the Project area are discussed in section B.1.1.

5.4 Public Land, Recreation, and Special Interest Areas

The Project would not be within 0.25 mile of any national parks, forests, wildlife refuges, trails, scenic river systems, or natural landmarks; state parks or forests; or federally designated wilderness areas. In addition, DTE has consulted with the USDA-NRCS regarding private easements such as the Agricultural Conservation Easement Program and Wetland Reserve Program, and has determined that none would be crossed. To date, no lands enrolled in the Wetland Reserve Program or Wetland Reserve Easement Program have been identified as being crossed by the Project.

The entire Project would be located within the Schuylkill River National and State Heritage Area. The Schuylkill River Greenway Association, a non-profit organization, manages the heritage area, designated by the United States Congress as natural, cultural, historic and recreation resources that form a cohesive, naturally distinct landscape (Schuylkill River National and State Heritage Area 2017). Through natural and cultural resource preservation, education, recreation, community revitalization, and heritage tourism the Schuylkill River Greenway Association works to revitalize and restore the heritage area. DTE is proposing an HDD of the Schuylkill River, which is a state designated scenic river and considered a Pennsylvania water trail for canoes, kayaks, and small watercraft, between MP 0.3 and 0.6. The HDD crossing method would minimize direct impacts on both the river and heritage area. As mentioned above, impacts would generally be short-term and temporary; therefore, we conclude that there would be no significant impact on the Schuylkill River National and State Heritage Area.

Four additional NHAs are located in the Project area, including the Furnace Creek, Manatawny Creek, Oley Valley, and Bieber Creek NHAs. The Project would cross core

habitat in the Furnace Creek NHA between MP 10.6 and 10.7 using HDD methods, and would be parallel to the NHA between MP 10.7 and 10.9, with an offset of about 25 feet. The Furnace Creek NHA is designated by the PNHP, which is a multi-agency partnership focused on gathering information on ecological resources to guide conservation work and land-use planning (PNHP 2017a). The three additional NHAs (Manatawny Creek, Oley Valley, and Bieber Creek) would be near the Project (1,470 feet, 1,830 feet, and 75 feet, respectively) but core habitat would not be crossed by the Project. Given that the core habitat of the Furnace Creek NHA would be crossed via HDD construction methods and core habitat for the Manatawny Creek, Oley Valley, and Bieber Creek NHAs would not be crossed, no impacts are anticipated. NHAs are discussed further in section B.3.1.

Four townships in the Project area (Amity, Union, Oley, and Rockland) are enrolled in conversation easements with Berks County Department of Agriculture (BCDA), which work in conjunction with the Berks County Agriculture Land Preservation Board, the Pennsylvania Bureau of Farmland Preservation, and the USDA-NRCS. Two voluntary conservation programs are administered by the BCDA: the agricultural conservation easement and the agricultural security areas (ASA). Under the ASA program, townships work with landowners who own 10 acres or more of viable agricultural land to form an ASA consisting of a minimum of 250 acres (County of Berks 2017). Land enrolled in the ASA is protected from condemnation and local nuisance ordinances. When an ASA reaches 500 acres, it is eligible for enrollment in the agricultural conservation easement program.

The BCDA acquires these clusters of 500 acres or more and the land is preserved by preventing development for any purpose other than agricultural production. Every seven years, the townships review the land enrollment in the ASA program and may add to or remove land from the program. Based on publicly available data, DTE has identified three locations where the pipeline would cross blocks of ASA easements (from MP 5.3 to 8.3, 9.6 to 10.7, and 10.9 to 12.8). Since the pipeline would be buried, and agricultural use could resume following construction, we do not anticipate that Project would result in a change in enrollment in these programs. No aboveground facilities would be located on land enrolled in these programs.

DTE has consulted with NRCS regarding its review of non-publicly available data to identify any additional easements that may be crossed by the Project. Three parcels enrolled in the Farm and Ranch Lands Protection Program (FRPP) are within 0.25 mile of the Project area. The FRPP is managed and administered by the USDA to provide funds to aid in the purchase of development rights to keep farm and ranchlands in agricultural use (USDA-NRCS 2017). Only one parcel enrolled in the FRPP would be crossed by the Project. Based on a review of the deed for this parcel we do not anticipate construction or operation of the Birdsboro Project would impact the parcel's enrollment status. DTE would coordinate with the landowner on the anticipated construction

schedule and any potential reduction in benefits of the FRPP associated with construction of the Project could be negotiated with DTE as part of the landowner's easement.

Two parks would be within 0.25 mile of the Birdsboro Pipeline Project. A Berks County baseball field would be 900 feet south of the pipeline near MP 0.0 and about 365 feet southwest of the proposed Birdsboro Power Facility. The Thun Trail, which is part of the Schuylkill River Trail, runs along the northern edge of the county baseball field. The Oley Township Volunteer Park would be 515 feet southwest of the pipeline near MP 10.8. Forest buffers between these parks and work areas would minimize visibility of construction activities for visual receptors at the parks and users of the trail, as well as mitigate dust and noise from construction.

In general, pipeline facility impacts on recreation special use areas occurring outside of forested land would be temporary, limited to the period of active construction, lasting a few weeks or months in any one area. These impacts would be mitigated by DTE's implementation of our Plan and its Procedures and E&SCP. Alternatively, clearing of forested land within the construction right-of-way, and maintenance of the permanent right-of-way as herbaceous and scrub-shrub vegetation types would change the viewscape for visual receptors in the area (see section B.5.5). Overall, we find that impacts from the Project on recreation special use areas would be highly localized and temporary, and impacts on the tourism industry would not be likely. Transportation and noise impacts from the Project are discussed in sections B.6.2 and B.8.2, respectively.

5.5 Visual Resources

The Project could alter existing visual resources in two ways: (1) construction activity and equipment may temporarily alter the viewshed; and (2) lingering impacts along the right-of-way from clearing during construction could alter existing vegetation patterns. The significance of these visual impacts would primarily depend on the quality of the viewshed, the degree of alteration of that view, the sensitivity or concern of potential viewers, and the perspective of the viewer.

Visual impacts would be greatest during construction of the Project because of the increased right-of-way needed for construction, the displaced soil, and the presence of construction personnel and equipment. After construction, temporary workspaces would be returned to pre-construction conditions by the restoration methods outlined in our Plan and DTE's Procedures and E&SCP.

Land affected by the Project is dominated by agricultural and open land on rolling low hills and valleys. Visual impacts would be most noticeable in areas of cleared forested land. The conversion of forested land to open land has the potential to impact its use as a visual buffer and reduce its aesthetic quality. In restored temporary work areas,

regrowth to pre-construction condition would take 20 years or more, depending on the species and age of the cleared forest.

The TETCO Meter Station would be constructed on agricultural land with several residences nearby. There are some trees that would act as a visual buffer for residents to the east and south of the station, however, these visual receptors may be able to view construction equipment and personnel during the construction phase, as well as view the facility while in operation, depending on their specific vantage points. This would result in a minor, permanent impact.

No other major aboveground facilities are proposed for the Project. Therefore, no significant permanent visual impacts are anticipated. Through DTE's implementation of its proposed construction and mitigation measures, as well as the revegetation measures in DTE's mitigation plans, we conclude that visual impacts of the entire Project would be appropriately minimized and no significant impacts would result.

6. Socioeconomics

The Project would be located entirely in Berks County, Pennsylvania, which has a population of 413,965 (U.S. Census Bureau 2017a). Construction and operation of the Project would have minimal impacts on population, employment, transportation, or the local economy.

6.1 Employment

Based on data from the U.S. Bureau of Labor Statistics, the 2016 labor force in Berks County was 214,394 with an average unemployment rate of 8.0 percent, compared to the state's unemployment rate of 5.8 percent (U.S. Bureau of Labor Statistics 2016). Project construction would require an estimated peak workforce of 120 workers. Due to the relatively short duration and transient nature of construction, it is anticipated that most non-local workers would not be accompanied by their families. The influx of any non-local workers would be temporary and limited to the six-month period of construction. The increase in employment for local workers would result in a temporary and negligible impact on unemployment rates in the Project area.

DTE does not anticipate hiring new staff to operate Project facilities as existing staff members would fill this role. Therefore, no long-term increase in population and employment within the townships crossed by the Project would be expected.

6.2 Transportation

The Project would cross 1 railroad and 26 public roads. The Pennsylvania Lines Railroad (MP 0.5) would be crossed using the HDD method, thereby precluding impacts. Of the 26 public roads, 14 would be crossed by open cut (including 5 gravel or dirt roads and 9 asphalt roads), 10 would be bored, and 2 would be crossed using the HDD method

(appendix D). State roads and highways would be crossed using the conventional bore method to avoid traffic impacts (see section A.8.2).

Although direct impacts on roads crossed by bore or HDD would generally be avoided, roads crossed by open cut methods would be temporarily affected by construction within the roadway. To minimize impacts at open cut road crossings, DTE would temporarily detour traffic and use appropriate signage. We have reviewed these road crossings, and in all but one location (Riga Lane, MP 0.9) reasonable detours are available. For the crossing of Riga Lane, DTE would keep at least one lane of the road open to traffic except when closure is essential for pipeline installation. When construction activities block the entire roadway, DTE would pause construction to allow vehicles to pass, as needed. DTE would arrange a road closure schedule with the appropriate transportation authority, provide traffic warning signs, and would use flagmen to stop traffic during the delivery of construction materials. DTE would typically complete open cut crossings of dirt or gravel roadways in a day or two, however open cut crossings of asphalt roads would take about a week. Following construction, these roadways would be restored to pre-construction conditions.

Motorists and bicyclists on roadways in the Project area may experience increased traffic due to the movement of heavy equipment and personnel. Most construction personnel would travel to and from the Project area during off-peak traffic hours, which would help minimize impacts on transportation systems. To ensure public safety, DTE would use flagmen to stop traffic during delivery of construction materials and would maintain access for emergency vehicles at road crossings.

6.3 Housing

Construction of the Birdsboro Pipeline Project would require a peak workforce of about 120 workers along three separate construction spreads. The 2013 rental housing vacancy rates in Berks County was 7.0 percent (U.S. Census Bureau 2015). The U.S. Census Bureau estimates that there were 11,541 vacant housing units in Berks County (U.S. Census Bureau 2015). In addition, there are about 113 hotels, motels, and bed and breakfasts and 58 recreation vehicle parks and campgrounds in Berks County (HotelMotels 2017, YellowBook 2017).

Based on the number of available rental units, hotels/motels, recreation vehicle parks, and campgrounds in the Project area, it is anticipated that there would be sufficient housing available for the peak Project workforce, even if all workers were non-local. However, the presence of the construction crews could cause a minor, temporary impact on the availability of hotels/motels in the direct vicinity of the Project area. No new workers would be hired for operation of the Project. Therefore, the Project is expected to have a negligible impact on housing in the Project area.

6.4 Public Services

Based on the nominal workforce anticipated for construction of the Project and lack of operational workforce for operation, the existing inventory of schools (98), hospitals (3), fire (75), and police (40) departments in the Project area are sufficient and impacts on public services are not anticipated (Public School Review 2017; Homefacts 2017; County of Berks 2017). DTE would develop an incident planning program as part of its Emergency Response Plan, which would include measures for coordination with local emergency responders (see section B.9.1).

6.5 Property Values

The potential impact of a pipeline on the value of a tract of land is related to many tract-specific variables, including the size of the tract, the current value of the land, the utilities and services that are available or accessible, the current land use, and the value of adjacent properties. Land values are determined by appraisals that would take into account objective characteristics of the property such as size, location, and any improvements. While there is recently published literature indicating that there is no identifiable or consistent link between the presence of natural gas pipeline easements and residential property values (Diskin *et al.* 2011, Wilde *et al.* 2012), valuation is subjective and is generally not considered in appraisals. The presence of a pipeline and the restrictions associated with a pipeline easement could influence a potential buyer's decision to purchase a property. If a buyer is looking for a property for a specific use that the presence of the pipeline renders infeasible, then the buyer may decide to purchase another property more suitable to their objectives. For example, a buyer wanting to develop the land for a commercial property with subsurface structures would likely not find the property suitable, but farmers looking for land for grazing or additional cropland could find it suitable for their needs. This would be similar to other buyer-specific preferences that not all homes have, such as close proximity to shopping or access to high quality school districts. We conclude the Project would have no significant impact on property values.

We received comments expressing concern that, once constructed, the Project would result in higher homeowner insurance rates on residential properties. FERC staff conducted independent research on this matter for a natural gas project in New York under Docket No. CP13-499-000 (FERC 2014). FERC representatives called a number of insurance agencies to inquire whether the presence of a utility could change the terms of an existing or new residential insurance policy. FERC asked the insurance agency contacts to identify those factors that would influence a change in a policy (e.g., the type of utility and proximity of the residence to the utility), how the policy would change, and if there was potential for a policy to be cancelled. While the results of this investigation suggested that there was potential for a residential insurance policy to be affected by the presence of a utility, the extent of the effect would be dependent on the terms of the individual landowner's policy and the terms of the policy held by the utility company.

Therefore, the insurance agency contacts were not able to quantify (in dollars or percent) the change in a policy premium.

6.6 Tax Revenue

Based on Commonwealth of Pennsylvania tax law, DTE would only be required to pay taxes on land purchased for placement of aboveground facilities, and not land simply encumbered by the pipeline easement. Based on the limited acreage affected by DTE's proposed aboveground facilities (see table A-2), the Project would not result in a significant, direct increase in Commonwealth tax revenues. The predominant source of tax revenue flowing into Berks County would therefore result from Commonwealth sales tax from the purchase of construction-related expenses and by the fuel, lodging, and food purchased by non-local construction workers during construction.

6.7 Environmental Justice

As requested by the EPA in its scoping comments for the Project, and in accordance with EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, we address the potential for disproportionately high and adverse health or environmental effects of the Project on minority and low-income populations. According to the CEQ environmental justice guidance under NEPA (CEQ 1997), minorities are those groups that include American Indian or Alaskan Native; Asian or Pacific Island; Black, not of Hispanic origin; or Hispanic. Minority populations are defined where either; (a) the minority population of the affected area exceeds 50 percent or, (b) the minority population of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. The CEQ guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. In this EA, low-income populations are defined as those individuals with a reported income below the poverty level, which was $29,111 in 2016 for a family of five (U.S. Census Bureau 2017b).

A census tract is comprised of a group of census blocks, which are the smallest geographic unit considered by the U.S. Census Bureau when compiling census data. According to the U.S. Census Bureau, the portion of minority populations in the county and census tracts that would be crossed by the Birdsboro Pipeline Project do not exceed 50 percent and population levels and are not mostly below the poverty line in this county. Further, these census tracts are similar to or lower than the state as a whole (see table B-14). However, we identified one census block in Birdsboro that is characterized as a low-income population (EPA 2017c). The pipeline would cross the census block between MP 0.0 and 0.2 and would be immediately adjacent to the proposed Birdsboro Power Facility. Impacts on this community would be most prominent during the construction period when construction personnel and equipment are moving through the area, and would predominately be associated with noise. As discussed in section B.8.2, DTE would

implement noise mitigation measures to reduce impacts on nearby receptors. As discussed throughout this EA, potentially negative environmental effects associated with the Project would be minimized and/or mitigated, as applicable. As such, there is no evidence that the Project would cause a disproportionate share of adverse environmental impacts on low-income populations.

Table B-14
Minority Populations and Poverty Levels in the Vicinity of the Project

County, State	Minority Populations as a Percentage of Total Population	Percent of the Population Below Poverty Level
Pennsylvania	18.4	9.3
Berks County	16.3	13.5
Census Tract 117.01	2.9	3.0
Census Tract 118.00	5.5	9.7
Census Tract 119.03	10.4	0.5
Census Tract 119.04	7.9	7.6
Census Tract 121.01	7.7	7.2
Census Tract 121.03	9.2	4.6
Census Tract 129.00	1.5	4.1

Source: U.S. Census Bureau 2017c (2011-2015 American Community Survey -Poverty: S1701; Race: B02001).

7. Cultural Resources

The National Historic Preservation Act (NHPA) (54 U.S.C. 3001 et seq.) is the linchpin piece of legislation in the nation's historic preservation program. While there are other federal historic preservation laws and regulations, most of them do not apply to FERC, although they may apply to federal land managing agencies.[12] The NHPA set-up the Advisory Council on Historic Preservation (ACHP), created the National Register of Historic Places (NRHP), and established State Historic Preservation Offices (SHPO).

Section 101 of the NHPA requires the identification of religious and cultural properties in the area of potential effect (APE) that may be important to Indian tribes that historically occupied or used the Project area, and may be eligible for listing on the NRHP. Indian tribes are defined in 36 CFR Part 800.16(m) as: "an Indian tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation, or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their

[12] For example, the Archaeological Resources Protection Act of 1979 applies to federal and tribal lands, but FERC does not own or manage any lands.

special status as Indians." FERC acknowledges that we have trust responsibilities to Indian tribes; so, on July 23, 2003, the Commission issued a "Policy Statement on Consultations with Indian Tribes in Commission Proceedings" in Order 635. It is the obligation of FERC, on behalf of all of the federal cooperating agencies, to consult on a government-to-government basis with Indian tribes that may have an interest in the Project.

Section 106 of the NHPA requires that all federal agencies, including FERC, take into account the effects of their undertakings on historic properties and afford the ACHP an opportunity to comment. Historic properties are archaeological sites, historic districts, buildings, structures, objects, or properties of traditional, religious, or cultural importance that are listed on or eligible for the NRHP. DTE is assisting us by providing information, analyses, and recommendations, as allowed by the regulations for implementing Section 106 at Part 800.2(a)(3), and FERC's regulations at 18 CFR 380.12(f). FERC remains responsible for all findings and determinations under the NHPA. As the lead federal agency for this Project,[13] FERC will address compliance with Section 106 on behalf of all the federal cooperating agencies in this EA. This section summarizes the current status of compliance with the NHPA for this Project.

7.1 Consultations

We sent copies of our NOI issued January 18, 2017 for the Birdsboro Pipeline Project to a wide range of stakeholders, including other federal agencies, such as the ACHP, EPA, COE, the U.S. Department of the Interior's National Park Service and the Bureau of Indian Affairs; state agencies, including the Pennsylvania SHPO; and Indian tribes that may have an interest in the Project area. The NOI contained a paragraph about Section 106 of the NHPA, and stated that we use the notice to initiate consultations with the SHPO, and to solicit their views, and those of other government agencies, interested Indian tribes, and the public on the Project's potential effects on historic properties. No state agencies filed comments about cultural resources issues during the scoping period in response to our NOI.

In a February 21, 2017 response to our NOI, the EPA requested that this EA should document consultations with the "state Historic Trust" and other interested parties regarding potential impacts on historic properties, and seek means of resolving any adverse effects. Consultations with the Pennsylvania SHPO and other interested parties are discussed below.

In response to the NOI, the Berks County Planning Commission, in a letter to FERC dated February 14, 2017, mentioned the Daniel Boone Homestead in Exeter

[13] Pursuant to 36 CFR 800.2(a)(2), the May 2002 "Interagency Agreement on Early Coordination of Required Environmental and Historic Preservation Reviews," and the Energy Policy Act of 2005.

Township, the Griesemer Complex in Amity Township, the Henry Fisher House and the Pleasantville Covered Bridge in Oley Township which are listed on the NRHP. The entire Oley Township is an NRHP-listed Historic District. The Exeter Friends Meeting House in Exeter Township is eligible for listing on the NRHP. The proposed pipeline route would only be in proximity to the Henry Fisher House, and would cross through the Oley Township Historic District (see below).

Also in response to the NOI, three members of the public (Hilary Fraley, Anna Erb, and Kate Kennedy) filed letters with FERC raising concerns about potential Project impacts on archaeological and historic sites, including the Oley Township Historic District. The NOI announced a public scoping session that was held at the Oley Fair Center on February 2, 2017. At that session, 12 speakers from the general public (Anne Hasz, Leslie Rebmann, Wait Hug, Terry Griffith, Gail Kessler, Jennifer Hanf, Kate Kennedy, Dyanne Jurin, Susan Munch, Robert Kessler, Peggy Hansen, and Lloyd Hopkins) raised concerns about potential Project impacts on archaeological and historic sites, including the Oley Township Historic District.

In an environmental information request (EIR), FERC staff requested that DTE document its communications with potential consulting parties, including local historical organizations, and Berks County. In particular, we requested that DTE provide copies of its "Draft Determination of Effect Report" (filed as appendix 4-G of Resource Report [RR] 4 of its May 1, 2017 application to the FERC) to local potential consulting parties including, but not limited to, the Oley Valley Heritage Association, Oley Township Historical Architectural Review Board, and Berks County Planning Commission, and file their comments on the report. In response, DTE indicated that the report would be provided to the consulting parties following receipt of comments from the SHPO. As the requested correspondence is outstanding, **we recommend that:**

- **<u>Prior to construction</u>, DTE should file with the Secretary documentation that its "Draft Determination of Effect Report" was submitted to the Oley Valley Heritage Association, Oley Township Historical Architectural Review Board, and Berks County Planning Commission, along with any comments received from these entities on the report.**

The FERC NOI was sent to the Indian tribes listed on table B-15. Only the Stockbridge-Munsee Community responded to our NOI. In a letter to FERC, dated February 6, 2017, the Tribal Historic Preservation Officer (THPO) for the New York Office of the Stockbridge-Munsee Community stated that the Project is within the tribe's area of interest, and requested the opportunity to review and comment on DTE's cultural resources survey plans.

Table B-15 Indian Tribes Contacted About the Project		
Sent FERC's January 18, 2017 NOI	**Sent DTE's November 7, 2016 Letters**	**Responses**
Absentee Shawnee Tribe of Oklahoma, (in care of [c/o]) Edwina Butler-Wolfe, Governor; Joseph Blanchard, THPO and Carol Butler, Environmental	Absentee Shawnee Tribe of Oklahoma, c/o Leonard Longhorn, THPO	None filed to date.
Cayuga Nation of New York	Cayuga Nation of New York, c/o Clint Halftown, Representative	None filed to date.
Delaware Nation of Oklahoma, c/o Kerry Holton, President; and Janson Ross, THPO	Delaware Nation of Oklahoma, c/o President	None filed to date.
Delaware Tribe of Indians in Oklahoma, c/o Chet Brooks, Chief; Susan Bachor, THPO; Blair Fink, THPO	Delaware Tribe of Indians in Oklahoma, c/o Chet Brooks, Chief	12/16/16 letter from THPO to K2 Consulting Services (K2) requesting subsurface testing results and identification of access roads. 6/6/17 letter from THPO to K2 accepting Phase I Archaeological Survey Report.
Eastern Shawnee Tribe of Oklahoma, c/o Glenna Wallace, Chief; Robin Dushane, THPO; and Roxane Weldon, NEPA	Eastern Shawnee Tribe of Oklahoma, c/o Robin Dushane, THPO	None filed to date.
Oneida Indian Nation of New York c/o Raymond Halbritter, Representative; Jesse Bergevin, Historian; and Stephen Sheldon, Environmental	--	None filed to date.
Oneida Nation of Wisconsin, c/o Cristina Danforth, Chair; and Corina Williams, THPO	--	None filed to date.
Onondaga Indian Nation of New York, c/o Tony Gonyea, Faithkeeper	Onondaga Indian Nation of New York, c/o Chief	None filed to date.
Saint Regis Mohawk Tribe of New York, c/o Beverly Cook, Chief; Arnold Printup, THPO; and Ken Jocks, Environmental	--	None filed to date.
Seneca Nation of Indians in New York, c/o Marice John, President; and Scott Abrams, THPO	Seneca Nation of Indians in New York, c/o Scott Abrams, THPO	None filed to date.
Seneca-Cayuga Tribe of Oklahoma, c/o William Fisher, Chief; and Micco Emarthla, THPO	Seneca-Cayuga Tribe of Oklahoma, c/o Chief	None filed to date.
Shawnee Tribe of Oklahoma, c/o Ron Sparkman, Chair; and Kim Jumper, THPO	Shawnee Tribe of Oklahoma, c/o THPO	None filed to date.
Stockbridge-Munsee Community in Wisconsin & New York, c/o Wally Miller, President; Sherry White, WI THPO; Bonney Hartley, NY THPO; and Greg Bunker, NEPA	Stockbridge-Munsee Community in Wisconsin, c/o President	11/15/16 form from Wisconsin THPO to K2 indicating Project not it tribe's area of interest. 2/6/17 letter from New York THPO to FERC stating Project is in tribe's area of interest, and tribes request opportunity to review DTE's cultural resources survey plans. 5/15/17 email from New York THPO to K2 accepting Phase I Archaeological Survey Report.
Tuscarora Nation of New York, c/o Leo Henry, Chief; Bryan Printup, THPO; and Neil Patterson, Environmental	Tuscarora Nation of New York, c/o Chief	None filed to date.

In addition to FERC's consultations, DTE communicated separately with interested Indian tribes and the Pennsylvania SHPO. In letters dated November 7, 2016, K2 Consulting Services (K2), DTE's cultural resources contractor, introduced the Project to the 11 Indian tribes listed in table B-15. Only two tribes responded back. On a form dated December 15, 2016, the THPO for the Stockbridge-Munsee Community in Wisconsin stated that the Project may not be within the tribe's area of interest; although the New York office of the tribe offered a different opinion in later correspondence with FERC. A December 16, 2016 letter to K2 from the THPO for the Delaware Tribe requested archaeological testing along the pipeline route, and the identification of access roads.

DTE indicated that it provided copies of its Phase I archaeological survey report to the Stockbridge-Munsee Community and the Delaware Tribe on March 27, 2017. The THPO of the Delaware Tribe responded in a June 6, 2017 letter to K2 stating that the tribe had no objections to the Project, as long as the reroutes that avoid archaeological sites are adopted by DTE into its proposed pipeline route. In a May 15, 2017 email to K2 the THPO for the New York Office of the Stockbridge Munsee Community stated that the survey report was reviewed, and the Project would have no adverse effects if the archaeological sites are avoided.

Communications between DTE and the Pennsylvania Historical and Museum Commission, representing the SHPO, began on November 7, 2016, with a letter from K2 describing the Project and the submittal of a Project Review Form. The SHPO responded on December 9, 2016, with a request that DTE conduct historic architectural and archaeological surveys along the proposed pipeline route, and attempt to relocate six previous recorded archaeological sites identified in the Project area. The SHPO also requested that DTE conduct a geomorphological assessment of areas with the potential for buried cultural horizons. During the initial field survey efforts conducted between October and December 2016, K2 assessed the geomorphological potential for deep alluvial soils within the Project APE and determined that deep testing was not warranted.

On December 15, 2016, K2 submitted to the SHPO copies of draft Pennsylvania Historic Resource Survey Forms for five historic architectural sites located along the Birdsboro Pipeline. The SHPO reviewed those forms on January 17, 2017, and requested additional data, including aerial photographs, for three sites: F.M. Brown Sons/Miller Farm #2; F.M. Brown Sons/Sailor Farm #3; and the Kline/Fick/Weller property. On March 10, 2017, K2 provided the SHPO with revised Historic Resource Survey Forms for those three farmsteads. The SHPO acknowledged receipt of the forms in a letter to K2 dated April 6, 2017, and reached the opinions that the Jacob Strunk Farm (Sailor Farm #3) and the Jacob de Turk Farm (Miller Farm #2) are eligible for nomination to the NRHP, while the Samuel Brunner Farm (Kline/Fick/Weller Farm) is not eligible. We agree with the SHPO.

On March 27, 2017, K2 provided the SHPO with a copy of its Phase I Archaeological Survey Report for the Birdsboro Pipeline Project (Kodlick and Koller 2017a). On August 8, 2017, K2 revised that report. In an August 28, 2017 EIR, we asked DTE to provide the SHPO with a copy of its revised Phase I report (Kodlick and Koller 2017b). On September 19, 2017, the SHPO provided a response to the revised Phase I report and agreed that no further archeological work was required based on the avoidance of archeological sites. However, the SHPO requested that DTE provide the avoidance plans and associated maps. DTE documented that it provided the avoidance maps to the SHPO on September 26, 2017.

On April 28, 2017, K2 provided the SHPO with a copy of its Draft Determination of Effects Report. In a May 24, 2017 response, the SHPO requested additional data. On July 6, 2017, K2 provided the SHPO with copies of historic aerials. On August 8, 2017, following a review of the mapping provided by K2, the SHPO requested more information regarding the potential for a discrete historic district within the APE, separate from the Oley Township Historic District. On October 10, 2017, K2 provided the SHPO with a letter report that identified the Limekiln Valley Rural Historic Landscape. The landscape includes two historic farmsteads (DeTurk Farm and Strunk Farm) that were previously recorded along the Birdsboro Pipeline route, which the SHPO had previously agreed were eligible for the NRHP (Kodlick 2017). The SHPO has not yet reviewed the Rural Historic Landscape Report.

7.2 Cultural Resources Investigations

Areas of Potential Effect

The November 7, 2016 letter from K2 to the SHPO defined the APE for archaeological sites to correspond to the limits of construction along the pipeline route, which would be 75 feet wide plus ATWS and access roads. For historic architectural sites, the APE would be expanded to include the entire tax parcel for each resource. K2's August 8, 2017 revision to its Phase I Archaeological Survey Report cites an average APE width of 75 feet along the pipeline route with some portions being narrowed in the vicinity of sensitive environmental resources and others being widened to accommodate for ATWS and aboveground facilities (Kodlick and Koller 2017b).

Overview Results

In its November 7, 2016 letter to the SHPO, K2 stated that it had reviewed the Pennsylvania Archaeological Site Survey, Pennsylvania Historic Resource Survey, and the Pennsylvania Historical and Museum Commission's Cultural Resources Geographic Information System. This site file search and review identified 16 previously recorded archaeological sites, and 14 previously recorded historic architectural sites, including the Oley Township Historic District, within 0.5 mile of the pipeline (see table 4.2-1 of RR 4 included with DTE's May 2017 application to the FERC).

K2's August 8, 2017 revised Phase I Archaeological Survey Report, dated August 8, 2017, indicated that five previous cultural resources surveys had been conducted in or near the APE. In addition, the report listed 15 previously identified archaeological sites within two miles of the APE. Only one of those previously recorded sites (prehistoric site 36BK219) was relocated by K2 during its survey of the pipeline route. Subsequent changes to the workspace design would avoid site 36BK219.

The Draft Determination of Effects Report produced by K2, filed as attachment 4G of RR 4, listed 19 previously recorded historic architectural sites in the Project area. Five of the previously recorded historic sites were not relocated in the APE by K2. The remaining fourteen previously recorded historic architectural sites were relocated in the APE, as listed in table B-16. Eight of those previously recorded historic architectural sites in the APE are contributing resources to the Oley Township Historic District (K2 2017).

Inventory Results

K2 conducted Phase I archaeological surveys along the route of the Birdsboro Pipeline between October 2016 and July 2017. The surveys resulted in the identification of nine archaeological sites in the APE: three historic archaeological sites and six prehistoric sites. None of these sites were evaluated in terms of their eligibility for listing on the NRHP. Instead, Project workspace modifications and minor pipeline reroutes were designed to avoid impacts on archaeological sites. K2 surveyed all of the Project modifications and confirmed that the Project would have no impact on any of the nine archaeological sites (Kodlick and Koller 2017a, b).

Between October and December 2016, K2's historic architectural survey along the route of the proposed Birdsboro Pipeline identified five newly recorded historic farmsteads (Muggleston, Limekiln Road Barn, Samuel Brunner, Jacob de Turk, and Jacob Strunk). Three of the newly recorded historic sites (Muggleston, Limekiln Road Barn, and Samuel Brunner Farm) were evaluated as not eligible for the NRHP, while two sites (Jacob de Turk Farm and Jacob Strunk Farm) are eligible. K2 found that the Project would have no adverse effects on the Jacob de Turk Farm. However, the Project would adversely affect the Jacob Strunk Farm. In addition, the DeTurk Farm and Strunk Farm were included within a newly identified Limekiln Valley Rural Historic Landscape.

Table B-16
Previously Recorded Historic Architectural Sites Relocated Within the Area of Potential Effect for the Project[a]

SHPO Key No.	Resource	NRHP Status	Relationship to Pipeline	Effect
156685	Reading Railroad – Main Line	Eligible	Cross with a bore	No effect[b]
112375	Philadelphia & Reading Railroad	Eligible	Cross with a bore	No effect[b]
025672	Merle Brown Property	Not evaluated	Recorded within the APE; not relocated during survey	No effect[b]
025673	Earl Hafer Property	Not evaluated	Recorded within the APE; not relocated during survey	No effect[b]
000796	Oley Township Historic District	Listed	Within APE	Adverse effect[c]
025854	Hunter Settlement-Boyertown Pike	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 800 feet from the house	Direct effect[d]
00957	Henry Fisher House	Listed	Pipeline 500 feet from the house	No effect[b]
025832	Rothenberger Farm	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 800 feet from the house	Direct effect[d]
025836	National Gypsum Property	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 600 feet from the house	Direct effect[d]
025839	Catherine Stahler Property	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 300 feet from the house	Direct effect[d]
025847	Thomas Rutter Property	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 800 feet from the house	Direct effect[d]
025913	Levan Homestead	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 2,100 feet from the house	Direct effect[d]
025908	Carl Herbein Property	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 500 feet from the house	Direct effect[d]
025920	Herbert Levan Property	Not evaluated; Contributing resource to the Oley Township Historic District	Pipeline 400 feet from the house	Direct effect[d]

[a] Source: K2 2017

[b] A determination of "no effect" is found when an undertaking would not alter, directly or indirectly, the qualifying characteristics or a historic property for which it is listed or eligible for inclusion in the NRHP.

[C] A determination of "adverse effect" is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish integrity of the property's location, design, setting, materials workmanship, feeling, or association. The "criteria of adverse effect" and examples of adverse effects are codified in 36 CFR Part 800.5(a)(1).

[d] A "direct effect" is found when an undertaking may directly alter the physical integrity of a historic property. A direct effect may be temporary or permanent.

7.3 Unanticipated Discovery Plan

As appendix 4E of RR 4, included with its May 2017 application to FERC, DTE attached its Unanticipated Discovery Plan for the Birdsboro Pipeline Project. Our June 12, 2017 EIR requested that DTE revise the Unanticipated Discovery Plan to include contact information for the Delaware Tribe, and document SHPO and tribal reviews. DTE filed a Revised Unanticipated Discovery Plan on July 3, 2017. A copy of the revised Unanticipated Discovery Plan was also included in the August 8, 2017 revised Phase I Archaeological Survey Report (Kodlick and Koller 2017b). The SHPO concurred with the Phase I report on September 19, 2017; however, to date DTE has not documented that the Unanticipated Discovery Plan has been reviewed by interested tribes.

7.4 Compliance with the National Historic Preservation Act

No traditional cultural properties, sacred sites, aboriginal burials, or objects of cultural patrimony were identified in the APE by the National Park Service, Bureau of Indian Affairs, SHPO, K2, or DTE, or any Indian tribes. After consultations with the SHPO and Indian tribes, FERC staff concludes that the Birdsboro Pipeline Project would have no effect on sites of traditional, cultural, or religious importance to Indian tribes; and therefore, we have completed compliance with Section 101(d)(6) of the NHPA.

We have not yet completed compliance with Section 106 of the NHPA. The SHPO has not yet accepted DTE's Determination of Effects Report or its Rural Historic Landscape Report.

K2 made a finding of adverse effects on the Jacob Strunk Farm and the Oley Township Historic District. Our June 12, 2017 EIR requested that DTE file a treatment plan for those historic properties. However, DTE has not yet filed any treatment plans.

Once we have a copy of the treatment plans, and documentation that they have been accepted by the SHPO, we would notify the ACHP of an adverse effects finding, in accordance with 36 CFR 800.6(a)(1), consult with the appropriate consulting parties, and seek means to resolve adverse effects. In order to assure completion of this process, **we recommend that:**

- **DTE <u>should not begin construction</u> of facilities and/or use of all staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

  a. DTE files with the Secretary:

  (1) remaining cultural resources survey reports;

(2) site evaluation reports and avoidance/treatment plans, as required; and

(3) comments on the cultural resources reports and plans from the Pennsylvania SHPO, Stockbridge-Munsee Community in Wisconsin, and the Delaware Tribe of Indians;

b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

c. the FERC staff reviews and the Director of OEP approves the cultural resources reports and plans, and notifies DTE in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All materials filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CUI//PRIV- DO NOT RELEASE."

8. Air and Noise

8.1 Air Quality

Construction and operation of the Project could potentially have effects on local and regional air quality. This section summarizes federal and state air quality regulations that are applicable to the proposed facilities. This section also characterizes the existing air quality and describes potential impacts the facilities may have on air quality regionally and locally.

The term air quality refers to relative concentrations of pollutants in the ambient air. Pollutants of concern are primarily ground-level ozone (ozone), carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), and respirable and fine particulate matter (inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns [PM_{10}] and less than or equal to 2.5 microns [$PM_{2.5}$]). Ozone is not directly emitted into the atmosphere from an emissions source. Ozone develops as a result of a chemical reaction between NO_x and volatile organic compounds (VOC) in the presence of sunlight.

As well as being the reactant to form ozone, VOCs are a subset of organic compounds that are emitted during fossil fuel combustion and can cause a variety of health effects, from irritation to serious health impacts. Fossil fuels would be required for use in construction equipment for the Project. Hazardous air pollutants are also emitted during fossil fuel combustion and contain compounds that are known or

suspected of causing cancer and other serious health effects. No additional combustion of fossil fuels is expected during the construction or operation of the Project.

Additionally, fugitive dust will be produced during Project construction and operation from earth moving, road dust, etc. The majority of fugitive dust would be particulate matter in excess of 10 microns, but a portion would be PM_{10} and $PM_{2.5}$.

GHGs produced by fossil-fuel combustion are CO_2, methane (CH_4), and nitrous oxide (N_2O). GHGs' status as a pollutant is not related to toxicity as they are non-hazardous to health at normal ambient concentrations. GHGs absorb infrared radiation in the atmosphere, and an increase in emissions of these gasses due to human activity is the primary cause of increased levels of CO_2 since the industrial age. These elevated levels of GHGs are the primary cause of rapid warming of the climate system, especially since the 1950s. These existing and future emissions of GHGs, unless significantly curtailed, will cause further warming and changes to the local, regional and global climate systems. During construction and operation of the Project, construction and operational equipment would emit limited quantities of GHGs.

Existing Air Quality

Ambient air quality is protected by federal and state air quality standards. The EPA establishes National Ambient Air Quality Standards (NAAQS) for the criteria pollutants nitrogen dioxide (NO_2), CO, SO_2, lead, $PM_{2.5}$ and PM_{10}.[14] The NAAQS include primary standards to protect human health, including sensitive populations such as children, the elderly, and asthmatics, and secondary standards to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings.

Under the Clean Air Act (CAA), each state prepares a State Implementation Plan (SIP) to demonstrate the state's air quality management program to attain or maintain the primary and secondary NAAQS. The SIP may also include stricter standards than the NAAQS. The PADEP implements the SIP in Pennsylvania, and has adopted the NAAQS.

Emissions of GHGs are typically quantified in terms of CO_2 equivalents (CO_{2e}) by multiplying emissions of each GHG by its respective global warming potential (GWP). The GWP is a ratio relative to CO_2 regarding each GHG's ability to absorb solar radiation

[14] The current NAAQS are listed on EPA's website at https://www.epa.gov/criteria-air-pollutants/naaqs-table.

and its residence time in the atmosphere. Accordingly, CO_2 has a GWP of 1 while CH_4 has a GWP of 25, and NO_x has a GWP of 298.[15] There are no federal regulations at this time limiting the emissions of CO_2. Downstream emissions of GHGs when natural gas is burned at the power plant are further discussed below.

The EPA has established Air Quality Control Regions (AQCR), defined as contiguous areas considered to have relatively uniform ambient air quality, and treated as single geographical units for reducing emissions and determining compliance with the NAAQS. The AQCRs are intra- and interstate regions, such as large metropolitan areas, where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated based on compliance with the NAAQS, for each pollutant. Designations fall under three main categories as follows: "attainment" (areas in compliance with the NAAQS); "nonattainment" (areas not in compliance with the NAAQS); or "unclassifiable" (areas lacking data to determine attainment). Areas formerly designated as nonattainment that have since demonstrated compliance with the NAAQS are considered "maintenance areas". Maintenance areas may be subject to more stringent regulatory requirements similar to nonattainment areas, to ensure continued attainment of the NAAQS. The SIP must include measures identifying how applicable air quality standards are achieved as well as maintained in each AQCR.

The Project would be in Berks County, Pennsylvania within the Northeast Pennsylvania-Upper Delaware Valley Interstate AQCR (40 CFR Part 81). Where crossed by the pipeline, Berks County is designated as in attainment for all NAAQS, with the exception of a marginal nonattainment designation for the 2008 8-hour ozone standard air quality designations in the Project area within Berks County are summarized in table B-17.

Federal Air Quality Requirements

The CAA, and its amendments, provide the federal statutes and regulations governing air pollution in the United States. The provisions of the CAA that are applicable to the Project are discussed below. New Source Review, Prevention of Significant Deterioration, National Emission Standards for Hazardous Air Pollutants, and impacts on designated Class I areas were not reviewed, as the Project would not include stationary sources.

[15] The GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs that the EPA has established for reporting GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

Table B-17 National Ambient Air Quality Standards Attainment Status for Berks County	
Air Pollutant	**Berks County, Pennsylvania**
SO_2	Attainment
CO	Attainment
NO_2	Attainment
Ozone (8-hour standard)	Marginal nonattainment
PM_{10}	Attainment
$PM_{2.5}$	Attainment
Lead	Attainment [a]

[a] Partial counties may be designated. Lyons and North Reading, Pennsylvania are within Berks County and designated as nonattainment areas for lead; however, the Project area in Reading, Pennsylvania is in attainment with the lead NAAQS.

General Conformity

The General Conformity Rule was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the NAAQS. The lead federal agency must conduct a conformity analysis if a federal action would result in the generation of direct and indirect emissions that would exceed the general conformity applicability threshold levels of the pollutant(s) for which an air basin is designated nonattainment or maintenance.

Conforming activities or actions should not, through additional air pollutant emissions:

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

The General Conformity Rule entails both an applicability analysis and a subsequent conformity determination, if applicable. A General Conformity Determination must be completed when the total direct and indirect emissions of a project would equal or exceed specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area.

Estimated emissions for the Project subject to review under the general conformity thresholds include construction emissions and operational emissions not subject to major or minor New Source Review permitting. The majority of emissions from the Project would result from construction. As ongoing operational emissions from the Project are limited to minor fugitive releases that would not exceed general

conformity applicability thresholds. Construction emissions are presented in table B-18 and a comparison of construction emissions to the applicable general conformity threshold are presented in table B-19. Detailed emission calculations for the emission estimates identified in tables B-18 and B-19 were filed in DTE's July 2017 submittals. These calculations are available for review on our website (eLibrary under Docket No. CP17-409-000).[16] Construction emission estimates for the Project would not exceed General Conformity applicability thresholds; therefore, a General Conformity Determination is not required.

Greenhouse Gas Mandatory Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000 metric tons of GHGs (as CO_{2e}) in one year. The Mandatory Reporting Rule is not a permit, does not require emission control devices, and is strictly a reporting requirement for stationary sources based on actual emissions. Subpart W of the Mandatory Reporting of GHG Rule establishes reporting requirements for natural gas supplier's transmission pipeline systems, and specifically natural gas transmission compression and blowdown[17] emissions. The Project would not involve compression. Blowdown activities are not estimated to emit 25,000 metric tons of GHGs as CO_{2e} per year, thus the reporting requirements are not anticipated to apply to the Project.

State Regulations

This section discusses the potentially applicable state air regulations for the Project. Emissions resulting from the Project are subject to Pennsylvania air quality standards, codified in the PAC. The PAC (25 Section 123.1) limits the emission of outdoor fugitive air contaminants. Sources that generate fugitive dust must take all reasonable actions to prevent PM from becoming airborne. These measures may include, but are not limited to, paving or frequent cleaning of roads, driveways and parking lots and applying water on dirt roads, material stockpiles and other surfaces which may give rise to airborne dusts.

[16] Detailed emissions calculations are available for public review on our website (www.ferc.gov) in our eLibrary system under Docket No. CP17-409-000; Accession No. 20170703-5208.

[17] A blowdown event is a planned or unplanned venting of pressurized natural gas from pipelines or facilities to the atmosphere. Planned gas venting may be performed during operations and maintenance activities to ensure proper operation of safety systems as well as the equipment, or to release gas prior to performing work on the facilities. Unscheduled gas venting of the emergency shutdown system is an unplanned event and can occur at any time under an abnormal operating condition.

The PAC (25 Section 123.2) prohibits fugitive PM emissions into the outdoor atmosphere to the extent that the emissions are visible at the point the emissions pass outside a person's property. The PAC (25 Section 126.501) established a heavy-duty diesel emission program under Section 177 of the CAA designed to achieve emission reductions of the precursors of ozone, PM, air toxics, and other air pollutants. Certain provisions of the California exhaust emission standards and test procedures were adopted for heavy-duty diesel vehicles manufactured in the year of 1985 and onward.

General Impacts and Mitigation

Construction

Emissions associated with construction activities generally include: 1) exhaust emissions from construction equipment, 2) fugitive dust emissions associated with construction vehicle movement on unpaved surfaces, and 3) fugitive dust associated with grading, trenching, backfilling, and other earth-moving activities. The exhaust emissions would depend on the equipment used and the horsepower-hours of operation. Fugitive dust emission levels would vary in relation to moisture content, composition, and volume of soils disrupted during construction. Estimated construction emissions for the Project are shown in table B-18.

Gasoline and diesel engines used during construction would be operated and maintained in a manner consistent with the manufacturers' specifications and the applicable EPA mobile source emission regulations (40 CFR 85), thus minimizing construction equipment emissions. Current EPA sulfur-in-fuel standards would also contribute to minimizing emissions from construction equipment. The construction equipment would be operated on an as-needed basis, and primarily during the daytime hours.

Fugitive dust and other emissions from construction activities generally do not result in a significant increase in regional pollutant levels, although local pollutant levels could increase temporarily. DTE would take measures to reduce fugitive dust through implementation of the measures in its Fugitive Dust Plan, including the watering of access roads, storage piles, and exposed surfaces during construction. Water used for fugitive dust control would be obtained from municipal water sources. DTE would also implement vehicle speed limits on unpaved roads and use gravel pads at paved road access points to remove excess dirt from tracks and tires.

Table B-18
Summary of Estimated Emissions from Construction of the Project

Source[a]	2018 Construction Emissions (tons per year)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_{2e}
Construction equipment and worker commutes[a]	65.2	37.5	0.16	4.33	3.55	3.44	4,650
Unpaved roads	0.00	0.00	0.00	0.00	5.40	0.54	0.00
Material handling and wind erosion	0.00	0.00	0.00	0.00	0.04	0.01	0.00
Project Total[b]	65.2	37.5	0.16	4.33	8.99	3.99	4,650[c]

[a] Emissions of CO_{2e} were not estimated for construction worker commutes; however, they would be minor.

[b] Due to rounding, the totals may not reflect the sum of the addends.

[c] Total CO_{2e} emissions are estimated to be 4,650.35 tons per year or 4,218.72 metric tons per year.

Table B-19
Comparison of Construction Emissions for the Project to General Conformity Thresholds

Air Pollutant	PM_{10}	$PM_{2.5}$	NO_X	SO_2	VOC
Project construction emissions (tons per year)	8.99	3.99	65.2	0.16	4.33
General conformity threshold (tons per year)	N/A	N/A	100	N/A	50

Once construction activities are completed, fugitive dust and construction equipment emissions would return to current levels. Emissions associated with the construction-related activities would be temporary in nature and we conclude they would not cause, or significantly contribute to, a violation of any applicable ambient air quality standard.

Operations

DTE does not propose any new or modified compressor stations or operating emission sources as part of the Project, and therefore, no air permitting actions are required. Fugitive natural gas emissions, however, occur from valve components during pipeline operations. Though it is not possible to fully determine the amount of future maintenance required, the Project would have the potential for operational emissions of VOCs and CO_{2e} from fugitive gas releases associated with the pipeline, meter stations, MLVs, and pigging facility. Estimated operational emissions for the Project are 975.8 tons per year (tpy) of CO_{2e} and negligible quantities of VOCs. DTE would also conduct planned blowdowns of the Project facilities for scheduled maintenance or in the event of an emergency. Emissions from blowdowns, which would occur twice per year for the

filter-separator at the TETCO Meter Station and once per year for all other equipment, would release an estimated 604.3 tpy of CO_{2e} and a negligible quantity of VOCs. These emissions would occur for the lifetime of the Project, and would be spread geographically in accordance with the fugitive potential of each section of the pipeline.

EPA developed a methodology to estimate the downstream GHG emissions from a project, assuming all of the gas to be transported is eventually combusted. In addition, in cases such as a lateral going to a power plant, the end use is easy to determine. As such, we estimated the GHG emissions from the end-use combustion of the natural gas to be transported by the Project as well as from the potential to emit GHGs from the Birdsboro Power Facility to get a potential range of downstream GHG emissions.

The Project can deliver up to 79 MMcf/d of new volumes of natural gas, which if combusted would produce 1.5 million metric tons of CO_2 per year.[18] The estimated total potential to emit GHGs from the Birdsboro Power Facility is about 1.3 million metric tons per year of CO_{2e}. This emission range represents an upper bound of GHG emissions because it assumes the total maximum capacity is transported 365 days per year and that the Birdsboro Power Facility operates at its maximum allowable level. In 2015, average natural gas-fired power plant utilization was only about 56.3 percent.[19] As such, it is unlikely that this total amount of GHG emissions would occur. Additionally, were the generation capacity to be fueled by coal or oil, the GHG emissions would be greater. This range of 1.3 to 1.5 million metric tons of GHG emissions would result in a 0.5 to 0.6 percent increase in GHG emissions from fossil fuel combustion in Pennsylvania[20], and a 0.02 to 0.03 percent increase in national emissions.[21]

Potential impacts on air quality associated with construction and operation of the Project would be minimized by adherence to all applicable federal and state regulations. Based on the analysis presented above, we conclude that construction and operation of the Birdsboro Pipeline Project would have no significant impact on local or regional air quality.

[18] CO_2, not CO_{2e}, as we do not account for downstream N_2O in combustion (very minor component) or methane leakage.

[19] EIA, Electric Power Monthly, 4-4-2016.

[20] Based upon Pennsylvania GHG emissions of 271 million metric tons for 2013, per year according to the Pennsylvania Greenhouse Gas Inventory 2016 (PADEP, January 2017).

[21] Based on 5,411 million metric tons of CO_2 in 2015 as presented by the EPA at https://www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf.

8.2 Noise and Vibration

The ambient sound level of a region is defined by the total noise generated within the specific environment, over varying land use types, and is usually composed of natural and artificial sounds. The land use in the Project area is primarily agricultural and industrial/commercial land; the Project would also cross smaller amounts of forested, open, and residential land. At any location, both the magnitude and frequency of environmental sounds may vary considerably over the course of a day and throughout the week. This variation is caused in part by changing weather conditions, the effect of seasonal vegetation cover, and human activities.

Ambient sound quality can be affected during construction and operation of the Project and the magnitude and frequency of sound levels can vary considerably during the day, week, or the seasons, based on changing weather conditions, vegetative cover, and non-Project sources of noise. Two measures that associate the time-varying quality of sound to its effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 decibels (dB) on the A-weighted scale (dBA), added to account for people's greater sensitivity to nighttime sound (between the hours of 10:00 pm and 7:00 am). The A-weighted scale is used as human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perceptible sound level change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 9 dBA is perceived as a doubling of sound.

Noise sensitive areas (NSA) within the vicinity of a project may include residences, schools, churches, or any location where people reside or gather and may be affected by construction and operation of the Project. Construction equipment would contribute to ambient noise levels during construction; however, once construction is complete, noise would return to pre-construction levels with the exception of NSAs near the TETCO Meter Station, where operations would contribute to an increase in ambient sound levels.

Regulatory Noise and Vibration Requirements

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* providing information for state and local regulators to use when developing their own ambient noise standards. The EPA has determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity noise interference. An L_{dn} of 55 dBA is equivalent to a continuous sound level of 48.6 dBA. For comparison, normal speech at a distance of 3 feet averages 60 to 70 dBA L_{eq}.

The Commonwealth of Pennsylvania has established a motor vehicle noise regulation under 67 Section 157.11 PAC that requires all motor vehicles operated under any condition of grade, load, acceleration, or deceleration to not exceed specified noise limits for the category of motor vehicle within applicable speed limits. Rockland Township, where the TETCO Meter Station would be located, has a noise and vibration control ordinance in place that prevents continuous noise in excess of established maximum sound levels in certain frequency bands along zoning district boundaries. The meter station is in agricultural land and appears to be within the same zoning district as the surrounding land, and DTE has stated that it would comply with local noise ordinances.

In addition, the following noise ordinances are applicable to pipeline construction activities and are in place within the Project area. Similar to Rockland Township, the Borough of Birdsboro has a noise control ordinance in place that prevents continuous noise in excess of established maximum sound levels in certain frequency bands along zoning district boundaries. Per the Union Township noise ordinance, maximum permissible 1-hour L_{eq} levels are established for daytime and nighttime activity in residential areas (60 dBA and 55 dBA, respectively) and for activity at any time in commercial areas (65 dBA). Amity Township has a noise control ordinance that states that operation of construction equipment should not exceed 85 dBA for one hour, and night-time operation of construction equipment cannot cause a noise disturbance across a residential property line. DTE has stated that it would comply with all local noise ordinances and they are not addressed further.

General Impacts and Mitigation

Construction

Construction noise is highly variable as equipment operates intermittently. The type of equipment operating at any location changes with each construction phase. The noise level impacts on NSAs along the pipeline right-of-way due to construction activities would depend on the type of equipment used, the duration of use for each piece of equipment, the number of construction vehicles and equipment used simultaneously, and the distance between the source and receptor. Construction of the pipeline would result in a temporary increase in ambient noise.

DTE proposes to use the HDD construction method at four locations along the pipeline (see table A-5). NSAs were identified within 0.5 mile of each HDD entry and exit pit, and an acoustical survey and analysis was conducted at the nearest NSAs to each HDD entry and exit pit. DTE conduced the acoustical analysis under a conservative scenario that includes an HDD drill rig and associated equipment on each side of the HDDs. Table B-20 summarizes the noise impacts on the nearest NSA to each HDD as determined using the conservative assessment scenario, as well as any NSAs where noise levels from HDD construction would exceed 55 dBA L_{dn} with noise mitigation measures.

Table B-20
Acoustical Survey and Analysis Summary for Horizontal Directional Drills[a]

Nearby NSA	Approximate Distance and Direction of NSA from HDD Location	Estimated L_{dn} due to Project Construction (dBA)	Ambient L_{dn} (dBA)	Construction L_{dn} plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)	L_{dn} of Construction plus Ambient L_{dn} (dBA) with Mitigation[b]	Potential Increase Above Ambient (dB) with Mitigation[b]
HDD-1 (Exit, MP 0.3)							
NSA-03	350 feet SE	44.7	46.2	48.6	2.4	47.0	0.9
HDD-1 (Entry, MP 0.6)							
NSA-01	900 feet N	44.7	56.5	56.8	0.3	56.6	0.0
HDD-2 (Entry, MP 2.1)							
NSA-01	*75 feet W*	*67.0*	*46.4*	*67.0*	*20.6*	*58.1*	*11.6*
NSA-03	*775 feet SE*	*57.0*	*40.4*	*57.9*	*17.4*	*52.3*	*11.9*
HDD-2 (Exit, MP 2.2)							
NSA-02	375 feet SW	60.2	50.0	61.1	11.1	53.9	4.0
HDD-3 (Entry, MP 4.0)							
NSA-01	*300 feet NW*	*65.0*	*35.3*	*65.0*	*29.8*	*55.8*	*20.6*
HDD-3 (Exit, MP 4.2)							
NSA-02	900 feet E	46.3	42.2	47.7	5.6	43.8	1.6
HDD-4 (Entry, MP 10.5)							
NSA-05	400 feet E	55.1	45.3	55.5	10.2	48.6	3.3
HDD-4 (Exit, MP 10.7)							
NSA-01	250 feet NE	51.4	55.6	57.0	1.4	56.1	0.5

E = east; S = south; N = north; SE = southeast; NE = northeast; W = west.

[a] Locations that exceed the FERC guideline level with mitigation are noted in *italics.*

[b] Estimates include a 10 dB sound reduction due to the use of portable acoustic panels or enclosing the drill rig.

Without dampening noise, and based on the levels from HDD construction noise could exceed 55 dBA L_{dn} at five NSAs. Construction via HDD is expected to take place primarily during daylight hours, although 24-hour operation may be required during certain activities, such as pull-back. HDD construction noise would be temporary, occurring over a limited timeframe (a maximum of 6 weeks at each site).

DTE would implement general noise mitigation measures, which may include installation of noise barriers, enclosing the drill rig, and offering to temporarily re-locate residences of nearby NSAs during periods of elevated noise. However, DTE has not identified the site-specific noise control measures that would be implemented at each HDD. Estimates of construction and ambient noise provided in table B-20 include the addition of noise control measures.

Based on the acoustical analysis, the contribution of noise from HDD construction to existing ambient levels would result in an exceedance of 55 dBA L_{dn} or an increase of greater than 10 dB with the implementation of noise control measures at three NSAs in the vicinity of HDDs 2 and 3. Because noise associated with HDD construction could exceed an L_{dn} of 55 dBA at multiple NSAs, and DTE has not identified site-specific mitigation measures for any HDD, **we recommended that:**

- **Prior to construction of HDDs 2, 3, and 4, DTE should file with the Secretary, for the review and written approval by the Director of OEP, an HDD noise mitigation plan to reduce the projected noise level attributable to the proposed drilling operations at NSAs with predicted noise levels above 55 dBA L_{dn}. During drilling operations, DTE should implement the approved plan, monitor noise levels, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA or 10 dBA over ambient levels at the NSAs.**

Where ambient noise levels exceed 55 dBA L_{dn}, HDD construction would not result in a 10 dB or greater noise increase at any NSA. Based on the temporary nature of HDD construction, the mitigation measures that DTE would implement to minimize impacts on nearby NSAs, and our recommendation, there would be no significant noise impact associated with HDD construction.

Operations

Some sound would also be generated by the operation of the proposed TETCO Meter Station. DTE estimated ambient sound levels at the closest NSAs to the TETCO Meter Station site using land use data (see table B-21). DTE also collected ambient sound level data at the proposed meter station for use in calibrating its acoustical model, and DTE also conducted an acoustical impact assessment for the NSAs nearest to the proposed meter station. Operational noise from the meter station, located within Rockland Township, would be limited to the vicinity of the facility, and DTE has

indicated that operation would be in compliance with the Rockland Township noise ordinance. The FERC guidance levels establish more stringent noise requirements than the local ordinance. As such, the impacts discussed are based on the FERC standards. Table B-21 provides the estimated noise impacts resulting from the operation of the meter station at the nearest NSAs, and appendix I depicts each NSA.

Table B-21
Acoustical Analysis of the TETCO Meter Station

NSA	Distance and Direction of NSA	Existing Ambient L_{dn} (dBA)	Existing L_{dn} + L_{dn} of Meter Station (dBA)	Existing L_{dn} + L_{dn} of Meter Station (dBA) with Mitigation [a]	Potential Increase Above Ambient (dB)
TETCO NSA-01	130 feet east	48.9	64.2	52.6	3.7
TETCO NSA-02	700 feet southwest	46.8	56.6	47.5	0.7
TETCO NSA-03	740 feet southeast	60.0	60.1	60.0	0.0
TETCO NSA-04	1,340 feet north	64.1	64.2	64.1	0.0

[a] The assumed noise controls would result in an 18 dB decrease in operating noise, and may include the use of ultra-low noise valves, acoustically-insulated buildings, and acoustical blankets on aboveground piping at the meter station site.

DTE would implement noise controls, which may include the use of ultra-low noise valves, acoustically-insulated buildings, and acoustical blankets on aboveground piping at the meter station site. With planned mitigation, as shown in table B-21, operation of the meter station would not result in an exceedance of FERC's noise criterion of 55 dBA L_{dn} at nearby NSAs and the overall impact on noise levels would not be significant. However, DTE has not identified the site-specific noise control measures that would be implemented.

It is our experience that meter stations can vary widely in terms of actual noise impacts after being placed into service relative to the predicted impacts from these stations. To verify the accuracy of DTE's acoustical analyses and ensure sound levels do not exceed our criterion, **we recommend that**:

- **DTE should file a noise survey with the Secretary no later than 60 days after placing the TETCO Meter Station in service. If a full flow/load condition noise survey is not possible, DTE should provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the TETCO Meter Station under interim or full flow/load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, DTE should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. DTE should confirm compliance with the above requirement by filing a second noise survey with**

the Secretary no later than 60 days after it installs the additional noise controls.

Based on the analyses conducted, the mitigation measures proposed, and our recommendations, we conclude that construction and operation of the Project would not result in significant noise impacts on residents, or the surrounding communities.

9. Reliability and Safety

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

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If inhaled in high concentrations, oxygen deficiency can result in serious injury or death. Methane has an auto-ignition temperature of over 1,000 degrees Fahrenheit and is flammable at concentrations between 5 and 15 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite if there is an ignition source present. A flammable concentration within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses upward rapidly in air.

9.1 Safety Standards

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

Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adoption and enforcing the federal standards, while Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement actions. Pennsylvania is authorized under Section

5(a) to assume all aspects of the safety program for intrastate, but not interstate, facilities (PHMSA 2017a).

The DOT pipeline standards are published in 49 CFR 190 through 199. Part 192 specifically addresses natural gas pipeline safety issues. Under a MOU on Natural Gas Transportation Facilities, dated January 15, 1993, between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.12(a)(9)(vi) of the FERC's regulations require that an applicant certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards. If the FERC becomes aware of an existing or potential safety problem, there is a provision within the MOU to promptly alert the DOT. The MOU also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the FERC's jurisdiction. The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

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

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

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

- Class 4: Location where buildings with four or more stories aboveground are prevalent.

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

Class locations also specify the maximum distance to a sectionalizing block valve (e.g. 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; MAOP; inspection and testing of welds; and the frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

The Project would be constructed primarily through Class 1 and 2 areas, although a Class 3 area would also be crossed between MP 0.8 and 0.9. Throughout the life of the pipeline, DTE would monitor population changes near the pipeline in accordance with CFR 49, Title 192, Subpart L (Section 192.609 and 192.611) to determine whether the pipeline requires upgrades to meet changes in population. If a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline, DTE would reduce the MAOP, or replace the segment with pipe of sufficient grade and wall thickness if required, in order to comply with DOT requirements for the new class location. However, DTE has designed the Project to Class 3 standards to avoid or minimize the need for future replacements in the event that class locations for the pipeline increase.

The Pipeline Safety Improvement Act of 2002 requires operators to develop and follow a written integrity management program that contains all the elements described in 49 CFR 192.911 and addresses the risks on each transmission pipeline segment. More specifically, the law establishes an integrity management program that applies to all high consequence areas (HCA), which are defined as areas where a gas pipeline accident could considerably harm people and their property and that require an integrity management program to minimize the potential for an accident. DTE indicated that no areas along the proposed pipeline route meet the definition of an HCA. DTE would use criteria specified by the DOT to identify HCAs if conditions change along the proposed pipeline.

The DOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required under 49 CFR 192.615 to establish an emergency plan that includes procedures to minimize the hazards of natural gas pipeline emergency. DTE has indicated its intent to develop and implement an Emergency Response Plan in accordance with the regulations, which requires that the plan be

prepared prior to commencing operations of a pipeline (49 CFR 192.615). Key elements of the plan include procedures for:

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

The DOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. DTE would establish and maintain a liaison with the appropriate fire, police, and public officials to coordinate mutual assistance during emergencies.

9.2 Pipeline Accident Data

The DOT requires that all operators of natural gas transmission pipelines notify the DOT of any significant incident and submit an incident report within 20 days. Significant incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization; or
- involved property damage of more than $50,000 (1984 dollars).[22]

During the 20-year-period from 1995 through 2014, a total of 1,265 significant incidents were reported on more than 300,000 total miles of natural gas transmission pipelines nationwide. Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table B-22 provides a distribution of the causal factors as well as the number of each incident by cause.

[22] $50,000 in 1984 dollars is approximately $120,000 as of June, 2017 (U.S. Bureau of Labor Statistics 2017).

Table B-22
Natural Gas Transmission Pipeline Significant Incidents by Cause 1995-2014

Cause	Number of Incidents[a]	Percentage
Corrosion	291	23.0
Excavation[b]	207	16.4
Pipeline material, weld, or equipment failure	337	26.6
Natural force damage	147	11.6
Outside forces[c]	79	6.2
Incorrect operation	40	3.2
All other causes[d]	164	13.0
Total	1,265	-

[a] All data gathered from PHMSA Significant incident files, January 14, 2016. http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelineincidenttrends

[b] Includes third party damage.

[c] Fire, explosion, vehicle damage, previous damage, intentional damage.

[d] Miscellaneous causes or unknown causes.

The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 49.6 percent of all significant incidents. The pipelines included in the data set in table B-22 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain is a time-dependent process. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside forces, excavation, and natural forces are the cause of 34.2 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; and weather effects such as winds, storms, and thermal strains and willful damage. Older pipelines have a higher frequency of outside forces incidents, in part, because their location may be less well known and less well marked as compared to newer pipelines. In addition, the older pipelines contain a disproportionate number of smaller-diameter pipelines, which have a greater rate of outside force incidents. Smaller pipelines are more easily crushed or broken by mechanical equipment or earth movement. Table B-23 provides a breakdown of outside force incidents by cause.

Table B-23 Outside Forces Incidents by Cause 1995-2014[a]		
Cause	**Number of Incidents**	**Percent of Outside Force Incidents**
Third party excavation damage	172	13.6
Operator excavation damage	24	1.9
Unspecified excavation damage / previous damage	11	0.9
Heavy rain / floods	72	5.7
Earth movement	34	2.7
Lightning / temperature / high winds	26	2.1
Natural force (other)	15	1.2
Vehicle (not engaged with excavation)	47	3.7
Fire / explosion	8	0.6
Previous mechanical damage	6	0.5
Fishing or maritime activity	7	0.5
Intentional damage	1	0.1
Electrical arcing from other equipment / facility	1	0.1
Unspecified / other outside force	7	0.6
Total	431	-

[a] Excavation, Outside Force, and Natural Force from table B-22.

Since 1982, operators have been required to participate in "One-Call" public utility programs in populated areas to minimize unauthorized excavation activities near pipelines. The "One-Call" program is a service used by public utilities and some private sector companies (e.g. oil pipelines, cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. DTE would participate in the Pennsylvania One-Call program. In addition, safety and damage-prevention personnel employed by DTE would be present onsite to monitor, inspect, and assess all third-party activities near the Project area.

9.3 Impact on Public Safety

As stated in section B.9.1, DTE would comply with all applicable DOT pipeline safety standards as well as regular monitoring and testing of the pipeline. While pipeline failures are rare, the potential for pipeline systems to rupture and the risk to nearby residents is discussed below.

The service incidents data summarized above in table B-23 include pipeline failures of all magnitudes with widely varying consequences. Table B-24 below presents the average annual injuries and fatalities that occurred on natural gas transmission pipelines in the 5-year period between 2010 and 2014.

Table B-24 Injuries and Fatalities - Natural Gas Transmission Pipelines		
Year	**Injuries**	**Fatalities**
2010[a]	61	10
2011	1	0
2012	7	0
2013	2	0
2014	1	1

[a] All of the fatalities in 2010 were due to the Pacific Gas and Electric pipeline rupture and fire in San Bruno, California on September 9, 2010.

The majority of fatalities from pipelines are due to incidents with local distribution pipelines not regulated by the FERC. These are natural gas pipelines that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes, which are more susceptible to damage. Local distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

The nationwide total of accidental fatalities from various anthropogenic and natural hazards are listed in table B-25 to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to other hazard categories. Furthermore, the fatality rate associated with natural gas distribution lines is much lower than the fatalities from natural hazards such as lightning, tornados, or floods. The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1995 to 2014, there were an average of 63 significant pipeline incidents, 9 injuries and 2 fatalities per year.

As the number of significant incidents over more than 303,000 of natural gas transmission lines indicate the risk is low for an incident at any given location, DTE's construction and operation of the Project would represent a minimal increase in risk to the nearby public and we are confident that with implementation of the standard safety design criteria, the Project would be constructed and operated safely.

Table B-25 Nationwide Accidental Deaths[a]	
Type of Accident	**Annual No. of Deaths**
All accidents	117,809
Motor vehicle	45,343
Poisoning	23,618
Falls	19,656
Injury at work	5,113
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Floods[b]	81
Lightning[b]	49
Tornadoes[b]	72
Tractor turnover[c]	62
Natural gas distribution lines[d]	14
Natural gas transmission pipelines[d]	2

[a] All data, unless otherwise noted, reflects 2005 statistics from U.S. Census Bureau, Statistical Abstract of the United States: 2010 (129th Edition) Washington, DC, 2009; http://www.census.gov/statab.

[b] NOAA National Weather Service, Office of Climate, Water and Weather Services, 30 year average (1985-2014) http://www.weather.gov/om/hazstats.shtml

[c] Bureau of Labor Statistics, 2007 Census of Occupational Injuries

[d] PHMSA significant incident files, January 14, 2016. http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelineincidenttrends, 20 year average.

10. Cumulative Impacts

European settlers reached Pennsylvania in the early 17th century. Today about 12.7 million people reside in the state. This includes over 410,000 people that live in Berks County where the Project would be constructed (U.S. Census Bureau 2017a). Previous activities in the Project area have resulted in significant impacts on forest cover, fragmentation, and composition. The Northern Piedmont ecoregion is an area of plains, open valleys, and low, rounded hills historically dominated by Appalachian oak, while the Northeastern Highlands ecoregion consists of low mountains in the Project vicinity with vegetation consisting of northern hardwood and spruce fir forests (EPA 2017d, Woods *et al.* 1999). Activities such as agriculture, mining, or logging have disturbed most of the forested land in the vicinity of the Project, creating early successional forest cover types composed of young pioneer tree species that lack a closed, mature tree canopy (Southern Appalachian Bird Conservancy 2014).

In accordance with NEPA, we identified other actions located in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment.

As defined by CEQ, a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects within the region as part of the affected environment (environmental baseline) which was described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered.

As described in the environmental analysis section of this is EA, constructing and operating the Project would temporarily and permanently impact the environment. The Project would affect geology, soils, water resources, vegetation, wetlands, wildlife, cultural resources, visual resources, air quality, noise, and some land uses. Given that the Project would not include major aboveground facilities and would result in negligible tax benefits, as discussed in section B.6.6, it would have negligible effects on socioeconomic indicators and socioeconomic indicators are not discussed further.

10.1 Geographic Scope of Cumulative Impacts

Consistent with CEQ guidance and to determine cumulative impacts, we expanded the geographic boundaries of our review into geographic scopes as described below. Actions located outside the geographic scope are generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

We conclude that many of the Project-related impacts would be contained within or adjacent to the temporary construction right-of-way and ATWS. For example, erosion control measures included in our Plan and DTE's Procedures and E&SCP, would keep disturbed soils within work areas. For other resources, the contribution to regional cumulative impacts is lessened by the expected recovery of ecosystem function. This is in contrast with other large-scale development projects in which wetlands are permanently converted to uplands. Similarly, vegetative communities would be cleared, but revegetation would proceed immediately following construction in all temporary work areas. Additionally, we determined that visual impacts would be minimal at any discrete location along the proposed pipeline route.

Based on these conclusions and determinations; DTE's implementation of impact avoidance, minimization, and mitigation measures as described in our Plan and its Procedures and E&SCP; and its adherence to our recommendations, we find that most of the impacts of the Project would be largely limited to the 13.2-mile-long, 75-foot-wide construction corridor in Berks County. Furthermore, because the impacts of the Project would generally be localized, they would only contribute incrementally to a cumulative

impact in the Project area. As a result, we have calibrated the scope of our analysis to the magnitude of the aforementioned environmental impacts. It is estimated that Project completion would occur within less than 1 year.

Based on the impacts of the Project as identified and described in the EA and consistent with CEQ guidance, we have determined the resource-specific geographic scopes listed in table B-26 and described below are appropriate to assess cumulative impacts.

Table B-26
Geographic Scope for Cumulative Impacts Analysis

Environmental Resource	Geographic Scope
Soils and Geology	Construction workspaces
Water Resources, Wetlands, Vegetation, Wildlife	HUC-12 watershed. For direct in-water work includes potential overlapping impacts from sedimentation, turbidity, and water quality
Cultural Resources	0.5-mile from centerline
Land Use, Recreation, and Visual	1 mile from the centerline and existing visual access points (e.g., road crossings)
Air Quality – Construction	0.25 mile from pipeline
Air Quality – Operations	50 kilometers (31 miles) of the Project
Noise - Construction	0.25 mile (general construction) to 0.5 mile (HDD construction) from the pipeline
Noise - Operations	0.5 mile from the TETCO Meter Station

Hydrologic Unit Code -12 subwatersheds typically define the drainage area upstream of tributaries to major rivers, and range from 10,000 to 40,000 acres in size. The Birdsboro Pipeline Project would cross four HUC-12 subwatersheds, including a total area of 84,627 acres (see table B-5).

- Impacts on geology and soils would be largely contained within the Project workspaces, and therefore we evaluated other projects/actions within the same construction footprint as the Project.

- Impacts on water resources (primarily increased turbidity) could extend outside of the workspaces, but would also be contained to a relatively small area. Furthermore, impacts on water resources are traditionally assessed on a watershed level. Therefore, for water resources we evaluated other projects/actions within the HUC-12 subwatersheds crossed by the Project.

- Impacts on wetlands, vegetation, and wildlife could extend outside of the workspaces but would generally be contained to a relatively small area within or adjacent to Project workspaces. We believe the watershed scale is most

appropriate to evaluate impacts as it provides a natural boundary to accommodate general wildlife habitat and ecology characteristics in the Project area. Therefore, we evaluated projects within the HUC-12 subwatersheds crossed by the Project.

- Impacts on land use, recreation, and visual resources would be restricted to the construction workspaces and the immediate surrounding vicinity. However, in recognition of the scenic attributes of the Project area, the geographic scope for land use, recreation, and visual resources is 1.0 mile.

- Impacts on cultural resources would also be largely contained within or adjacent to Project workspaces. Therefore, we evaluated other projects/actions that overlapped with known cultural features potentially within the APE, or within 0.5-mile for an historic architectural structure.

- Temporary impacts on air quality, including fugitive dust, would be largely limited to areas within 0.25 mile of active construction. This radius was increased to 50 kilometers (31 miles) during operations.

- Temporary noise from construction of the Project would overlap with noise from other construction projects, which would be limited to areas within 0.25 mile of Project construction. This radius was increased to 0.5 mile for HDD locations and the TETCO Meter Station.

10.2 Other Projects Considered

As discussed in section B.5.2, DTE consulted public sources for each municipality crossed by the proposed pipeline route to obtain information on any planned future developments. To date, no planned commercial, residential, or other developments have been identified within 0.25 mile of the Project facilities.

One commentor raised concern regarding impacts on water resources, including water quality, due to historical violations by other pipeline companies in Pennsylvania. The contribution of past actions to the cumulative impacts of the proposed action are captured in the current environmental conditions by proxy. In general, the affected environment (environmental baseline), which is described under the specific resources throughout section B, reflects the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Potential cumulative impacts associated with recently completed, current, proposed, or reasonably foreseeable future actions within the Project area are described in table B-27. The projects identified within the resource-specific geographic scopes include one energy project (the Birdsboro Power Facility), various Pennsylvania Department of Transportation (PennDOT) projects to upgrade and/or expand

Table B-27
Existing or Proposed Projects with Potential to Contribute to Cumulative Impacts

Project and Proponent	Location	Status	Potential Impact Area	Closest Known Distance to Project[a]	Description	Resource(s) Potentially Cumulatively Affected
FERC-Jurisdictional Projects						
None						
Energy and Other Pipeline Projects						
Birdsboro Power Facility, Birdsboro Power	Birdsboro, Pennsylvania	Future	99.0 acres	0.0 mile	Birdsboro Power is constructing a 485-megawatt, natural gas-fired power plant in the Borough of Birdsboro. The facility is designed to generate electricity using a combustion turbine generator and a heat recovery steam generator that will provide steam to drive a steam turbine generator. Construction is expected to begin in 2017	Soils and Geology, Water Resources, Vegetation, Wildlife, Land Use, Recreation, Visual Resources, Air and Noise
Infrastructure and Other Projects						
PennDOT Improvement Projects	Amity, Exeter, Oley, and Pike Townships, Pennsylvania	Past, Present, Future	4.8 acres	0.3 - 2.7 miles	Construction of a roundabout at the intersection of State Routes 73 and 662 in Oley Township (about 4.0 acres), bridge replacement / rehabilitation of five bridges (on State Routes 562, 1026, and 2047, Fisher Mill Road, and Blacksmith Road), and replacement of a box culvert on State Route 2041. Work on these projects would occur between September 2017 and November 2019.	Water Resources, Vegetation, Wildlife, Land Use, Recreation, Visual Resources, and Noise
River Run Meadows Apartments, Housing Development Corporation Mid-Atlantic	Robeson Township, Pennsylvania	Future	29.0 acres	4.0 miles	A 58-unit housing development on a wooded lot between Reading and Birdsboro off Route 724. Construction began in 2017.	Water Resources, Vegetation, Wildlife

Source: DTE Energy 2017

[a] Distances are estimated based on publicly available data. A distance of "0 mile" indicates an overlap of affected lands with the Project.

infrastructure, and one housing development. Potential impacts most likely to be cumulative with the Project's impacts are related to geology and soils, water resources, vegetation and wildlife (including federally and state listed endangered and threatened species), land use, visual resources, cultural resources, air, and noise.

10.3 Geology and Soils

The Project, in addition to other projects within the geographic scope of the cumulative impact assessment (limited to the Birdsboro Power Facility), may have cumulative impacts on geology since projects may be subject to natural geological hazards and would impact soil resources, resulting in soil erosion and compaction.

The Birdsboro Power Facility would be located within the geographic scope for geology and soils for the Project where the Birdsboro Pipeline terminates on the Birdsboro Power Facility property. The greatest potential for impact would result from construction through karst terrain, which does not underlie the Birdsboro Power Facility. In addition, the Birdsboro Power Facility would be constructed on previously disturbed industrial land that was once the site of a steel mill. Because cumulative impacts on geological resources would be limited to the location of the pipeline within the Birdsboro Power Facility property, cumulative impacts would not be significant.

Permanent impacts would occur where soils are encumbered by the Birdsboro Power Facility and the Project's aboveground facilities. The Birdsboro Power Facility site was previously noted to have contaminated soils; however, cleanup of the site has been completed (EPA 2017d). Because the proposed pipeline would end at the Birdsboro Power Facility site boundary, DTE conducted a soils investigation within its proposed right-of-way adjacent to the Birdsboro Power Facility; contaminated soils were encountered and would be remediated during construction (see section B.1.2).

DTE would minimize incremental impacts on soils through implementation of its E&SCP, which would be reviewed and approved by the Berks County Conservation District. Similarly, the Birdsboro Power Facility would implement its E&SCP, which was approved by the conservation district in 2015. In addition, both companies would implement their SPCC plans to minimize the potential for material spills. Therefore, we conclude that cumulative impacts on geology and soils from the Project in consideration with other projects would be minor.

10.4 Water Resources and Wetlands

Because impacts on surface waters and wetlands can result in downstream sedimentation or turbidity, the geographic scope for cumulative impacts on water resources and wetlands includes each HUC-12 subwatershed crossed by the Project. Hydrologic units define the source area that contributes surface water to a specified outlet

point, and they are delineated based on surface water flow along natural hydrologic breaks.

The Project, in addition to other projects within the geographic scope, may have cumulative impacts on water resources and wetlands, including changes in groundwater recharge, impacts on surface and groundwater quality, sedimentation and increased turbidity due to erosion or construction within surface waters, and temporary and permanent impacts on wetlands. Construction of the Project would result in temporary and minor impacts on groundwater and surface water resources, as well as temporary and long-term impacts on wetlands.

All of the projects identified in table B-27 are within one of the four subwatersheds that would be crossed by the Birdsboro Pipeline Project. Each of these projects has the potential to result in impacts on wetlands and waterbodies during construction and operation, including changes in water quality, and sedimentation and increased turbidity due to erosion or construction within surface waters. Therefore, the Project, when considered with other projects in the vicinity, would result in cumulative impacts on water resources and wetlands.

Since the Birdsboro Power Facility would be located on previously disturbed industrial land, no direct impacts on waterbodies or wetlands are anticipated. However, concurrent construction of the Birdsboro Power Facility within the vicinity of the Project could increase the amount of exposed soil in the area, thereby increasing the potential for soil erosion and sedimentation into surface waterbodies. To avoid and minimize potential impacts on surface water, construction of the Birdsboro Power Facility would adhere to the environmental requirements of applicable federal and state permits.

Because the Project and other projects would be required to comply with mitigation requirements and conditions in their CWA Section 401 and 404 permits for wetland and water quality impacts, and the incremental impacts of the Project would be mostly temporary and minor, we conclude that cumulative impacts would not be significant.

10.5 Vegetation and Wildlife

Cumulative effects on vegetation and wildlife affected by the Project, including threatened and endangered species, could occur in the HUC-12 watersheds crossed by the Project (see table B-27). The PennDOT projects are not expected to contribute discernably to cumulative impacts on vegetation or wildlife since they involve replacement of existing infrastructure along roadways with adjacent vegetation habitat that would not be considered quality habitat. Similarly, the Birdsboro Power Facility would be constructed on previously disturbed industrial land that does not provide quality wildlife habitat. However, construction of the housing development would result in the permanent conversion of 29 acres of forested lands to residential lands within a HUC-12

watershed crossed by the Project. DTE would minimize impacts on vegetation and wildlife habitat by implementing the measures in our Plan and its Procedures and E&SCP, and by minimizing forested crossings.

Cumulative impacts on federally and state listed threatened and endangered species and federal species of concern could occur if other projects were to affect the same habitats as the Project. However, the ESA consultation process includes consideration of the current status of affected species and how cumulative impacts would be minimized. We conclude that the cumulative impacts on vegetation and wildlife resources, including threatened and endangered species, would not be significant.

10.6 Land Use, Recreation, and Visual Resources

The geographic scope that was identified for cumulative impacts on land use, recreation, and visual resources is within a 1-mile radius of the Project. Pipelines are buried and thus allow for most uses of the land following construction. Therefore, with the exception of the permanent right-of-way (including a permanent conversion of forested land to herbaceous cover), construction and operation of the proposed pipeline would have minor, temporary effects on existing and future land use. Temporary workspace areas would be restored in accordance with our Plan, DTE's Procedures and E&SCP, as well as individual landowner agreements. Projects with new, aboveground facilities generally have greater impacts on land use than the operational impacts of a pipeline. The PennDOT projects are generally replacements of, or minor modifications to, existing infrastructure and would result in negligible impacts on land use. The Birdsboro Power Facility would be constructed on an existing industrial lot that has been generally inactive since 2002. Although the lot would be retained for industrial purposes, the use of the parcel would increase during construction and operation of the power facility (e.g., increased vehicle traffic, noise).

The proposed TETCO Meter Station is more than 1.0 mile from the other projects listed in table B-27, including the Birdsboro Power Facility, and would not contribute to a cumulative effect within the geographic scope. The remaining minor facilities that would be constructed as part of the proposed Project (i.e. valves) would result in the conversion of a small amount of agricultural land to industrial land and add a small visual impact. In addition, the Project would add incrementally to the visual impact at the Birdsboro Power Facility during construction and where forested land is cleared for Project construction and operation, but the overall contribution would be negligible.

As the Project and other projects would not significantly change the character of the land, and as the land use types impacted are abundant in the geographic scope, we conclude that cumulative impacts on these resources would not be significant.

10.7 Cultural

Of the projects identified in table B-27, only the Birdsboro Power Facility would have a construction footprint that overlaps with the Project; however, no cultural resources have been identified within the survey corridor where these projects would overlap. Additionally, two of the PennDOT projects would occur within the Oley Township Historic District: one is replacing existing infrastructure (bridge) and the other is making a modification to an existing roadway. Any project with a federal nexus would have to adhere to the regulations for compliance with Section 106 of the NHPA outlined in 36 CFR 800; and any adverse effects on historic properties would be reduced or mitigated. We conclude that given the federal laws and regulations that protect historic properties, mentioned above, it is not likely that there would be significant cumulative impacts on historic properties.

10.8 Air Quality

Air emissions from projects in the vicinity of the Project would be additive. Construction activities for the projects identified in table B-27 would involve the use of heavy equipment that would generate emissions of air contaminants and fugitive dust. Construction of the non-jurisdictional Birdsboro Power Facility is expected to begin in 2017, and is anticipated to be completed in April of 2019. Two of the PennDOT bridge replacement/rehabilitation projects are expected to begin in the first quarter of 2018. Construction of the Project would result in temporary increases of emissions due to the use of construction equipment and fugitive dust associated with grading, trenching, backfilling, and other earth-moving activities. As discussed in section B.8.1, impacts from construction and operation of the Birdsboro Pipeline Project would not result in any violation of applicable ambient air quality standards, including general conformity thresholds (see table B-19). Any potential cumulative impacts from construction would be limited to the duration of the construction period, and would be temporary and minor.

None of the projects listed in table B-27 are considered major emissions sources. The Birdsboro Power Facility project proponents obtained an Air Permit (PADEP Permit #06-05154A) for emissions associated with operation of the facility; emissions are quantified in table B-28. During operations, emissions from the Birdsboro Pipeline Project would be limited to fugitive emissions of CO_{2e} and VOCs. Therefore, while concurrent operation of the Birdsboro Power Facility and the Birdsboro Pipeline Project would result in a cumulative increase in emissions of air pollutants, we conclude that the Project and other projects in the geographic scope would not result in significant cumulative impacts on regional air quality.

Table B-28 Summary of Estimated Emissions from Operation of the Birdsboro Power Facility[a]							
Source	**NO_X**	**CO**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAPs[b]**
Birdsboro Power Facility	96.6	69.5	17.6	23.7	56.7	56.7	9.9

[a] Emissions estimates based on PADEP Permit #06-05154A.

[b] HAP = hazardous air pollutant.

10.9 Climate Change

Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer are not indications of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change.

The United States and the world are warming; global sea level is rising and acidifying; and certain extreme weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHGs in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture and clearing of forests. These impacts have accelerated throughout the end of the 20th and into the 21st century.

Although climate change is a global concern, for this cumulative analysis, we focus on the potential cumulative impacts of climate change in the Project area. The following observations of environmental impacts that may be attributed to climate change in the Northeast region (U.S. Global Change Research Program 2014):

- average temperatures have risen about 2 degrees Fahrenheit between 1895 and 2011 and are projected to increase another 1 to 8 degrees Fahrenheit over the next several decades with more frequent days above 90 degrees Fahrenheit;
- areas that currently experience ozone pollution problems are projected to experience an increase in the number of days that fail to meet the federal air quality standards;
- an increase in health risks and costs for vulnerable populations due to projected additional heat stress and poor air quality;
- precipitation has increased by about 5 inches and winter precipitation is projected to increase 5 to 20 percent by the end of the century;

- extreme/heavy precipitation events have increased more than 70 percent between 1958 and 2010 and are projected to continue to increase;
- sea levels have risen about 1 foot since 1900 and are projected to continue increasing 1 to 4 feet by 2100 stressing infrastructure (e.g., communications, energy, transportation, water, and wastewater);
- severe flooding due to sea-level rise and heavy downpours is likely to occur more frequently;
- crop damage from intense precipitation events, delays in crop plantings and harvest, and heat stress negatively affect crop yields;
- invasive weeds are projected to become more aggressive due to their benefit of higher CO_2 levels;
- a change in range, elevation, and intra-annual life cycle events of vegetation and wildlife species; and
- an increase in carrier habitat and human exposure to vector-borne diseases (e.g., Lyme disease or West Nile virus).

Our analysis presents the direct and indirect GHG emissions associated with construction and operation of the projects and the potential impacts of GHG emissions in relation to climate change, to the extent practicable (see section B.8.1).

Currently, there is no scientifically-accepted methodology available to correlate specific amounts of GHG emissions to discrete changes in average temperature rise, annual precipitation fluctuations, surface water temperature changes, or other physical effects on the global environment or the Northeast region. However, contributions to GHG emissions globally results in the climate impacts discussed above for the Northeast region.

As discussed above, we have disclosed the potential GHG emissions from the Project and climate change impacts in the Northeast region associated with global GHG emissions. Additionally, burning natural gas emits less CO_2 compared to other fuel sources (e.g., fuel, oil, or coal).

10.10 Noise

Noise impacts would occur during construction of the entire Project; however, operational noise impacts would be limited to the vicinity of the TETCO Meter Station. Because the impact of noise is highly localized and attenuates quickly as the distance from the noise source increases, the Project could contribute to a cumulative noise impact

on NSAs within 0.25 mile along the proposed pipeline route and within 0.5 mile of an HDD and the TETCO Meter Station.

Construction of the projects identified in table B-27 would involve the use of heavy equipment that would generate noise. The potential for cumulative noise impacts on NSAs would be greatest near MP 0.0, where the Birdsboro Power Facility would be constructed and an HDD of the Schuylkill River is proposed. At this location, noise from HDD installation of the pipeline is not expected to exceed the FERC guideline levels (see table B-20).

During typical construction of the pipeline (e.g., clearing, grading, trenching), noise would be temporary, generally limited to daylight hours, and would not be expected to reach the FERC L_{dn} guideline level of 55 dBA. Although noise associated with HDD construction could exceed an L_{dn} of 55 dBA at multiple NSAs, we recommend that DTE implement adequate mitigation measures to ensure that HDD noise impacts are minimized (see section B.8.2). Further, HDD construction would range from 3 to 6 weeks at each location, and DTE would limit 24-hour operations to certain activities, such as pull-back. We conclude that cumulative construction noise within the geographic scope would not be significant.

Operation of DTE's proposed new TETCO Meter Station could contribute to noise impacts within a 0.5-mile radius. The analysis completed in section B.8.2 quantifies predicted noise levels, and determined with planned mitigation, operation of the meter station would not result in an exceedance of FERC's noise criterion of 55 dBA at nearby NSAs, and that overall impact on noise levels would not be significant. In considering other potential noise sources in the geographic scope and the contribution of the Project, we conclude that a significant cumulative noise impact would not occur during operation of the Project.

10.11 Conclusions on Cumulative Impacts

We conclude that impacts associated with the Project would be relatively minor, and we are recommending additional measures to further reduce the environmental impacts associated with the Project. The impacts from other existing and proposed projects or general activities within the geographic scope are also expected to be generally temporary and minor. Therefore, we anticipate that the Project would contribute a negligible to minor cumulative impact when the effects of the Project are added to past, present, and reasonably foreseeable projects within the geographic scope.

C. ALTERNATIVES

In accordance with NEPA and Commission policy, we evaluated alternatives to the Project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives included the no action alternative, system alternatives, major pipeline route alternatives, and minor route variations. No significant aboveground facilities are proposed. The evaluation criteria used for developing and reviewing alternatives were:

- ability to meet the Project's stated objective;
- technical and economic feasibility and practicality; and
- significant environmental advantage over the proposed action.

Our evaluation of alternatives is based on Project-specific information provided by the applicant; input from stakeholders; publicly available information; our consultations with federal and state resource agencies, including scoping comments from the EPA and COE; and our expertise and experience regarding the siting, construction, and operation of natural gas transmission facilities and their potential impact on the environment.

1. Evaluation Process

Through environmental comparison and application of our professional judgement, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g. publicly available data, geographic information system data, aerial imagery) and assume the same right-of-way widths and general workspace requirements. Where appropriate, we also use site-specific information (e.g. field surveys or detailed designs).

Our environmental analysis and this evaluation consider quantitative data (e.g. acreage or mileage) and uses common comparative factors such as total length, amount of collocation, and land requirements. Our evaluation also considers impacts on both the natural and human environments. These impacts were described in detail in section B of this EA. Because the alternatives represent mostly alternative locations for natural gas facilities, the specific nature of these impacts on the natural and human environments would generally be similar to the impacts described in section B. In recognition of the competing interest and the different nature of impacts resulting from an alternative that sometimes exist (i.e. impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative and discount or eliminate factors that are not relevant or may have less weight or significance.

The alternatives were reviewed against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the Project. An alternative that cannot achieve the purpose for the Project cannot be considered as an acceptable replacement for the Project. All of the alternatives considered here are able to meet the Project purpose stated in section A.2 of this EA. Specifically, DTE proposes to provide 79 MMcf/d of year-round natural gas transportation capacity to the Birdsboro Power Facility.

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

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

One of the goals of an alternatives analysis is to identify alternatives that avoid significant impacts. In section B, we evaluated each environmental resource potentially affected by the Project and concluded that constructing and operating the Project would not significantly impact these resources. Consistent with our conclusions, the value gained by further reducing the (not significant) impacts of the Project when considered against the cost of relocating the route/facility to a new set of landowners was also factored into our evaluation.

2. No-action Alternative

If the Commission were to deny DTE's application, the Project would not be built and the environmental impacts identified in this EA would not occur. Under this alternative, DTE would not provide natural gas supply to the Birdsboro Power Facility. If the no-action alternative is selected, other natural gas transmission companies could propose to construct similar facilities to meet the demand for new service at the Birdsboro Power Facility. Such actions could result in impacts similar to or greater than

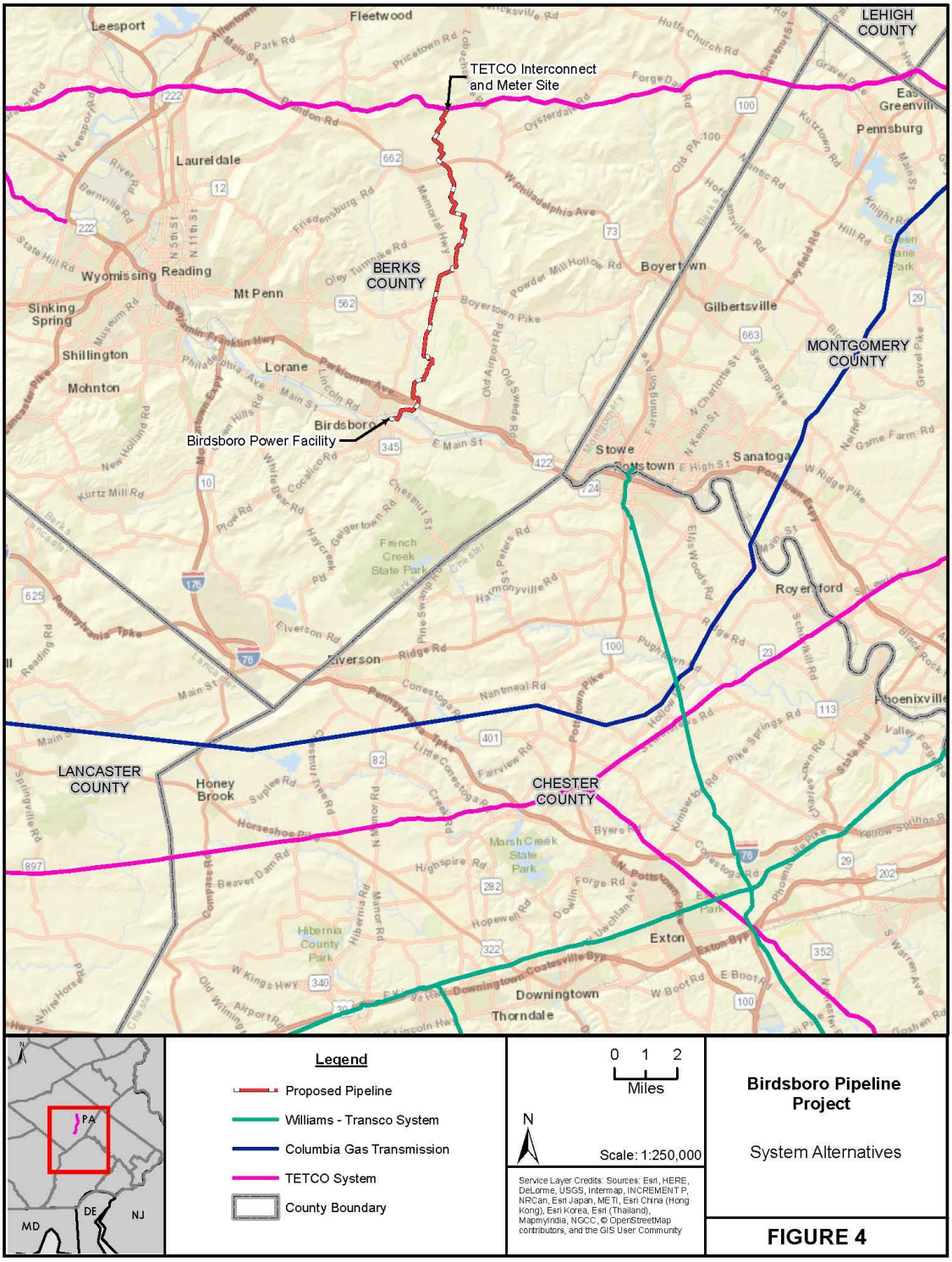
the Project. Therefore, we have concluded that the no-action alternative would not provide a significant environmental advantage and would not satisfy the Project objectives.

3. System Alternatives

System alternatives would generally use existing, modified, or proposed pipeline systems to meet the purpose and need of the Birdsboro Pipeline Project. Although modifications or additions to existing or proposed pipeline systems may be required, implementation of a system alternative would deem it unnecessary to construct all or part of the Project. These modifications or additions could result in environmental impacts that are less than, similar to, or greater than those associated with construction and operation of the Project. Additionally, we evaluated alternative transportation systems for delivering natural gas to the Birdsboro Power Facility.

We reviewed the Project area for existing natural gas transmission pipelines that could possibly be used as system alternatives. In addition to the TETCO pipeline system north of Birdsboro, which DTE proposes an interconnect with, three interstate natural gas transmission pipelines are located within the general vicinity of the Birdsboro Power Facility (see figure 4). Additionally, Columbia Gas Transmission (Columbia), TETCO, and Transcontinental Gas Pipe Line Company (Transco) have natural gas transmission pipelines about 10.0, 13.0, and 18.0 miles south of Birdsboro in Chester County, respectively. Based on a straight-line route from their closest points, pipeline construction from any of these three southern systems would require at a minimum 5.0 miles of forest clearing (45.5 acres) because most of the land south of Birdsboro and north of Highway 23 is forested and contains nature preserves, state game lands, and a state park; the proposed route would affect 15.9 acres.

Pipeline construction from the southern systems could also affect more residential and developed properties, with more developed lands being identified further south from Birdsboro. Transco also has a 6-inch-diameter lateral pipeline to Pottstown that is about 9 miles from the Birdsboro Power Facility; however, a pipeline from this location would affect more residential development as well as require construction parallel to the Schuylkill River. Pipeline construction from other points along the lateral would also affect more residential developments and potentially more forested land. As such, the Columbia, Transco, and southern TETCO systems do not provide a significant environmental advantage over the Project.


TETCO Interconnect and Meter Site
Birdsboro Power Facility
BERKS COUNTY
LEHIGH COUNTY
MONTGOMERY COUNTY
CHESTER COUNTY
LANCASTER COUNTY
Leesport
Fleetwood
Laureldale
Wyomissing
Reading
Mt Penn
Sinking Spring
Shillington
Mohnton
Lorane
Birdsboro
Boyertown
Gilbertsville
Pennsburg
Stowe
Sanatoga
Pottstown
Royersford
Phoenixville
Limerick
Honey Brook
Exton
Downingtown
Thorndale
Marsh Creek State Park
French Creek State Park
Hibernia County Park
PA
NJ
DE
MD
Legend
Proposed Pipeline
Williams - Transco System
Columbia Gas Transmission
TETCO System
County Boundary
0 1 2
Miles
N
Scale: 1:250,000
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Birdsboro Pipeline Project
System Alternatives
FIGURE 4

Liquefied natural gas (LNG) in relatively small volumes is transported via truck and/or rail in many locations throughout the United States. Commercially available LNG tanker trucks have storage/transmission capacities ranging between 7,500 gallons and 16,000 gallons; commercially available railway tankers have storage/transmission capacities ranging between 16,000 and 30,000 gallons. Based on the capacities of these systems, it would take approximately 60 to 130 trucks per day, or 32 to 64 railway tankers per day, to deliver the 79 MMcf/d of gas to the Birdsboro Power Facility. In addition, liquefaction and vaporization facilities would need to be constructed at the receipt and delivery points, respectively. Although a rail line is present near the Birdsboro Power Facility, it does not directly service the plant and no rail line exists that connects the delivery and receipt points; therefore, shipping by rail would not be considered practical. Transportation by truck would increase air emission and traffic impacts in the area. Based on the impacts and number of trucks and/or rail cars that would be needed to transport the Project volumes and the facilities, time, and cost necessary to process and deliver these volumes, we have determined the use of this system would not be economically practical, and based on traffic and air emission impacts, would likely not provide a significant environmental advantage. Therefore, we do not consider this alternative further.

4. Major Route Alternatives

A major route alternative is one that deviates from the proposed pipeline alignment for a substantial length and distance in an effort to reduce overall environmental impacts. Major route alternatives would involve a new pipeline route that would still interconnect with TETCO's pipeline (potentially in a different location), but would ultimately connect with the Birdsboro Power Facility.

During the scoping process, comments were received requesting route alternatives that would avoid Oley Township. Commentors are concerned with the potential effects of the pipeline on the Oley Township Historic District. The primary concern is that the aboveground elements of the pipeline would have negative visual effects. Therefore, we reviewed two major route alternatives that would avoid Oley Township (see figure 5).

In an effort to keep the comparisons consistent between the proposed route and the alternatives and in keeping with FERC guidelines, desktop data was used in the alternatives analysis for both the alternative routes and the proposed routes (see table C-1).

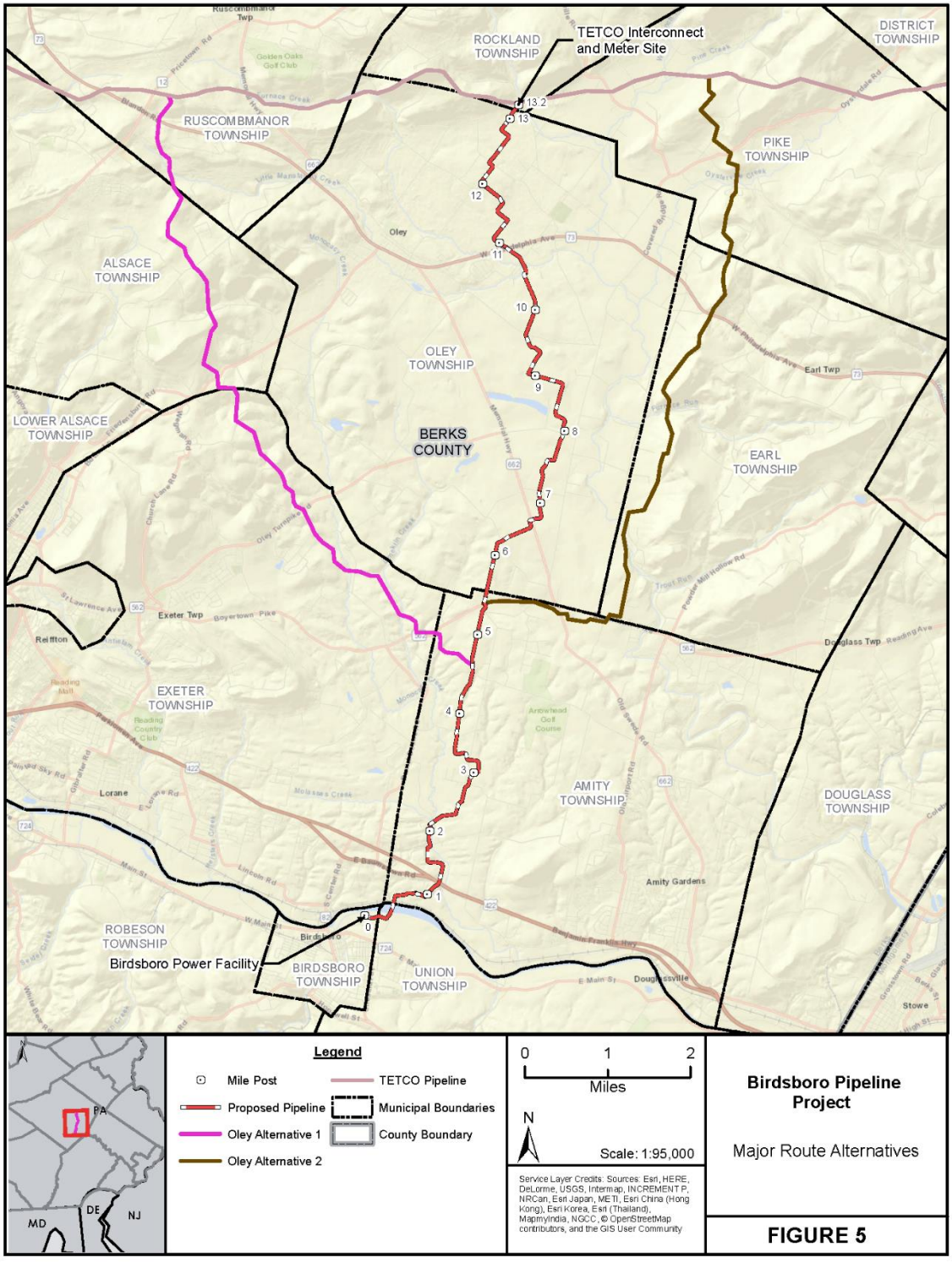

TETCO Interconnect and Meter Site
ROCKLAND TOWNSHIP
DISTRICT TOWNSHIP
RUSCOMBMANOR TOWNSHIP
PIKE TOWNSHIP
ALSACE TOWNSHIP
OLEY TOWNSHIP
LOWER ALSACE TOWNSHIP
BERKS COUNTY
EARL TOWNSHIP
EXETER TOWNSHIP
AMITY TOWNSHIP
DOUGLASS TOWNSHIP
ROBESON TOWNSHIP
Birdsboro Power Facility
BIRDSBORO TOWNSHIP
UNION TOWNSHIP
Legend
Mile Post
Proposed Pipeline
Oley Alternative 1
Oley Alternative 2
TETCO Pipeline
Municipal Boundaries
County Boundary
0 1 2
Miles
N
Scale: 1:95,000
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
PA
MD
DE
NJ
Birdsboro Pipeline Project
Major Route Alternatives
FIGURE 5

Table C-1 Major Route Alternatives to the Birdsboro Pipeline Project			
Resource	**Proposed Route[a]**	**Oley Alternative One**	**Oley Alternative Two**
Pipeline length (miles)	13.2	14.1	14.9
Construction acres[b]	120.4	127.9	135.7
Operation acres[c]	80.2	85.3	90.5
Collocation length (miles)	1.4	0.1	1.7
Residences within 50 feet	9	0	1
NWI wetlands within 200-foot-wide corridor	7	7	6
PFO / PSS NWI wetlands within 200-foot corridor	4	4	4
Total waterbodies crossed	11	16	15
Ponds / Lakes within a 200-foot-wide corridor	1	2	1
Karst features within a 200-foot-wide corridor (number)	38	2	19
Previously identified cultural resources	6	10	9
Forested land (construction / operation)	22.8 / 15.2	58.3 / 38.8	65.7 / 43.8
Residential land (construction / operation)	1.2 / 0.8	1.6 / 1.1	3.1 / 2.1

[a] The data included for the proposed route are based on desktop data to allow for consistent comparison of data types between the proposed route and variations.

[b] Construction acres estimated based on an assumed 75-foot-wide easement.

[c] Operation acres estimated based on an assumed 50-foot-wide easement.

4.1 Oley Alternative One

Oley Alternative One follows the proposed route from MP to 0.0 to MP 4.6 where it traverses west-northwest to avoid Oley Township and connects with TETCO in Ruscombmanor Township, about 4.5 miles west of the proposed interconnect. Oley Alternative One offers some advantages. First, it does avoid the historic district and would have nine fewer residences within 50 feet of construction work areas. Oley Alternative One also crosses only 2 known karst features, compared to the 38 karst features crossed within the 200-foot-wide corridor of the Project. However, the alternative is about 14.1 miles in total length, which would equate to about 7.5 more acres of impacts during construction than the proposed route. Oley Alternative One would also require at least 35.5 additional acres of tree clearing during construction, and about 23.6 additional acres of forested land would remain cleared permanently for operations. Oley Alternative One, while avoiding the historic district and crossing fewer karst features, would also affect five more waterbodies, four more cultural sites and more overall acreage compared to the Project. In balancing the factors evaluated, we do not find an

overall significant environmental advantage for the alternative when compared to the proposed route.

4.2 Oley Alternative Two

Oley Alternative Two would follow the proposed route from MP to 0.0 to MP 5.3 where it traverses east-northeast to avoid Oley Township and connect with TETCO about 2.5 miles east of the proposed interconnect. Oley Alternative Two offers some advantages. First, it also avoids the historic district. It also affects about half as many known karst features and would have eight fewer residences within 50 feet of construction work areas. However, Oley Alternative Two is about 14.9 miles in total length, which would equate to about 15.3 more acres of impacts during construction. Significantly, Oley Alternative Two crosses much more forested area compared to the other alternatives analyzed and would require at least 42.9 more acres of tree clearing during construction than would the proposed route. The alternative would also affect three more cultural sites and cross about 0.2 mile more (about 2.0 additional acres) of residential land use, compared to the Project. In balancing the factors evaluated, we do not find an overall significant environmental advantage for the alternative when compared to the proposed route.

5. Minor Route Variations

Route variations are relatively short deviations (generally in close proximity to the proposed route) that would avoid or further reduce impacts on specific localized resources. A total of 12 route variations were considered by DTE during initial project planning and incorporated into the proposed route. During the Project pre-filing period, we asked DTE to review the route for variations that would further avoid impacts on resources such as karst areas, wetlands, bog turtle habitat, and cultural sites. Following submittal of the application, DTE identified an additional cultural resource site and incorporated a route variation to avoid the site. We reviewed these route variations in our analysis in section B and have determined that DTE's reasoning was sufficient and the implementation of these variations was preferable. Appendix J lists the 13 route variations that have been incorporated into the proposed route.

Following additional field investigations of the karst areas associated with the HDDs, DTE revised the wetland and waterbody crossing method at MP 12.5 from an HDD to an open cut. Because of this change in construction method and based on correspondence with the EPA, we reviewed route variations to avoid or minimize surface impacts on the exceptional value wetland and coldwater fishery near this location. The wetland at MP 12.5 is actually part of a larger contiguous wetland complex that extends about 0.9 mile, following the stream corridor. A route variation about 600 feet to the northwest of the proposed crossing would require a wetland crossing length of about 620 feet, compared to the proposed 210-foot-long crossing associated with the proposed route. Variations to the southeast of the proposed crossing would require a crossing

width of about 300 to 400 feet and would include forested wetlands. Therefore, we have determined that the proposed crossing location minimizes impacts on the wetland and associated coldwater fishery.

In addition to route variations, the EPA requested in correspondence with FERC that DTE consider other trenchless construction techniques to minimize impacts on the wetland and stream at MP 12.5. These include the conventional bore and direct pipe methods. Based on topography and safety requirements, DTE indicated that a bore of the wetland/stream complex would be 300 feet long, which exceeds the length that DTE considers feasible for this crossing. DTE also considers the direct pipe method infeasible because the necessary equipment is generally designed for much larger diameter pipelines (30 to 60 inches in diameter).

As mentioned above, DTE's proposed construction impacts were reduced by a decreased right-of-way width of about 30 feet and a dry-ditch crossing of the stream during appropriate timing windows. We consider these minimization measures to have reduced impacts to levels that do not require the use of methods which may prove to be infeasible. Based on the questionable feasibility of a conventional bore or direct pipe crossing, we have determined that the alternative crossing methods are not feasible and do not consider them further.

6. Conclusion

After reviewing the alternatives to the Project, we conclude that none would satisfy the evaluation criteria. In summary, we have determined that the proposed action, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project's objectives.

D. STAFF CONCLUSIONS AND RECOMMENDATIONS

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

1. DTE shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. DTE must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;

    b. justify each modification relative to site-specific conditions;

    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and

    d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP, or the Director's Designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

    a. The modification of conditions of the Order;

    b. stop work authority; and

    c. the imposition of any additional measures deemed necessary to assure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction,** DTE shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction,** DTE shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

   DTE's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. DTE's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas pipeline or aboveground facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. DTE shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by the Commission's Plan, and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;

   b. implementation of endangered, threatened, or special concern species mitigation measures;

   c. recommendations by state regulatory authorities; and

   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the authorization and before construction begins**, DTE shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. DTE must file revisions to the plan as schedules change. The plan shall identify:

    a. how DTE will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;

    b. how DTE will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;

    c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;

    d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;

    e. the location and dates of the environmental compliance training and instructions DTE will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);

    f. the company personnel (if known) and specific portion of DTE's organization having responsibility for compliance;

    g. the procedures (including use of contract penalties) DTE will follow if noncompliance occurs; and

    h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

        (1) completion of all required surveys and reports;

        (2) the environmental compliance training of onsite personnel;

        (3) the start of construction; and

        (4) the start and completion of restoration.

7. DTE shall employ at least one EI per construction spread. The EIs shall be:

    a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see Condition 6 above) and any other authorizing document;

c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

d. a full-time position, separate from all other activity inspectors;

e. responsible for documenting compliance with the environmental conditions of that Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and

f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, DTE shall file updated status reports with the Secretary on a **biweekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on DTE's efforts to obtain the necessary federal authorizations;

b. the construction status of each spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);

d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;

e. the effectiveness of all corrective actions implemented;

f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

g. copies of any correspondence received by DTE from other federal, state, or local permitting agencies concerning instances of noncompliance, and DTE's response.

9. DTE must receive written authorization from the Director of OEP **before commencing construction of any Project facilities**. To obtain such authorization, DTE must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. DTE must receive written authorization from the Director of OEP **before placing the Project into service.** Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service,** DTE shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed and installed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

    b. identifying which of the conditions in the Order DTE has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **Prior to construction**, DTE shall file with the Secretary, for review and approval by the Director of OEP, an updated Karst Mitigation Plan that considers any PADCNR concerns or comments.

13. DTE shall not bury construction debris (e.g., stumps, brush, excess rock) in the construction right-of-way during restoration, **unless specifically approved in writing** by the landowner or land managing agency for beneficial reuse, stabilization, or habitat restoration.

14. DTE shall conduct vegetation clearing activities between September 1 and March 31, or file mitigation measures to avoid impacts on migratory birds (e.g., pre-construction nest surveys in suitable habitat) and documentation, for review and approval by the Director of OEP, indicating that clearing outside of this timeframe is acceptable to the FWS.

15. DTE **shall not begin construction** of the Project **until:**

    a. FERC staff completes any necessary ESA Section 7 consultation with the FWS; and

    b. DTE has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

16. **Prior to construction**, DTE shall file with the Secretary documentation that its "Draft Determination of Effect Report" was submitted to the Oley Valley Heritage Association, Oley Township Historical Architectural Review Board, and Berks County Planning Commission, along with any comments received from these entities on the report.

17. DTE **shall not begin construction** of facilities **and/or use** of all staging, storage, or temporary work areas and new or to-be-improved access roads **until:**

    a. DTE files with the Secretary:

        (1) remaining cultural resources survey reports;

        (2) site evaluation reports and avoidance/treatment plans, as required; and

        (3) comments on cultural resources reports, and plans from the Pennsylvania SHPO, Stockbridge-Munsee Community in Wisconsin, and the Delaware Tribe of Indians;

    b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

    c. the FERC staff reviews and the Director of OEP approves the cultural resources investigation reports and plans, and notifies DTE in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

    All materials filed with the Commission containing **location, character, and ownership** information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CUI//PRIV- DO NOT RELEASE."**

18. **Prior to construction of HDDs 2, 3, and 4**, DTE shall file with the Secretary, for the review and written approval by the Director of OEP, an HDD noise mitigation plan to reduce the projected noise level attributable to the proposed drilling operations at NSAs with predicted noise levels above 55 dBA L_{dn}. During drilling operations, DTE shall implement the approved plan, monitor noise levels, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA or 10 dBA over ambient levels at the NSAs.

19. DTE shall file a noise survey with the Secretary **no later than 60 days after placing the TETCO Meter Station in service**. If a full flow/load condition noise survey is not possible, DTE shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the TETCO Meter Station under interim or full flow/load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, DTE shall file a

report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year of the in-service date**. DTE shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

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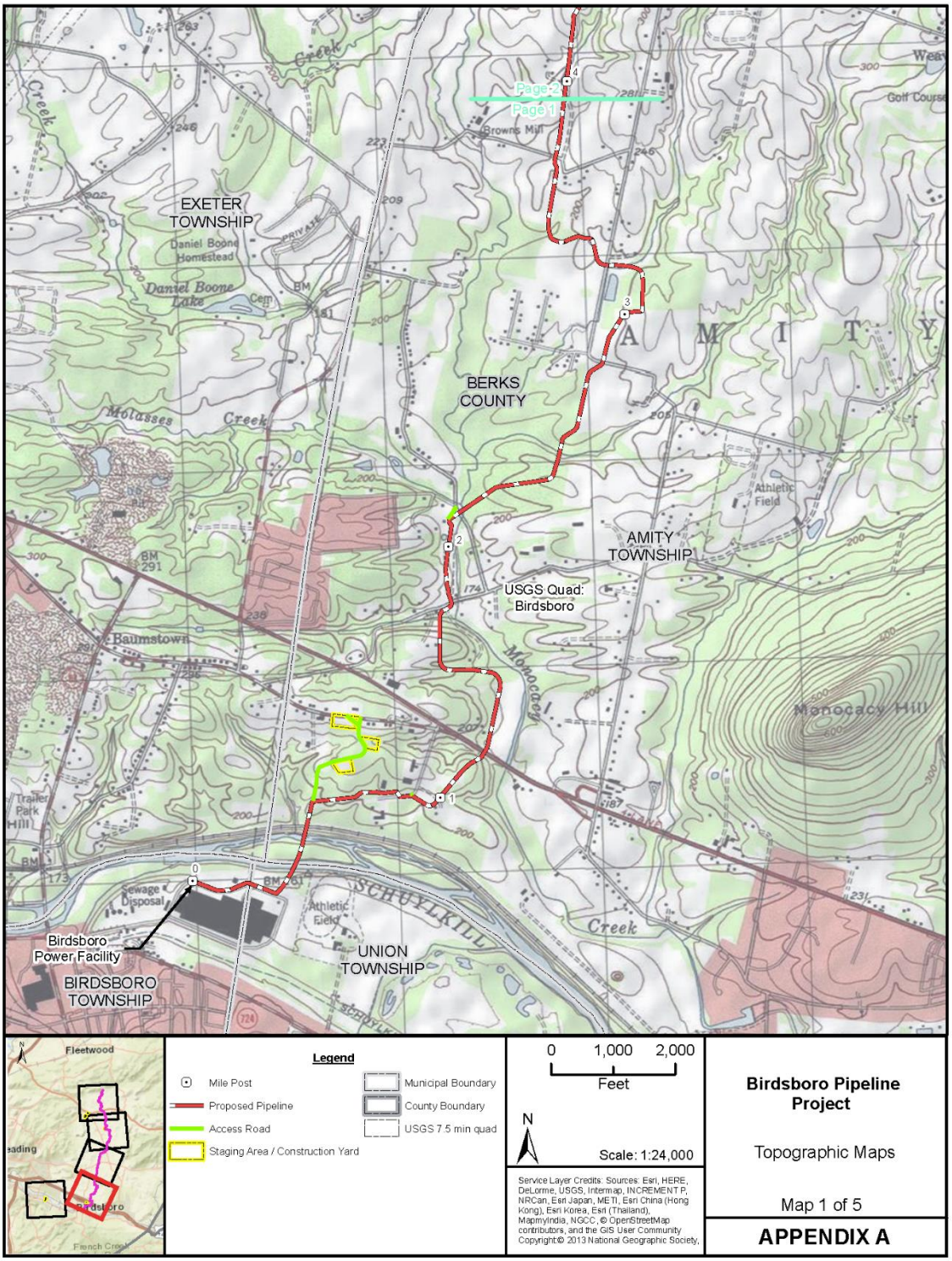
Edge Engineering and Science, LLC is a third party contractor assisting the Commission staff in reviewing the environmental aspects of the project application and preparing the environmental documents required by NEPA. Third party contractors are selected by Commission staff and funded by project applicants.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

APPENDIX A
TOPOGRAPHIC MAPS OF THE PROJECT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Daniel Boone Homestead
Daniel Boone Lake
Molasses Creek
BERKS COUNTY
AMITY TOWNSHIP
USGS Quad: Birdsboro
Baumstown
Monocacy
Monocacy Hill
Athletic Field
Sewage Disposal
Birdsboro Power Facility
BIRDSBORO TOWNSHIP
UNION TOWNSHIP
SCHUYLKILL
Creek
Page 2
Page 1
Browns Mill
Golf Course
Trailer Park
BM 291
BM 173
Legend
Mile Post
Proposed Pipeline
Access Road
Staging Area / Construction Yard
Municipal Boundary
County Boundary
USGS 7.5 min quad
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Feet
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Scale: 1:24,000
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
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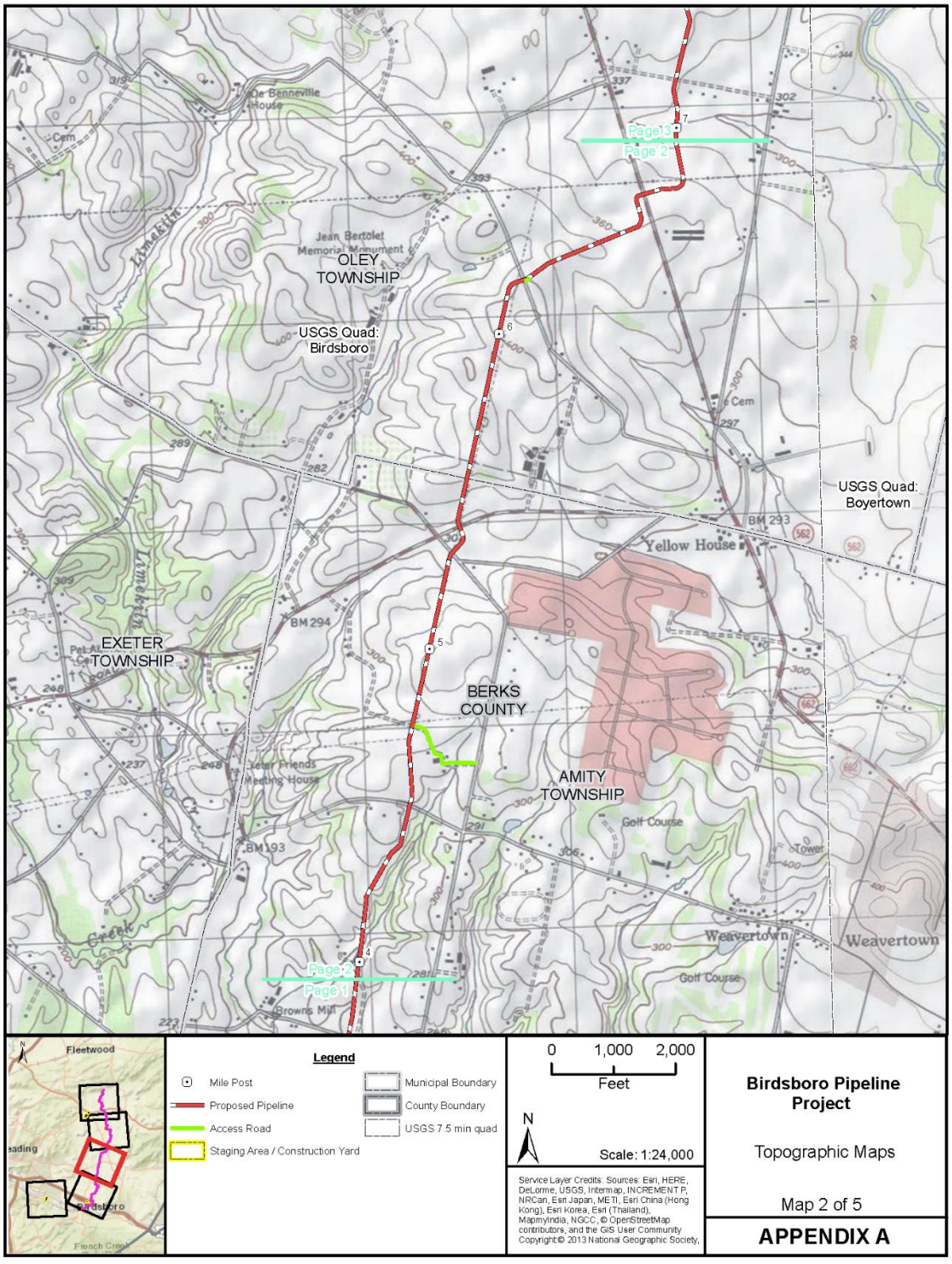
OLEY TOWNSHIP
USGS Quad: Birdsboro
USGS Quad: Boyertown
EXETER TOWNSHIP
BERKS COUNTY
AMITY TOWNSHIP
Jean Bertolet Memorial Monument
De Benneville House
Yellow House
BM 294
BM 293
BM 193
Golf Course
Weavertown
Browns Mill
Page 3
Page 2
Page 1
Legend
Mile Post
Proposed Pipeline
Access Road
Staging Area / Construction Yard
Municipal Boundary
County Boundary
USGS 7.5 min quad
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Scale: 1:24,000
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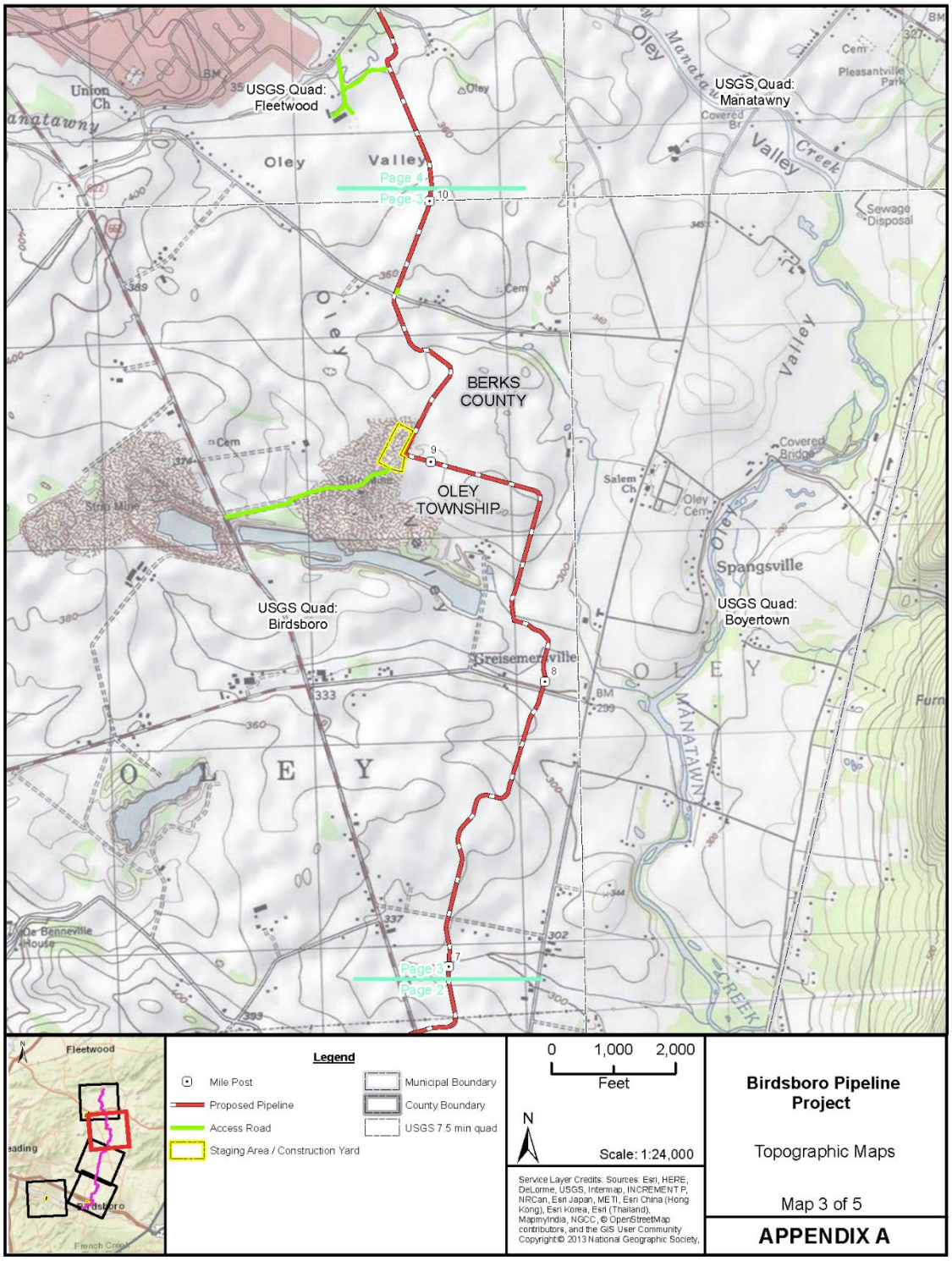
USGS Quad:
Fleetwood
USGS Quad:
Manatawny
Oley
Valley
Page 4
Page 3
10
BERKS
COUNTY
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OLEY
TOWNSHIP
Strip Mine
Spangsville
USGS Quad:
Birdsboro
USGS Quad:
Boyertown
Greisemerville
8
333
299
O L E Y
MANATAWNY
337
302
7
Page 3
Page 2
Valley Creek
Sewage
Disposal
Covered
Bridge
Salem
Ch
Oley
Cem
Union
Ch
Pleasantville
Park
Fleetwood
Legend
Mile Post
Proposed Pipeline
Access Road
Staging Area / Construction Yard
Municipal Boundary
County Boundary
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Scale: 1:24,000
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
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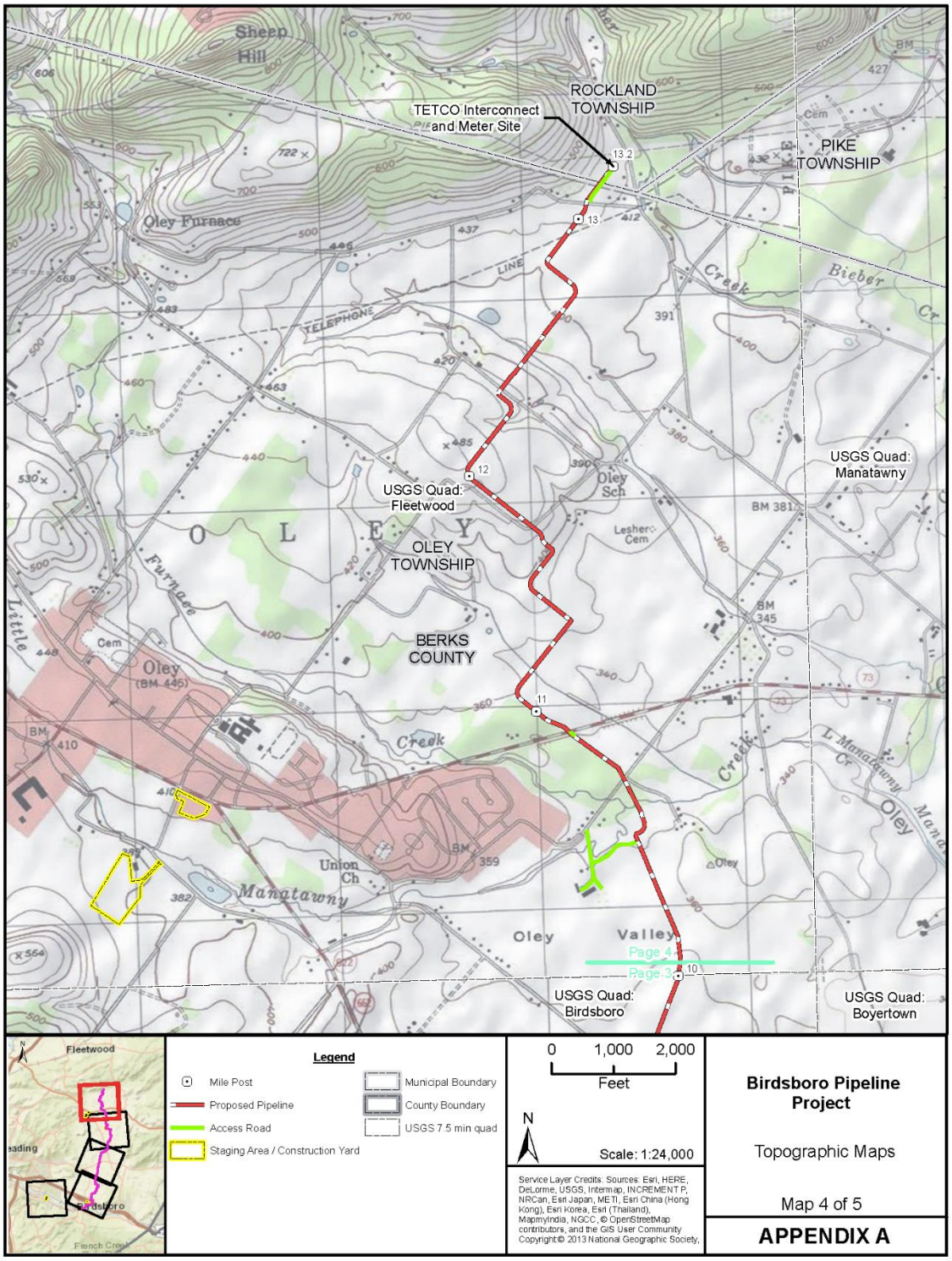
Sheep Hill
ROCKLAND TOWNSHIP
TETCO Interconnect and Meter Site
PIKE TOWNSHIP
Oley Furnace
USGS Quad: Fleetwood
USGS Quad: Manatawny
OLEY TOWNSHIP
BERKS COUNTY
Oley Valley
USGS Quad: Birdsboro
USGS Quad: Boyertown
Legend
Mile Post
Proposed Pipeline
Access Road
Staging Area / Construction Yard
Municipal Boundary
County Boundary
USGS 7.5 min quad
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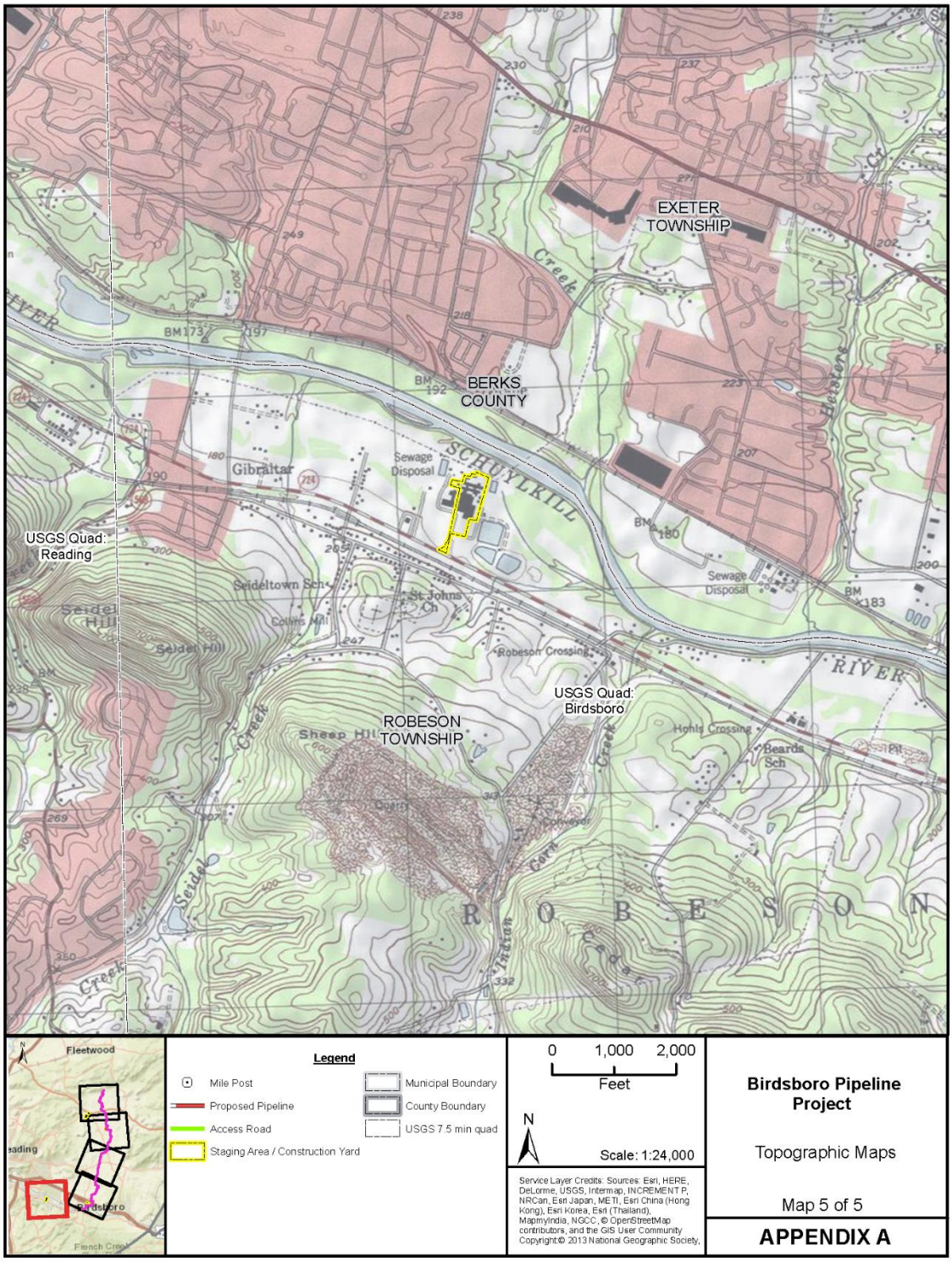
EXETER TOWNSHIP
BERKS COUNTY
SCHUYLKILL
Gibraltar
Sewage Disposal
USGS Quad: Reading
Seidletown Sch
St Johns Ch
Collins Mill
Seidel Hill
Robeson Crossing
USGS Quad: Birdsboro
ROBESON TOWNSHIP
Hohls Crossing
Beards Sch
RIVER
Fleetwood
Birdsboro
French Creek
Legend
Mile Post
Proposed Pipeline
Access Road
Staging Area / Construction Yard
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County Boundary
USGS 7.5 min quad
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APPENDIX A

APPENDIX B

LOCATION OF ADDITIONAL TEMPORARY WORKSPACE FOR THE PROJECT

Appendix B Location of Additional Temporary Workspace for the Project			
Facility	**Project Milepost[a]**	**ATWS Size (acres)**	**Land Use Type**
Pipeline Facilities			
ATWS-01	0.3	1.6	Commercial / Industrial
ATWS-02	0.6	0.2	Forest / Utility right-of-way
ATWS-03	0.6	0.2	Forest
ATWS-04	0.9	<0.1	Open land/Forest
ATWS-05	1.2	<0.1	Forest
ATWS-06	1.2	<0.0	Open land
ATWS-07	2.0	1.6	Residential / Open land
ATWS-08	2.3	0.5	Forest
ATWS-09	2.8	<0.1	Agricultural / Commercial / Industrial
ATWS-10	2.8	<0.1	Agricultural / Commercial / Industrial
ATWS-11	3.3	<0.1	Agricultural / Forest / Commercial / Industrial
ATWS-12	3.7	<0.1	Agricultural / Commercial / Industrial
ATWS-13	3.8	<0.1	Agricultural / Commercial / Industrial
ATWS-14	4.0	0.1	Agricultural
ATWS-15	4.5	<0.1	Residential
ATWS-16	4.5	<0.1	Agricultural / Commercial / Industrial
ATWS-17	4.7	<0.1	Agricultural
ATWS-18	4.8	<0.1	Agricultural
ATWS-19	5.3	<0.1	Agricultural / Commercial / Industrial
ATWS-20	5.3	<0.1	Agricultural / Commercial / Industrial
ATWS-21	5.4	<0.1	Agricultural / Commercial / Industrial
ATWS-22	5.4	<0.1	Agricultural / Commercial / Industrial
ATWS-23	6.2	<0.1	Agricultural / Commercial / Industrial
ATWS-24	6.2	<0.1	Agricultural
ATWS-25	6.7	0.1	Agricultural / Commercial / Industrial
ATWS-26	6.7	<0.1	Agricultural / Commercial / Industrial
ATWS-27	7.1	<0.1	Agricultural / Commercial / Industrial
ATWS-28	7.2	<0.1	Agricultural
ATWS-29	8.0	<0.1	Agricultural / Commercial / Industrial
ATWS-30	8.2	0.1	Agricultural
ATWS-31	8.3	<0.1	Open land
ATWS-32	9.7	<0.1	Agricultural
ATWS-33	9.7	<0.1	Agricultural/Commercial/Industrial
ATWS-34	10.5	<0.1	Agricultural / Open land

Appendix B (continued)
Location of Additional Temporary Workspace for the Project

Facility	Project Milepost[a]	ATWS Size (acres)	Land Use Type
ATWS-35	10.7	0.8	Agricultural / Commercial / Industrial
ATWS-36	10.9	<0.1	Agricultural
ATWS-37	11.3	0.2	Agricultural
ATWS-38	11.7	<0.1	Agricultural / Commercial / Industrial
ATWS-39	11.8	<0.1	Agricultural
ATWS-40	12.3	<0.1	Agricultural
ATWS-41	12.3	<0.1	Agricultural / Commercial / Industrial
ATWS-42	12.3	<0.1	Agricultural
ATWS-43	12.3	0.2	Agricultural
ATWS-44	13.0	<0.1	Agricultural
Aboveground Facilities			
ATWS-45	13.2	0.8	Utility right-of-way / Agricultural

[a] Approximate milepost along the pipeline right-of-way.

APPENDIX C
MODIFICATIONS TO THE FERC PROCEDURES FOR THE PROJECT

Appendix C Modifications to the FERC Procedures for the Project						
Approximate Milepost	**ATWS / Facility ID**	**Feature ID (Type)**	**Section in FERC Procedures**	**Description of Modification**	**Justification**	**Additional Mitigation**
0.6	ATWS-03	MB7 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
0.9	ATWS-04	CO2 (PFO wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support road crossing and point of inflection.	DTE would install erosion and sediment controls in accordance with its E&SCP.
1.2	ATWS-06	KL1 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support road crossing.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.0	ATWS-07 [a]	MU9 (PUB wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.1	ATWS-07 [a]	MU4 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.1	ATWS-07 [a]	MU1 (intermittent stream)	V.B.2	ATWS within 50 feet of waterbody	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.1	ATWS-07 [a]	MU2 (PSS wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.1	ATWS-07 [a]	MU2 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
2.3	ATWS-08	MB33 (PFO Wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.

Appendix C (continued)
Modifications to the FERC Procedures for the Project

Approximate Milepost	ATWS / Facility ID	Feature ID (Type)	Section in FERC Procedures	Modification	Justification	Additional Mitigation
2.4	ATWS-08	MB33 (PFO wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
3.3	ATWS-11 [a]	LP2 (PFO wetland) and LP7 (intermittent stream)	V.B.2; VI.B.1.a	ATWS within 50 feet of wetland and waterbody	Workspace to support road crossing.	DTE would install erosion and sediment controls in accordance with its E&SCP.
3.3	ATWS-11 [a]	LP9 (PFO wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support road crossing.	DTE would install erosion and sediment controls in accordance with its E&SCP.
4.0	ATWS-14 [a]	BR13 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support road crossing and HDD Construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
9.1	Contractor Yard [a]	AC3 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Wetland within the contractor yard at an existing quarry.	The wetland would be surrounded by orange safety fence and a 5-foot buffer would be maintained; no direct impacts would occur.
10.6	ATWS-34 [a]	HO2 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.
10.7	ATWS-35 [a]	HE1 (PFO wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support HDD construction.	DTE would install erosion and sediment controls in accordance with its E&SCP.

[a] The upland adjacent to the ATWS consists of disturbed land (such as cultivated or rotated cropland, commercial / industrial land, or residential land. Therefore, placement of the ATWS is in compliance with the Procedures. However, FERC staff reviewed the site-specific justification provided for the location of the ATWS to ensure adequate protection of wetlands and/or waterbodies within 50 feet.

APPENDIX D
ROAD AND RAILROAD CROSSINGS ASSOCIATED WITH THE PROJECT

Appendix D Road and Railroad Crossings Associated with the Project			
Road or Railroad Name	**Milepost**	**Crossing Method**	**Surface Type**
Pennsylvania Lines LLC Railroad Crossing	0.5	HDD	Existing railroad
Unnamed Driveway	0.8	Open cut	Asphalt
Riga Lane	0.9	Open cut	Asphalt
Ben Franklin Highway East (US 422)	1.2	Conventional bore	Asphalt
Monocacy Hill Road	1.8	Open cut	Asphalt
Valley Road	2.1	HDD	Asphalt
Limekiln Road	2.8	Conventional bore	Asphalt
Limekiln Road	3.3	Conventional bore	Asphalt
Browns Mill Road	3.8	Open cut	Asphalt
Private Driveway	4.0	Open cut	Gravel
Weavertown Road	4.5	Open cut	Asphalt
Farm Road	4.8	Open cut	Dirt
Limekiln Road	5.3	Conventional bore	Asphalt
Boyertown Pike (PA 562)	5.4	Conventional bore	Asphalt
Hunter Road	6.2	Open cut	Asphalt
Memorial Highway (PA 662)	6.7	Conventional bore	Asphalt
Oak Lane	7.2	Conventional bore	Asphalt
Oley Turnpike Road	8.0	Conventional bore	Asphalt
Unnamed Road	9.1	Open cut	Gravel
Kauffman Road	9.7	Conventional bore	Asphalt
Farm Road	10.1	Open cut	Dirt
Farm Road	10.4	Open cut	Dirt
Bertolet Mill Road	10.7	HDD	Asphalt
West Philadelphia Avenue (PA 73)	10.9	Conventional bore	Asphalt
Jefferson Street	11.8	Open cut	Asphalt
Mud Run Road	12.3	Open cut	Asphalt
Water Street	13.1	Open cut	Asphalt

APPENDIX E
EXISTING UTILITIES CROSSED BY THE PROJECT

Appendix E Existing Utilities Crossed by the Project		
Project Milepost	**Project Type[a]**	**Width of Existing Right-of-way (feet)[b]**
0.5	Windstream underground fiber optic	N/A
0.6	Overhead electric utility line	60
0.6	Overhead electric utility line (crossed by access road)	15
0.6	Overhead electric utility line (crossed by access road)	15
0.8	Overhead electric utility line	50
0.8	Amity Township sanitary sewer line	N/A
0.8	Overhead electric utility line	N/A
0.9	Overhead electric utility line	15
0.9	Overhead electric utility line	N/A
1.2	Overhead electric/fiber optic utility line	N/A
1.2	Overhead electric utility line	25
1.2	UGI gas line	N/A
1.4	Overhead electric utility line	70
1.7	Windstream underground copper line	N/A
1.8	Overhead electric utility line	15
2.0	Overhead electric utility line	N/A
2.1	Amity Township sanitary sewer line	N/A
2.1	Overhead electric utility line	15
3.3	Overhead electric utility line	15
3.8	Overhead electric utility line	15
3.9	Windstream underground copper line	N/A
4.0	Overhead electric utility line	N/A
4.5	Overhead electric utility line	15
5.3	Overhead electric utility line	15
5.4	Windstream underground copper line	N/A
6.2	Overhead electric utility line	15
6.7	Overhead electric utility line	15
6.8	Overhead electric utility line	100
7.2	Overhead electric utility line	15
8.0	Overhead electric utility line	15
8.0	Overhead electric utility line	15
10.9	Overhead electric utility line	15
11.7	Gas line	N/A

Appendix E (continued) Existing Utilities Crossed by the Project		
Project Milepost	**Project Type[a]**	**Width of Existing Right-of-way (feet)[b]**
13.1	Overhead electric utility line	15
13.1	TETCO pipeline (abuts the TETCO Meter Station site and within ATWS-45)	15

[a] DTE will identify operators of existing utility lines during the design phase, using the One Call Program. Unless otherwise noted, utilities would be crossed by the pipeline.

[b] Width of existing infrastructure right-of-way as measured in GIS. N/A = not available.

APPENDIX F
WATERBODIES CROSSED BY THE PROJECT

Appendix F
Waterbodies Crossed by the Project[a]

Feature ID	Approximate Milepost	Waterbody Name	Flow Regime	Crossing Width (feet)[b]	State Water Quality Classification[c]	Fishery Type[d, e]	Impaired Designated Use (identified pollutant)	Crossing Method	In-stream Timing Restrictions[f, g]
Pipeline									
Schuylkill River	0.4	Schuylkill River	Perennial	175	WWF, MF	None	Fish consumption (PCBs)	HDD	No in-stream work between 10/15 and 4/15[f]
Schuylkill River	0.5	Schuylkill River	Perennial	136	WWF, MF	None	Fish consumption (PCBs)	HDD	No in-stream work between 10/15 and 4/15[f]
FO2	0.9	Unnamed tributary to Schuylkill River	Intermittent	1	WWF, MF	None	Not listed	Timber mat	None
KL3	1.4	Unnamed tributary to Monocacy Creek	Intermittent	2	WWF, MF	None	Not listed	Dam-and-pump / Flume[h]	None
CH2	1.6	Unnamed tributary to Monocacy Creek	Intermittent	1.5	WWF, MF	None	Not listed	Dam-and-pump / Flume[h]	None
CH3	1.8	Tributary 01729 to Monocacy Creek	Perennial	16	WWF, MF	None	Not listed	Dam-and-pump / Flume or cofferdam[h]	None
MU8	1.8	Unnamed Tributary to Monocacy Creek	Ephemeral	3	WWF, MF	None	Not listed	Dam-and-pump / Flume	None
S4	2.1	Monocacy Creek	Perennial	15	WWF, MF	None	Not listed	HDD	None

Appendix F (continued) Waterbodies Crossed by the Project[a]									
Feature ID	**Approximate Milepost**	**Waterbody Name**	**Flow Regime**	**Crossing Width (feet)[b]**	**State Water Quality Classification[c]**	**Fishery Type[d, e]**	**Impaired Designated Use (identified pollutant)**	**Crossing Method**	**In-stream Timing Restrictions[f, g]**
MB30	2.2	Unnamed tributary to Monocacy Creek	Ephemeral	1	WWF, MF	None	Not listed	HDD	None
MB29	2.5	Tributary 01738 to Monocacy Creek	Perennial	12	WWF, MF	None	Not listed	Dam-and-pump / Flume or cofferdam[h]	None
LP5	3.2	Tributary 01739 to Monocacy Creek	Perennial	13	WWF, MF	None	Not listed	Dam-and-pump / Flume or cofferdam[h]	None
LP7	3.3	Unnamed tributary to Monocacy Creek	Intermittent	3	WWF, MF	None	Not listed	Timber mat	None
LP12	3.5	Unnamed tributary to Monocacy Creek	Intermittent	2	WWF, MF	None	Not listed	Dam and pump / Flume[h]	None
BR12	4.1	Unnamed tributary to Monocacy Creek	Ephemeral	4	WWF, MF	None	Not listed	HDD	None
BR10	4.2	Unnamed tributary to Monocacy Creek	Ephemeral	1	WWF, MF	None	Not listed	Timber mat	None

Appendix F (continued)
Waterbodies Crossed by the Project[a]

Feature ID	Approximate Milepost	Waterbody Name	Flow Regime	Crossing Width (feet)[b]	State Water Quality Classification[c]	Fishery Type[d, e]	Impaired Designated Use (identified pollutant)	Crossing Method	In-stream Timing Restrictions[f, g]
BR8	4.4	Unnamed tributary to Monocacy Creek	Ephemeral	3	WWF, MF	None	Not listed	Timber mat	None
FI2	7.0	Tributary 01673 to Manatawny Creek	Perennial	3	CWF, MF	Naturally reproducing trout water	Not listed	Dam-and-pump / Flume	No in-stream work between 10/01 and 12/31
SCH1	8.1	Tributary 01675 to Manatawny Creek	Ephemeral	4	CWF, MF	Naturally reproducing trout water and stocked trout water	Aquatic life (crop-related agricultural – excessive algal growth and crop-related agricultural-siltation)	Dam-and-pump / Flume	No in-stream work between 10/01 and 12/31
AC1	8.3	Tributary 01676 to Manatawny Creek	Perennial	10	CWF, MF	Naturally reproducing trout water	Aquatic life (crop-related agricultural – excessive algal growth and crop-related agricultural-siltation)	Conventional bore	No in-stream work between 10/01 and 12/31
Little Manatawny Creek	10.6	Little Manatawny Creek	Perennial	15	CWF, MF	Naturally reproducing trout water	Not listed	HDD	No in-stream work between 10/01 and 12/31

Appendix f (continued)
Waterbodies Crossed by the Project[a]

Feature ID	Approximate Milepost	Waterbody Name	Flow Regime	Crossing Width (feet)[b]	State Water Quality Classification[c]	Fishery Type[d, e]	Impaired Designated Use (identified pollutant)	Crossing Method	In-stream Timing Restrictions[f, g]
HE3	11.2	Tributary 01687 to Little Manatawny Creek	Intermittent	10	CWF, MF	Naturally reproducing trout water	Not listed	Dam-and-pump / Flume or cofferdam	No in-stream work between 10/01 and 12/31
GF1	12.5	Tributary 01693 to Manatawny Creek	Perennial	12	CWF, MF	Naturally reproducing trout water	Not listed	Dam-and-pump / Flume[h]	No in-stream work between 10/01 and 12/31
Access Roads									
Little Manatawny Creek	10.5	Little Manatawny Creek	Perennial	15	CWF, MF	Naturally reproducing trout water	Not listed	Existing culvert – no improvements proposed	No in-stream work between 10/01 and 12/31

[a] Aboveground facilities, contractor yards, and ancillary facilities would not impact any waterbodies.

[b] Crossing width is the bank-to-bank width of stream at the pipeline centerline crossing unless noted otherwise. Crossing width is provided regardless of crossing method.

[c] As classified by PAC Title 25 Chapter 93.9. WWF - Warm Water Fishes; CWF - Cold Water Fishes; and MF - Migratory Fishes.

[d] As classified under PAC Title 58, Chapter 57.11 by the PA Fish and Boat Commission (PFBC) as a Class A Wild Trout Water and as a Wild Trout Water.

[e] As classified by PAC Title 58, Chapter 57.4 by the PFBC as a Wilderness Trout Water; all streams classified as Wilderness Trout Waters qualify as EV resources;

[f] Per the PDCNR, HDD construction is restricted across and the Schuylkill River for the protection of eastern redbelly turtle between October 15 and April 15.

[g] Per PFBC, in-stream work restrictions for naturally reproducing trout waters and coldwater fisheries are in effect between October 1 and December 31 and in-stream work restrictions for stocked trout waters are in effect between March 1 and June 15.

[h] These streams are within areas of potentially shallow bedrock; however, DTE has committed to 4-foot of cover for each open-cut waterbody to minimize or avoid the potential for scour.

APPENDIX G
WETLANDS CROSSED BY THE PROJECT

Appendix G Wetlands Crossed by the Project[a]							
Wetland ID	**Approximate Milepost**	**Wetland Classification[b]**	**Exceptional Value Wetland and Characteristic[c]**	**Crossing Length (feet)[d]**	**Area Affected by Construction (acres)[e]**	**Area Affected by Operation (acres)[f]**	**Crossing Method**
Birdsboro Pipeline							
MB4	0.8	PEM	No	46	0.1	<0.1	Open cut
CO2 - Crossing 1	0.9	PFO	No	4	<0.1	0.0	Timber mat
CO2 - Crossing 2	0.9	PFO	No	2	<0.1	<0.1	Open cut
CO2 - Crossing 3	0.9	PFO	No	10	<0.1	<0.1	Timber mat
MB12 - Crossing 1	1.0	PSS	No	54	<0.1	<0.1	Open cut
MB12 - Crossing 2	1.0	PSS	No	14	<0.1	0.0	Timber mat
MB12 - Crossing 3	1.0	PSS	No	34	<0.1	0.0	Timber mat
MB12 - Crossing 4	1.0	PEM	No	30	<0.1	<0.1	Open cut
MB16	1.0	PEM	No	14	<0.1	<0.1	Open cut
Vernal Pool 1	1.0	PEM	No	4	0.0	0.0	Fence and avoid
KL1 - Crossing 1	1.2	PEM	No	214	0.3	0.1	Open cut
KL1 - Crossing 2	1.4	PEM	No	49	0.1	<0.1	Open cut
KL1 - Crossing 3	1.4	PFO	No	360	0.3	0.3	Open cut
KL1 - Crossing 4	1.6	PSS	No	22	<0.1	<0.1	Open cut
CH7	1.8	PFO	No	30	<0.1	<0.1	Open cut
MU7	1.8	PSS	No	15	<0.1	<0.1	Open cut
MU6	1.9	PEM	No	635	0.5	0.2	Open cut
MU4	2.0	PEM	No	295	0.2	0.1	Open cut
MU2 - Crossing 1	2.1	PEM	No	50	0.1	<0.1	Open cut
MU2 - Crossing 2	2.1	PEM	No	21	0.0	0.0	HDD
MB25	2.2	PFO	No	187	0.0	0.0	HDD
MB33	2.5	PFO	No	201	0.1	0.1	Open cut
LP2 - Crossing 1	3.1	PFO	No	133	0.1	0.1	Open cut (push-pull)

Appendix G (continued)
Wetlands Crossed by the Project[a]

Wetland ID	Approximate Milepost	Wetland Classification[b]	Exceptional Value Wetland and Characteristic[c]	Crossing Length (feet)[d]	Area Affected by Construction (acres)[e]	Area Affected by Operation (acres)[f]	Crossing Method
LP2 - Crossing 2	3.2	PFO	No	452	0.4	0.3	Open cut (push-pull)
BR2	3.9	PEM	No	16	<0.1	<0.1	Open cut
BR13	4.1	PEM	Yes (i)	185	0.0	0.0	HDD
AC1	8.3	PEM	Yes (iii)	10	<0.1	<0.1	Open cut
HO2 - Crossing 1	10.6	PEM	Yes (ii)	43	0.0	0.0	HDD
HO2 - Crossing 2	10.6	PEM	Yes (ii)	47	0.0	0.0	HDD
HO3 - Crossing 1	10.6	PFO	Yes (ii)	99	0.0	0.0	HDD
HO3 - Crossing 2	10.6	PFO	Yes (ii)	22	0.0	0.0	HDD
HO3 - Crossing 3	10.6	PFO	Yes (ii)	146	0.0	0.0	HDD
HE1 - Crossing 1	10.7	PEM	Yes (i)	9	0.0	0.0	HDD
HE1 - Crossing 2	10.7	PFO	Yes (i)	58	0.0	0.0	HDD
GF2	12.5	PEM	Yes (i) and (iii)	194	0.1	<0.1	Open cut
Contractor Yard							
AC1	9.1	PEM	No	0	0.0	0.0	Fence and avoid
Project Total				**3,705**	**2.4**	**1.2**	

[a] All wetlands within the Project workspace are crossed by the Birdsboro Pipeline; no aboveground facilities are proposed in wetlands. No access roads are proposed in wetlands; where existing, permanent access roads abut wetlands, DTE would not modify or widen the access roads.

[b] Wetland classification according to Cowardin *et al.* 1979.

[c] Pennsylvania wetlands designated under PAC 25, Chapter 93 as Exceptional Value and classified under Chapter 105.17 as (i) wetlands which serve as habitat for federally listed threatened or endangered species; (ii) wetlands that are hydrologically connected to or located within 0.5-mile of wetlands identified as (i); and (iii) are adjacent to a wild trout stream or exceptional value water or are within natural or wild areas.

[d] Crossing length is representative of the centerline crossing length, regardless of the crossing method.

[e] Area affected by construction is the total area of wetland within the construction right-of-way. No impact acres included for wetlands located within HDD crossings.

[f] Operational impacts on PEM, PFO, and PSS wetlands account for the 10-foot-wide corridor centered on the pipeline that would be permanently maintained as PEM. In PFO wetlands, the operational impacts include the selective cutting of trees within 15 feet of the centerline with roots that may jeopardize the integrity of the pipeline. In some areas, the maintenance corridor is less than 30-feet-wide.

APPENDIX H

NORTHERN LONG-EARED BAT 4(D) STREAMLINED CONSULTATION FORM

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.):
Jennifer Zielinski, Federal Energy Regulatory Commission, (202) 502-5256, jzielinski@ferc.gov

Project Name: Birdsboro Pipeline Project

Project Location (include coordinates if known): Eastern Berks County, Pennsylvania

Basic Project Description (provide narrative below or attach additional information):

The Birdsboro Pipeline Project includes approximately 13.2 miles of 12-inch-diameter natural gas pipeline extending from an interconnect with Texas Eastern Transmission Company's pipeline in Rockland Township to the proposed Birdsboro Power Facility located in the Borough of Birdsboro. The Project would also include a meter station and pig launcher at the TETCO interconnect, a pig receiver at the power facility location, and other appurtenant facilities.

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion	10.3	
If known, estimated acres[5] of forest conversion from April 1 to October 31	Unknown	
If known, estimated acres of forest conversion from June 1 to July 31[6]	0.0	
Does the project include timber harvest? (if yes, report acreage below)	☐	☒
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

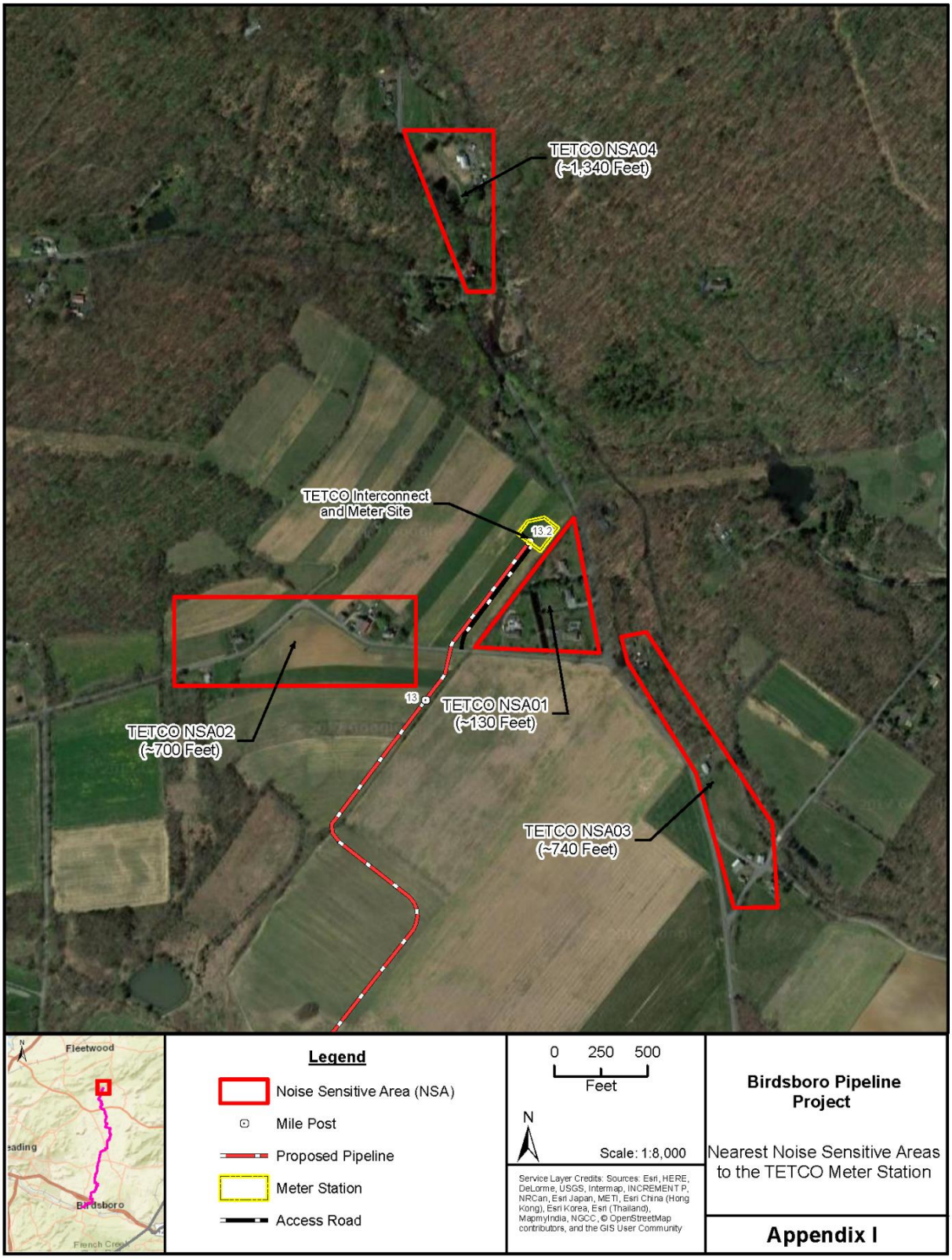
The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: _____ _____ Date Submitted: 11/1/17

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

APPENDIX I

NEAREST NOISE SENSITIVE AREAS TO THE TETCO METER STATION


TETCO NSA04
(~1,340 Feet)
TETCO Interconnect
and Meter Site
13.2
13
TETCO NSA01
(~130 Feet)
TETCO NSA02
(~700 Feet)
TETCO NSA03
(~740 Feet)
Fleetwood
Birdsboro
French Creek
Legend
Noise Sensitive Area (NSA)
Mile Post
Proposed Pipeline
Meter Station
Access Road
0 250 500
Feet
N
Scale: 1:8,000
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Birdsboro Pipeline Project
Nearest Noise Sensitive Areas to the TETCO Meter Station
Appendix I

APPENDIX J

MINOR ROUTE VARIATIONS INCORPORATED INTO THE PROPOSED PROJECT

Appendix J Minor Route Variations Incorporated into the Proposed Project		
Route Variation	**Proposed Project Milepost Range**	**Reason for Variation from Preliminary Route**
Variation 1	0.0 – 0.7	Avoid wetland impacts; engineering constraints related to HDD
Variation 2	0.9 – 1.2	Minimize wetland impacts; engineering constraints related to U.S. Route 422 crossing
Variation 3	1.2 – 1.3	Avoid cultural resource impacts
Variation 4	1.4 – 1.5	Landowner request; constructability constraints
Variation 5	2.4 – 2.6	Engineering constraints crossing stream
Variation 6	2.6 – 2.7	Avoid wetland impacts
Variation 7	2.8 – 2.9	Avoid wetland impacts
Variation 8	3.0 – 3.2	Avoid wetland impacts
Variation 9	3.8 – 4.1	Minimize wetland impacts
Variation 10	6.2 – 9.6	Avoid cultural resource impacts; avoid surface mine; landowner request
Variation 11	10.5 – 11.1	Avoid tree clearing and T&E habitat; avoid cultural resource impacts
Variation 12	11.7 – 12.8	Avoid wetland impacts; avoid cultural resource impacts
Variation 13	12.5 – 12.9	Minimize wetland impacts