Federal Energy Regulatory Commission
Office of Energy Projects

January 2019

Adelphia Gateway, LLC

Docket Nos. CP18-46-000
CP18-46-001

Adelphia Gateway Project
Environmental Assessment

Washington, DC 20426

Cooperating Agencies

U.S. Environmental Protection Agency

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas Branch 1
Adelphia Gateway, LLC
Adelphia Gateway Project
Docket Nos. CP18-46-000
CP18-46-001

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Adelphia Gateway Project, proposed by Adelphia Gateway, LLC (Adelphia) in the above-referenced dockets. Adelphia requests authorization to purchase, construct, and operate natural gas transportation facilities (including compression) in Northampton, Bucks, Montgomery, Chester, and Delaware Counties in Pennsylvania, and New Castle County, Delaware.

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

The U.S. Environmental Protection Agency and U.S. Department of Transportation – Pipeline and Hazardous Materials Safety Administration participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis.

The proposed Adelphia Gateway Project includes the following new facilities:

- two 16-inch-diameter laterals (Parkway [0.3 mile] and Tilghman [4.4 miles]);
- two 5,625 horsepower compressor stations (Marcus Hook and Quakertown);
- five meter and regulator stations (Quakertown, Delmarva, Monroe, Transco, and Tilghman);

- seven blowdown assembly valves (Chester Creek, Paoli Pike, French Creek, Cromby, Schuylkill River, Perkiomen Creek, and East Perkiomen Creek);
- two mainline valves;
- two tap valves (Quakertown and Skippack); and
- four pig launcher/receiver facilities.[1]

Adelphia would also purchase an existing system currently owned and operated by Interstate Energy Company, LLC, including:

- 84.2 miles of existing 18-inch-diameter pipeline (the northern 34.8-mile-long segment was designed to transport oil or natural gas but has been transporting natural gas exclusively since 2014, and the southern 49.4-mile segment was previously used to transport fuel oil);
- 4.4 miles of existing 20-inch-diameter pipeline (which currently transports natural gas); and
- four meter stations (along the existing 18-inch-diameter mainline at mileposts 50, 68, 80, and 84).

The Commission mailed a copy of the *Notice of Availability* to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested parties; and local libraries and newspapers. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the Environmental Documents page (https://www.ferc.gov/industries/gas/enviro/eis.asp). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (https://www.ferc.gov/docs-filing/elibrary.asp), click on General Search, and enter the docket number in the "Docket Number" field, excluding the last three digits (i.e. CP18-46). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

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

Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before 5:00 pm Eastern Time on **February 3, 2019.**

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

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

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

(3) You can file a paper copy of your comments by mailing them to the following address. Be sure to reference the project docket number (CP18-46-000 or CP18-46-001) with your submission: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426.

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

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

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

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ADELPHIA GATEWAY PROJECT

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
Adelphia	Adelphia Gateway, LLC
ATWS	additional temporary workspace
BAV	blowdown assembly valve
Boundary Monument	Delaware-Pennsylvania Boundary Monument 21½
Certificate	Certificate of Public Convenience and Necessity
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIMC	Cleanups in my Community
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
Columbia	Columbia Gas Transmission
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAC	Delaware Administrative Code
dB	decibel
dBA	decibels on the A-weighted scale
DNREC	Delaware Department of Natural Resources and Environmental Control
EA	environmental assessment
EI	environmental inspector
EIS	environmental impact statement
ESA	Endangered Species Act
ESCGP	Erosion and Sediment Control General Permit
E&SCP	Erosion and Sediment Control Plans
FERC	Federal Energy Regulatory Commission
existing mainline	18-inch-diameter pipeline
Existing System	the 18-inch-diameter pipeline, 20-inch-diameter pipeline, and the four existing meter stations
g	gravity
GHG	greenhouse gas
gpm	gallons per minute
Guidance	Guidance for Pipeline Flow Reversals, Product Changes, and Conversion to Service
GWP	global warming potential
HCA	high consequence area
HDD	horizontal directional drill

HRSF	Historic Resource Survey Form
HUC	hydrologic unit code
IBA	Important Bird Area
IEC	Interstate Energy Company, LLC
IRCP	Inadvertent Return Contingency Plan
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
MAOP	maximum allowable operating pressure
Marcus Hook NHA	Marcus Hook to Commodore Barry Bridge Natural Heritage Area
meter station	meter and regulator station
MLV	mainline valve
MOU	Memorandum of Understanding
MP	milepost
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHA	Natural Heritage Area
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNSR	Nonattainment New Source Review
NOAA	National Oceanic and Atmospheric Administration
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed Adelphia Gateway Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Session*
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
Noxious Weed Plan	Noxious Weeds/Invasive Plant Species Control and Mitigation Plan
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NWI	National Wetlands Inventory
O_3	ozone

OEP	Office of Energy Projects
OTR	Ozone Transport Region
PAC	Pennsylvania Administrative Code
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PAH	polycyclic aromatic hydrocarbon
PASPGP	Pennsylvania State Programmatic General Permit
PCB	polychlorinated biphenyl
PennDOT	Pennsylvania Department of Transportation
PennEast	PennEast Pipeline
PGDC	Pennsylvania Geospatial Data Clearinghouse
PEM	palustrine emergent
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PGA	peak ground acceleration
PGC	Pennsylvania Game Commission
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	FERC's *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	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Project	Adelphia Gateway Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PSS	palustrine scrub-shrub
RCRA	Resource Conservation and Recovery Act
risk assessment	human health risk assessment
SAP	Sampling and Analysis Plan for the Tilghman and Parkway Laterals
SCC	Social Cost of Carbon
Secretary	Secretary of the Federal Energy Regulatory Commission
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures

SWPA	source water protection area
TETCO	Texas Eastern Transmission Company, LP
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEIA	U.S. Energy Information Administration
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compounds

A. PROPOSED ACTION

1. Introduction

On January 12, 2018, Adelphia Gateway, LLC (Adelphia) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP18-46-000. Adelphia is seeking a Certificate of Public Convenience and Necessity (Certificate) under Section 7(c) of the Natural Gas Act (NGA) to purchase, construct, and operate natural gas transmission facilities in Delaware and Pennsylvania. Adelphia's proposed facilities, referred to as the Adelphia Gateway Project (Project), would include the purchase and repurposing of existing pipelines and meter facilities owned by Interstate Energy Company, LLC (IEC) (Existing System) in Pennsylvania and construction of new 16-inch-diameter pipeline laterals, compression, and related facilities in Delaware and Pennsylvania. On August 31, 2018, Adelphia filed an amendment to its application under Docket No. CP18-46-001 seeking to increase the design capacity on the northern segment of the existing 18-inch-diameter pipeline from 175 million cubic feet per day to 250 million cubic feet per day.[1]

We[2] 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.

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) and the Energy Policy Act of 2005. Consistent with NEPA (40 CFR 1501.6) and their respective responsibilities and regulations, the U.S. Environmental Protection Agency (USEPA) and U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (USDOT-PHMSA) 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 Adelphia's proposal. The USEPA formally requested to be a cooperating agency on June 7, 2018.[3] The USDOT-PHMSA formally requested to be a cooperating agency on August 16, 2018; however, the USDOT-PHMSA was involved

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1 1 dekatherm is approximately 1,000 cubic feet

2 "We," "us," and "our" refer to the environmental staff of the Office of Energy Projects (OEP).

3 Available on eLibrary under accession no. 20180607-5018. To access the public record for this proceeding, go to FERC's Internet website (http://www.ferc.gov), click on "Documents & Filings" and select the "eLibrary" feature. Click on "Advanced Search" from the eLibrary menu and enter the accession number for the document of interest.

with the Project prior to the formal request and was present at the May 30, 2018 Project scoping session.

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;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and
- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

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 assessment of environmental impacts is an integral part of FERC's decision on whether to issue Adelphia a Certificate to purchase, construct and operate the proposed facilities, as amended. The Commission also bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Adelphia Gateway Project is in the public interest.

2. Purpose and Need

Adelphia states that the purpose of its proposed Project is to provide a clean, safe, and low-cost supply of natural gas pipeline capacity to the Greater Philadelphia industrial region with potential to serve additional markets in the Northeast while continuing to provide uninterrupted service to two existing power plants at the northern end of the Existing System, the Lower Mount Bethel Power Plant, and the Martins Creek Power Plant. Adelphia proposes to place the portion of the Project not currently in operation into service in the fourth quarter of 2019. In total, the Adelphia Gateway Project would transport 850 million cubic feet per day of natural gas.

The Commission does not direct the development of the gas industry's infrastructure regionally or on a project-by-project basis, or redefine an applicant's stated purpose.

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. Proposed Facilities

The proposed Adelphia Gateway Project, summarized below, consists of existing and new proposed facilities. Adelphia would construct the new facilities identified in table A-1. Adelphia would also purchase an existing system currently owned and operated by IEC, which includes:

- 84.2 miles of existing 18-inch-diameter pipeline (existing mainline; the northern 34.8-mile segment was designed to transport oil or natural gas but has been transporting natural gas exclusively since 2014, and the southern 49.4-mile segment was previously used to transport fuel oil);[4]

- 4.4 miles of existing 20-inch-diameter pipeline (which currently transports natural gas); and

- four existing meter and regulator stations (meter station) along the existing mainline at mileposts (MP) 50, 68, 80, and 84.

Collectively, the existing mainline, 20-inch-diameter pipeline, and the four existing meter stations are referred to as the Existing System. The existing mainline and associated facilities were built in the 1970's under jurisdiction of the Pennsylvania Public Utility Commission pursuant to Section 1(c) of the NGA. IEC installed the 20-inch-diameter pipeline, under the same jurisdiction, in 2002. The Project would result in the transport of an additional 250 million cubic feet of natural gas per day along southern end of the existing mainline, 250 million cubic feet of natural gas per day along the northern end of the existing mainline, and no change to the existing 350 million cubic feet per day capacity of the 20-inch-diameter pipeline.

To support construction of these facilities, Adelphia also proposes to use 13 access roads during construction, 12 of which would be maintained for operation of the Project (further detailed below in table A-4) and one contractor wareyard. The general location of the Project is shown in figure 1 below, and detailed maps for the new laterals and aboveground facilities are included in appendix A.

[4] The lengths for the northern and southern segments are based IEC's alignment sheets, which are available on eLibrary under accession no. 20180531-5394. Specifically, the existing mainline's interconnect to TETCO's pipeline at the existing Quakertown Meter Station at MP 50 in Bucks County, Pennsylvania is the transition point that defines the northern and southern segments.

Table A-1
Proposed New Facilities for the Project

Facility	Milepost	Township(s)	County and State
New Pipeline Facilities (diameter, length)			
Tilghman Lateral (TL; 16-inch-diameter, 4.4 miles)[a]	TL 0.0 to 4.4	Lower Chichester, Trainer, Chester	Delaware County, Pennsylvania
Parkway Lateral (PL; 16-inch-diameter, 0.3 mile)	PL 0.0 to 0.3	Penn-Del-City Delaware (Community), Lower Chichester	New Castle County, Delaware and Delaware County, Pennsylvania
Four pig launcher/receiver facilities[b]	TL 0.0 TL 4.4 PL 0.0 PL 0.3	Penn-Del-City Delaware (Community), Lower Chichester, Chester	Bucks County, Northampton County, Delaware County, Pennsylvania and New Castle County, Delaware
New Compressor Stations[c]			
Quakertown Compressor Station (5,625 horsepower)	49.4	Richland, West Rockhill	Bucks County, Pennsylvania
Marcus Hook Compressor Station (5,625 horsepower)	0.0	Lower Chichester	Delaware County, Pennsylvania
New Meter and Regulator Stations (Meter Station)			
Quakertown Meter Station[c]	49.4	Richland, West Rockhill	Bucks County, Pennsylvania
Transcontinental Gas Pipe Line Company (Transco) Meter Station[a,c]	TL 0.3	Lower Mount, Bethel	Delaware County, Pennsylvania
Monroe Meter Station[c]	TL 2.7	Trainer	Delaware County, Pennsylvania
Tilghman Meter Station[c,d]	TL 4.4	Chester	Delaware County, Pennsylvania
Delmarva Meter Station[c,e]	PL 0.3	Penn-Del-City Delaware (Community)	New Castle County, Delaware
New Appurtenant Facilities along the Existing Mainline			
Seven new blowdown assembly valves (BAV)[c]	9.5 14.5 25.7 27.3 28.4 34.0 36.7	East Pikeland, Skippack, Thornbury, East Goshen, Perkiomen	Montgomery, Delaware, and Chester Counties, Pennsylvania
Two new mainline valves	6.7 17.9	Concord, East Whiteland	Delaware County, Pennsylvania
Quakertown Tap Valve[c]	49.4	Richland, West Rockhill	Bucks County, Pennsylvania
Skippack Tap Valve	36.0	Skippack	Montgomery County, Pennsylvania

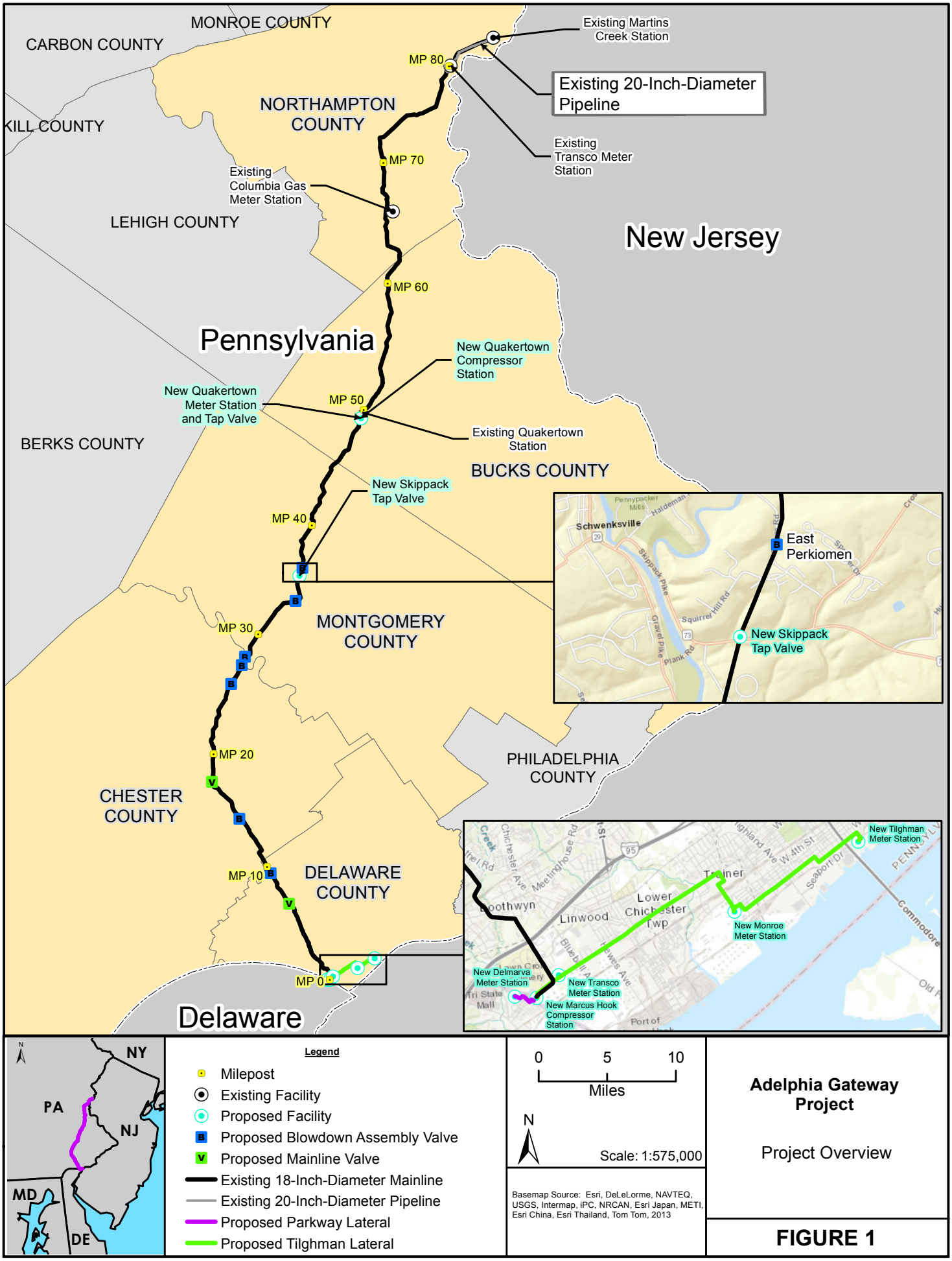
[a] The Tilghman Lateral and Transco Meter Station would be connected via a 3-inch-diameter pipeline to be installed via open cut across Ridge Road.

[b] A pipeline "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.

[c] These facilities would be collocated with or immediately adjacent to existing natural gas facilities or similar infrastructure.

[d] This meter station would include a delivery interconnect to the Philadelphia Electric Company.

[e] This meter station would include delivery interconnects to Columbia Gas Transmission (Columbia), Delmarva, and Texas Eastern Transmission Company, LP (TETCO).


MONROE COUNTY
CARBON COUNTY
KILL COUNTY
NORTHAMPTON COUNTY
LEHIGH COUNTY
BERKS COUNTY
BUCKS COUNTY
MONTGOMERY COUNTY
CHESTER COUNTY
DELAWARE COUNTY
PHILADELPHIA COUNTY
New Jersey
Pennsylvania
Delaware
Existing Martins Creek Station
MP 80
Existing 20-Inch-Diameter Pipeline
Existing Transco Meter Station
MP 70
Existing Columbia Gas Meter Station
MP 60
New Quakertown Compressor Station
New Quakertown Meter Station and Tap Valve
MP 50
Existing Quakertown Station
New Skippack Tap Valve
MP 40
MP 30
MP 20
MP 10
MP 0
Schwenksville
East Perkiomen
New Skippack Tap Valve
New Tilghman Meter Station
New Monroe Meter Station
New Delmarva Meter Station
New Transco Meter Station
New Marcus Hook Compressor Station
NY
PA
NJ
MD
DE
Legend
Milepost
Existing Facility
Proposed Facility
Proposed Blowdown Assembly Valve
Proposed Mainline Valve
Existing 18-Inch-Diameter Mainline
Existing 20-Inch-Diameter Pipeline
Proposed Parkway Lateral
Proposed Tilghman Lateral
0 5 10
Miles
N
Scale: 1:575,000
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013
Adelphia Gateway Project
Project Overview
FIGURE 1

The maximum allowable operating pressure (MAOP) of the existing mainline and 20-inch-diameter pipeline would not change, remaining at 1,083 and 1,200 pounds per square inch gauge (psig), respectively. The new pipeline laterals and associated meter stations, as well as the compressor stations, would be designed to accommodate 1,440 psig; however, Adelphia would only be authorized to operate these new proposed facilities at pressures up to 1,200 psig.

In addition to the facilities described above, Adelphia would install a cathodic protection system along the pipeline laterals.[5]

The existing 20-inch-diameter pipeline and the northern segment of the existing mainline (MP 49.4 to MP 84.2) are currently in operation transporting natural gas, with cathodic protection systems in place, and would require no modifications with the exception of the installation of fencing within the existing Martins Creek Station site. Overall, environmental impacts on most resources associated with Adelphia's purchase of the Existing System are not anticipated. However, where applicable, operational impacts associated with the facilities on the northern system are reviewed in the respective sections below, including geology and reliability and safety.

The southern segment of the existing mainline (MP 0.0 to MP 49.4) would require construction at the locations where new appurtenant facilities are proposed to support the conversion from transportation of fuel oil to natural gas (see table A-1). Additional requirements associated with conversion of the Existing System are discussed in section B.9. The southern segment currently has cathodic protections systems in place, and no other modifications of the southern segment of the existing mainline are proposed. Therefore, the environmental analysis that follows (sections B through D) focuses on an assessment of potential impacts from construction and operation of Adelphia's new facilities as described above, except where otherwise noted, for example in the air quality section.

5. Land Requirements

As discussed above, the scope of the environmental analysis, except where otherwise noted, is focused on those facilities that will be newly constructed to meet the Project purpose and need. The Project would affect a total of 46.7 acres during construction and 21.5 acres during operation, as further discussed below and in section B.5.

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

5.1 Pipeline Facilities

Existing Pipeline Facilities

Adelphia would acquire 4.4 miles of existing 20-inch-diameter pipeline and 84.2 miles of existing mainline. These facilities are located in Northampton, Bucks, Montgomery, Chester, and Delaware Counties in Pennsylvania. The 20-inch-diameter pipeline and 34.8 miles of the existing mainline are currently in operation and would not require any modifications. Alternatively, the southern 49.4-mile-long segment of the existing mainline would require installation of new facilities at discrete locations to support the conversion from transportation of oil to natural gas. These new facilities are discussed further below and listed in table A-2.

IEC, the current owner of the Existing System, performed annual surveys of both pipeline systems in the summer of 2018, as well as conducted anomaly investigations and karst surveys on portions of the existing mainline. These surveys and applicable results are discussed in section B, where applicable.

New Pipeline Facilities

Adelphia would construct new facilities at discrete locations along the existing mainline on previously disturbed lands, as well as develop new greenfield routes for the proposed laterals and associated facilities. The proposed Parkway and Tilghman Laterals are depicted in figure 2 and appendix A-1.

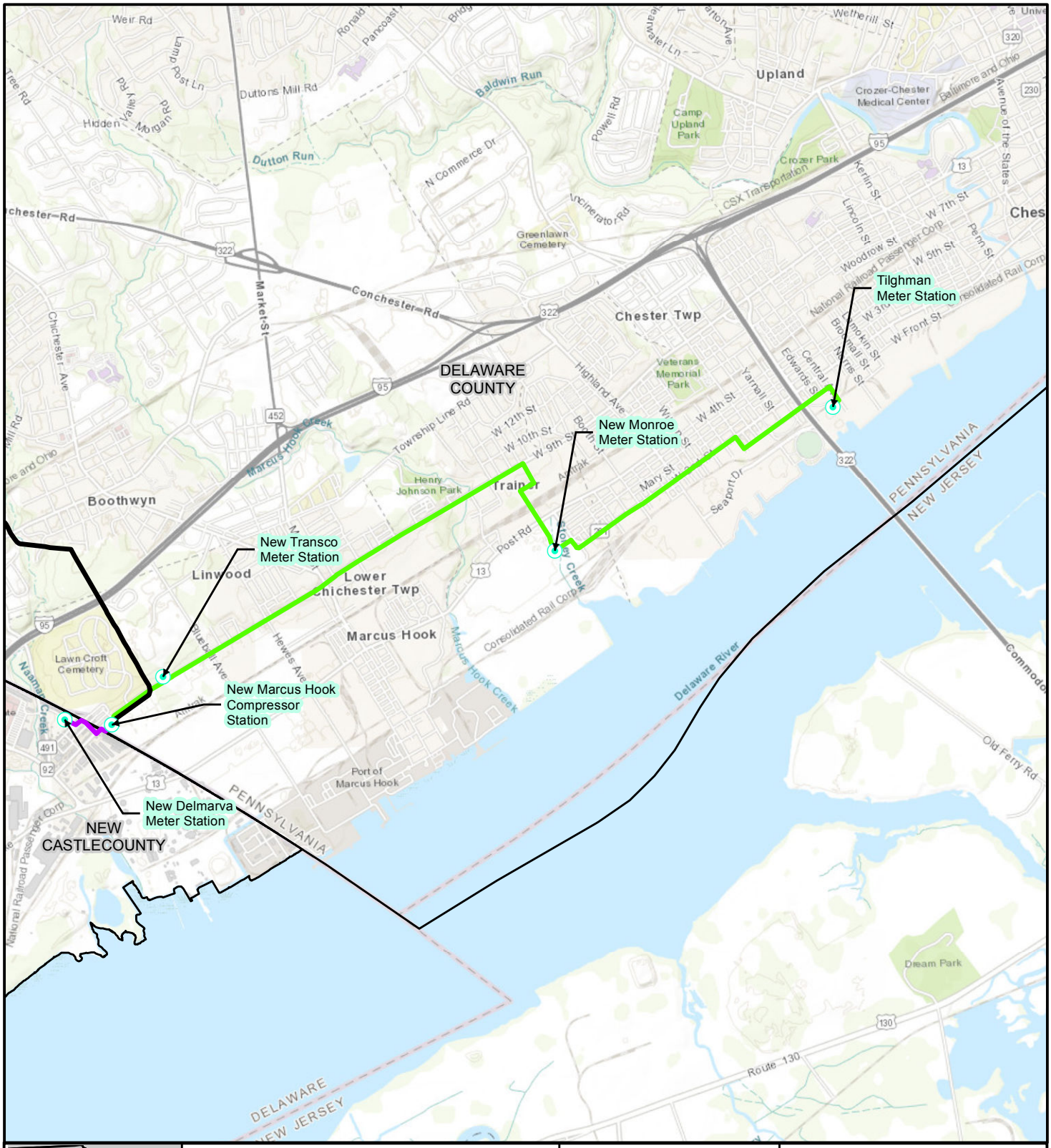
The construction rights-of-way for the proposed new 16-inch-diameter pipeline laterals would typically be 65-feet-wide in upland areas and 50-feet-wide at waterbody crossings. However, the majority of the Project laterals, 77 percent or about 3.6 miles, would be installed via the horizontal directional drill (HDD) method within existing roadways, which requires additional temporary workspace (ATWS). After construction, Adelphia would maintain 30-foot-wide permanent rights-of-way, except in roadways where no permanent easement would be granted and between HDD entry and exit points, where the right-of-way would not be maintained. Adelphia would be required to prepare a manual of written procedures for operation and maintenance of the Project, including detail on how Adelphia would access and maintain the pipelines, in accordance with 49 CFR 192.605.

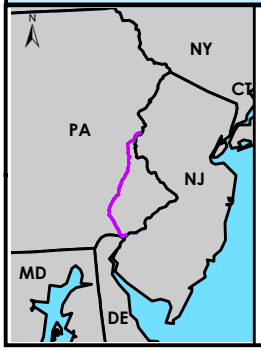
Additional land would be required for installation of cathodic protection; however, the acreage that would be affected by rectifiers or groundbeds associated with cathodic protection has not yet been determined.

Table A-2
Summary of Land Requirements for the Project

Facility	Land Affected During Construction (acres)[a]	Land Affected During Operation (acres)[a]
New Pipeline Facilities		
Parkway Lateral[b]	1.4	0.7
Tilghman Lateral[b,c]	25.5	3.8
New Compressor Stations		
Marcus Hook Compressor Station[d]	7.5	7.5
Quakertown Compressor Station[e]	3.7	1.2
New Meter and Regulator Stations		
Quakertown Meter Station[f]	0.0	0.0
Transco Meter Station	0.9	0.9
Monroe Meter Station	<0.1	<0.1
Tilghman Meter Station	0.1	0.1
Delmarva Meter Station (including three interconnects)	0.6	0.4
Access roads	4.2	4.7[g]
New Appurtenant Facilities along the Existing Mainline		
Mainline Valve (MLV) 1	0.1	<0.1
MLV 2	0.1	<0.1
Chester Creek BAV[h]	0.1	<0.1
Paoli Pike BAV[i]	0.1	<0.1
French Creek BAV[i]	0.1	<0.1
Cromby BAV[h]	0.2	<0.1
Schuylkill River BAV[i]	0.1	<0.1
Perkiomen Creek BAV[i]	0.1	<0.1
East Perkiomen Creek BAV[i]	0.1	<0.1
Quakertown Tap Valve[f]	0.0[f]	0.0[f]
Skippack Tap Valve	0.1	<0.1
Project Total[j]	**46.7**	**21.5**

[a] The numbers in this table have been rounded for presentation purposes; the totals may not reflect the sum of the addends.
[b] This includes impacts associated with the corresponding additional temporary workspace and pig launcher/receiver facilities for this lateral.
[c] This includes impacts associated with the pipeline that would connect the Tilghman Lateral to the Transco Meter Station.
[d] This facility site would also serve as a contractor wareyard for the proposed Project.
[e] This includes impacts associated with the new meter station that would be installed at this facility site.
[f] Impacts for this facility are included in those reported for the Quakertown Compressor Station.
[g] Operational impacts are greater than construction impacts because the access road Adelphia would use to access the Schuylkill River BAV during operation (AR- 28.04-02) has a larger footprint than the access road proposed for use during construction of this BAV (AR- 28.04-01).
[h] This facility would be constructed at an existing valve site that is about 40 feet by 25 feet that would be expanded to be 40 feet by 30 feet.
[i] This facility would be constructed at an existing valve site that is about 15 feet by 15 feet that would be expanded to be 30 feet by 30 feet.
[j] The Project totals include the portion of the existing Martins Creek Station that Adelphia would acquire from IEC. No modifications are required with the exception of the installation of fencing within the existing Martins Creek Station.





Legend

- Existing Facility
- Proposed Facility
- Existing 18-Inch-Diameter Mainline
- Proposed Parkway Lateral
- Proposed Tilghman Lateral
- County Boundary

0 2,000 4,000
Feet

N

Scale: 1:40,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Parkway and Tilghman Laterals

FIGURE 2

Adelphia would require ATWS for road, wetland, and waterbody crossings; at HDD entry and exit points; for storage of segregated topsoil, construction materials, equipment movement; and for other site-specific constraints (see appendix B). Adelphia would implement its *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), which are based on FERC's *Wetland and Waterbody Construction and Mitigation Procedures*[6] with modifications, including reducing ATWS setback requirements from certain wetlands and waterbodies (see appendix C). We have reviewed these alternate measures and find them adequately justified, except for Adelphia's proposed a diversion ditch to manage stormwater flow at the Transco Meter Station, see our recommendation in section B.2.2.

About 3.8 miles (81 percent) of the laterals would be collocated or adjacent to existing rights-of-way, as shown in table A-3. Although Adelphia 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. Adelphia 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)[7] (e.g., minor field realignments and workspace shifts requested by the landowner that do not affect other landowners or sensitive resources), which Adelphia has adopted without modification. Adelphia would restore all ATWS to pre-construction conditions, and allow those areas to revert to previous uses following construction.

Table A-3
Collocation of the Parkway and Tilghman Laterals with Existing Rights-of-Way

Type of Right-of-Way	Start Milepost	End Milepost	Distance within Existing Right-of-Way (feet)
Parkway Lateral			
Road	0.1	0.2	493
Tilghman Lateral			
Road, powerline, pipeline	0.0	0.3	1,795
Road, powerline	0.3	2.2	10,031
Pipeline	2.3	2.9	0
Road, powerline	2.9	3.7	4,382
Road	3.7	3.8	348
Road, pipeline	3.8	4.3	2,661
Road	4.3	4.4	422
Road	4.4	4.4	0

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

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

5.2 Aboveground Facilities

Adelphia would acquire four existing meter stations at MPs 50, 68, 80, and 84 along the existing mainline in Northampton and Bucks Counties, Pennsylvania. The Martins Creek Station is on a 134.6-acre site at MP 84 at the terminus of both the existing mainline and 20-inch-diameter pipeline. Adelphia would purchase 2 acres of the 134.6-acre site associated with its operation of the existing meter station and would install fencing. The existing Transcontinental Gas Pipe Line Company, LLC (Transco) Meter Station is on a 1.6-acre site at MP 80 and includes an interconnect to Transco's existing system. The existing Columbia Gas Transmission, LLC Meter Station (Columbia; MP 68) provides intrastate commerce natural gas services. The existing Quakertown Meter Station (MP 50) occupies about half of a 1.5-acre site and includes an interconnect to Texas Eastern Transmission Company, LP (TETCO) existing system. All four of the existing meter stations are currently in operation and would not require any modifications beyond the installation of fencing at the Martins Creek Station.

The proposed new aboveground facilities for the Adelphia Gateway Project include two compressor stations, five meter stations, two mainline valves (MLV), seven blowdown assembly valves (BAV), four pig launcher/receiver facilities, and two tap valves. Construction of these facilities would require a total of 15.5 acres of land, 12.3 acres of which would be used permanently during operation (see table A-2 and appendix A-2). The majority of these impacts would be on lands classified as industrial/commercial land, 11.6 and 10.6 acres, respectively, and all but the new MLVs and the new Transco Meter Station would on sites already have existing natural gas infrastructure or similar facilities in place. Land impacts for the access roads to these facilities are discussed below (section A.5.4). Pipe interconnects and pig launcher/receiver facilities would be entirely within the permanent rights-of-way and would not result in any additional impacts.

5.3 Contractor Wareyard

Adelphia has proposed one contractor wareyard within the existing Marcus Hook Pump Station (see table A-2 and appendix A-2) for the storage of pipe and contractor materials. This 7.5-acre site is also the location of the proposed Marcus Hook Compressor Station. No improvements would be required for Adelphia's use of the site as a laydown and storage area.

5.4 Access Roads

Adelphia would use existing public and private roads to the extent feasible to access the pipeline rights-of-way and aboveground facilities. Adelphia has identified 13 access roads that would provide access to aboveground facilities during construction of the Project, all of which would be maintained for operation, except for AR-28.04- 01 (see table A-4 and appendix A-2).

Table A-4
Access Roads Proposed for the Project

Access Road	Project Facility	Nearest Mile-post	Status[a]	Road Surface Type	Existing or New	Modifications	Affected Land Use	Length (feet)	Area (acres)[b]
AR-MCS- 01	Martins Creek Station	0.0	Temp / Perm	Asphalt	Existing	None	Developed	1,900	0.9
AR-QCS- 01	Quakertown facilities[c]	49.4	Temp / Perm	Asphalt	Existing	None	Developed	2,650	0.4
AR-TL-01	Transco Meter Station	0.3	Temp / Perm	Asphalt	Existing	None	Developed	120	0.1
AR-9.53- 01	Chester Creek BAV	9.5	Temp / Perm	Gravel / Dirt	Existing	None	Developed	1,109	0.5
AR-14.46- 01	Paoli Pike BAV	14.5	Temp / Perm	Dirt	Existing[d]	Expansion / Gravel / Matting	Developed / Open Land	37[e]	<0.1
AR-17.92- 01	MLV 2	17.9	Temp / Perm	N/A	New	N/A	Open Land / Developed	105	0.1
AR-6.66- 01	MLV 1	19.9	Temp / Perm	N/A	New	N/A	Open Land/ Developed	105	<0.1
AR-25.74- 01	French Creek BAV	25.7	Temp / Perm	Grass	Existing[f]	None	Open Land	1,479	0.4
AR-27.34- 01	Cromby BAV	27.3	Temp / Perm	Gravel	Existing	None	Developed	2,059	0.7
AR-28.04- 01	Schuylkill River BAV	28.0	Temp only	Grass / Paved / Dirt	Existing[d]	None	Developed / Open Land	3,379	0.8
AR-28.04- 02	Schuylkill River BAV	28.0	Perm only	Paved	Existing[g]	None	Developed	3,640	1.3
AR-33.97- 01	Perkiomen Creek BAV	34.0	Temp / Perm	Grass / Wetland	Existing[f]	Matting[h]	Open Land	211	0.1
AR-35.95- 01	Skippack Tap Valve	36.0	Temp / Perm	Dirt / Grass	Existing	None	Developed / Open Land	304	0.1
AR-36.68- 01	East Perkiomen Creek BAV	37.0	Temp / Perm	Gravel	Existing	None	Developed	58	<0.1

Table A-4
Access Roads Proposed for the Project (continued)

Access Road	Project Facility	Nearest Mile-post	Status[a]	Road Surface Type	Existing or New	Modifications	Affected Land Use	Length (feet)	Area (acres)[b]

Notes: N/A = not applicable as this access road would be newly constructed as part of the proposed Project. The existing land use type for this access road is provided in table B-14.

[a] Temp / Perm = access roads that would be used during both construction and operation of the Project; Temp only = access roads that would be for use only during construction of the Project; Perm only = access roads that would be for use only during operation of the Project.

[b] The numbers in this table have been rounded for presentation purposes. As a result, the total impacts for access roads reported throughout this EA may not reflect the sum of the addends.

[c] This existing access road would provide access during construction and operation of the Quakertown Compressor and Meter Stations. Access to workspace adjacent to but outside of the fenceline at the existing Quakertown facility to construct the tap valve would occur within the existing facility boundary.

[d] Access for this facility would be achieved, in part, via the right-of-way of the existing mainline.

[e] Adelphia would expand the existing 10-foot road to be 37 feet in length for use during construction only. Following construction, Adelphia would restore all but the existing access road's original footprint which would be maintained for operation.

[f] Access for this facility would be achieved via the right-of-way of the existing mainline.

[g] IEC holds an easement agreement for use of Schuylkill River Trail to access for operation and maintenance of its facilities. This easement would transfer to Adelphia upon purchase of the Existing System.

[h] Matting is proposed only during construction of the Project. See section B.2.3 regarding use of this access road during operations.

Of the 13 access roads to be used during construction, 9 are existing roads that would not require modifications, 2 are existing roads that would be improved, and 2 are newly proposed roads for the Project. The two new permanent access roads are proposed within open land and would provide access to the two new MLVs.

Twelve of the 13 access roads used during construction would be maintained for the life of the Project. Alternatively, only the existing portion of AR-14.46- 01 would be maintained for operational access to the Paoli Pike BAV (see the figure for this BAV in appendix A-2). Also, Adelphia would use AR-28.04-02 (the Schuylkill River Trail) for operation and maintenance, based on an easement agreement held by IEC that would transfer to Adelphia upon purchase of the Exiting System. Use of these access roads during operation would impact a total of 4.7 acres of industrial/commercial and open lands. Potential impacts from maintenance and operation of the BAV on Schuylkill River Trail are discussed in section B.5.3, as well as our recommendation regarding use of the trail for access.

6. Construction Schedule and Workforce

Adelphia anticipates that construction of the Project would commence as soon as the Project is approved, subject to the receipt of necessary permits and regulatory approvals, and would last 8 months. Adelphia plans to complete all tree-clearing activities in accordance with agency-recommended timing windows to minimize potential impacts on nesting migratory birds and other federally and state-listed species, as further discussed in sections B.3.4 and B.4. Adelphia also states that general construction activities would be performed Monday to Saturday, during daylight hours or from 6:30 am until 6:30 pm, whichever is less. With the exception of HDD activities, which are further detailed in section B.8.2, Adelphia anticipates that construction activities would not occur on federal holidays or at night. Adelphia has not identified any specific construction activities, other than two HDDs (HHD-5 and HDD-9) and pipeline pullback at the remaining HDD sites, that would occur at night. Other activities often conducted at night include operation of pumps at dry-ditch waterbody crossings; hydrostatic testing; and tie-ins. Adelphia may opt to perform these additional construction activities at night. Adelphia's projected in-service date is the fourth quarter of 2019.

According to Adelphia, construction of all facilities would occur simultaneously and would require the following workforce:

- 45-50 workers to construct the Quakertown Compressor Station;
- 45-50 workers to construct the Marcus Hook Compressor Station;
- 10-15 workers to install each valve (i.e., MLVs, BAVs, tap valves);

- 20-30 workers to construct each meter station; and
- 40-50 workers to construct each pipeline lateral.

Construction of the Adelphia Gateway Project would require a total estimated peak temporary work force of about 515 people;[8] between 7 and 10 permanent workers would be required for operation of the Project.

7. Construction, Operations, and Maintenance Procedures

The Project would be designed, constructed, operated, and maintained in accordance with applicable requirements defined by the USDOT-PHMSA 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, 49 CFR 192 specifies pipeline material and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Where Adelphia would construct the laterals using conventional overland construction techniques, construction would proceed in one continuous operation with the entire process coordinated to minimize the total amount of time it would take to construct the Project. Adelphia has committed to implement the measures outlined in FERC's Plan. Additionally, Adelphia has committed to implement, with specific modifications, the measures outlined in FERC's Procedures. FERC's Plan and Procedures are baseline construction and mitigation measures developed to minimize the potential environmental impacts of construction on upland areas, wetlands, and waterbodies. Adelphia requested site-specific modifications to sections V.B.2.a and VI.B.1.a of FERC's Procedures to allow workspace and/or access roads within 50 feet of waterbodies and wetlands at 18 locations; we have reviewed these modifications and find that Adelphia has provided adequate justification. With one exception, a proposed diversion ditch to manage stormwater flow at the Transco Meter Station which is discussed in section B.2.2, as well as our recommendation regarding the need for Adelphia to identify an alternative stormwater management configuration. Appendix C provides a summary of each site-specific modification to FERC's Procedures.

Adelphia would implement its Procedures (FERC Procedures with modifications) during construction of the Project. In addition, Adelphia would adhere to mitigation measures from FERC's Plan. Adelphia has also committed to develop site-specific Erosion and Sediment Control Plans (E&SCP) prior to construction. Adelphia would submit these E&SCP to the Conservation Districts for each county in Pennsylvania.

[8] We assume that each facility would require a separate workforce, regardless of collocation, e.g., the Quakertown facilities would require a total peak workforce of 95 workers.

Additionally, Adelphia would also implement additional construction, restoration, and mitigation plans, including the following:

- Fugitive Dust Plan;
- Inadvertent Return Contingency Plan (IRCP);
- Noxious Weeds/Invasive Plant Species Control and Mitigation Plan (Noxious Weed Plan);
- Residential Access and Traffic Management Plan;
- Sampling and Analysis Plan for the Tilghman and Parkway Laterals (SAP);
- Spill Prevention, Control, and Countermeasures (SPCC) Plan;[9]
- Unanticipated Discovery of Contamination Plan;
- Unanticipated Discovery Plan for cultural resources and human remains; and
- Winter Construction Plan.

These plans were filed on August 10 and October 2, 2018, and are available for review on the Project docket.[10] We have reviewed these construction and mitigation plans, and in conjunction with our recommendations in section B, have found them acceptable.

7.1 General Pipeline Construction Procedures

Figure 3 below depicts the typical pipeline construction sequence and general pipeline construction activities. Appendix D depicts typical construction figures. Prior to construction, Adelphia would mark each pipeline centerline and the limits of the construction rights-of-way, ATWS areas, highway and railroad crossings, access roads, and environmentally sensitive areas (e.g., water wells, wetlands, waterbodies, cultural resource sites, rare species habitat) identified in landowner easement agreements, environmental permit conditions, survey results, or by federal, state, or local agencies. Adelphia 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.

[9] Incorporated in IEC's Integrated Contingency Plan, which Adelphia would adopt as its own plan upon purchase of IEC's Existing System.

[10] Adelphia's Mitigation Plans are available on eLibrary under accession nos. 20180813-5039 and 20181002-5167.

Adelphia Gateway 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. Adelphia would chip and spread, stack, or handle per individual landowner agreements and applicable regulations and ordinances the cleared non-wetland vegetation and stumps. In wetlands, Adelphia would cut most vegetation to grade to maintain the integrity of the root systems.

Temporary soil erosion and sedimentation control devices would be installed as needed, in accordance with our Plan, and maintained throughout construction and restoration of the Project. Adelphia would cut and brace existing fences as needed along the rights-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, Adelphia would grade the construction rights-of-way and ATWS, where necessary, to provide a level work surface.

Trenching would be conducted with a backhoe or ditching machine. Adelphia would use conventional rock-trenching methods, such as with track-mounted mechanical rippers, to break large stones and bedrock. Blasting is not proposed for this Project. Excavated soils would be stockpiled along the rights-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, Adelphia would store subsoil adjacent to the trench within the construction rights-of-way limits and maintain it separately from topsoil piles.

Typically, the trench would be excavated at least 12 inches wider than the diameter of the pipe (about 28 inches wide for a 16-inch-diameter pipe). Adelphia would excavate the trench to allow a minimum of 3 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.

Adelphia would truck individual sections of pipe to the construction rights-of-way and string them 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 off-load pipe from the trailers. A track-mounted, hydraulic pipe-bending machine would 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 rights-of-way.

The pipe segments would then be placed on temporary supports and welded together. Adelphia would weld its pipeline in compliance with 49 CFR 192 *(Transportation of Natural and Other Gas by Pipeline Minimum Federal Safety Standards*), American Petroleum Institute Standard 1104 (*Welding of Pipelines and Related Facilities),* and Adelphia's specifications. All pipe welds would be coated to

prevent corrosion, and Adelphia would inspect and repair any defects in the coating prior to lowering the pipe into the trench.

Prior to lowering in the pipe, Adelphia would inspect the trench to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. The pipe would then be lifted from the temporary supports and lowered into the trench using sideboom tractors. In rocky areas, Adelphia would place a layer of screened soil or sand on the bottom of the trench to protect the pipe. Once the pipe has been lowered in, Adelphia would backfill the trench with previously excavated materials. If excavated materials are not suitable (i.e., too rocky), the pipeline would be covered with more suitable fill or protected with a rock shield (i.e., padding placed around the pipe). Adelphia would not use topsoil to provide padding around the pipe. Subsoil would be used to fill the bottom of the trench, with segregated topsoil replaced after the subsoil.

After backfilling, Adelphia would hydrostatically test the pipeline segments to ensure the system is free from leaks and meets safety requirements at operating pressures. Refer to section B.2.2 for additional information on hydrostatic testing.

Final cleanup would begin after backfilling and as soon as weather and site conditions permit. In accordance with our Plan, Adelphia would be required 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. If final cleanup is prevented by winter snowfall, Adelphia would implement its Winter Construction Plan, which includes measures to temporarily stabilize the rights-of-way and avoid erosion until spring thaw conditions (see section A.7.2).

Adelphia would implement restoration practices in accordance with our Plan and its Procedures, 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.

Permanent erosion and sediment control measures would be installed. Adelphia would restore fences, gates, driveways, and roads disturbed by pipeline construction to pre-construction conditions or better. Adelphia would install markers showing the location of the pipeline at fence and road crossings to identify it as the owner and convey emergency information in accordance with applicable government regulations, including USDOT-PHMSA safety requirements.

In upland locations, Adelphia would revegetate areas disturbed by construction with an appropriate seed mixture approved by the local County Conservation District and

apply mulch as appropriate to avoid erosion. Adelphia has also committed to develop site-specific E&SCP prior to the start of construction.

7.2 Special Pipeline Construction Procedures

Road and Railroad Crossings

The Project would cross 27 local, state, and federal roads, and 12 railroads, of which two roads would be crossed twice (see appendix E). Further, about 3.3 miles (70 percent) of the pipeline laterals would be constructed within roadways.

All but two of the proposed road crossings and all of the proposed railroad crossings would be within one of the nine proposed HDD crossings (see table A-5), which would avoid direct impacts on the road surface and railroads. Two roads would be open cut at three crossing locations: Parkway Avenue (MP 0.1) and Ridge Road (MP 0.2) would be open cut during installation of the Parkway Lateral; and Ridge Road (MP 03) would be open cut during installation of the pipeline to connect the Tilghman Lateral to the Transco Meter Station. Nine roads would be temporarily encumbered by construction workspace. Adelphia is also proposing to construct portions of the new laterals within or immediately adjacent to Parkway Avenue and Ridge Road (see section B.6.2). Construction at these areas would be a combination of open cut and HDD methods. To minimize impacts associated with construction in and across roadways, Adelphia would temporarily detour traffic through these areas.

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

HDD Number	Begin Milepost	End Milepost	Length (feet)	Primary Features Avoided[a]
HDD 1	0.0	0.4	1,848	Ridge Road
HDD 2	0.4	0.9	2,798	Ridge Road, nearby residences
HDD 3	0.9	1.7	4,330	Ridge Road, nearby residences
HDD 4	1.8	2.2	2,587	Marcus Hook Creek, Ridge Road, nearby residences
HDD 5	2.4	2.6	950	6th Street, U.S. Highway 13/Post Road Railroads,
HDD 6	2.9	3.4	2,798	State Highway 291/West 2nd Street
HDD 7	3.5	3.7	1,531	State Highway 291/West 2nd Street
HDD 8	3.9	4.2	1,795	U.S. Highway 322
HDD 9	4.3	4.4	422	U.S. Highway 322

[a] Given the urban setting of the proposed lateral, additional roadways would be within the path of an HDD or temporarily encumbered by the HDD pull string workspace, see appendix E.

Horizontal Directional Drill Crossing Method

The HDD method involves drilling a pilot hole under the waterbody, roadway, or sensitive feature, then enlarging that hole through successive reaming passes until the hole is large enough to accommodate the pipe. Throughout the process of drilling and enlarging the hole, Adelphia would circulate a slurry (drilling fluid), primarily made of materials such as nonhazardous bentonite clay and water, downhole through the drilling tools to lubricate the drill bit, remove drill cuttings, and hold the hole open. Pipeline 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. Adelphia would not require hand-clearing of vegetation between the entry and exit pits for placement of the HDD guide wires.

Waterbody Crossings

Adelphia proposes to cross streams using dam-and-pump, dam-and-flume, and HDD crossing methods. Adelphia would adhere to the measures specified in our Plan and its Procedures, as well as any additional requirements that may be specified in federal or state waterbody crossing permits.

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, Adelphia would use pumps with hoses 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 and discharged into a well vegetated upland area. Adelphia would install intake screens at the pump inlets to prevent or limit entrainment of aquatic life, and install energy-dissipating devices 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 and backfilling of the trench, Adelphia would restore the stream bed to prevent erosion and scour. Restoration of the stream banks would also occur prior to the removal of temporary dams to re-establish flow through the construction work area.

Flume Crossing Method

A dry-ditch flume crossing diverts or isolates flow during pipe installation through the use of flumes to maintain water flow and fish passage during pipeline construction. Typically, water is diverted across the trench area through one or more flume pipes of suitable diameter to convey the maximum water flow anticipated during construction.

Adelphia would use temporary sandbags, bladders, or other impervious materials to support and seal the ends of the flume which would direct stream flow into the flume through the construction area. These temporary dams at both the upstream and downstream sections of the flume pipe create a containment area where turbid water is confined. If the pipeline trench requires dewatering during construction of the Project, the water would be pumped through upland dewatering/filtering structures to create a dry work area for trench excavation and pipe installation. Immediately after backfilling, bottom recontouring, and restoration of stream banks, Adelphia would remove the flume pipes and temporary dams and restore flow through the construction work areas.

Horizontal Directional Drill Crossing Method

Adelphia would cross one waterbody (Marcus Hook Creek) using the HDD method as described above. On December 13, 2018 Adelphia filed its geotechnical engineering report, including the results for 20 geotechnical borings drilled and sampled along the HDD alignments.[11] Adelphia has prepared an IRCP that includes measures to prevent, contain, and mitigate any inadvertent returns from HDD activities. Additional information on the HDDs are provided in section B.1.1.

Wetland Crossings

The newly proposed pipeline laterals would not cross any wetlands; however, work in wetlands is proposed at four locations associated with installation of Paoli Pike, Perkiomen Creek, and East Perkiomen Creek BAVs, and ATWS associated with construction of the Quakertown facilities. Adelphia would limit construction equipment operating in wetland areas to that needed to clear the existing right-of-way to excavate 20-foot-long sections of the existing pipeline and replaced those sections with valve assemblies. Adelphia would then backfill the trenches and restore the right-of-way. Where proposed construction areas at existing facilities are within wetlands, Adelphia has proposed the use of timber mats to minimize impacts. Also, at the Paoli Pike BAV site, Adelphia would implement the use of low-ground-weight construction equipment or other measures in accordance with its Procedures. Additional mitigation may be required pending results of Adelphia's ongoing coordination with U.S. Fish and Wildlife Service (USFWS) and Pennsylvania Fish and Boat Commission (PFBC) for activities within 300 feet of wetlands containing potential bog turtle or eastern redbelly habitat, respectively (see section B.4).

Existing Utility Crossings

The proposed pipelines would cross 192 existing utility lines (see appendix F), the majority of which are overhead electric lines. Prior to construction, Adelphia would utilize the state One-Call systems in Delaware and Pennsylvania to locate known utilities

[11] Available on eLibrary under accession nos. 20180831-5177, 20181119-5196, and 20181213-5095.

and to ensure no other existing pipelines or utilities are buried within the right-of-way. In the event that an existing utility is damaged during construction, Adelphia would notify the owner of the utility and stop work, if necessary due to safety concerns, in the vicinity of the utility until the facility is repaired.

Residential Areas

Adelphia has identified all residences within 50 feet of construction workspaces, and would implement measures in accordance with our Plan, to minimize impacts in these locations. 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. Additionally, appendix G contains site-specific plans for construction within 25-feet of residences. We encourage affected landowners to review these plans and provide us any comments during the EA comment period.

Winter Construction

Based on Adelphia's anticipated schedule, construction of the Project could occur during the winter season. Adelphia has developed a Winter Construction Plan which includes specialized methods and procedures to protect resources during the winter season in accordance with our Plan and Adelphia's Procedures. These measures would include methods of snow handling, that would be limited to construction work areas, and snow removal. Adelphia would establish gaps in topsoil piles to facilitate drainage of melting snow across the right-of-way. If inclement weather prohibits replacement of topsoil immediately following construction, Adelphia would stabilize topsoil piles (e.g., mulching and erosion controls) until weather conditions improve. As discussed in section B.1.2, when final cleanup would be prevented by winter snowfall, Adelphia would implement measures to temporarily stabilize the right-of-way and avoid erosion until spring thaw conditions. In addition, Adelphia has stated that it would also develop a Project-specific Stormwater Pollution Prevention Plan prior to construction.

7.3 Aboveground Facility Construction Procedures

Adelphia would construct aboveground facilities in accordance with all applicable federal and state regulations (including 49 CFR 192). 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 include preparing foundations, installing underground piping, installing aboveground piping and machinery, testing the piping and control equipment, and cleaning and stabilizing the work area. Adelphia would fence aboveground facilities, and cover areas around buildings, meters, piping, and associated

equipment with gravel. Any areas not covered with rock or paved would be seeded with a compatible grass and maintained as herbaceous cover.

7.4 Environmental Compliance Inspection and Monitoring

Prior to construction, Adelphia would conduct environmental training for the 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, and Adelphia'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. Adelphia has committed to employing at least five EIs 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.

Adelphia would conduct post-construction monitoring to document restoration and revegetation of the rights-of-way and other disturbed areas and to address any landowner concerns in accordance with our Plan and its Procedures. Adelphia would monitor wetlands annually for a period of 3 years or until revegetation is successfully established in accordance with its Procedures. Adelphia 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. Adelphia would also submit quarterly monitoring reports to FERC to document the status of revegetation in disturbed areas. These reports would describe the results of post-construction inspections, any problem areas, landowner/agency concerns, 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). Adelphia would also file a wetland revegetation monitoring report with FERC three 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 periodically inspect the Project throughout construction to independently audit the EIs to ensure 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.

7.5 Operations and Maintenance

During operation of the Project, Adelphia 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 rights-of-way where erosion is occurring, Adelphia would restore the area and repair existing erosion control devices or install additional devices, as necessary.

To maintain accessibility to the rights-of-way and accommodate pipeline integrity surveys, Adelphia would periodically clear vegetation along the permanent pipeline rights-of-way using mechanical mowing or cutting. Trees within 15 feet of the pipelines with roots that may compromise the pipeline integrity may be selectively cut and removed from the rights-of-way. Routine vegetation maintenance in upland areas would not be conducted more frequently than once every 3 years, with the exception of a 10-foot-wide corridor centered on the pipeline that would be maintained as necessary 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 USFWS (see section B.3.4).

Adelphia personnel also would perform regular operation and maintenance activities on equipment at the pig launcher/receiver facilities, compressor and meter stations, MLVs, and BAVs. 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.

8. 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 FERC. These non-jurisdictional facilities may be integral to a project (e.g., 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.

Adelphia anticipates that electrical power upgrades would be required at the compressor and meter stations. Adelphia does not know the route or length of the new power lines required for these facilities; however, they anticipate that the new powerlines would be routed from existing power poles nearby, and would not require large tracts of land or routing of new transmissions lines. Electrical power upgrades would be under the jurisdiction of the respective power company, who would be required to obtain all necessary permits and authorizations.

9. Public Review and Comment

On May 1, 2018, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Adelphia Gateway Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Sessions* (NOI). The

NOI was published in the Federal Register and was mailed to 4,709 interested parties, including federal, state, and local government representatives and agencies; elected officials; affected landowners; environmental and public interest groups; Native American tribes; other interested parties; and local libraries. The NOI also established a scoping period and requested that the public provide comments on specific concerns about the Project or issues that should be considered during the preparation of the EA.

In order to facilitate scoping and receive verbal scoping comments, we conducted two public scoping sessions in the Project area. Scoping sessions were held on May 30, 2018, in Center Valley, Pennsylvania and May 31, 2018, in Essington, Pennsylvania. We received a total of 13 verbal comments at these scoping sessions. Transcripts of these comments are part of the Commission's public record and are available for viewing on FERC's website.[12] In addition to FERC staff, the USDOT-PHMSA was present at the May 30, 2018 Project scoping session.

In total the Commission received 531 comments on the Project, of which 68 letters/verbal comments were received during the scoping period established by the NOI (May 1, 2018 through June 1, 2018). The environmental comments received are summarized below and addressed, as applicable, in relevant sections of this EA, as shown in table A-6.

Several commenters requested that the scoping period be extended and stated that insufficient public notice or available meeting dates were provided for the scoping sessions, and state that the scoping session format is restrictive. Regarding the extension of the scoping period, we have reviewed all comments submitted on or prior to December 31, 2018. The purpose of the public scoping sessions are to allow individuals/groups to provide comments on the public record regarding their particular environmental concerns. The format of these sessions is conducive to allowing the maximum number of commenters the opportunity to express their concerns. Additionally, as indicated in the NOI, the public scoping sessions were just one of four methods identified to provide comments. Consequently, we conclude this concern has been addressed.

Additionally, several commenters who live in proximity to the proposed site of the Quakertown Compressor Station expressed concern that nearby residents were excluded from the mailing list and had not received notice of the Project. FERC's third-party contractor, Edge Engineering and Science, Inc., performed an independent analysis of the mailing list using parcel data maintained by the counties in the Project area and determined that, with few exceptions, the mailing list was comprehensive and included contacts for parcels within 0.5 mile of the compressor station. In addition, the mailing list has been continually updated throughout the environmental review process to include all commenters.

[12] Available on eLibrary under accession nos. 20180530-4005 and 20180531-4014.

Table A-6 Environmental Issues Identified During the Public Scoping Process	
Issue	**EA Section Addressing Issue**
Air quality, greenhouse gases, health impacts, climate change (including methane and fugitive emissions)	sections B.8.1, B.10.9, and B.10.10
Alternatives (including alternative sites, electric-driven compression, and routing analysis)	section C
Aquatic resources (including temperature impacts)	section B.3.2
Cultural resources and impacts on historical sites	section B.7
Cumulative impacts	section B.10
Geology (including karst, HDD constructability, blasting, steep terrain, and acid-producing rock)	section B.1.1
Land use, recreation, and visual impacts (including impacts on conservation areas and land enrolled in easement programs, and scenic rivers)	section B.5
Noise (including vibration)	section B.8.2
Safety of new and existing natural gas infrastructure (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)	sections B.2 and B.1.1
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.7.2

Many of the comments received are in opposition to the Adelphia Gateway Project, including numerous commenters that question the need for the Project; expressing opposition to fossil fuels in favor of renewable energy, questioning if the natural gas would be exported, and raising concerns regarding health risks associated with natural gas sourced from hydraulic fracturing. Commenters also raised concerns with Project emissions and impacts on air quality and health. The need for the Project

will be determined by the Commission in the Order. The extraction of natural gas in shale formations by hydraulic fracturing is not the subject of this EA, nor is the issue directly related to the Project; however, health impacts due to Project emissions are reviewed in section B.8.1. Commenters also raise concerns regarding cumulative impacts of the Adelphia Gateway Project, PennEast Pipeline (PennEast), Mariner East Projects (I and II), and four Tennessee Gas pipeline projects (i.e., the 300 Line Extension, Northeast Upgrade, Northeast Diversification Project, and Marcellus Pooling Point Project). The 300 Line Extension, Northeast Upgrade, Northeast Diversification, and Marcellus Pooling Point Projects were completed in 2014 and, as such, are captured in this analysis as baseline. Alternatively, Tennessee Gas Pipeline cancelled the Northeast Diversification Project, so it is not discussed further. The remaining projects are discussed in section B.10, Cumulative Impacts.

Commenters question the siting of the Quakertown Compressor Station, MLVs, and BAVs in proximity to residential communities, schools, senior citizen centers, churches, as well as watersheds and historic districts. Numerous commenters also express safety concerns for the integrity of an older pipeline and the associated conversion of service to transport a high-pressure gas. Several commenters express concern for the lack of an appropriate safety, noise, and/or emission buffer between the Quakertown Compressor Station and residences, which one commenter specifically points to FERC's landowner pamphlet (*An Interstate Natural Gas Facility on My Land? What Do I need to Know?*) as specifying the need for a larger parcel for the compressor stations for such a buffer. While FERC's landowner pamphlet does provide examples of typical acreages of compressor stations, gas companies are not required to acquire a parcel of this size, provided that the noise and air quality requirements are met in their proposed parcel (see section B.8.1). Additionally, the landowner pamphlet discusses buffer zones or protection areas in reference to natural gas storage fields and is not a requirement for a compressor station. Commenters also expressed concern with strains on local emergency services and access to Project facilities during emergencies. Safety concerns are discussed in detail in section B.9.

One commenter asks that FERC review the original permits issued for the project. The state permitting process associated with the existing mainline's permits from the 1970s is beyond the scope of this EA. Commenters also state that the Project should be evaluated to ensure that it meets the goals of town comprehensive planning and ordinances and that FERC should prepare an environmental impact statement (EIS) for the Project to assess all impacts from the conversion and newly proposed facilities. As discussed in section A.1, FERC is the lead federal agency with siting authority under the NGA, which preempts local comprehensive planning and ordinances. 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.[13]

The Delaware Riverkeeper Network and other commenters express concerns that the capacity on the southern portion of the existing mainline would be increased in the future and would result in project segmentation. In order for Adelphia to increase the capacity of any Project pipeline or component, beyond that which would be authorized if a Certificate is issued, it would be required to submit an application that would be thoroughly reviewed in accordance with NGA and NEPA. FERC is not aware of any plans to increase the capacity beyond that which was requested. Commenters also state that there are other pipeline projects in the area that would be considered project segmentation. Other pipeline projects are reviewed in section B.10.

Commenters also express concerns regarding Project impacts on surface and groundwater quality; wetlands; floodplains; wildlife and vegetation; threatened and endangered species; cultural resources and historic structures; soils; property values; land use; pollution prevention practices; methane leaks and greenhouse gas (GHG) emissions; and climate change. All substantive comments are addressed in the relevant EA sections as outlined above in table A-6.

10. Permits and Approvals

As discussed, in section A.1, the USEPA and USDOT-PHMSA participated as cooperating agencies in the preparation of this EA. USDOT-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. The USEPA has delegated water quality certification, under Section 401 of the Clean Water Act (CWA), to the Pennsylvania Department of Environmental Protection (PADEP).

Table A-7 provides a list of federal and state permits related to construction and operation of the Project.

[13] 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).

Table A-7 Environmental Permits, Approvals, and Consultations for the Project		
Agency	**Permit / Approval / Consultation**	**Status**
Federal		
FERC	Certificate of Public Convenience and Necessity	Application submitted January 2018; Amended application submitted August 2018.
U.S. Army Corps of Engineers, Philadelphia District	CWA Section 404	Included with PASPGP-5.
USFWS	Endangered Species Act, Section 7consultation	Adelphia initiated informal consultation in July 2017. FERC consultation is ongoing.
	Migratory Bird Treaty Act	Consultation initiated in January 2018. FERC consultation is ongoing.
National Oceanographic and Atmospheric Administration National Marine Fisheries Service	Essential Fish Habitat	Consultation initiated and response received in August 2018. Consultation is complete.
	Endangered Species Act, Section 7 consultation	Consultation initiated and response received in August 2018. No listed species present. Consultation is complete.
United States Department of Agricultural Natural Resource Conservation Service	Conservation Easements	Consultation initiated in August 2018.
USEPA	Contaminated groundwater and soils	Consultation initiated in August 2018. USEPA provided comments on Adelphia's filings in September and October 2018; consultation is ongoing.
State		
Pennsylvania[a]		
PADEP	Joint Permit, Chapter 105 Water Obstruction and Encroachment Permit (Pennsylvania State Programmatic General Permit 5 [PASPGP-5])	Submitted December 17, 2018.
	CWA Section 401 Water Quality Certification	Included with PASPGP-5.
	Coastal Zone Management Consistency	Submitted on October 12, 2018.
	Erosion and Sediment Control General Permit-2 (ESCGP-2) for Earth Disturbance Associated with Oil and Gas Activities	Submitted to respective counties, see below.
	Air Plan Approval (Quakertown Compressor Station and Marcus Hook Compressor Station)	Application submitted April 16, 2018. PADEP held public hearing on December 4, 2018. Review is ongoing.
	General Permit-5 for Utility Line Crossings (Pennsylvania Chapter 105 Water Obstruction and Encroachment General Permit)	Permit in development
	General Permit-8 for Temporary Road Crossings (Pennsylvania Chapter 105 Water Obstruction and Encroachment General Permit)	Submitted on August 3, 2018; revisions submitted on October 8 and December 14, 2018. Review is ongoing.
	General Permit-11 for Maintenance, Testing, Repair, Rehabilitation or Replacement of Water Obstructions (Pennsylvania Chapter 105 Water Obstruction and Encroachment General Permit)	Submitted on August 3, 2018; revisions submitted on October 8 and December 14, 2018. Review is ongoing.

Table A-7 (continued) Environmental Permits, Approvals, and Consultations for the Project		
Agency	**Permit / Approval / Consultation**	**Status**
Pennsylvania (continued)		
Pennsylvania Game Commission (PGC)	Threatened and endangered species consultation and clearance	Initiated consultation in July 2017. The PGC provided concurrence on September 22, 2017 and October 10, 2018. Concurrence on Project modifications provided on November 8, 2018 are pending.
Pennsylvania Fish and Boat Commission (PFBC)	Threatened and endangered species consultation and clearance	Initiated consultation in July 2017. The PFBC provided concurrence on September 5, 2017. Revised consultation submitted in January and September 2018. Concurrence on Project modifications is pending.
Pennsylvania Department of Conservation and Natural Resources (PADCNR)	Threatened and endangered species consultation and clearance	Initiated consultation in August 2017. PADCNR provided concurrence on August 25, 2017. Revised consultation based on project modifications submitted in January and November 8, 2018; review is ongoing.
Pennsylvania Historical and Museum Commission (State Historic Preservation Office [Pennsylvania SHPO])	Section 106 of the National Historic Preservation Act (NHPA) consultation	Consultation initiated in August 2017. Revised consultation submitted in December 2017 and August 2018. Consultation is ongoing.
Pennsylvania Department of Transportation (PennDOT)	Highway Occupancy Permits	To be submitted prior to construction.
County Conservation District – Bucks County, Pennsylvania	ESCGP-2 - under the National Pollutant Discharge Elimination System (NPDES) Program	Submitted December 14, 2018.
County Conservation District – Chester County, Pennsylvania	ESCGP-2 - under the NPDES Program	Submitted on September 6, 2018. Approved on November 1, 2018.
County Conservation District – Delaware County, Pennsylvania	ESCGP-2 - under the NPDES Program	Submittal for Chester Creek Blowdown and MLV 1 on September 6, 2018 and approved on September 11, 2018. Submitted for Marcus Hook Compressor Station and Tilghman Lateral on December 14, 2018.
County Conservation District – Montgomery County, Pennsylvania	ESCGP-2 - under the NPDES Program	Submitted for Perkiomen Creek and East Perkiomen Creek BAVs and Skippack Tap Valve on September 6, 2018. Approvals received on October11 and 15, 2018.
Delaware		
Delaware Department of Natural Resources and Environmental Control (DNREC)	Threatened and Endangered Species Consultation and Clearance	Initiated consultation in August 2017. DNREC provided concurrence on September 2017 and March 6, 2018. Consultation is ongoing pending DNREC's review of Adelphia's wetland and waterbody survey report for the Delmarva Meter Station completed in November 2018.
	Air containment equipment registration	Submitted on August 6, 2018.
	Sediment and Stormwater Management Plan	Surveys complete; plan development in progress.

Table A-7 (continued)
Environmental Permits, Approvals, and Consultations for the Project

Agency	Permit / Approval / Consultation	Status
Delaware (continued)		
Delaware Division of Historical and Cultural Affairs (Delaware SHPO)	Section 106 of the NHPA consultation	Consultation initiated in August 2017. Revised consultation submitted in November 2018 and Delaware SHPO concurrence received in December 2018.

[a] While the Project is within the Delaware River Basin, Adelphia stated in its October filing (accession no. 20181005-5189) that per the Delaware River Basin Compact, the proposed Project is exempt from the Delaware River Basin Commission's review. To date the Delaware River Basin Commission has not filed a response to the contrary

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Project's potential direct and indirect impacts on environmental resources. When considering the environmental consequences of the proposed Project, the duration and significance of any potential impacts are described below according to four levels. Construction and operation of the Adelphia Gateway Project would have temporary, short-term, long-term, and permanent impacts. As discussed throughout this EA, temporary impacts are defined as occurring only during the construction phase. Short-term impacts are defined as lasting up to 3 years. Long-term impacts would eventually recover, but require more than 3 years. Permanent impacts are defined as lasting throughout the life of the Project, such as with the construction of an aboveground facility. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

As discussed in section A, the scope of the environmental analysis, except where otherwise noted, is focused on those facilities that will be newly constructed to meet the Project purpose and need. Therefore, the Project area referenced throughout section B corresponds to the proposed sites where these new facilities would be installed and operated, again, unless otherwise noted.

1. Geology and Soils

1.1 Geology

The Project would be within the Lowland and Intermediate Upland section of the Atlantic Coastal Plain physiographic province, the Piedmont Upland section of the Piedmont physiographic province, the Gettysburg-Newark Lowland section of the Piedmont physiographic province, and the Great Valley section of the Ridge and Valley physiographic province as shown in table B-1 below (Pennsylvania Department of Conservation and Natural Resources [PADCNR] 2018a,b; Delaware Geological Survey 2017a).

The Lowland and Intermediate Upland section of the Atlantic Coastal Plain province is characterized by relatively flat upper terrace surface cut by shallow valleys. Local relief in this section ranges from 0 to 200 feet (PADCNR 2018b).

The Piedmont Upland section of the Piedmont province is characterized by broad, rounded to flat-topped hills and shallow valleys. Local relief in this section ranges from 100 to 1,220 feet (PADCNR 2018b).

The Gettysburg-Newark Lowland section is characterized by rolling low hills and valleys with isolated higher hills. Local relief in this section ranges from 20 to 1,355 feet (PADCNR 2018b).

Table B-1 Physiographic Provinces within the Project Area		
Physiographic Province	**Section**	**Project Sites**
Atlantic Coastal Plain	Lowland and Intermediate Upland	Marcus Hook Compressor Station Delmarva Meter Station Transco Meter Station Monroe Meter Station Tilghman Meter Station Parkway Lateral Tilghman Lateral
Piedmont	Piedmont Upland	MLV 1 MLV 2 Chester Creek BAV Paoli Pike BAV
	Gettysburg-Newark Lowland	Skippack Tap Valves Quakertown facilities French Creek BAV Cromby BAV Schuylkill River BAV Perkiomen Creek BAV East Perkiomen Creek BAV
Ridge and Valley	Great Valley	Martins Creek Station
Sources: PADCNR 2018a,b; Delaware Geological Survey 2017a.		

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, with karst terrain on the south side. Local relief in this section ranges from 140 to 1,100 feet (PADCNR 2018b).

Adelphia conducted geotechnical investigations at HDD locations along the Tilghman Lateral in Delaware County, Pennsylvania (Atlantic Coastal Plain section). Adelphia has filed boring logs and the geotechnical engineering report for the Project. Based on these filings surficial geology consists of interbedded clays, sands, and silts overlying hornblende gneiss bedrock. Bedrock was encountered at depths between 22 and 47 feet below ground surface. However, bedrock was not encountered in all of the borings drilled. The Project is proposed near the Fall Line, which marks the boundary between crystalline bedrock of the Piedmont physiographic province from sediments of the Atlantic Coastal Plain physiographic province in the eastern United States (USGS 2000a).

We received a comment from the USEPA regarding the potential for water quality impacts resulting from the disturbance or exposure of acid producing rock in the Project area, which does occur in some areas of Pennsylvania. A review of maps for

Pennsylvania and Delaware indicate that no geologic units containing potential acid-producing minerals are present in the Project area or vicinity (PADCNR 2006, Spoljaric and Jordan 1966, Delaware Geological Survey 2017b).

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 typically found in sedimentary rock 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, fossils have been discovered in geologic formations that would be crossed by the Project, including the Stockton Formation, Lockatong Formation, and Brunswick Formation (Paleobiological Database 2018, Bascom *et al.* 1931). Project components that would cross these geologic formations include the Skippack Tap Valve, Quakertown facilities, and French Creek, Cromby, Schuylkill River, Perkiomen Creek, and East Perkiomen Creek BAVs. These facilities would be in areas of previous disturbance from construction of the existing mainline; therefore, we conclude it is unlikely that Project construction would encounter paleontological resources. Based on the industrial nature and previous disturbance of the Project area where the new pipeline laterals are proposed, no paleontological resources are anticipated. Therefore, we conclude that the Project would not adversely affect paleontological resources.

Mineral Resources

The primary mineral resources in Pennsylvania include coal reserves, natural gas, and petroleum products (U.S. Energy Information Administration [USEIA] 2016a). Pennsylvania is also one of the top 10 producing states for aggregate/crushed stone, which usually involves limestone/dolomite, sandstone, and argillite (PADEP 2018a). Delaware does not have any petroleum, natural gas, or coal resources (USEIA 2016b). Sand and gravel are the principal mineral resources recovered in the State of Delaware, according to the Delaware Geological Survey (Doyle and Pickett 1981).

Information regarding coal mining, oil and gas, and industrial mineral mining activities in the Project area in Pennsylvania was obtained from the Pennsylvania Geospatial Data Clearinghouse ([PGDC] 2018a,b,c,d). No mining permits or active, inactive, or abandoned coal mines were identified within 0.25 mile of the Project.

Based on data from the PGDC, there are no active or inactive oil and gas wells within 0.25 mile of the Project (PGDC 2018e). Further, no planned oil and gas wells were identified in the Project area based on a review of permits (PADEP 2018b). The Project would not cross any known gas storage facilities (USEIA 2016a,b). No industrial mineral resource extraction operations were identified within 0.25 mile of the Project in

Pennsylvania or Delaware (USGS 2018a; PGDC 2018f). Therefore, we conclude that no mineral resources would be impacted as a result of the Project.

Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and/or structures, and injury to people. Such hazards typically are seismic-related, including earthquakes, surface faulting, and soil liquefaction. Other potential hazards include landslides, flooding, and ground subsidence (including karst terrain). These hazards, as well as the feasibility of utilizing HDD based on geologic conditions present in the Project area, and the potential for an inadvertent return of drilling fluid to the surface during HDD activities are discussed below.

Seismic Hazards

The horizontal force a structure must withstand during an earthquake is related to ground acceleration, and seismic hazards can be assessed utilizing peak ground acceleration (PGA) values, expressed as the equivalent to the acceleration of a falling object due to gravity (g). Based on USGS seismic hazard mapping, the Project facilities are proposed in an area where the maximum PGAs of 10 to 12 percent g have a 2 percent chance of being exceeded in 50 years, and PGAs between 2 and 4 percent g have a 10 percent chance of being exceeded in 50 years. For reference, a PGA of 10 percent g is generally considered the minimum threshold for damage to older structures or structures not constructed to resist earthquakes. A 2 to 4 percent g PGA is characterized as light to moderate perceived ground shaking and very light to no potential damage (Worden and Wald 2016).

The Project would be in a region of low historical earthquake activity. A review of earthquake activity over the last 50 years identified 63 events within 30 miles of the Project, all with Richter scale magnitudes of 4.6 or less (USGS 2018b). These earthquakes were generally more than 10 miles from the Project area.

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 2018c). According to the USGS Quaternary Fold and Fault Database, no Quaternary-age faults would be crossed by the Project (USGS 2018d). As such, we conclude the risk of a significant earthquake in the Project area damaging Project facilities is low and the risk of seismic ground faulting to occur is also low. Similarly, because the Project area has a low potential for strong prolonged ground shaking associated with seismic events, we conclude 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. Potential causes of construction-induced landslides 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. The Project is in an area that has a low susceptibility to landslides (Delano and Wilshusen 2001). Areas of active construction for the Project would not traverse slopes greater than 25 percent. Additionally, most of the Project area has been previously disturbed during construction of the Existing System, thus the locations for the proposed new facilities have been graded and leveled. Similarly, since the majority of the laterals (81 percent) would be collocated or adjacent to existing rights-of-way, and the new stations would be sited at or adjacent to previously developed areas, these areas have been graded and leveled. As such, we conclude the potential for landslides to occur during construction or operation of the Project is negligible.

Subsidence

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst formation due to limestone or gypsum bedrock dissolution; sediment compaction due to groundwater pumping and/or oil and gas extraction; and underground mining. Subsidence can range from small, localized areas of collapse, to a broad, regional lowering of the ground surface.

Karst features, including sinkholes, caves, and caverns, form as a result of long-term dissolution of soluble bedrock such as limestone, dolomite, and gypsum. The USGS Digital Map Compilation and Database for karst in the U.S. was used to determine areas where karst features exist, or could exist, in the proposed Project area (USGS 2014). Bedrock formations with the potential to form karst features are present in the area of the Martins Creek Station, MLV 2, along portions of the Existing System north of MLV 2, and in Northampton County where bedrock comprises limestone and dolomites. Additionally, a desktop review of the PADCNR historic karst feature data identified surface depressions in the area of the Martins Creek Station, about 1.0 mile northwest of MLV 2, and along the same portions of the Existing System as noted above (PADCNR 2018a).

We received comments expressing concern for the Existing System's proximity to karst areas, and examples of where erosion along the Existing System had occurred historically. Karst/erosional remediation activities were completed by IEC in 2016 and 2018 at three locations along the existing mainline, as discussed in its *Karst Remediation*

Activity for 2018 memorandum dated June 21, 2018.[14] Two of the areas (MPs 73.2 and 81.7) were assessed and remediated by IEC by backfilling and compacting to address erosion issues in 2018. The third area (MP 70.2) was remediated to address land subsidence in 2016. IEC states that the repair was successful and additional subsidence has not occurred at this location since 2016. Given the presence of potential karst along the Existing System, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary of the Commission (Secretary), for review and written approval by the Director of the Office of Energy Projects (OEP), a Karst Monitoring Plan for the Existing System. The plan should include:**

  a. frequency and duration of monitoring;

  b. conditions requiring remedial action; and

  c. the karst remediation measures Adelphia will implement along the Existing System.

As discussed above, there are no active or inactive oil and/or gas wells within 0.25 mile of the Project and there are no active or abandoned subsurface mines within 0.25 mile of the Project. Land subsidence resulting from groundwater extraction typically occurs in unconsolidated aquifer systems (USGS 2000b). In addition, groundwater extraction has resulted in the formation of sinkholes in karst areas. As discussed above, construction of the new Project facilities would not affect karst areas; therefore, we conclude that based on our analysis and recommendation above for the Existing System, land subsidence due to groundwater over-pumping, mine subsidence, or oil and gas extraction would not occur in the Project area.

Flash Flooding

Portions of the Tilghman Lateral and the following Project components would be within the Federal Emergency Management Agency 100-year floodplain: Paoli Pike and Schuylkill River BAVs and the permanent access roads to the Cromby, Chester Creek, Paoli Pike, and Schuylkill River BAVs. Project facilities within floodplains include existing valves that would be replaced with BAVs requiring minor ground disturbance (generally expansion of the existing 15-foot by 15-foot site to a 30-foot by 30-foot site) or new components that would be buried (i.e., pipeline laterals with a typical construction right-of-way of 65 feet); therefore, we conclude that the Project facilities would not discernably alter the flood storage 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. As discussed in section B.2.2, the

[14] Available on eLibrary under accession no. 20180813-5039.

Tilghman Lateral would cross two waterbodies: Marcus Hook Creek and Stoney Creek. Adelphia would cross Marcus Hook Creek using the HDD method, at an anticipated depth of over 33 feet beneath the streambed. Adelphia would install the pipeline with a minimum cover of 3 feet between the streambed and the top of the pipeline at the Stoney Creek crossing. To minimize erosion impacts, Adelphia has committed to implementing erosion and sediment control techniques in accordance with our Plan and its E&SCP. Temporary erosion controls would be maintained until permanent erosion control devices are established or restoration is completed. In addition, Adelphia would maintain the pipeline in accordance with USDOT-PHMSA pipeline standards at 49 CFR 192, which include requirements for pipeline monitoring during operation. Adelphia performed preliminary buoyancy calculations and determined weighted pipe would not be needed even in the event of flash flooding. Therefore, we conclude that Project facilities would not be adversely impacted by bank erosion or scour hazards.

Blasting

Blasting is sometimes required for pipeline projects in areas with shallow bedrock (bedrock less than 6 feet from the surface). Areas with potentially shallow bedrock were identified using the U.S. Department of Agriculture – Natural Resources Conservation Service's (USDA-NRCS) Web Soil Survey (USDA-NRCS 2017). Although shallow bedrock is anticipated to underlie approximately 57.6 percent of the Project workspace, blasting is not proposed. Where necessary, Adelphia would avoid blasting by breaking apart large stones or bedrock using conventional rock-trenching methods such as ripping, grinding, chipping, or hammering. In the event that blasting becomes necessary, Adelphia would submit a blasting plan to FERC for review and FERC's approval prior to beginning blasting activities. Therefore, we conclude that the Project area (including structures) would not be significantly impacted by blasting.

HDD Feasibility and Geotechnical Investigation

The length of an HDD alignment, pipeline diameter, and subsurface material along the crossing are factors in the technical feasibility of an HDD installation. Subsurface conditions that can affect feasibility of an HDD installation include excessive rock strength and abrasivity, coarse granular materials, poor bedrock quality, overburden/bedrock transitioning along the drilled hole, solution cavities, and artesian conditions. Drilling fluid circulated downhole will flow in the path of least resistance. In the drilled annulus, the path of least resistance may be an existing fracture or fissure in the soil or rock substrate. When this happens, circulation could be lost or reduced. This is a common occurrence in the HDD process. Loss of drilling fluids does not prevent completion of the drilled alignment, nor does it necessarily encompass an inadvertent return of drilling fluids at ground surface. Chances for an inadvertent return to occur are greatest near the drill entry and exit points where the drill path has the least amount of ground cover. Adelphia has proposed the use of the HDD construction method at nine locations along the Tilghman Lateral in Delaware County, Pennsylvania. To minimize

potential drilling complications, including inadvertent returns, Adelphia would contract with an HDD installation contractor who would follow various industry standard best management practices, such as monitoring drilling fluid makeup and injection rates, maintaining a clean borehole during the drilling process in order to minimize annular borehole pressures, and installing conductor casing, if necessary, at entry and exit locations. Additionally, Adelphia would follow its IRCP which outlines specific procedures to minimize and address inadvertent returns during HDD operations and which would be finalized prior to construction of the Project. We have requested specific changes to the IRCP with our recommendation in section B.1.2.

As discussed in section A.7.2, Adelphia filed a geotechnical engineering report for the Project. Based on the results of the geotechnical investigation documented in Adelphia's engineering report, we believe that HDDs are a feasible installation method for the proposed pipeline. However, due to the relatively thin cover of unconsolidated materials overlying bedrock along the alignments there could be complications with the drill encountering bedrock and a transitioning of the drilled hole through unconsolidated overburden materials into and out of bedrock. This could not only present challenges during drilling, but also during pull back of the product pipeline due to misalignment of the drilled hole. Additionally, the occurrence of coarse granular material (cobbles) along the alignment could facilitate both the loss of drilling fluids as well as instability of the drilled hole. Given these potential complications, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary a final HDD feasibility assessment regarding the potential misalignment of the drilled hole through unconsolidated overburden/bedrock interface(s) along the HDD alignments. Adelphia should also include in the assessment an evaluation of the potential for hydrofracture and an inadvertent return using the U.S. Army Corps of Engineers' Delft method[15] (or an equivalent method) for drilling through unconsolidated material, and/or a qualitative analysis for an inadvertent return through bedrock utilizing rock quality designation values obtained from the bedrock cores.**

Ground excavation would be generally limited to trenching and facility installation during construction; no additional ground would be excavated during operation of the Project. Therefore, no operational impacts on geologic resources would occur. With strict adherence to the mitigation measures identified and our recommendations, we conclude impacts on geologic resources, including geologic hazards, are not anticipated to be significant.

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15 *Recommended Guidelines for Installation of Pipelines beneath Levees using Horizontal Directional Drilling*, prepared for USACE, Kimberlie Staheli [*et al.*], April 1998.

1.2 Soils

Soil characteristics in the Project area were assessed using the USDA-NRCS Web Soil Survey (USDA-NRCS 2017). 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.

Soil Limitations

Soils were grouped and evaluated according to characteristics that could affect construction or increase the potential for operational impacts. These characteristics include: designated 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 9.4 acres (20.1 percent) of land affected by the proposed Project are classified as prime farmland or farmland of statewide importance (see table B-2). The Project would not impact soils designated as unique or locally important farmland. Conservation easements are discussed in section B.5.3. Of this 9.4 acres, Adelphia would restore 4.1 acres to preconstruction conditions for agricultural use in accordance with our Plan. As such, Adelphia would impact about 5.3 acres of prime farmland or farmland of statewide importance, which would be permanently converted to developed land as a result of the construction of the proposed aboveground facilities and permanent access roads. However, no soils classified as prime farmland or farmland of statewide importance affected by the Project are currently cultivated. Due to the availability of prime farmland and farmland of statewide importance in the vicinity of the Project and the lack of cultivated agricultural land in the Project area, we conclude impacts on prime farmland and farmland of statewide importance from the Project would be permanent, but minor and not significant.

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]	Shallow Bedrock[d]	Stony / Rocky Soils[e]	Low Revegetation Potential[f]
Pipeline Laterals					
Parkway Lateral	0.0	0.1	0.0	0.0	1.4
Tilghman Lateral	3.6	1.1	20.9	20.9	20.9
Aboveground Facilities					
Delmarva Meter Station	0.0	0.0	0.0	0.0	0.6
Marcus Hook Compressor Station and contractor wareyard	0.0	6.7	0.0	0.0	0.7
Martins Creek Station	0.1	0.0	2.0	0.0	1.8
Monroe Meter Station	0.0	0.0	<0.1	<0.1	<0.1
Quakertown facilities	2.3	0.0	1.4	2.3	1.4
Skippack Tap Valve	0.1	0.0	0.1	0.0	0.0
Tilghman Meter Station	0.0	0.0	0.1	0.1	0.1
Transco Meter Station	0.5	0.4	0.0	0.0	0.0
Access roads	2.4	0.4	2.2	0.4	1.5
MLVs and BAVs	0.5	0.2	0.4	0.1	0.0
Project Total	**9.4**	**8.9**	**26.9**	**23.7**	**28.3**
Percent of Project area[g]	**20.1**	**19.1**	**57.6**	**50.7**	**60.6**

[a] Numbers are reported in acres unless otherwise noted. 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. Highly compaction prone soils include soils with drainage classification ratings of poor and very poor.

[d] Includes soils that have lithic bedrock or paralithic bedrock within 6 feet of the soil surface according to the USDA-NRCS.

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

[f] Includes soils with a USDA-NRCS Non-irrigated Capability Class of 7 or 8.

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

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 and wetland 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 about 19.1 percent of the Project footprint, as shown in table B-2. To minimize compaction, Adelphia would adhere to our Plan and its Procedures. Measures in the Plan include segregating topsoil in all residential areas and other areas at the landowner's request and testing topsoil and subsoil for compaction. Adelphia would decompact subsoil, if necessary, using deep tillage implements to restore areas to pre-construction conditions. Additionally, Adelphia has committed to plowing subsoil prior to replacement of topsoil. In areas that have become compacted, limiting percolation of stormwater during construction activities, Adelphia would conduct compaction testing and decompaction, as necessary, to reduce further runoff during construction.

During spring thaw, Adelphia would adhere to its Winter Construction Plan which specifies the use of equipment mats where soils are excessively wet to minimize rutting and mixing of topsoil and subsoil, and specifies postponing construction activities until early morning or evening when the ground is frozen in excessively wet areas.

Overall, Adelphia's implementation of the measures described above would minimize the amount of soil compaction; therefore, we conclude that impacts on soil compaction would be not significant.

Soil Erosion

Soil erosion potential is dependent on 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 on moderate to steep slopes. Soils with a lighter texture (i.e., sandy, loamy) occurring in areas of bare or sparse vegetative cover are typically more susceptible to erosion by wind. None of the soils crossed are highly susceptible to erosion by water or wind; however, clearing, grading, and equipment movement can accelerate the erosion process and, without adequate protection, could result in discharge of sediment to waterbodies and wetlands. Adelphia would minimize the potential for erosion and offsite migration of sediments by using temporary erosion control devices, such as silt fencing, hay or straw bales, or temporary slope breakers in accordance with our Plan, and Adelphia's Procedures and E&SCP. Adelphia would place spoil piles a minimum of 10 feet from the edge of surface waterbodies and stabilize these piles with sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, in accordance with our Plan and its Procedures, to minimize soil loss due erosion caused by wind and water. In addition, Adelphia would implement its Fugitive Dust Plan which includes watering construction areas for dust control, thus reducing soil loss due to wind erosion.

EIs would regularly monitor erosion control devices during construction. After construction, Adelphia would monitor and maintain erosion control devices until the area is stabilized or until permanent controls can be installed. In accordance with our Plan, it would complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, temporary erosion controls (i.e., temporary slope breakers, sediment barriers, and mulch) would be maintained until conditions allow for completion. Revegetation measures would be applied in accordance with our Plan and Adelphia's Procedures as soon as possible following completion of construction activities. These measures would minimize the amount of soil loss as a result of erosion. Therefore, we conclude that Project soil erosion impacts would be short-term and not significant.

Shallow Depth to Bedrock and Stony/Rocky Soils

Construction through stony/rocky soils or soils with shallow bedrock (those with bedrock less than 6 feet from the surface) could result in the incorporation of stones or bedrock fragments into surface soils, which could interfere with agricultural practices and inhibit revegetation efforts. Stony/rocky soils are anticipated to occur within 50.7 percent of the Project workspace and shallow bedrock is anticipated to occur within 57.6 percent of the Project workspace (see table B-2). As previously discussed, Adelphia is not proposing blasting for the Project.

In areas where topsoil would be segregated (i.e., residential areas), excess rock and large stones unearthed during decompaction would be removed from at least the top 12 inches of soil prior to replacement in accordance with our Plan and Adelphia's E&SCP. 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. In addition, Adelphia would follow measures outlined in our Plan to minimize and avoid adverse effects due to topsoil mixing which include: segregation of at least 12 inches of topsoil in deep soils and make every effort to segregate the entire topsoil layer in soils with less than 12 inches of topsoil; maintaining separation of salvaged topsoil and subsoil throughout all construction activities; and stabilizing topsoil piles to minimize loss due to wind and water erosion. With adherence to mitigation measures outlined in our Plan and because blasting is not required for construction of the Project, we conclude impacts on bedrock and stony/rocky soils would not be significant.

Low Revegetation Potential

Revegetating areas affected by construction of the Project may be more difficult in areas with low revegetation potential. About 60.6 percent (28.3 acres) of soils within the Project area were determined to have a low revegetation potential (see table B-2). Of the 28.3 acres of soils determined to have a low revegetation potential within the

Project area, 24.3 acres are classified as urban or made land[16] and 4.0 acres are in areas of previous disturbance where vegetation has been removed and the areas are covered with gravel (e.g., Martins Creek and Quakertown facilities and access roads). Construction activities at the Martins Creek Station would be limited to installation of a chain-link fence in an area of graveled land. Activities at the Quakertown facilities site would occur partially within the existing facility where land is industrial-use. Additionally, soils at this facility would be paved or graveled for operation. Because these sites are in urban/made land or graveled areas, which are void of vegetation, revegetation is not a concern.

The potential for successful revegetation for the remaining Project soils would be high or moderate. Workspace not covered with gravel or asphalt would be graded, restored, and reseeded in accordance with our Plan, and Adelphia's Procedures, specific landowner requests, and/or consultations with local soil conservation authorities. Adelphia would verify that any imported soils for use in residential areas is certified noxious weed and soil pest free unless otherwise approved by the landowner, and Adelphia would implement its Noxious Weed Plan to minimize the establishment and spread of noxious and invasive weeds during construction activities.[17] We conclude that implementation of our Plan and Adelphia's Procedures and E&SCP, as well as Adelphia's adherence to its Noxious Weed Plan, would result in successful revegetation of the Project workspaces and no significant soils impacts would occur as a result of the Project from lack of revegetation or invasive species.

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. Based on our review of the USEPA's Cleanups in My Community (CIMC) website, two Resource Conservation and Recovery Act (RCRA) Corrective Action sites and one USEPA Superfund Site were identified in the vicinity of the Project along the Tilghman Lateral (USEPA 2018a). These sites have known contamination and are undergoing cleanup and remediation activities as described below. Also, in consultation between Adelphia and PADEP the contamination may exist at the proposed site of the Marcus Hook Compressor Station. In consultation with the USEPA, Adelphia has prepared a Draft SAP, discussed further below.

The Congoleum Corporation Plant 3 is a 51.4-acre site about 10 feet from the proposed Tilghman Lateral at MP 1.5. In 2016, the USEPA determined that the Congoleum Corporation completed the requirements for RCRA Corrective Action. Institutional controls are in place at the site restricting land and groundwater usage due to

[16] Consisting of Udorthents, shale and sandstone.

[17] Adelphia's draft Noxious Weed Plan is available on eLibrary under accession no. 20180813-5039.

exceedance of residential standards for heavy metals in soil and groundwater (USEPA 2018a). Based on Adelphia's description of proposed activities near the Congoleum Corporation Plant 3, and given the many potential sources of contamination in the vicinity, the USEPA recommended that Adelphia develop a sampling plan. The plan should include the collection of soil samples to the depth of pipeline installation and groundwater samples to a depth of 1 foot below the maximum drill depth. For the portion of the Tilghman Lateral that would be adjacent to the Congoleum Corporation Plant 3, samples should be collected every 150-200 feet for analysis of heavy metals and volatile and semi-volatile organic compounds. The USEPA also recommended researching groundwater data from nearby Superfund sites to assess other analytes that should be tested. These recommendations were generally incorporated into Adelphia's Draft SAP. This plan and our recommendation are discussed below.

The Metro Container Corporation Superfund site is a 10.4-acre site adjacent to the Tilghman Lateral at MP 2.6. This Superfund site was added to the National Priorities List by the USEPA in 2012. Adelphia has proposed an HDD adjacent to the site that, as currently proposed, includes an ATWS within the Superfund site. This site has been used for industrial and commercial purposes for over 100 years. Soil and groundwater at the site are contaminated with polychlorinated biphenyls (PCB), inorganics, polycyclic aromatic hydrocarbons (PAH) and/or volatile organic compounds (VOC) (USEPA 2018b). Multiple removal actions have occurred since 1988 to contain and remove contaminants from the property. The USEPA implemented a limited response action at the site from 2013 to 2014 (GHD 2015). The current extent of contamination is unknown, as such there is potential for Project activities to expose contamination during construction. Adelphia is in consultation with the USEPA and PADEP regarding the Project and this site. Based on the USEPA review of the Project and the Metro Container Corporation site, the USEPA does not anticipate the Project would negatively affect future response actions associated with the site.[18] In consultation initiated by Adelphia, the USEPA concluded there is low probability of workers encountering site-related hazardous substances at unsafe levels; however, the USEPA recommended that Adelphia implement the following precautionary measures during construction:

- screening excavations for carbon disulfide gases;
- adhering to characterization and disposal of waste, specifically HDD cuttings, per standard environmental procedures and laws; and
- analyzing HDD cuttings for PCBs in addition to other required characterization analysis.

[18] USEPA correspondence regarding this site is available on eLibrary under accession no. 20181002-5167.

To date, Adelphia has not incorporated USEPA's recommendation into its SAP; however, Adelphia continues to consult with USEPA regarding potential impacts from the Project in proximity to the Metro Container Corporation Superfund site.

The Monroe Energy site is about 350 acres in size and is adjacent to MP 2.7 of the proposed Tilghman Lateral. The USEPA initiated a RCRA Facility Assessment at the site in 1989. The RCRA Facility Assessment Report was finalized in 1991 and required further action/investigation to address soil, groundwater, and air contamination. Investigation and remediation activities have been ongoing since 1991. Human exposure and groundwater are listed as "controlled" (based on the results of groundwater monitoring, contamination is not migrating) according to the information provided through the USEPA's CIMC website (USEPA 2018a). Corrective action remains ongoing at the site and includes quarterly groundwater sampling events.

In addition, two contaminated sites were identified near MLV 2: the Foote Mineral Company Superfund site and Johnson Mathey-West Whiteland CIMC site. The sites are 0.3 mile north and 0.6 mile northwest of the proposed MLV 2 site, respectively (USEPA 2018a). The Foote Mineral Company site is a 79-acre property in East Whiteland Township, Pennsylvania. Remediation has been underway at the site since the early 1990s and has included: removal of radioactive soils, stabilization of process tailings, and consolidation of site wastes and capping the quarry area. Semi-annual groundwater monitoring is on-going to monitor progress. In September 2017 an Institutional Control in the form of an environmental covenant was established. Additionally, this site has met the requirements for the USEPA's Sitewide Ready for Anticipated Use classification, meaning all aspects of the site cleanup are in place and have been achieved and no unacceptable risks are present (USEPA 2018a). Based on USEPA's review of the Project, it is not anticipated that the Project would negatively affect future response actions associated with the Foote Mineral Company Superfund site. Given the USEPA's review of the site, distance from the Project, and current status of the site cleanup, we conclude the Project would not negatively affect the site.

The Johnson Mathey-West Whiteland CIMC site is a 20-acre property in West Chester, Pennsylvania. Corrective action is underway and human exposure and groundwater are listed as controlled according to the information provided through the USEPA's CIMC website (USEPA 2018a). Currently, Adelphia does not plan to conduct soil or groundwater investigations within the Project area for the proposed MLV 2. If suspected contaminated soils or groundwater were identified during construction (e.g., malodorous soils and/or groundwater with visible staining and/or sheen), Adelphia would implement its Unanticipated Discovery of Contamination Plan. This plan specifies measures to protect workers and minimize the spread of contamination which include but are not limited to: stopping work in the area of suspected contamination; evacuation of personnel to an up-wind location; coordination of mobilization of emergency response personal and notification/coordination with the USEPA and/or state and local agencies in

regards to response action; sampling and analysis; and proper handling of any excavated soils. While the USEPA has not provided comments on the status of the Johnson Mathey-West Whiteland CIMC site, given the distance from the Project area (0.6 mile), we conclude that the Project would not negatively affect the site.

Based on our review of PADEP's Hazardous Sites Cleanup Activities, Storage Tank Cleanup Activities, and Land Recycling Cleanup Activities, seven Land Recycling Cleanup sites were identified within 0.25 mile of the Tilghman Lateral (PADEP 2018c,d,e,f; PGDC 2018g), see table B-3. The program encourages voluntary cleanup of contaminated industrial and commercial sites by the public sector to allow for safe use of the site.

Table B-3
Contaminated Sites within 0.25 mile of the Tilghman Lateral

Site Name	Affected Media	Contaminants of Concern	Nearest Milepost	Approximate Distance – Direction from Nearest Milepost (feet) [a]
Latch Rosen Prop/ConocoPhillips Trainer Ref	Soil, Groundwater	Inorganics, Pesticides	2.5	950 – west
Abbonizio Recycling Facility	Soil	Other Organics, PAH	3.3	915 – southeast
Sunoco LLC Marcus Hook	Soil, Groundwater	Inorganics, Fuel Oil No 2, Fuel Oil No 6	0.8	275 – southeast
Marcus Hook Ref Auto Lab	Soil, Groundwater	Not provided	0.7	945 – southeast
Edwards Res	Soil	Not provided	1.2	690 – southeast
Peco Pkg Lot City Of Chester Greenspace & Riverwalk	Soil	Chlorinated Solvents, PAH	4.4	460 – southeast
Abm Wade Site	Soil, Groundwater	Not provided	4.2	550 – southeast

Source: PADEP 2018c,d,e,f; PGDC 2018g

[a] Distances are based on available information on site location. Extent of contamination present at the site may be closer to the Project location.

Adelphia filed a Draft SAP detailing soil and groundwater sampling activities it would conduct along the Parkway and Tilghman Laterals, which includes the installation of 57 borings.[19] Adelphia would collect soil and groundwater samples along each of the laterals at intervals of about 1,500 feet, except adjacent to the Metro Container Corporation and Congoleum Corporation Plant 3 sites, where samples would be collected every 100 feet. All samples would be analyzed for VOCs, semi-volatile organic compounds, and heavy metals. Adelphia currently does not have survey access to the

[19] The draft plan, which includes a figure depicting the proposed sample locations is available on eLibrary under accession no. 20181002-5167.

Monroe Energy site; therefore, samples at nearby points in this area would be collected. Adelphia would also collect samples at each HDD entry and exit point.

If contamination is identified in the Project area prior to construction, Adelphia would consult with the USEPA and PADEP to identify appropriate response activities, including additional mitigation measures based on site-specific conditions during construction to minimize the spread of contamination in soil and/or groundwater at these sites. If contamination is identified in the Project area during construction (e.g., malodorous soils and/or groundwater with visible staining and/or sheen), Adelphia would implement measures in accordance with its Unanticipated Discovery of Contamination Plan, and any additional measures that may be recommended by the USEPA and PADEP during consultation. Work in the area would be halted until the applicable agencies are notified and the extent of contamination is determined.

In the event of an inadvertent leak or spill of petroleum products or hazardous material, Adelphia would implement its SPCC Plan, which would specify cleanup procedures. The SPCC Plan would be finalized prior to construction of the Project, and provided to the FERC for review.

Due to the current and historic industrial land use of the Marcus Hook area, and because agency consultations regarding mitigation measures are still on-going, and sampling results from contaminated site investigation activities have not been provided, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary the Final SAP for the Parkway and Tilghman Laterals, including any USEPA and PADEP comments on the SAP, for review and written approval by the Director of OEP. The Final SAP should include:**

  a. a clear definition of the number of samples, depth of sample collection, and analysis for each sampling location;

  b. a commitment to plug and abandon borings/monitoring wells in accordance with state and federal guidelines;

  c. sampling every 100 feet near the PADEP contaminated sites listed in table B-3 of the EA and expanded analytical testing to include known contaminants;

  d. addition of PCBs to the SAP for soil and groundwater samples collected adjacent to the Metro Container Corporation site; and

  e. site-specific plans for construction in areas of contamination, based on USEPA and PADEP consultations, that include:

(1) the extent of contamination in relation to construction work areas;

(2) description of the contamination plumes (i.e., migrating, stable), where available;

(3) identification of areas where Project construction (including HDDs) could create a preferential migration path for contamination; and

(4) proposed mitigation measures developed in consultation with the USEPA and PADEP.

To minimize the potential for inadvertent releases of drilling fluid to the ground surface at HDD locations and provide timely response to mitigate impacts on the environment, Adelphia would implement its IRCP. Adelphia would ensure that all drilling returns are sampled to assess for environmental contamination and ensure wastes are disposed of in accordance with regulatory requirements. In addition, Adelphia would conduct soil and groundwater sampling to assess the presence of contamination at HDD entry and exit points as detailed in its Draft SAP and implement measures to minimize the spread of any subsurface contamination from construction, in consultation with the USEPA and PADEP. However, the IRCP does not address mitigation measures in the event of an inadvertent release in an area of existing contamination; therefore, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary a revised IRCP, for review and written approval by the Director of OEP, which addresses containment and cleanup measures for inadvertent releases in areas of contamination.**

<u>General Impacts and Mitigation</u>

Construction activities such as clearing, grading, trench excavation, installation, backfilling, and the movement of construction equipment along the rights-of-way would impact soil resources. Clearing the rights-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 soils with a shallow depth to bedrock can bring stones or rock fragments to the surface that could interfere with restoration of the rights-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 drilling fluid could adversely affect soils.

Adelphia would implement our Plan and its Procedures to minimize impacts on soils associated with the Project. Measures to segregate topsoil from subsoil in residential areas and in other areas at the landowner's request would contribute to post-construction revegetation success, and minimize the potential for long-term erosion. Implementation of Adelphia's Noxious Weed Plan would control and minimize the introduction of weeds and invasive plant species in the Project area. Additionally, Adelphia would implement its Winter Construction Plan in conjunction with other plans during winter months to mitigate for winter-specific Project construction impacts.

Construction and operation of the Project would convert about 5.3 acres of prime farmland and farmland of statewide importance to industrial/commercial use. This constitutes a permanent, but minor impact due to the availability of prime farmland and farmland of statewide importance in the vicinity of the Project and that there is no actively cultivated agricultural land in the Project area. In addition, the permanent compaction of soils beneath aboveground facilities and access roads would have permanent hydrological impacts on the area; however, impacts would be highly localized and minor. We conclude that Adelphia's implementation of our Plan and Adelphia's Procedures and its E&SCP, adherence to its SPCC Plan, Unanticipated Discovery of Contamination Plan, IRCP, Winter Construction Plan, Fugitive Dust Plan, and Noxious Weed Plan during construction and restoration, in combination with our recommendations, would adequately minimize impacts on soils, and no significant impacts on soils as a result of the Project would occur.

In addition, prior to the start of construction Adelphia would develop its site-specific E&SCP which would be approved by the applicable County Conservation Districts that administers the National Pollutant Discharge Elimination System Program in conjunction with the PADEP.

2. Water Resources and Wetlands

2.1 Groundwater Resources

Existing Groundwater Resources

The Project overlies four types of bedrock aquifers: Piedmont and Blue Ridge aquifers in early Mesozoic basins (sandstone and shale), carbonate rock, crystalline rock, and Valley and Ridge carbonate-rock aquifers (Trapp and Horn 1997). Aquifers in early Mesozoic basins and carbonate rocks are more productive than crystalline-rock aquifers. Recharge is highly variable and is dependent on local precipitation and runoff, topographic relief, and land surface available for infiltration (Trapp and Horn 1997). Bedrock aquifers crossed by the Project are summarized in table B-4 below.

Typical well yields in large diameter wells in early Mesozoic basin aquifers range from about 5 to 80 gallons per minute (gpm), and wells greater than 200 feet deep have

higher yields (Trapp and Horn 1997). Carbonate rock aquifers are mainly composed of limestones and dolomites. Well yields in carbonate rocks depend on the degree of fracturing and development of solution cavities. Water well yields in the Great Valley section of the Valley and Ridge province are reported to range from 25 to 210 gpm. 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, averaging around 18 gpm in the Project vicinity (Trapp and Horn 1997).

Table B-4
Bedrock Aquifers Crossed by the Project

Aquifer	Type	Project Sites
Piedmont and Blue Ridge	Early Mesozoic basins (sandstone and shale)	MLV 1 Chester Creek BAV Paoli Pike BAV Skippack Tap Valve Quakertown facilities French Creek BAV Cromby BAV Schuylkill River BAV Perkiomen Creek BAV East Perkiomen Creek BAV
	Carbonate rock	MLV 2
	Crystalline rock	Marcus Hook Compressor Station Delmarva Meter Station Transco Meter Station Monroe Meter Station Tilghman Meter Station Parkway Lateral Tilghman Lateral
Valley and Ridge	Carbonate rock	Martins Creek Station

Source: Trapp and Horn 1997

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. Several sites in the Project workspace and vicinity have known groundwater contamination and are undergoing cleanup and remediation activities. Additional details regarding these sites are included in section B.1.2.

Adelphia conducted a geotechnical investigation at the proposed HDD crossings along the Tilghman Lateral to verify sub-surface geologic conditions, groundwater, and potential contamination. Based on bore logs, groundwater was encountered at depths ranging from 8 to 16 feet below ground surface at HDD locations along the Tilghman Lateral. Additionally, shallow groundwater may be encountered during construction at Project areas in close proximity to waterbodies (i.e., Tilghman Lateral at the Marcus Hook Creek and Stoney Creek crossings) and areas near documented wetlands (i.e.,

Chester Creek, Paoli Pike, Schuylkill River, East Perkiomen Creek, and Perkiomen Creek BAVs, and the Quakertown facilities).

Designated Sole Source Aquifers

The USEPA defines a sole source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer and for which there are no reasonably available alternative drinking water sources should the aquifer become contaminated. The sole source aquifer program enables the USEPA to review proposed projects that are receiving federal funding to ensure the projects do not contaminate the sole source aquifer. The Marcus Hook Compressor Station (which would also be used as a wareyard) and the two laterals and associated interconnects would be within the Delaware River Streamflow Zone/New Jersey Coastal Plains Aquifer sole source aquifer zone (USEPA 2018c).

Water Supply Wells and Seeps

Adelphia identified wells and springs within 150 feet of the Project; no springs were identified. One industrial well, four unused wells and 13 wells of "other" use were identified within 150 feet of the Project (see table B-5). Additionally, an industrial water well is within the fenceline of Martins Creek Station; however, construction is not planned within 150 feet of this well. No changes in annual groundwater withdrawal are planned for the Martins Creek Station industrial water well to support further operations at the facility.

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 and Delaware, the SWPA program includes the wellhead protection program. The Project would not cross any wellhead protection areas in Delaware (FirstMap Delaware 2018). In the counties crossed by the Project in Pennsylvania, some public water supply providers have defined SWPAs for their wellheads and source water (Pennsylvania Source Water Protection 2010). For Project areas within Pennsylvania, Adelphia is in consultation with the Chester Water Authority and Richland Township Water Authority, responsible for public water supply service in the Project area, to confirm if any SWPAs and/or wellhead protection areas have been established. The Richland Township Water Authority identified three water source wells: 2 wells about 1.8 miles northwest of Quakertown facilities (Entry point 101) and 1 well about 2.0 miles northeast of Quakertown facilities (Entry point 103). The Chester Water Authority identified water facility assets in the Project Area which included water mains and transmission mains, but did not include surface or groundwater sources. Through implementation of our Plan, Adelphia's Procedures, SPCC Plan, and IRCP, Adelphia would mitigate potential impacts on SWPAs and wellhead protection areas and we would

not expect impacts on these areas. Further, Adelphia would implement the measures described in section A.7.2 when crossing utilities.

Table B-5
Groundwater Supply Wells within 150 Feet of Proposed Work Areas

Nearest Project Component	Well Use	Water Use[a]	Nearest Milepost	Distance – Direction from Nearest Milepost (feet)
Marcus Hook Compressor Station	Abandoned	Other	0.0	0
Marcus Hook Compressor Station	Abandoned	Other	0.0	0
Marcus Hook Compressor Station	Abandoned	Other	0.0	0
Marcus Hook Compressor Station	Abandoned	Other	0.0	0
Tilghman Lateral	Unused	Industrial	1.4	130 – NW
Tilghman Lateral ATWS-TL-05	Monitoring	Other	1.1	132 – W
Tilghman Lateral ATWS-TL-17	Not Provided	Other	2.9	148 – N
Tilghman Lateral ATWS-TL-17	Not Provided	Other	2.9	101 – NW
Tilghman Lateral ATWS-TL-17	Not Provided	Other	2.9	66 – SW
Tilghman Lateral ATWS-TL-21	Test	Other	3.9	22 – SE
Tilghman Lateral ATWS-TL-21	Observation	Unused	3.9	66 – SE
Tilghman Lateral ATWS-TL-21	Test	Other	3.9	22 – SE
Tilghman Lateral ATWS-TL-21	Observation	Unused	3.9	22 – SE
Tilghman Lateral ATWS-TL-21	Observation	Unused	3.9	22 – SE
Tilghman Lateral ATWS-TL-21	Observation	Unused	3.9	22 – SE
Tilghman Lateral ATWS-TL-21	Test	Other	3.9	22 – SE
Tilghman Lateral	Not Provided	Other	2.8	0
Tilghman Lateral	Not Provided	Other	2.8	0

Notes: NW = northwest; W = west; N = north; SW = southwest; and SE = southeast.
Source: PADCNR 2018c, DNREC 2017.
[a] Other is used to define an intended usage by the owner other that the following: air conditioning, agriculture, bottling, commercial, domestic, desalination, dewater, power (generation), fire (protection), geothermal, institution, irrigation, industrial, industrial (cooling), medicinal, mining, recreation, stock, unused.

General Impacts and Mitigation

Construction of the pipeline would generally require the excavation of a trench 6 feet deep to achieve a minimum depth of cover of 3 feet, except in consolidated rock where a minimum of 2 feet of cover would be required. We received comments regarding depth of cover and erosional concerns along the Existing System. A discussion of known areas where erosion occurs along the existing mainline and the potential for subsidence due to karst formation is included in section B.1.1, which also includes a recommendation for development of a Karst Monitoring Plan for the Existing System. Information regarding surface cover and pipeline safety is discussed in section B.9.4. Surface drainage and groundwater recharge patterns can be temporarily altered by

clearing, grading, trenching, and soil stockpiling activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. We expect the resulting changes in water levels and/or turbidity in these aquifers to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside. Soil compaction from construction could reduce the ability of the soil to absorb water, thereby reducing groundwater recharge.

Based on available data from the PADCNR Pennsylvania Groundwater Information System, depth to groundwater in the Project area could be as shallow as 8 feet below ground surface (PADCNR 2018c). In addition, Adelphia conducted a geotechnical investigation at HDD locations along the Tilghman Lateral. Based on boring logs provided, groundwater was encountered between 8 and 16 feet below ground surface and bedrock was encountered at depths between 22 and 47 feet below ground surface in the area of the Tilghman Lateral HDD locations. Impacts on groundwater from HDD operations would be minimized by the use of HDD fluid additives certified for conformance with National Sanitation Foundation and American National Standards Institute Standard 60, acceptable by PADEP HDD Guidance (PADEP 2018h). Drilling fluids, primarily composed of non-hazardous and non-toxic bentonite clay, can act to seal the walls of the borehole and would minimize the amount of drilling fluid released into the surrounding geologic formations and potentially reaching the ground surface. Water for use at HDD locations would be supplied from existing public water systems (e.g., fire hydrants) at a maximum anticipated volume of 1,750,000 gallons. Water would be recovered from drill cuttings, sampled for contamination, and if not contaminated, would be reused in order to reduce the volume of overall water needed for HDD activities. To avoid or minimize potential impacts on groundwater, Adelphia would comply with our Plan, and its SPCC Plan, E&SCP, and IRCP.

Adelphia has committed to consultation with the USEPA, state, and local agencies regarding requirements for the reuse of drilling fluids and water from boring to boring. Adelphia would contain drilling fluids onsite until tested for disposal in accordance with local disposal requirements. In the event an HDD location must be abandoned, Adelphia would prepare a site-specific grouting plan for submittal to the appropriate regulatory agency for review and approval. In general, the drilled hole would be grouted using a cement grout or cement/bentonite grout mixture from boring terminus depth to a depth of 5 feet below ground surface. The top 5 feet of the boring would be restored to previous conditions (i.e., soil, pavement) in accordance with Adelphia's IRCP.

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, Adelphia would implement its SPCC Plan during construction. The

SPCC Plan includes spill prevention measures and cleanup methods to reduce potential impacts should a spill occur. In addition, Adelphia would prohibit refueling and storage of hazardous substances within 400 feet of water wells.

Currently, no drinking water wells have been identified within 150 feet of any construction activities (table B-5). If drinking water wells are identified, Adelphia would offer pre-construction and post-construction evaluations of water quality and yield of drinking water wells within 150 feet of any construction to affected landowners. In the event of well damage during construction, Adelphia would provide a temporary water source to landowners for water supply wells and would mitigate the damage by conducting restoration, repair or replacement of water supply, including installation of a new well if applicable. We do not anticipate any impacts on water wells outside of 150 feet of construction. As discussed in section B.1.1, Adelphia is not proposing blasting as a construction technique for this Project.

Karst features were identified in the area of the Martins Creek Station, about 1.0 mile northwest of MLV 2, and along portions of the Existing System (PADCNR 2018a, USGS 2014). No wells were identified within 150 feet of the Project in these areas where karsts features were identified. Wells within the vicinity of the Existing System in karst areas were not assessed as there would be no ground disturbance in these areas related to the Project.

Lastly, there is low probability that pipeline operations would contaminate groundwater because methane is lighter than air. The methane would generally dissipate rapidly through the air in the event of a pipeline leak, thereby causing no impact on groundwater. Therefore, Project operation is not anticipated to impact groundwater quality.

If Adelphia encounters contaminated groundwater during construction, it would follow the procedures within the Unanticipated Discovery of Contamination Plan. Work in the area of contamination would be halted until the applicable agencies are notified and the extent of contamination is determined. As discussed in section B.1.2, multiple contaminated sites were identified within 0.25 mile of the Project. While the extent of contamination of these sites in relation to the Project area is unknown, with implementation of the mitigation measures described above, our recommendation (in section B.1.2), adherence to its SAP, and consultation with the USEPA and PADEP, we conclude that the Project would not result in significant impacts on groundwater resources in the Project area.

2.2 Surface Water Resources

Existing Surface Water Resources

Watersheds are classified by regions that drain into the same river system, which can be defined by topography. Rainfall drains from land into tributaries, which in turn drain into streams, rivers, and eventually the ocean. Many smaller watersheds (also known as sub-basins and sub-watersheds) are contained within larger watersheds. Project construction activity would occur within the larger Delaware River watershed, and within 11 hydrologic unit code (HUC) 12 sub-watersheds; the sub-watersheds and approximate locations are provided in table B-6.

Table B-6
Watersheds Crossed by the Project

Subwatershed (HUC 12)	Drainage Area (acres)	Facilities
Upper Tohickon Creek (020401050701)	28,239.4	Quakertown facilities
Eastern Branch Perkiomen Creek (020402030807)	39,018.5	East Perkiomen Creek BAV
Lower Perkiomen Creek (020402030809)	24,511.7	Perkiomen Creek BAV and Skippack Tap Valve
Mingo Creek – Schuylkill River (020402031006)	33,177.1	Schuylkill River BAV and Cromby BAV
Lower French Creek (020402030702)	30,047.5	French Creek BAV
Valley Creek (020402050104)	13,227.7	MLV 2
Ridley Creek (020402020602)	24,193.1	Paoli Pike BAV
East Branch Chester Creek (020402020603)	7,452.8	Transco Meter Station
Chester Creek (020402020605)	22,794.6	Chester Creek BAV, and MLV 1
Oldmans Creek – Delaware River (020402020608)	39,309.6	Parkway Lateral, Tilghman Lateral, Marcus Hook Compressor Station, and Delmarva Meter Station
Repaupo Creek – Delaware River (020402020607)	32,382.7	Tilghman Lateral, Monroe Meter Station, Tilghman Meter Station

In August 2018, Adelphia completed field surveys of the Project area to identify waterbodies that would be crossed by the proposed new pipeline laterals or otherwise within Project construction workspaces. 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.

The Tilghman Lateral would cross two waterbodies in Pennsylvania. Marcus Hook Creek is an intermediate (10- to 100-foot-wide), perennial waterbody and Stoney Creek is a minor (less than 10-feet-wide), intermittent waterbody as described in table B-7. No waterbodies are within construction workspaces for the Parkway Lateral, MLVs, BAVs, compressor stations, meter stations, or contractor wareyard.

Table B-7
Waterbodies Affected by the Project

Waterbody	Milepost	Flow Type	Crossing Length (feet)	Size Class[a]	Fishery Class[b]	Impaired Designated Use[c]	Crossing Method	In-stream Timing Restrictions
Tilghman Lateral								
Marcus Hook Creek	2.0	Perennial	12	Intermediate	WWF; MF	Impaired aquatic life use	HDD	June 1 – November 30
Stoney Creek	2.7	Intermittent	5	Minor	WWF; MF	Impaired aquatic life use	Dry Crossing	June 1 – November 30

Note: Class = Classification.

[a] Minor (<10-feet-wide); Intermediate (>10 - <100-feet-wide).

[b] As classified by PADEP under Pennsylvania Administrative Code Title 25 Chapter 93.9. WWF = Warm Water Fishes; and MF = Migratory Fishes (PADEP 2018g).

[c] State water quality classification has been defined in the Section 303(d) list (PADEP 2018g).

Sensitive Waterbody Crossings

The CWA requires that each state review, establish, and revise water quality standards for 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 CWA 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.

The Project facilities planned for construction would not cross state-designated High Quality or Exceptional Value waterbodies. In addition, they would not cross any designated fisheries of special concern (such as trout waters or waters containing special status species; see section B.3.2). The Project would not cross federally designated wild and scenic rivers. No waterbodies would be crossed or within Project workspaces in Delaware.

Both of the waterbodies that would be crossed by the Tilghman Lateral are listed as 303(d) impaired waterbodies for aquatic life use. Marcus Hook Creek is impaired due to metals, siltation, variable water flow, and habitat modification caused by land-based waste disposal, urban runoff/storm sewers, and habitat alterations. Stoney Creek is impaired due to siltation, variable water flow, and habitat modification caused by habitat alterations and urban runoff/storm sewers (PADEP 2018g). Adelphia would cross the waterbodies via HDD or a dry construction technique (dam-and-pump or flume), and would adhere to our Plan, Adelphia's Procedures, and the measures in its E&SCP to minimize runoff to the waterbodies during construction (including the installation of erosion control devices and revegetation).

Surface Water Intakes and Source Water Protection Areas

No potable surface water intakes are within 3 miles downstream of Project waterbody crossings (PADEP 2000). While SWPA data are not public in Pennsylvania, Adelphia consulted with the Chester Water Authority and Richland Water Authority to identify any SWPAs in the Project vicinity and neither authority identified surface water sources in the Project vicinity. Therefore, no impacts on surface water intakes or SWPAs are anticipated as a result of waterbody crossings for the Project.

The Project would not cross any surface water SWPAs in Delaware (University of Delaware 2018).

General Impacts and Mitigation

Adelphia proposes to cross Stoney Creek using dry ditch (dam-and-pump or dam-and-flume) methods. 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, Adelphia would implement dry ditch crossing methods. The pipeline would be installed beneath Stoney Creek in accordance with applicable state and federal permits and Adelphia's Procedures. Typical waterbody crossing methods are described in section A.7.2.

Marcus Hook Creek would be crossed by HDD, thereby avoiding or minimizing impacts on the creek; however, if an inadvertent return of HDD drilling fluid occurs within a waterbody, the resulting turbidity could temporarily affect water quality. The location for HDD 5 along the Tilghman Lateral is in the vicinity of a USEPA-regulated Superfund site (Metro Container Corporation Superfund site). Surface water could be affected by contaminants associated with this nearby contaminated site during HDD construction. However, consultations are ongoing with the USEPA regarding HDD activity near the Superfund site. Soil and groundwater contamination are further discussed in sections B.1.2 and B.2.1 and include our recommendation.

In addition, Adelphia would implement the measures in its IRCP, which addresses measures for prevention, detection, and mitigation for inadvertent returns. Adelphia would use water from municipal sources for HDD construction, thereby avoiding impacts on surface water resources from water withdrawals. Adelphia's adherence to measures within its IRCP and Procedures, 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.

Adelphia would limit the construction right-of-way width to 50 feet at Stoney Creek and would install erosion controls to minimize impacts. Adelphia would generally install the pipeline with a minimum of 3 feet of cover from streambed to the top of the pipeline.[20] 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 Stoney Creek. The HDD crossing of Marcus Hook Creek would be installed significantly deeper than the minimum requirement (a minimum of 33 feet beneath the streambed).

In addition, ATWS along the Tilghman Lateral, the Quakertown Compressor and Meter Stations, and Paoli Pike BAV, would be within 50 feet of waterbodies, as identified in appendix C. Adelphia would implement erosion controls to protect these waterbodies from sedimentation in accordance with its Procedures and E&SCP.

Commenters expressed concern over impacts on water quality in the Cooks Creek Watershed. This watershed runs along the border between Bucks and Northampton Counties in Pennsylvania. While the existing mainline crosses the watershed, no new facilities are planned to be constructed within the Cooks Creek Watershed. The Clean Air Council and Delaware Riverkeeper Network expressed concern regarding the proximity of the Chester Creek and Paoli Pike BAVs to nearby waterbodies (Chester Creek and Ridley Creek, respectively). Construction of these facilities would not directly affect waterbodies, and Adelphia would implement the measures in our Plan and its Procedures to minimize the potential for sedimentation impacts. Adelphia would also restore construction workspaces to pre-construction contours and install erosion and sediment controls to minimize the potential for preferential pathways of stormwater runoff.

[20] This is consistent with USDOT-PHMSA requirements in 49 CFR 192, which require a minimum of 36 inches of cover in normal soil in non-navigable waters.

Adelphia proposed a diversion ditch to manage stormwater flow from the Transco Meter Station into a nearby wetland. Directing stormwater flow into a wetland would not be in compliance with section VI.B.3.b of FERC's Procedures. Since Adelphia did not provide sufficient justification for this modification to the Procedures that would result in impacts on a wetland, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary, for review and written approval by the Director of OEP, results of consultation with the PADEP and the Delaware County Conservation District to identify an alternative stormwater management configuration at the Transco Meter Station that would not result in impacts on nearby wetlands.**

Adelphia would minimize and mitigate impacts on surface waters, including sensitive surface waters, through implementation of trenchless construction methods and adherence with our Plan, its Procedures, and IRCP. Therefore, we conclude that the Project would not have a significant impact on surface waters.

Water Usage

Adelphia would hydrostatically test the proposed new pipeline laterals and piping at the Marcus Hook Compressor Station, Quakertown facilities, and Skippack Tap Valve using municipal water from Pennsylvania (no water would be sourced from Delaware). No chemicals would be added to treat the water. In addition, Adelphia would use municipal water for HDD construction and for fugitive dust suppression.

Table B-8 presents the sources and estimated quantities of water used for hydrostatic testing of the Project.

Table B-8
Water Use for Hydrostatic Testing of the Project

Facility	Water Needed (gallons)	Water Source
Parkway Lateral[a]	16,928	Municipal
Tilghman Lateral[a]	216,767	Municipal
Marcus Hook Compressor Station	8,505	Municipal
Quakertown Compressor Station	9,781	Municipal
Total	**251,981**	-

[a] Includes associated interconnects and/or meter stations.

Hydrostatic test water would be temporarily stored in tanks and then hauled offsite to an approved disposal facility after all testing is complete. Because Adelphia would not withdraw surface water for hydrostatic testing, and would dispose of hydrostatic test

water at an approved location, we conclude impacts from hydrostatic testing would be temporary, minor, and not significant.

2.3 Wetlands

The U.S. Army Corps of Engineers (USACE) and USEPA 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" (USACE 1987). Wetlands generally include swamps, marshes, bogs, and similar areas.

Existing Wetland Resources

Adelphia conducted wetland delineation surveys in accessible areas during June and December 2017, February through May 2018, and in October 2018 in accordance with the USACE Wetland Delineation Manual (USACE 1987) and the applicable regional supplements (the Eastern Mountain and Piedmont [USACE 2012] and the Atlantic and Gulf Coastal Plain regional supplements [USACE 2010]). Surveys were conducted at sites where proposed Project facilities would be constructed, with the exception of portions of the Tilghman Lateral where Adelphia has not been provided access. Field surveys to delineate wetlands for these Project facility sites would be completed when access is provided by the respective landowner.

Where field survey access is not currently available, Adelphia reviewed aerial imagery and available web-based inventories to determine the presence of wetlands, including the USFWS's National Wetlands Inventory (NWI) mapper, PADEP's eMap Database, Delaware Department of Natural Resources and Environmental Control's (DNREC) NavMap Database, and the USDA-NRCS' Web Soil Survey.

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 Pennsylvania Administrative Code (PAC) Title 25, Chapter 93. They include 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 alongside a designated drinking water supply; and
- are within natural or wild areas (e.g., federal and state land).

Wetland types are generally classified using the NWI classification system, which generally includes palustrine emergent (PEM), palustrine scrub-shrub (PSS), and

palustrine forested (PFO) wetlands (Cowardin *et al.* 1979). PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens; representative species documented during Adelphia's surveys in PEM wetlands include reed canarygrass, creeping Jenny, skunk cabbage, sensitive fern, tussock sedge, common rush, and other various sedge species. 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; northern spicebush, and wood privet. PFO wetlands are dominated by hydrophytic tree species at least 20 feet tall; Adelphia documented honey locust, Norway maple, white mulberry, Chinese sumac, and other tree species during field surveys in PFO wetlands.

Five wetlands would be affected by construction of the proposed Project. Table B-9 provides the wetland type and state classification of each wetland affected by the Project, as well as the impacted acreage; impacts are summarized in table B-10. Although PFO wetlands were documented during surveys, none would be impacted by construction of the Project. As discussed in section B.2.2, Adelphia proposed a diversion ditch to manage stormwater flow during operation of the Transco Meter Station into a nearby wetland that is classified in part as PFO, which we conclude is not adequately justified (see appendix C). While wetland delineations for a portion of the Tilghman Lateral has not been completed, desktop review has indicated that no wetlands are within the proposed right-of-way for the pipeline lateral.

General Impacts and Mitigation

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 subsoil and topsoil. Construction could also affect water quality within wetlands due to sediment loading or inadvertent spills of fuel of chemicals, as well as cause changes in the hydrological profile.

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 transition back into a community similar to that of the pre-construction state. In PEM and PSS wetlands, the herbaceous vegetation would regenerate quickly (typically within 1 to 3 years and 3 to 5 years, respectively).

Table B-9
Wetlands Crossed by the Project[a]

Project Facility	Wetland ID	NWI / Cowardin Class	Section 105.17 EV Characteristic[b]	Source	Area affected by Cons. (acres)[c,d,e]	Area Affected by Ops. (acres)[c,d,e]
Paoli Pike BAV	PP-W-01	PEM	(i)	FD, NWI	0.05	0.01
Paoli Pike BAV Access Road	PP-W-01	PEM	(i)	FD, NWI	0.01	0.0
Perkiomen Creek BAV Access Road	PC-W-01	PEM	N/A	FD	0.04	0.04
East Perkiomen Creek BAV	EP-W-01	PEM	N/A	FD	<0.01	<0.01
Quakertown Compressor and Meter Stations	QCS-W-01	PEM	N/A	FD	0.61	0.00
Quakertown Compressor and Meter Stations	QCS-W-01	PSS	N/A	FD	0.12	0.00

FD = Field Delineation; Cons. = Construction; Ops. = Operations.

[a] Facilities not listed do not impact wetlands. However, Adelphia proposed a diversion ditch to manage stormwater flow during operation of the Transco Meter Station into a nearby wetland, which we conclude is not adequately justified (see appendix C).

[b] 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.

[c] Area affected by construction is the total area of wetland within the construction workspace for the given Project component.

[d] The numbers in this table have been rounded for presentation purposes.

[e] Impacts include existing access roads which contain culverts and would not be modified for the Project.

Table B-10
Wetland Impact Summary of the Project

NWI Classification	Wetland Area Affected During Cons. (acres)[a,b]	Wetland Area Affected During Ops. (acres)[a,b]
PSS	0.1	0.0
PEM	0.7	0.1
Total	**0.8**	**0.1**

[a] The numbers in this table have been rounded for presentation purposes.

[b] All impacts on wetlands would occur at aboveground facilities or access roads associated with the Project.

Currently, no known wetlands would be affected by construction or operation of the pipeline laterals or the associated meter stations (Delmarva, Monroe, Transco,[21] and Tilghman). The Project would impact wetlands during construction and operation of aboveground facilities along the existing mainline, including a total of 0.8 acre of temporary impacts at the Paoli Pike, Perkiomen Creek, and East Perkiomen Creek BAVs and the Quakertown Compressor and Meter Stations. Of the 0.8 acre, operation of the Paoli Pike and East Perkiomen Creek BAVs, as well as the access roads for the Paoli Pike and Perkiomen Creek BAVs would affect a total of 0.1 acre of PEM wetlands. One exceptional value wetland would be impacted by construction and operation of the Paoli Pike BAV, resulting in the permanent loss of 0.01 acre. This wetland's designation is due to the presence of suitable habitat for the bog turtle, which is a federally listed species (see section B.4.1).

It is our preference to avoid locating aboveground facilities within wetlands; however, each of the BAV sites are existing aboveground facilities along the existing mainline being modified for the transmission of natural gas. In section C, we evaluate alternative locations for the Quakertown Compressor Station, as well as the Paoli Pike and Perkiomen Creek BAVs. To mitigate impacts on the portion of the wetland within the expanded access road (AR14.46-01) at the proposed Paoli Pike BAV site, Adelphia would install timber mats and geotextile fabric in wetland areas during construction. Given construction at the proposed Paoli Pike BAV site would be constrained by the existing valve's proximity to Paoli Pike, Ridley Creek, and adjacent vegetation, we find Adelphia's proposed mitigation associated with temporary use of the expanded portion of the existing access road is acceptable.

In addition to those wetlands directly affected by the Project, Adelphia has requested modifications to our Procedures to allow work within 50 feet of wetlands in certain areas. As described in appendix C, these modifications were requested at the Chester Creek, Paoli Pike, Schuylkill River, Perkiomen Creek, East Perkiomen Creek BAVs, as well as areas along the Tilghman Lateral and at the Quakertown Compressor and Meter Stations. With the exception of the requested modifications at the Quakertown Compressor and Meter Stations, the ability to avoid wetlands or increase the buffer between wetlands and workspaces is constrained by the footprint of the existing facility. To minimize impacts on these wetland resources that would not be directly affected by the Project, but would be in close proximity to construction activities, Adelphia would install double row silt fence to prevent sedimentation into adjacent wetlands and would not conduct refueling operations within 100 feet of these wetlands. At the Quakertown Compressor and Meter Stations, temporary board mats would be installed within wetlands areas to prevent compaction and rutting, while at the Paoli Pike BAV, low-ground-weight construction equipment or other measures in accordance with its

[21] As discussed in section B.2.2, Adelphia proposed a diversion ditch at the Transco Meter Station that would direct stormwater into a nearby wetland, which we conclude is not adequately justified.

Procedures would be used to avoid impacts on the portion of the wetland containing suitable bog turtle habitat within ATWS-14.46-02 (see section B.4.1).

Adelphia would minimize wetland impacts by implementing the construction and mitigation measures outlined in its Procedures. General construction and mitigation measures from Adelphia's Procedures include:

- installing sediment barriers immediately after initial ground disturbance within construction work areas, and immediately upslope of wetland boundaries, to contain spoil within the Project area and to prevent sedimentation to adjacent wetland areas;

- locating extra work areas (such as staging and spoil storage areas) at least 50 feet from wetland boundaries, except those areas identified in appendix C;

- cutting vegetation just above ground level, leaving the existing root systems in place;

- prohibiting the use of rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize workspaces;

- prohibiting the use of lime, fertilizer, or mulch during the restoration of wetlands; and

- limiting vegetation maintenance of the operational rights-of-way in wetlands along the existing mainline and 20-inch-diameter pipeline, as applicable, 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.

Adelphia is proposing to access the Perkiomen Creek BAV via a portion of the existing mainline's right-of-way that is characterized as PEM wetlands (AR-33.97-01, see appendix A-2). While Adelphia has proposed to mitigate impacts on the wetland during construction of the BAV through the use of timber mats, double row silt fencing, and sediment controls, it has not proposed or identified potential mitigation measures to mitigate impacts from operational use of the access road. Further, Adelphia did not request a site-specific modification to section VI.B.1.d, which restricts new access roads or use of existing access roads through wetlands if it would result in impacts on the wetland. Therefore, we conclude the access road for operation at the Perkiomen Creek BAV has not been adequately justified and would result in impacts on wetland PC-W-01, and **we recommend that**:

- **<u>Prior to construction</u>, Adelphia should file with the Secretary, for review and written approval by the Director of OEP, site-specific**

justification for operational use of AR-33.97-01 for access to the Perkiomen Creek BAV, or identify an alternative access route for use during operation that avoids impacts on wetlands.

Although the proposed Project would result in temporary impacts on 0.8 acre of wetlands and permanent impacts on about 0.1 acre of wetlands, Adelphia's implementation of its Procedures, including the noted minimization and mitigation measures, and with our recommendation above, we conclude that wetland impacts would not be significant. Additional mitigation may be required by Pennsylvania State agency(ies) for activities within 300 feet of wetlands containing potential bog turtle habitat (see section B.4.1).

3. Vegetation, Fisheries, and Wildlife

3.1 Vegetation

Existing Vegetation Resources

Construction of the facilities associated with the proposed Project would occur in the Middle Atlantic Coastal Plain or Northern Piedmont Ecoregions. The Tilghman Lateral would be predominantly in the Middle Atlantic Coastal Plains, along with the Monroe and Tilghman Meter Stations; however, these facilities would be in a highly developed area with little to no natural vegetation. A small portion of the Tilghman Lateral, all of the Parkway Lateral, and remaining aboveground facilities that would be constructed as part of the Project would be in the Northern Piedmont ecoregion, which is an area of plains, open valleys, and low, rounded hills, historically dominated by Appalachian oak forest (USEPA 2013; Woods *et al.* 1999).

The Project would predominantly affect lands that have been highly developed; industrial/commercial land accounts for 78.6 percent of the land that would be affected by the Project. Vegetated land types affected by the Project would include open land, forested vegetation, and non-forested wetlands (see table B-11). No actively cultivated land (i.e., agricultural land) would be affected by construction of the Project. Wetlands affected by the Project, including wetland plant species identified during field surveys, are discussed in section B.2.3. Impacts on developed land (including industrial/commercial roadways, railroads, and residential land) are discussed in section B.5.1, and impacts on open waters are discussed in section B.2.2. Acreage impacts on each vegetation classification are included in table B-11.

Table B-11
Construction and Operation Impacts on Vegetation Cover Types in the Project Area[a]

Facility	Open Land		Upland Forest		Non-Forested Wetland		Total	
	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.
Pipeline Facilities[b]								
Parkway Lateral	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1
Tilghman Lateral	1.0	0.1	2.4	0.4	0.0	0.0	3.3	0.5
Aboveground Facilities[b]								
Marcus Hook Compressor Station and contractor wareyard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quakertown facilities	1.4	0.4	0.0	0.0	0.7	0.0	2.1	0.4
Delmarva Meter Station	0.6	0.4	0.0	0.0	0.0	0.0	0.6	0.4
Transco Meter Station	0.0	0.0	0.9	0.9	0.0	0.0	0.9	0.9
Monroe Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tilghman Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Martins Creek Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skippack Tap Valve	0.1	<0.1	0.0	0.0	0.0	0.0	0.1	<0.1
MLV 1	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	0.0
MLV 2	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	0.0
Chester Creek BAV	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Paoli Pike BAV	0.0	0.0	0.0	0.0	0.1	<0.1	0.1	<0.1
French Creek BAV	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Cromby BAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Schuylkill River BAV	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	0.0
Perkiomen Creek BAV	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
East Perkiomen Creek BAV	0.0	0.0	0.0	0.0	<0.1	<0.1	<0.1	<0.1
Access Roads								
Quakertown Compressor and Meter Stations access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transco Meter Station access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Martins Creek Station access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skippack Tap Valve access road	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
MLV 1 access road	<0.1	<0.1	0.0	0.0	0.0	0.0	<0.1	<0.1
MLV 2 access road	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Chester Creek BAV access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table B-11(continued)
Construction and Operation Impacts on Vegetation Cover Types in the Project Area[a]

Facility	Open Land		Upland Forest		Non-Forested Wetland		Total	
	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.
Access Roads (continued)								
Paoli Pike BAV access road	<0.1	0.0	0.0	0.0	<0.1	0.0	<0.1	0.0
French Creek BAV access road	0.4	0.4	0.0	0.0	0.0	0.0	0.4	0.4
Cromby BAV access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Schuylkill River BAV access road[c]	0.6	0.0	0.1	0.0	0.0	0.0	0.7	0.0
Perkiomen Creek BAV access road	<0.1	<0.1	0.0	0.0	<0.1	<0.1	0.1	0.1
East Perkiomen Creek BAV access road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**4.5**	**1.6**	**3.4**	**1.4**	**0.8**	**0.1**	**8.8**	**3.0**

[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. All numbers are reported in acreages. Construction impact acreages are based on the anticipated workspaces required to construct the Project. Operational impact acreages are operational footprint for the Project.

[b] Impacts associated with temporary workspace and ATWS are included in impact totals for pipeline laterals or corresponding aboveground facilities.

[c] Access to the Schuylkill River BAV during operations only would occur via the Schuylkill River Trail (AR-28.04-02) which is paved.

Open land is the largest type of vegetation affected by the Project (about 4.5 acres) and includes areas characterized by upland herbaceous and upland scrub-shrub vegetation, including pastures and existing rights-of-way. Representative herbaceous species identified during Adelphia's field surveys within open land included ground ivy, poverty oatgrass, and Timothy grass; one shrub species, the multiflora rose, was also typically observed during surveys.

About 3.4 acres of upland forested vegetation would be affected by the Project. Tree species documented during field surveys include honey locust, Norway maple, white mulberry, and the tree of heaven.

Non-forested wetland vegetation constitutes about 9.1 percent of the vegetation affected by Project; species identified during surveys are identified in section B.2.3.

Vegetation Communities of Special Concern

Adelphia consulted with the USFWS, PADCNR, and DNREC to determine the presence of sensitive or protected vegetation within the Project area; none were identified during consultation. However, the Project would cross, or be in proximity to, multiple Pennsylvania natural heritage areas (NHA), including Naamans Creek, Marcus Hook to

Commodore Barry Bridge (Marcus Hook), Goshen Road Woods, Schuylkill River-Port Providence, Sacony Creek, Quakertown Swamp, Butter Creek, and Delaware River-Oughoughton Creek 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] 2011). They 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 habitat; however, no formal protections are granted to these areas. Although supporting habitat would be affected in all identified NHAs, the only area defined with core habitat that would be affected in the Marcus Hook NHA, which is discussed further below.

The Tilghman Lateral would cross both core and supporting habitat for the Marcus Hook NHA, in a predominantly industrial area with only a narrow band of remnant vegetation along the river banks with some areas of emergent aquatic vegetation. The area is designated as industrial areas that have been abandoned, and are becoming revegetated, such that there is an opportunity to re-establish a vegetated corridor along the river (PNHP 2011). Although the Tilghman Lateral would cross 1.7 miles of supporting habitat (affecting about 8.2 acres) and 0.2 mile of core habitat (affecting 1.9 acres), the majority of the affected acreage is already developed. Additionally, consultation with PADCNR indicated that the Project would not impact the nearby NHAs.[22] Project activities would delay the current revegetation of these areas, but no significant or permanent impacts on this NHA are anticipated given the limited extent of vegetated habitat that would be disturbed during construction and operation. Species of concern identified by PFBC and Pennsylvania Game Commission (PGC) during Project consultation are discussed in section B.4. Because core habitat within the permanent right-of-way of the Tilghman Lateral would be restored following construction, impacts would be short-term and minor.

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 during Project surveys observed within the Project area include multiflora rose and Japanese stilt-grass.

Impacts and Mitigation

Installing the pipeline laterals would require the temporary and permanent clearing of vegetation, as described in section A.7. Table B-11 summarizes the temporary construction and permanent operational impacts of the Project on each vegetation cover

[22] Available on eLibrary under accession no. 20181002-5167.

type. Impacts on industrial/commercial and residential land are discussed in section B.5.1; wetland impacts are addressed in section B.2.3.

Impacts on upland 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. Adelphia would maintain upland forest vegetation in the permanent rights-of-way in an herbaceous state through the operational life of the Project. In addition, about 0.9 acre of forested land would be converted to developed lands within the footprint of the Transco Meter Station. As discussed above, the Project would not impact large continuous forested areas and would therefore not cause forest fragmentation.

Adelphia would minimize clearing of forested habitat by constructing the pipeline laterals in predominantly industrial/commercial land. To further minimize impacts on vegetative communities from construction and operation of the Project, Adelphia would implement measures described in 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; and
- conducting annual monitoring and reporting to FERC to document the status of revegetation until deemed successful.

For non-forested vegetation types, including open land and non-forested wetlands, impacts from construction would generally be short-term and temporary. 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.

Following construction, Adelphia 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, Adelphia would implement its Noxious Weed Plan to prevent and control the spread of noxious weeds and invasive plant species. Measures include using certified weed-free mulch and stock-piling trench spoil in areas of known infestations adjacent to the removal site and replacing it at the same location. Also, following completion of work in areas identified as containing noxious weeds and invasive plant species, Adelphia would clean vehicles of soil and debris.

Where required, Adelphia would remove invasive species either by physical removal, use of approved herbicides, or covering them with growth-preventing materials,

such as black plastic tarps. In accordance with Adelphia's Procedures, herbicides would only be used to control invasive species within 100 feet of (or within) wetlands if approved by applicable agencies. Adelphia would inspect the disturbed areas after the first and second growing seasons and continue inspections/revegetation efforts until the disturbed areas are adequately restored. In accordance with our Plan, Adelphia would be required to implement measures that ensure that the right-of-way is restored to pre-construction conditions or better, and cannot contain a greater proportion of weed species than adjacent areas. Based on the types and amounts of vegetation affected by the Project and Adelphia's proposed avoidance, minimization, and mitigation measures to limit Project impacts, we conclude that impacts on vegetation from the Project would not be significant. To facilitate revegetation, Adelphia would seed construction workspaces using seed mixes approved by the local County Conservation Districts and has committed to develop site-specific E&SCP prior to the start of construction.

3.2 Fisheries

Existing Aquatic Resources

All waterbodies that would be crossed by the Project are freshwater and in Pennsylvania. Freshwater waterbodies in Pennsylvania are classified by PADEP according to water quality and aquatic communities. 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 (PAC 2018).

As discussed in section B.2.2, there are two waterbodies that would be crossed by the Tilghman Lateral: Marcus Hook Creek (MP 1.9) and Stoney Creek (MP 2.7). These waterbodies are both classified as warmwater fisheries and migratory fisheries. No commercial fisheries have been identified within either of the waterbodies that would be crossed by the Tilghman Lateral; however, recreational species in these waterbodies may include black crappie, white crappie, channel catfish, and bullhead (PFBC 2018a). Although not crossed by the Project, one freshwater pond near the proposed Quakertown facilities would be about 10 feet from proposed ATWS-QCS-01 (see appendix C). This waterbody is classified by USFWS as a palustrine unconsolidated bottom, permanently flooded resource; however, it has not been classified as a fisheries resource by PFBC and is therefore not discussed further.

Fisheries of Special Concern

In addition to the general PADEP classifications, select waterbodies are further classified as High Quality, Exceptional Value, or capable of supporting trout, and are therefore provided special protections. Neither of the waterbodies crossed by the Project have been designated as High Quality or Exceptional Value waters, and neither are designated as coldwater trout streams (PADEP 2018i, PFBC 2018a). No other PFBC-

designated fisheries of concern would be affected by the Project (PFBC 2018a,b,c,d). In addition, no federally or state-listed fish species were identified as potentially occurring in the Project area.

The Project would be within the Delaware River Basin, which supports diadromous species utilizing marine and freshwater habitats during their life cycles. Diadromous species within the Delaware River Basin that could occur in the Project vicinity include the American shad, American eel, Atlantic coast striped bass, and river herring (PFBC 2011). However, consultations with the National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service (NMFS) indicate that the Project would not affect essential fish habitat or waterbodies containing protected species under NMFS' purview (NMFS 2018a,b).

General Impacts and Mitigation

As previously noted, construction of the Project would require crossings of Marcus Hook Creek and Stoney Creek, which are both classified by the PFBC as warmwater fisheries that are supportive of migratory fisheries (PFBC 2018a). Only Marcus Hook Creek contains perennial stream flow, and is therefore able to provide permanent habitat to fish. Stoney Creek contains intermittent stream flow, and therefore could provide seasonal or temporary fish habitat.

To minimize impacts from sedimentation and turbidity in streams crossed by the proposed Tilghman Lateral, Adelphia would install the pipeline using dry-ditch (dam-and-pump or dam-and-flume) construction methods at Stoney Creek and a trenchless (HDD) construction method at Marcus Hook Creek. Waterbody crossing methods are listed in section B.2.2 and described in detail in section A.7.2. In-stream blasting is not proposed for this Project (see section B.1.1).

While dry-ditch crossing methods would reduce turbidity and downstream sedimentation during construction, minor aquatic habitat alterations could still occur. Temporary impediments, changes in 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.

Adelphia's use of HDD construction methods would avoid direct impacts on fisheries during construction across Marcus Hook Creek. However, if an inadvertent return of drilling fluid occurs within a waterbody, the resulting turbidity could impact water quality and impede fish movement. In addition, water quality could be adversely affected by an accidental spill of hazardous material into a waterbody. Adelphia's adherence to its Procedures, IRCP, and SPCC Plan would minimize the potential for these impacts, as well as the response time for notification and clean-up. Water quality could also be adversely be affected by contaminants associated with a nearby USEPA Superfund site if contamination were encountered during HDD construction. Possible

soil and groundwater contamination which could be encountered during construction are discussed further in sections B.1.2 and B.2.1.

PFBC restricts in-stream activities in waterbodies with designated classifications, but typically does not enforce construction timing restrictions for warmwater fisheries. However, in accordance with its Procedures, Adelphia would consult with the PFBC to obtain written approval to conduct in-stream work outside of the FERC-identified warmwater fisheries window (conduct work between June 1 and November 30) if necessary.

Adelphia proposes to use 13 access roads to access aboveground facilities during construction, of which 12 would be maintained for operation of the Project (see table A-4). No waterbodies would be affected by construction or operation of the access roads or aboveground facilities.

To further minimize impacts on waterbodies and fisheries, Adelphia would implement its Procedures, which includes measures to:

- install and maintain erosion control devices;
- ensure all flow downstream of crossings is appropriately maintained;
- prevent and respond to equipment fluid spills by implementing the Project SPCC Plan;
- implement its IRCP in the event of inadvertent returns during HDD drilling activities;
- restore streambeds and banks to pre-construction conditions;
- maintain a 25-foot-wide riparian corridor for the full width of the permanent rights-of-way; and
- limit vegetative maintenance immediately adjacent to waterbodies to a 10-foot-wide strip centered over the pipeline laterals.

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

3.3 Wildlife Resources

Existing Wildlife Resources

Wildlife habitats are based on the vegetative cover types within the Adelphia Gateway Project area and include open land, forested land, and wetlands. 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-12. Developed land (industrial/commercial and residential land) also occurs within the Project area; however, it typically provides limited habitat for wildlife and is therefore discussed in section B.5.1.

Table B-12
Common Wildlife Species in the Project Area

Vegetative Cover Type	Common Wildlife Species
Open (herbaceous/shrub) upland	Virginia opossum, eastern cottontail, short-tailed shrew, white-tailed deer, woodchuck, striped skunk, red fox, eastern garter snake, American toad, Canada goose, American robin, mourning dove, and American crow.
Upland forest	Virginia opossum, white-tailed deer, woodland jumping mouse, red fox, gray squirrel, eastern box turtle, eastern hognose snake, American robin, and northern cardinal.
PEM and PSS wetland	Meadow vole, white-tailed deer, eastern box turtle, northern water snake eastern ribbonsnake, red-spotted newt, pickerel frog, song sparrow, swamp sparrow, red-winged blackbird, herons, and wrens.
Sources: DNREC 2015; PGC 2011a,b; PGC 2018a; PNHP 2018a,b; PFBC 2018e,f,g,h,i,j.	

Managed and Sensitive Wildlife Areas

Adelphia consulted with the USFWS, DNREC, PADNCR, PFBC, and PGC, to identify managed or sensitive wildlife habitats in the vicinity of the Project (USFWS 2018a, DNREC 2018, PADCNR 2018d, PFBC 2018k, and PGC 2018b). Agency consultation and review of Pennsylvania databases indicated that no state wildlife management areas or existing or proposed wildlife refuges would be crossed by the Project. The closest state-owned land is Ridley Creek State Park, which is about 2.7 miles east of the existing mainline (PADCNR 2018e). The Project would cross, or is in the vicinity of, multiple designated 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 affected by the Project. A total of

46.7 acres of land would be disturbed for construction of the Project; however, as shown in table B-11, only 8.8 acres of land with vegetation conducive for wildlife habitat would be disturbed. The remaining 37.9 acres (81.2 percent) of land that would be disturbed by construction includes previously developed residential or industrial/commercial habitat (see table B-14, below). Potential short-term impacts on wildlife include the displacement of individuals from construction areas (including pollinator species such as bees and butterflies) and the direct mortality of small, less mobile mammals, reptiles, and amphibians that are unable to vacate the construction area. Permanent impacts would include conversion of forested or scrub-shrub habitats to an herbaceous state within the maintained rights-of-way or aboveground facility sites. Long-term impacts would include the temporary construction right-of-way within forested areas and periodic disturbance of wildlife during operation and maintenance. However, about 81 percent of the proposed pipeline laterals (a total of 3.8 miles) would be collocated or adjacent to existing rights-of-way.

Fragmentation of forested areas results in changes to 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). Approximately 3.4 acres of forested land would be affected by construction of the Project, specifically for construction of the Transco Meter Station, Parkway Lateral, and Tilghman Lateral; however, the forested habitats at these locations are already fragmented by existing development.

Adelphia proposes to use 11 existing roads,[23] as well as 2 new access roads for construction of the Project (see table A-4). The 2 new permanent access roads would affect 0.2 acre of open land. Twelve of these access roads would be maintained for operation of the Project. Access to the Schuylkill River BAV during operation would occur via the Schuylkill River Trail. See section B.5.3 for additional discussion of this trail and our recommendation.

Adelphia would implement impact minimization measures as described in our Plan and its Procedures, which would include:

- revegetating the rights-of-way, where applicable, with seed mixes approved by local County Conservation Districts;
- maintaining a 25-foot-wide buffer of native vegetation along the edge of waterbodies; and
- utilizing existing rights-of way and previously developed industrial/commercial land to the extent practicable.

[23] Two of these access roads are located entirely within the right-of-way of the existing mainline.

Although mortality of individuals 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 Adelphia's proposed route within developed lands and previously fragmented forest habitat, and the implementation of its proposed impact avoidance and minimization measures, we conclude that construction and operation of the Adelphia Gateway Project would not have population-level impacts or significantly measurable negative impacts on wildlife.

3.4 Migratory Birds

On March 30, 2011, the USFWS 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 USFWS. The Project would be within Bird Conservation Region 28 (Appalachian Mountains), Region 29 (Piedmont), and Region 30 (New England/Mid-Atlantic Coast) of the North American Bird Conservation Initiative (Bird Studies Canada and North American Bird Conservation Initiative 2014).

The primary concern for impacts on migratory birds, including bald eagles, is mortality of eggs and/or young because 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). Adelphia has proposed a route that would minimize impacts on migratory birds by avoiding forested habitat, where practicable, such that only 3.4 acres of forested land would be cleared, much of which would be within heavily industrialized areas.

The pipeline laterals would cross an Important Bird Area (IBA) of Global Magnitude (Delaware Coastal Zone IBA), which is recognized by the National Audubon Society and the American Bird Conservancy. Although not protected by state or federal agencies, this IBA is designated for the protection of migrating shorebirds such as the piping plover (*Charadrius meoldus*) and red knot (*Calidris canutus*) (Delaware Audubon Society 2018a,b). This area contains known spawning grounds for the horseshoe crab (*Limulus polyphemus*) which provides a vital food source for migrating shorebirds (Delaware Audubon Society 2018a). The Marcus Hook Compressor Station is also within the Delaware Coastal Zone IBA; however, it would be located on developed land, such that its construction would not cause a loss of habitat. Further, as identified in table B-24, below, operation of the Marcus Hook Compressor Station is not anticipated to significantly increase ambient noise.

Based on the characteristics and habitat requirements of migratory birds known to occur in the Project area, the amount of similar habitat adjacent to and in the vicinity of

the Project, Adelphia's implementation of the measures in our Plan and its Procedures, including revegetation of disturbed areas after construction and conducting vegetation maintenance outside of the typical migratory bird nesting season, we conclude that construction and operation of the Adelphia Gateway Project would not have significant impacts on migratory bird populations.

To further minimize impacts on migratory birds, Adelphia has committed to clearing all trees between October 1 and March 31, outside of the peak migratory bird nesting period (April 15 to August 1). In addition, Adelphia has indicated that, should rookeries or raptor nests be identified during construction of the Project, it would consult with the USFWS, DNREC, and/or PADCNR to develop applicable avoidance measures. The state listed peregrine falcon is discussed in section B.4.2.

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 Endangered Species Act (ESA), species proposed for listing by the USFWS, 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 Adelphia Gateway Project, FERC is responsible for the ESA Section 7 consultation process with the USFWS. 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 Adelphia, as our non-federal representative, with the USFWS – Pennsylvania and Delaware Field Offices to determine whether any federally listed threatened or endangered species, federal species of concern, or designated critical habitats occur in the Project area. Table B-13 describes the federally and state-listed species with the potential to occur in the Project area, as identified during consultation with USFWS, their preferred habitat, and our determination of effect.

Table B-13
Federal and State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area

Species	Federal Status[a]	State Status[a]	Habitat Description	Effect Determination
Reptiles				
Bog turtle (*Clemmys 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 (USFWS 2010, USFWS 2006, USFWS 2018a).	*Not likely to adversely affect.* Potential habitat was identified during Phase 1 surveys of the workspaces and roads for the Chester Creek BAV and the Paoli Pike BAV. Project construction and operation associated with the Paoli Pike BAV would directly impact suitable habitat for the bog turtle. Adelphia would employ an USFWS Recognized Qualified Bog Turtle Surveyor during excavation activities to monitor for the bog turtle and implement applicable protective measures.
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 2018i)	*No significant impact*. Potential habitat was identified during species surveys for the Schuylkill River BAV; however, in accordance with our recommendation, Adelphia would implement appropriate mitigation and limit construction to the non-active window, or consult with PFBC, to minimize or avoid impacts on the eastern redbelly turtle.
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 (USFWS 2007).	*Not likely to adversely affect.* Although the proposed Tilghman and Parkway Laterals contain upland forested habitat, the patches are isolated, relatively small, and enclosed by developed lands; therefore, the Indiana bat is not anticipated to occur within forested areas that would be crossed by the Project.
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 (e.g., barns and sheds). Forages within the understories of forested habitat (USFWS 2018b).	*Not likely to adversely affect.* USFWS did not identify any known roosting sites within 150 feet or known hibernaculum within 0.25 mile of the Project. Impacts on forested habitat would be minimal as the Project is primarily situated in developed areas.

Table B-13 (continued)
Federal and State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area

Species	Federal Status[a]	State Status[a]	Habitat Description	Effect Determination
Birds				
Red knot	T	T	Uses sandy beaches and tidal mudflats during spring and fall migration; winters on coastal mudflats in Central and South America (USFWS 2013).	*No effect.* The Project is proposed within developed lands and no shoreline, beaches, or tidal mudflats would be affected.
Peregrine Falcon (*Falco peregrinus*)	-	E	Nest on cliffs overlooking rivers, bridges, and tall buildings within cities and urban environments (PGC 2018c).	*No significant impact*. A nesting pair is likely present in the vicinity of the Cromby BAV; however, based on consultation with PGC, the nature of proposed activities at this site would not likely impact the pair.
Plants				
Small whorled pogonia (*Isotria medeoloides*)	T	T	Grows in mature hardwood stands of beech, birch, maple, hickey, and oak containing an open understory with acidic soils and a thick layer of organic matter, often on slopes near streams (USFWS 2008a).	*No effect.* Forested portions of the proposed Project are limited to fragmented forested habitat on nearly level elevations adjacent to agricultural habitat and industrial/commercial habitat containing no waterbodies.

[a] E = endangered; T = threatened.

Federally listed species with a determination of "no effect" as documented in table B-13, are not discussed further. No designated critical habitat occurs in the Project area. Adelphia also consulted with PADCNR, PGC, and PFBC regarding state listed species and habitats, as discussed in section B.4.2. Adelphia consulted with the NMFS regarding potential threatened and endangered species within the Project vicinity. No designated essential fish habitat or federally protected species occur in the Project area (NMFS 2018b).

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 perennial, saturated, deep (3- to 5-inch) mucky soils, and predominantly emergent vegetation (USFWS 2006). A wetland found to contain these three characteristics (either together or in separate areas) during habitat (Phase 1) surveys is considered suitable habitat and may require additional (Phase 2) surveys to determine species presence or absence.

To determine whether suitable bog turtle habitat occurred in the Project vicinity, USFWS recommended that Adelphia conduct Phase 1 surveys. Although wetland delineations are still being completed along portions of the proposed Tilghman Lateral, Adelphia assessed the presence of wetlands in these areas by viewing inaccessible parcels from nearby accessible areas, and through review of desktop data. These reviews indicated that no wetlands were present in the accessible areas and therefore no Phase 1 surveys for bog turtles are planned for the currently inaccessible areas; however, the lack of wetlands along the lateral would be field verified prior to construction. Where field surveys were completed, Adelphia identified five locations (Chester Creek BAV, Paoli Pike BAV, Schuylkill River BAV, Perkiomen Creek BAV, and East Perkiomen Creek BAV) that were within 300 feet of wetlands and were therefore subject to the Phase 1 surveys; surveys at these locations were conducted in April 2018. Of the five areas, wetlands at the Chester Creek and Paoli Pike BAVs were identified as containing suitable bog turtle habitat. Project workspaces associated with the Chester Creek BAV would be about 190 feet from the potential bog turtle habitat, while workspace for the Paoli Pike BAV, as well as the majority of the BAV site and a portion of the access road to be used during construction only (AR-14.46-01), would be within bog turtle habitat.

Wetland habitat at the Paoli Pike BAV site contains emergent wetland species including tussock sedge (*Carex stricta*), skunk cabbage (*Symplocarpus foetidus*), sensitive fern, and other various sedge species (*Carex spp.*). Hydrology is attributed to groundwater seeps and springs adjacent to proposed Project workspaces which creates a soft, mucky substrate. The Paoli Pike BAV and access road (AR-14.46-01) would temporarily affect 0.06 acre of suitable bog turtle habitat during construction, of which,

0.01 acre of emergent wetland habitat would be permanently lost within the footprint of the Paoli Pike BAV.

Excavation in suitable habitat has the potential to result in the direct take of bog turtles; however, Adelphia would surround all work areas and access roads at the Chester Creek and Paoli Pike BAVs with exclusion fencing and has proposed to have an USFWS Recognized Qualified Bog Turtle Surveyor present during excavation activities to monitor for the bog turtle. Work at the proposed Chester Creek BAV would occur adjacent to, but not within, suitable habitat for the bog turtle. In addition, exclusion fencing would be installed around the workspaces and access road for this BAV under the supervision of the Bog Turtle Surveyor to preclude entry of bog turtles into the work area; therefore, we find that all practical measures have been taken to minimize potential impacts on the bog turtle at the Chester Creek BAV. Construction of the Paoli Pike BAV would occur within and adjacent to potential bog turtle habitat. In section C.6.4 we evaluate alternative locations for this BAV and determine that none provide an overall environmental advantage over the proposed site. Therefore, construction of the Paoli Pike BAV at the proposed site, with the implementation of exclusion fencing and use of the Bog Turtle Surveyor would minimize impacts on bog turtles to the extent practicable. While we are assuming presence of bog turtles at these two BAV sites, and active construction could result in a take of bog turtles, we have determined that with the employment of a USFWS Recognized Qualified Bog Turtle Surveyor during construction and the limited amount of habitat that would be disturbed, construction and operation of the Project *is not likely to adversely affect* the bog turtle. In accordance with our recommendation below, construction of the Project could not commence until FERC's consultation requirements under the ESA are completed and mitigation measures are finalized for work in and near wetlands with suitable bog turtle habitat.

Indiana Bat

The USFWS' Information for Planning and Consultation system indicates that the Project is within the range of the federally listed Indiana bat, although the species was not identified by USFWS during informal consultation. The Indiana bat hibernates during winter in caves or abandoned mines and roosts in dead and dying trees with exfoliating bark in the summer months. Forested patch sizes suitable to support individual roosting bats or a maternity colony have not been determined, but based on life history, USFWS has indicated that isolated forested stands less than 10 acres would likely not provide sufficient resources for an Indiana bat (USFWS 2008b). Although one forested patch equal to about 13 acres would be crossed along the Tilghman Lateral (MP 2.2), the patch is narrow and surrounded by highly developed lands, thereby providing low quality, isolated habitat. Project-related impacts on the Indiana bat, if present, 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. Because the Project would not affect large contiguous blocks

of forested habitat, we have determined that construction and operation of the Project *may affect, but is not likely to 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 (USFWS 2018c). The USFWS 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 (USFWS 2018c). 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 (USFWS 2018d). Therefore, in accordance with the USFWS' 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.

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. The Project would result in impacts on 3.4 acres of forested habitat. Further, Adelphia consulted with the USFWS and determined that there are no known roosting sites within 150 feet of the Project, or known hibernaculum within 0.25 mile of the Project (USFWS 2018a).

Because Adelphia would minimize impacts on forested habitat by constructing in predominately developed areas, we have determined that construction and operation of the Project *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.

Adelphia is continuing to consult with the USFWS regarding federally listed threatened and endangered species that may be present in the Project area as well as recently identified workspaces. To ensure compliance with our responsibilities under Section 7 of the ESA, **we recommend that:**

- **Adelphia should not begin construction of the Project until:**

  a. **FERC staff completes ESA Section 7 consultations with the USFWS; and**

  b. **Adelphia 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

Adelphia's consultation with the PADCNR, PGC, and PFBC identified potential and known occurrences of two state listed threatened and endangered species in the Project area including the peregrine falcon and eastern redbelly turtle. Species information including preferred habitat and our determination of effect are identified in table B-13 and discussed below.

Eastern Redbelly Turtle

This state listed threatened species inhabits relatively large, deep waterbodies including streams, rivers, ponds, lakes, and marshes with permanent water and ample basking sites (PFBC 2018i). 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 area, and as requested by PFBC during consultation, Adelphia conducted surveys within 200 feet of the French Creek BAV, Schuylkill River BAV, and Chester Creek BAV in May 2018.

Adelphia submitted survey results for the eastern redbelly turtle to PFBC on August 17, 2018. Based on these results, PFBC found no significant impacts on the eastern redbelly turtle from construction and operation of the Chester Creek or French Creek BAVs would occur. However, PFBC has recommended that Adelphia implement protective measures during construction of the Schuylkill River BAV. Specifically, PFBC recommends that Adelphia install a super silt fence barrier at the Schuylkill River BAV, in between the area adjacent to the Schuylkill River and the BAV to prevent turtles from entering the affected area. The PFBC recommends this fence should be installed during the inactive period of the eastern red belly turtle (October 15 – April 15) so that active turtles or turtle nests do not become trapped within work areas. Finally, if

adherence to the timing window is not feasible, PFBC recommends that a qualified biologist be on-site to conduct a clearance survey prior to construction. Adelphia has not committed to implement PFBC's recommended mitigation measures and we concur with the recommendations. Therefore, **we recommend that:**

- **Prior to construction, Adelphia should confirm in a filing with the Secretary, that it will install super silt fence barrier at the Schuylkill River BAV during the inactive period of the eastern red belly turtle (October 15 – April 15), and if this timing window cannot be met, then Adelphia will have a qualified biologist on-site to conduct a clearance survey prior to construction.**

Based on the proposed mitigation measures and our recommendation associated with the eastern redbelly turtle, we have determined that construction and operation of the Project would have *no significant impact* on the eastern redbelly turtle.

Peregrine Falcon

The state listed endangered peregrine falcon was identified during the Pennsylvania Natural Diversity Inventory database review and subsequent consultation with PGC. Impacts on the peregrine falcon could include habitat disturbance due to human activity during construction. Long-term impacts could occur due to permanent loss of trees and suitable habitat. Consultations with PGC indicated that a known nesting pair of peregrine falcons is present near the proposed Cromby BAV; however, based on the nature of the activities proposed at the site, the PGC determined that impacts on the nesting pair are not likely. We concur.

As construction of the Project would result in limited forest clearing, and activities at the proposed Cromby BAV would not be likely to affect a known nesting pair, construction and operation of the Project would have *no significant impact* on the peregrine falcon.

5. Land Use and Visual Resources

Adelphia is proposing to construct new facilities as described in section A.4 in Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania and in New Castle County, Delaware. Most of the land Adelphia would affect by Project construction is industrial/commercial land (78.6 percent). Other land uses that would be affected by the Project include open land, residential land, and forested land. Impacts on open water and wetlands are discussed in sections B.2.2 and B.2.3, respectively.

In total, the Project would affect 46.7 acres of land during construction, including the pipeline lateral construction rights-of-way, ATWS, compressor and meter stations, a contractor wareyard, access roads, BAVs, MLVs, pig launcher/receiver facilities, and tap

valves. Of the 46.7 acres that would be affected during construction, about 25.2 acres would be restored to pre-construction uses. The remaining 21.5 acres would be maintained for operation of the Project. Table B-14 summarizes the Project's temporary (construction) and permanent (operational) land use impacts.

5.1 Land Use

Industrial/Commercial Land

Industrial/commercial land includes existing industrial and commercial facilities and existing roads and railroads. As presented in table B-14, the Adelphia Gateway Project would affect a total of 36.7 acres of industrial/commercial land during construction. About 18.2 acres within proposed temporary workspaces would be returned preconstruction conditions after construction, as well as 3.9 acres within the permanent rights-of-way of the laterals. The aboveground facilities would permanently encumber 10.6 acres of industrial/commercial land. Given the majority of impacts on industrial/commercial land would be temporary and minor, we conclude that impacts on these lands would not be significant.

The pipeline laterals would cross and temporarily encumber 27 public roads and 12 railroads (see appendix E). Adelphia is also proposing to install portions of the new laterals within or immediately adjacent to Parkway Avenue and Ridge Road (see section B.6.2) via the open cut and HDD methods. Adelphia would cross all but two roads and all of the railroads by one of the nine proposed HDDs (see table A-5), thereby avoiding direct impacts on these features, or about 22 acres, assuming a 30-foot-wide right-of-way. Two roads would be crossed three times using the open-cut method, which allows for a more expedited crossing and less ATWS. Nine roads would be temporarily encumbered by construction workspace. All roads would be restored to pre-construction conditions. Transportation impacts are discussed in section B.6.2.

Open Land

Project construction would affect 5.4 acres of open land, defined as non-forested upland, scrub-shrub upland, pasture land, grassland, and utility rights-of-way (see table B-14). About 3.7 acres would be temporarily disturbed during construction and allowed to revert to natural conditions after construction. During operation, 0.1 acre would be within the new maintained rights-of-way and 1.6 acres would be encumbered by aboveground facilities. 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. Therefore, we conclude that the Project would not result in significant impacts on open land.

Table B-14
Land Use Affected by Construction and Operation of the Project[a]

Facility	Industrial / Commercial		Open Land[b]		Forest Land		Residential Land		Total	
	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.
Pipeline Facilities[c]										
Parkway Lateral	1.4	0.7	0.0	0.0	0.1	0.1	0.0	0.0	1.4	0.7
Tilghman Lateral	21.0	3.3	1.0	0.1	2.4	0.4	1.2	0.0	25.5	3.8
Aboveground Facilities[c]										
Marcus Hook Compressor Station and contractor wareyard	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5
Quakertown facilities	1.6	0.8	2.1	0.4	0.0	0.0	0.0	0.0	3.7	1.2
Delmarva Meter Station	0.0	0.0	0.6	0.4	0.0	0.0	0.0	0.0	0.6	0.4
Transco Meter Station	0.0	0.0	0.0	0.0	0.9	0.9	0.0	0.0	0.9	0.9
Monroe Meter Station	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
Tilghman Meter Station	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Martins Creek Station	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0
Skippack Tap Valve	0.0	0.0	0.1	<0.1	0.0	0.0	0.0	0.0	0.1	<0.1
MLV 1	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1
MLV 2	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1
Chester Creek BAV	<0.1	<0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1
Paoli Pike BAV	<0.1	<0.1	0.1	<0.1	0.0	0.0	0.0	0.0	0.1	<0.1
French Creek BAV	<0.1	<0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1
Cromby BAV	0.2	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	<0.1
Schuylkill River BAV	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1

Table B-14 (continued)
Land Use Affected by Construction and Operation of the Project[a]

Facility	Industrial / Commercial		Open Land[b]		Forest Land		Residential Land		Total	
	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.
Pipeline Facilities (continued)										
Perkiomen Creek BAV	<0.1	<0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1
East Perkiomen Creek BAV	0.1	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.1	<0.1
Access Roads										
Quakertown Compressor and Meter Stations access road	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Transco Meter Station access road	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Martins Creek Station access road	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Skippack Tap Valve access road	<0.1	<0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
MLV 1 access road	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	<0.1	<0.1
MLV 2 access road	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Chester Creek BAV access road	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Paoli Pike BAV access road	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
French Creek BAV access road	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.4	0.4
Cromby BAV access road	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
Schuylkill River BAV access roads[d]	0.2	1.3	0.6	0.0	0.1	0.0	0.0	0.0	0.8	1.3
Perkiomen Creek BAV access road	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
East Perkiomen Creek BAV access road	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
Total	**36.7**	**18.5**	**5.4**	**1.7**	**3.4**	**1.4**	**1.2**	**0.0**	**46.7**	**21.5**

Table B-14 (continued)
Land Use Affected by Construction and Operation of the Project[a]

Facility	Industrial / Commercial		Open Land[b]		Forest Land		Residential Land		Total	
	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.	Cons.	Ops.

[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. All numbers are reported in acreages. Construction impact acreages are based on the anticipated work spaces required to construct the Project. Operational impact acreages are operational footprint for the Project.

[b] Non-forested wetlands are included in the open land category. No PFO wetlands would be within Project workspaces.

[c] Impacts associated with temporary workspace and ATWS are included in impact totals for pipeline laterals or corresponding aboveground facilities.

[d] Operational impacts are greater than construction impacts because the access road Adelphia would use to access the Schuylkill River BAV during operation (AR- 28.04-02) has a larger footprint than the access road proposed for use during construction of this BAV (AR- 28.04-01).

Forested Land

Forested land is defined by upland areas with a variety of tree species, including honey locust, Norway maple, white mulberry, and the tree of heaven. A total of 3.4 acres (7.3 percent) of the land that would be affected by construction of the Project is classified as forested land (see table B-14). Operation of the Project would result in the permanent conversion of 1.4 acres of forested land to industrial/commercial land within the permanent rights-of-way of the pipeline laterals and at the proposed site for the Transco Meter Station. After construction, trees and shrubs would be allowed to grow within the temporary construction rights-of-way and other temporary workspaces. Impacts on forested land would be long-term in the temporary construction rights-of-way and permanent within the permanent right-of-way and where aboveground facilities are proposed, as it would likely take 20 years or more for mature trees to re-establish within the construction areas. 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. We find that the Project would not result in significant impacts on forested land.

Residential Land

Residential land is comprised of residential lawns, gardens, and yards and residential subdivisions, which would be crossed by the Tilghman Lateral. Adelphia would temporarily disturb 1.2 acres of residential land during construction. Following construction Adelphia would restore these areas to pre-construction conditions, in accordance with our Plan. Additional detail on residential areas is provided in section B.5.2.

5.2 Residential Land and Planned Developments

Adelphia consulted with planning departments for each county in the Project area and reviewed public records to identify planned residential or industrial/commercial developments. Each entity indicated that no known developments are planned within 0.25 mile of the Project. However, Adelphia identified 22 structures and 15 residences that are within 50 feet of construction workspaces (see table B-15).

Table B-15 Structures Within 50 Feet of the Project			
Type of Structure	**Nearest Proposed Milepost**	**Municipality, State**	**Distance to Construction Workspace (feet)**
Parkway Lateral			
Storage Unit	0.0	Lower Chichester, Pennsylvania	43
Multi-family	0.1	Lower Chichester, Pennsylvania	35
Multi-family	0.1	Lower Chichester, Pennsylvania	40
Multi-family	0.1	Claymont, Delaware	16 (see appendix G)
Multi-family	0.1	Claymont, Delaware	15 (see appendix G)
Multi-family	0.1	Claymont, Delaware	12 (see appendix G)
Marcus Hook Compressor Station			
Storage Unit	N/A	Lower Chichester, Pennsylvania	24
Tilghman Lateral			
Unknown	0.4	Lower Chichester, Pennsylvania	12
Multi-family	1.0	Lower Chichester, Chester, Pennsylvania	37
Commercial Shopping Center	1.2	Lower Chichester, Pennsylvania	9
Gas Station (Sunoco)	1.2	Lower Chichester, Pennsylvania	9
Restaurant	1.4	Lower Chichester, Pennsylvania	8
Flooring Distribution Center	1.4-1.5	Trainer, Pennsylvania	14
Funeral Home	2.0	Trainer, Pennsylvania	27
Barber Shop	2.2	Trainer, Pennsylvania	31
Commercial Landscape Supply Store	2.2	Trainer, Pennsylvania	31
Church	2.2	Trainer, Pennsylvania	50
Scrap Yard/Auto Parts Sales	2.8	Trainer, Pennsylvania	5
Unknown	3.0	Trainer, Pennsylvania	31
Scrap Metal Recycling Center	3.0	Trainer, Pennsylvania	11
Food Distribution Center	3.0	Trainer, Pennsylvania	25
Waste Center	3.3	Trainer, Pennsylvania	32

Table B-15 (continued) Structures Within 50 Feet of the Project			
Type of Structure	**Nearest Proposed Milepost**	**Municipality, State**	**Distance to Construction Workspace (feet)**
Tilghman Lateral (continued)			
Single family	3.4	Chester, Pennsylvania	6 (see appendix G)
Single family	3.4	Chester, Pennsylvania	19 (see appendix G)
Single family	3.4	Chester, Pennsylvania	31 (see appendix G)
Single family	3.5	Chester, Pennsylvania	12 (see appendix G)
Single family	3.5	Chester, Pennsylvania	36
Single family	3.5	Chester, Pennsylvania	50
Unknown	3.7	Chester, Pennsylvania	7
Single family	3.9	Chester, Pennsylvania	30
Unknown	3.9	Chester, Pennsylvania	41
Unknown	4.0	Chester, Pennsylvania	41
Unknown	4.1	Chester, Pennsylvania	36
Unknown	4.1	Chester, Pennsylvania	21
Single family	4.2	Chester, Pennsylvania	20 (see appendix G)
Unknown	4.4	Chester, Pennsylvania	22
French Creek BAV			
Single family	25.7	Chester, Pennsylvania	40

We received a comment from West Rockhill Township identifying a planned residential subdivision that would be on lands adjacent to and bordering the proposed Quakertown facilities at MP 49.4. The project proponent, Rich Hill Associates, Inc., has been consulting with the Richland and West Rockhill Townships regarding its plans, including mitigation of traffic issues and associated rezoning. Originally proposed to have 272 homes, the company has modified its plan down to a total of 220 units and has committed to including open spaces into its design (Bucks County Herald, Inc. 2018). According to an article in the Bucks County Herald, the company plans to maintain about half of the subdivision as open space. Because the subdivision has not been constructed, Rich Hill Associates, Inc. could configure the project such that the natural buffers between the adjacent parcel would mitigate noise and visual impacts on future residents. As described further below, Adelphia is consulting with the township on the design of its Project and has committed to installing landscaping to aid in visual screening for current nearby residences, which could also mitigate impacts on future residences of the planned subdivision. Based on Adelphia's proposed mitigation measures to minimize noise and visual impacts on existing residences, and its commitment to consult with the townships, we find that impacts on this planned developed would not be significant. This subdivision is discussed further in section B.10.

At all residences within 50 feet of proposed workspace, Adelphia would install 100-foot-long exclusion fences along the edges of the construction workspace and backfill and restore landscapes in accordance with our Plan and its Procedures. This includes restoring all residential areas to pre-construction conditions where possible or as specified by the landowners. Landowners would continue to have use of the permanent rights-of-way within the bounds of the easement agreement. However, permanent structures would not be allowed within the limits of the proposed operational rights-of-way.

Temporary construction impacts on residences and businesses in proximity to construction work areas could 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 lateral rights-of-way. Adelphia would minimize construction-related impacts on all residences through landowner notification of approximate timelines of active construction, at least two weeks in advance of construction activities, maintaining property access, mitigation of fugitive dust (see section B.8.1), and installation of safety fencing around any open trench.

Given the urban nature of the Project area for the pipeline laterals, Adelphia has developed a Residential Access and Traffic Mitigation Plan to minimize impacts on traffic flow and ensure access to homes and businesses in proximity to active construction is maintained.[24] See section B.6.2 for additional discussion of this plan and mitigation of impacts on transportation.

Adelphia has developed draft site-specific construction plans for all residences within 25 feet of construction work areas, see appendix G. These plans include a drawing depicting the residence in relation to the pipeline; workspace boundaries; the proposed permanent rights-of-way; and structures, roads, and miscellaneous features. In addition to the mitigation measures described above, Adelphia would require contractors to keep equipment in good working order, including mufflers, and limit the use of equipment to only that required for the specific Project feature being installed. Adelphia anticipates construction activities would generally occur during daylight hours, Monday through Saturday, except for limited 24-hour HDD operations at HDD-5 and HDD-9 and during pipeline pull-back for HDDs along the Tilghman Lateral. Other activities often conducted at night include operation of pumps at dry-ditch waterbody crossings; hydrostatic testing; and tie-ins. Adelphia may opt to perform these additional construction activities at night. Based on our review of the site-specific residential construction plans, Adelphia's mitigation measures, and our recommendation, we find impacts on residences would be temporary and not significant.

We received a comment from a landowner whose residence is about 800 feet east of MP 6.0 along the existing mainline, and raised concerns for impacts on their well and

[24] Available on eLibrary under accession no. 20180813-5039.

septic system from trenching and other associated construction activities. Adelphia's closest construction activities to this residence would be the installation of MLV 1 at MP 6.7; therefore, no direct impacts on this residence, or the associated well or septic system would occur. Potential impacts on groundwater resources are discussed in section B.2.1.

5.3 Public Land, Recreation, and Special Interest Areas

The Project would not be within 0.25 mile of any national parks, forests, wildlife refuges, or trails; state parks or forests; or federally designated wilderness areas. In addition, Adelphia conducted a search of the USDA-NRCS portal which contains data on various easements including: Emergency Watershed Protection Program – Floodplain Protection Easement, Emergency Wetland Reserve Program, Farm and Ranch Lands Protection Program, Grassland Reserve Program, Healthy Forest Reserve Program, and Wetland Reserve Program.[25] On August 3, 2018 Adelphia sent a letter to the USDA-NRCS requesting information for private easements that may not be reflected in the data on the agency's portal. Adelphia committed to continuing consultation with USDA-NRCS and to providing this correspondence to FERC.

We identified several local parks and recreation areas in proximity to the Tilghman Lateral, including: the Philadelphia Union Stadium and soccer fields (760 feet southwest of MP 4.2), Henry Johnson Park (630 feet north-northwest of MP 1.6), and Rocco Gaspari SR Municipal Park (450 feet north-northwest of MP 0.8). None of these parks or recreation areas would be crossed by the Project; therefore, no direct impacts would occur. Indirect impacts from construction of the Project on visitors to these facilities could include changes in the viewshed due to the presence of construction activities, associated noise, and the disruption of traffic flow in areas of active construction. Adelphia has committed to consult with the owners/managers of these facilities. Additionally, Adelphia has developed a Residential Access and Traffic Mitigation Plan, which is discussed in section B.6.2. Potential impacts from noise are discussed in section B.8.2. Visual impacts associated with the Project are discussed below.

Adelphia has identified 12 protected open spaces on lands purchased for preservation by Chester County within 0.25 mile of the Project (see table B-16). These areas, which include: five home owner association open spaces, three non-recreational/undeveloped opens spaces areas, two parks, and two trails, occur in areas along the existing mainline and would be in proximity (ranging from 0.0 feet to 0.23 mile) to the proposed MLVs, BAVs, and/or associated access roads. At four locations, the designated open space is immediately adjacent and/or crossed by the existing

[25] Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/dma/?cid=stelprdb1043925.

mainline, which includes the proposed sites for the Paoli Pike, French Creek, Cromby, and Schuylkill River BAVs.

Table B-16
Chester County Open Spaces in Proximity to the Project

Designated Parcel	Protection Entity	Distance to the Project (feet)
Paoli Pike BAV		
Wentworth Municipal Open Space (Non-recreational and Undeveloped)	East Goshen Township	0.0
Marydell Farms Park Municipal Open Space (Non- recreational and Undeveloped)	East Goshen Township	1,214.4
MLV 2		
Home Owner Association Open Space	Ryers Hunt Home Owners Association	158.4
Home Owner Association Open Space	Whitewoods Home Owners Association	316.8
French Creek BAV		
Municipal Open Space (Non-recreational and Undeveloped)	East Pikeland Township	52.8
French Creek Trail Municipal Recreation	East Pikeland Township	158.4
Brownfields Park Municipal Recreation	East Pikeland Township	89.8
Municipal Open Space (Non-recreational and Undeveloped)	East Pikeland Township	1,161.6
Home Owner Association Open Space	Quarters at Power Mill Home Owners Association	0.0
Home Owner Association Open Space	Kimberton Knoll Home Owners Association	105.6
Home Owner Association Open Space	Home Owners Association	158.4
Cromby BAV		
County Parks – Future Schuylkill River Park/Trail	Chester County Parks	0.0[a]
County Parks – Future Schuylkill River Park/Trail	Chester County Parks	316.8
Schuylkill River BAV		
County Parks – Future Schuylkill River Park/Trail	Chester County Parks	0.0[a]

[a] This open space would be crossed by the proposed access road for the corresponding Project component.

As discussed throughout this EA, these proposed facilities would be installed at existing valve sites. Although the existing sites would be expanded, the resulting footprint would be entirely within the right-of-way of the existing mainline. Impacts on

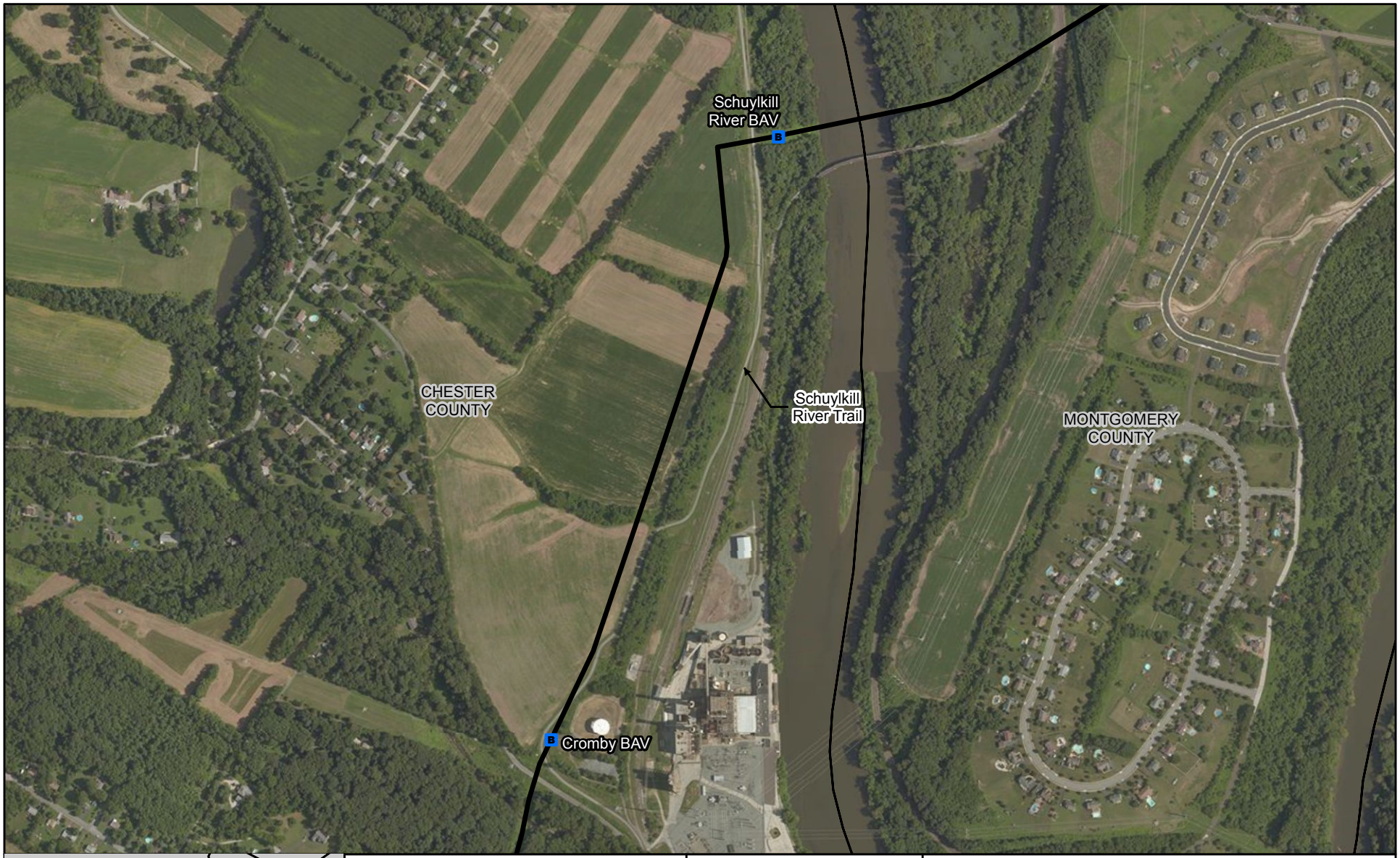
most of these areas would be minor and temporary, as they would effectively result in the replacement of existing infrastructure. However, the Project would result in permanent impacts on open space at the Paoli Pike BAV site and the trail that would be crossed by the access roads to the Cromby and Schuylkill River BAVs. Visual impacts associated with the Project are discussed below.

The Schuylkill River Trail is a multi-use trail system in Southeast Pennsylvania, which will be 130 miles long when complete (Schuylkill River Trail Association 2018). The current system, over 60 miles in length, is managed by a group of organizations and municipalities. The existing mainline crosses the trail at three locations in proximity to the proposed Cromby and Schuylkill River BAVs, and IEC currently uses the trail for operation and maintenance of the existing Schuylkill River valve (see figure 4 and appendix A-2). Although construction of the BAVs would not directly affect the trail, construction vehicles transporting equipment and personnel to Schuylkill River BAV would cross the trail. Adelphia has not identified any measures to address recreational use of the trail during construction. Further, Adelphia is proposing use of the trail to access the Schuylkill River BAV site during operation and maintenance of the Project, subject to an existing easement agreement that would transfer to Adelphia upon purchasing the Existing System from IEC. Because potential mitigation measures associated with Adelphia's use of the trail have not been provided, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary, for review and written approval by the Director of OEP:**

  a. **results of consultation with the applicable managing entity for the portion of the Schuylkill River Trail that would be impacted by construction and operation of the Schuylkill River BAV, generally between MPs 27.3 and 28.1 of the existing mainline, including copies of any correspondence; and**

  b. **mitigation measures that Adelphia will implement during construction and operation, including signage for trail users.**



Legend

- B — Proposed Blowdown Assembly Valve
- Existing 18-Inch-Diameter Mainline
- County Boundary

0 500 1,000
Feet

N

Scale: 1:9,000

Service Layer Credits:

Adelphia Gateway Project

Schuylkill River Trail

FIGURE 4

5.4 Coastal Zone Consistency

The Coastal Zone Management Act (CZMA) calls for the "effective management, beneficial use, protection, and development" of the nation's coastal zone and promotes active state involvement in achieving those goals. As a means to reach those goals, the CZMA requires participating states to develop management programs that demonstrate how those states will meet their obligations and responsibilities in managing their coastal areas. In Pennsylvania, the CZMA is administered by the PADEP through the Coastal Resources Management Program. Activities or development affecting land within Pennsylvania coastal zone are evaluated by the PADEP for compliance with the CZMA through a process called "federal consistency." The Marcus Hook Compressor Station (which is also proposed to be used as a contractor wareyard during construction), the portion of the Parkway Lateral in Pennsylvania, and all of the Tilghman Lateral (including associated meter stations) would be constructed within the Delaware Estuary Coastal Zone. Adelphia states that they would request a CZMA determination for the Project, however, because this determination is pending, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary a copy of PADEP's CZMA determination for the Adelphia Gateway Project.**

None of Project facilities proposed in Delaware would be within the coastal zone for this state.

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 rights-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 viewshed, the sensitivity or concern of potential viewers, and the perspective of the viewer.

<u>Pipeline Facilities</u>

Visual impacts associated with the pipeline laterals would be greatest during construction of the Project because of the increased width of rights-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 Adelphia's Procedures and E&SCP.

About 81 percent of the pipeline laterals would be within or adjacent to existing rights-of-way (see table A-3). As a result, the visual resources along the majority of the pipeline laterals have been previously affected by other industrial operations. 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 conditions in these forested areas would take 20 years or more, depending on the species and age of the cleared tree species. Most of the trees that would be cleared during construction of the pipeline laterals are on parcels with existing industrial or commercial facilities. Additionally, Adelphia has limited impacts on forested vegetation to the extent practicable (3.4 acres during construction would be impacted).

After construction of the pipeline laterals, most of the areas disturbed by construction would be restored and returned to pre-construction conditions in compliance with federal, state, and local permits; landowner agreements; and Adelphia's easement requirements. Adelphia would limit vegetation clearing to a 30-foot-wide right-of-way during operations for the pipeline laterals and would not clear or maintain the right-of-way between HDD entry and exit locations. Further, given about 3.3 miles (70 percent) of the pipeline laterals would be constructed within roadways, specifically in Parkway Avenue and Ridge Road as depicted in appendices A-1 and D, which would be restored to pre-construction conditions and are not subject to vegetation maintenance during operation, we conclude no visual impacts would occur as a result of operation of the pipeline within these areas. The primary long-term visual effects associated with the pipeline laterals would be the clearing of about 2.4 acres of forested vegetation along the south side of Ridge Road to accommodate workspace for installation of the Tilghman Lateral via HDD (between MPs 1.6 and 2.4). Visual impacts would be most noticeable for residents about 85 feet from construction workspaces on the northwest side of Ridge Road between MPs 1.7 and 1.8, and, to a lesser degree, passing motorists on Ridge Road. The permanent visual impacts of the pipeline laterals would be limited to the 0.5 acre of forested vegetation that would be permanently cleared for the new permanent rights-of-way. Through Adelphia's implementation of the revegetation measures in our Plan, placement of the laterals within or adjacent to existing disturbance where possible, and pipeline routing through predominately non-forested land, we conclude that visual impacts of the laterals would be appropriately minimized and not significant.

Aboveground Facilities

Adelphia would construct the Marcus Hook Compressor Station and Monroe and Tilghman Meter Stations within existing facility sites that are paved, contain similar infrastructure, and are classified as industrial/commercial land. Visual receptors in the vicinity of these facilities would include current workers at existing industrial facilities, visitors to nearby commercial businesses, motorists on nearby roadways, as well as the residents across the street from the existing Marcus Hook site. Residences in proximity to these stations are identified in table B-24 in section B.8.2 at distances ranging from 530 to 2,780 feet. Construction and operation of these stations would not result in changes to vegetation patterns. The facilities would be visible as new features in the viewshed, although they would be similar to the existing facilities at these sites.

Therefore, we conclude that no significant permanent visual impacts would occur from construction or operation of the Marcus Hook Compressor Station or the Monroe and Tilghman Meter Stations.

Similarly, Adelphia would construct the Quakertown Compressor and Meter Stations and the Delmarva Meter Station within existing facility sites; however, construction of these sites would require vegetation clearing and disturbance of 2.7 acres of open lands. Visual receptors in the vicinity of these facilities would include nearby residents, current workers and visitors to the commercial business just north of the existing site, and motorists on nearby roadways. Residences in proximity to these stations are identified in table B-24 in section B.8.2 at distances ranging from 312 to 640 feet.

The existing Quakertown facility is adjacent to Rich Hill Road (about 525 feet from the road) with trees north and south of the site that serve as a visual buffer for residents. Land to the east and west of the existing site are a mix of agricultural and open land; providing unobstructed views of the existing station. During construction of the Quakertown Compressor and Meter Stations, construction equipment and personnel would be visible to nearby residents, depending on their specific vantage points.

Following construction, the most prominent feature in the viewshed would be the compressor building at the Quakertown facilities, which would be about 35 feet in height with stacks that would extend about 5 feet above the roofline to a total height of 40 feet. Other support/control buildings would be 11 feet and 12 feet in height. These buildings would be new features in the viewshed and most noticeable for adjacent landowners, particularly the residence that is about 530 feet southeast of the proposed site, as well as motorists on Rich Hill Road.

Commenters, including nearby residents and town officials from West Rockhill Township, expressed concern for impacts on visual receptors. Adelphia is consulting with the township on the design of the compressor station, including selection of a color scheme. Adelphia is also coordinating with nearby landowners and has committed to installing landscaping to aid in visual screening for nearby visual receptors.

The proposed site of the Delmarva Meter Station is at the terminus of the Parkway Lateral, immediately adjacent to several residences on the north side of Parkway Avenue (see appendix A-2). The closest residence is about 312 feet southeast of the proposed site. Vegetation between the existing facility and these residents currently serves as a visual and noise buffer; however, Adelphia is proposing to install the Parkway Lateral via the open cut method at this location, which would result in removal of all or part of the existing vegetation for the nearby residences (0.1 acre of forest land). This meter station would also be in proximity to the Delaware-Pennsylvania Boundary Monument 21½ (Boundary Monument) and Hickman Row (historic district), which require consultation with the State Historic Preservation Office (SHPO), as discussed in section B.7.1.

Because consultation with West Rockhill Township and adjacent landowners to the Quakertown Compressor and Meter Stations is ongoing, and because Adelphia has not committed to mitigation of visual impacts on the residences on either side of Parkway Avenue from construction and operation of the proposed Delmarva Meter Station, **we recommend that:**

- **<u>Prior to construction</u>, Adelphia should file with the Secretary, for review and written approval by the Director of OEP, site-specific visual screening plans for the Quakertown Compressor and Meter Stations, developed in consultation with West Rockhill Township, and the Delmarva Meter Station. The plans should include photo simulations of the resulting viewshed from the perspective of the nearby visual receptors.**

In section B.7.1, we provide additional information on the visual screening plan to mitigate impacts on a historic district (Hickman Row) in proximity to the Delmarva Meter Station.

The Transco Meter Station would be constructed on forested land on the north side of Ridge Road. Adelphia had initially proposed to locate this meter station on the south side of Ridge Road on previously disturbed land. However, during landowner negotiations Adelphia agreed to locate the station on the proposed site, which would permanently convert about 0.9 acre of forested land to industrial/commercial land. Adelphia would maintain a 250-foot-wide forested buffer between the meter station and Ridge Road. Given the proposed site's proximity to similar infrastructure, our recommendation, and Adelphia's commitment to maintain vegetative screening, we conclude that visual impacts would be appropriately minimized and not significant.

<u>Access Roads</u>

To the extent feasible, Adelphia would use existing public and private roads along the pipeline laterals as the primary means of accessing the pipeline lateral rights-of-way and aboveground facilities. In addition to existing public roads, Adelphia has identified 13 access roads (2 new and 11 existing)[26] for use during construction the Project. Use of these access roads during construction, including modifications (e.g., widening, extending, and matting) of two existing access roads would affect a total of 4.2 acres. Following construction, 12 of the 13 access roads would be used for operation of the Project. Also, as discussed above, Adelphia would use the Schuylkill River Trail (AR-28.04-02) for operation and maintenance of the Schuylkill River BAV. This access road has a larger footprint than the temporary access road that would be used for construction, and as such, these permanent access roads would result in 4.7 acres of roadways, of

[26] These are existing access roads, supplemented with portions of the existing mainline's right-of-way, that are utilized by IEC for operation and maintenance.

which 0.2 acre would be associated with new permanent access roads. The trimming of trees and maintenance of two new access roads, located along the existing mainline and generally near existing roads and/or railroads, would result in a permanent but negligible impact on visual resources.

Through Adelphia's implementation of the revegetation measures in the Plan, placement of Project components within or adjacent to similar infrastructure and existing disturbance where possible, and limited clearing required for construction of the Project, we conclude that visual impacts of the entire proposed Project would be appropriately minimized and not significant.

6. Socioeconomics

The socioeconomic analysis for the proposed Project examines data from Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania, and New Castle County, Delaware. Of these, the greatest potential for socioeconomic impacts would occur in Bucks, Montgomery, and Delaware Counties, in Pennsylvania, and New Castle County in Delaware, where the new pipeline laterals and aboveground facilities are proposed. No work would be required at the existing facilities in Northampton County, except for the installation of a fence at the existing station. Because this work is likely to be conducted by a local contractor, impacts on socioeconomic characteristics in this county are not expected and it is not included in the analysis that follows.

The counties in the Project area have a combined estimated population for 2017 of 3.1 million people (U.S. Census Bureau 2018a). Socioeconomic impacts resulting from the construction and operation of the proposed Project would be related to the number of construction workers that would work in the Project area and their impact on population, public services, and employment during construction. Other potential effects include an increase in local traffic, decreased available housing, and increased tax revenue. We also received comments regarding property values.

6.1 Employment

Based on the U.S. Bureau of Labor Statistics, the average unemployment rate in 2017 for Pennsylvania was 4.9 percent, with unemployment rates of 4.2, 3.9, 3.6, and 4.5 percent in Bucks, Montgomery, Chester, and Delaware Counties, respectively. The average unemployment rate in 2017 for Delaware was 4.6 percent, with an unemployment rate of 4.5 percent in New Castle County (U.S. Bureau of Labor Statistics 2018a).

Construction of the Adelphia Gateway Project would require an estimated peak workforce of 515 workers.[27] The 515 workers would be spread through the Project area,

[27] We assume that the Quakertown Meter Station would require a separate workforce from that required for construction of the Quakertown Compressor Station.

with a concentration of workers (about 300 workers) in Delaware County, Pennsylvania for construction of the new laterals and associated aboveground facilities. Adelphia anticipates that about 60 percent, or 309 workers, of the construction workforce would be hired locally. Specialists and supervisory positions may be filled by non-local workers. Local workers would likely be residents of the counties in the Project area and/or adjacent counties, and would reside within commuting distance of the Project.

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 8-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 and a negligible impact on the population and services of the local municipalities.

Adelphia would hire between 7 and 10 workers for operation of the Project. This would result in a permanent, negligible impact on employment rates in the Project area.

6.2 Transportation

Construction of the Project may result in minor, temporary impacts on roadways due to construction and the movement of workers and heavy equipment. The Project would cross 12 railroads and 27 public roads (see appendix E). Adelphia would cross all but two of the proposed road crossings and all of the railroads using one of the nine HDDs proposed for the Project. This method avoids direct impacts on the road surface and associated transportation as described in section A.7.2. Two roads would be crossed three times using the open-cut method, which allows for a more expedited crossing with less ATWS requirements. However, this method would result in direct impacts on the road surface and associated transportation. Nine roads would be temporarily encumbered by construction workspace.

Two roads along the Tilghman Lateral (Blueball and Hewes Avenue) would be temporarily obstructed during construction to accommodate the pull string area for HDD-2 (see appendix A-1). Adelphia estimates that the pull string activities at this location would take place over 3 days with 24-hour operations.

Adelphia has proposed to construct portions of the new laterals within or immediately adjacent to Parkway Avenue and Ridge Road. Construction at these areas would be a combination of open cut and HDD. Adelphia has committed to maintaining one lane of open traffic at a time. In-road work for Parkway Avenue and Ridge Road is expected to occur over a 20-day and 6-month period, respectively. However, installation of the Tilghman Lateral within Ridge Road would occur over a distance of about 2 miles, as such construction at any one location in Ridge Road would occur over a shorter duration (a few days to a few weeks). Impacts on users of these roads and other roadways would be mitigated by measures described in Adelphia's Residential Access

and Traffic Mitigation Plan.[28] These measures include a commitment to maintain traffic flow through the establishment of detours or the use of steel plates. Adelphia would establish temporary detours in consultation with transportation authorities, and applicable permits (see table A-7).

A minor increase in traffic would occur during the 8-month construction period from the temporary influx of workers moving throughout the Project area; however, we anticipate that much of this travel would occur outside of peak traffic times. However, construction of the Marcus Hook Compressor Station, pipeline laterals and associated new meter stations in New Castle and Delaware Counties would be concentrated within a less than 5-mile-long stretch in an urban area with a mix of residential and industrial facilities. Currently Adelphia has only identified one wareyard that could be used for contractor parking (within the proposed Marcus Hook Compressor Station site). However, this yard would also be used for pipe storage and is the site of the proposed Marcus Hook Compressor Station. Construction of the new laterals would predominately be within or immediately adjacent to roadways, as such there would be limited upland areas within the construction rights-of-way that could serve as parking areas for construction workers. Finally, proposed temporary workspace and ATWS would encumber existing public parking lots, including parking lots at four locations along the Tilghman Lateral and one location along the Parkway Lateral, as well as public roadside parking along Ridge and Price Roads, thereby displacing current residences and workers to alternative parking areas in the vicinity. Because it is unlikely that the current inventory of public parking areas in proximity to Marcus Hook Compressor Station, two new laterals and associated meter stations would be able to accommodate the existing residents, workers, and visitors to the area, in combination with the anticipated peak workforce for these facilities (300 workers), **we recommend that**:

- **<u>Prior to construction</u>, Adelphia should identify parking areas for construction workers at the Marcus Hook Compressor Station and for the two new laterals and associated meter stations and file the information with the Secretary for review and written approval by the Director of OEP.**

A commenter raised concerns for safety and traffic impacts from construction the Quakertown facilities on schools in proximity and school buses that use Rich Hill Road. Adelphia anticipates that the majority of Project construction would occur during daylight hours, generally between the hours of 6:30 a.m. to 6:30 p.m.; therefore, construction workers commuting to the proposed Quakertown facilities (estimated to be 57 workers during peak construction) may contribute to traffic during peak morning commute times. Potential traffic delays could also occur associated with delivery of construction equipment and materials to the proposed site, but would be intermittent and short-term. Further, access to Rich Hill Road via Scholls Road and South West End

[28] Available on eLibrary under accession no. 20180813-5039.

Boulevard/ Route 309 provide alternative access in a relative short distance (about 2.5 miles). Therefore, we conclude that impacts on traffic in proximity to the proposed Quakertown facilities would temporary, and not significant.

Minimal traffic delays would also occur during the transportation of construction materials, specifically oversized equipment, on public roadways. Adelphia would obtain all permits necessary to transport construction materials on public roadways. With Adelphia implementation of its Residential Access and Traffic Mitigation Plan, adherence to applicable permits, and our recommendation, we conclude impacts on transportation would be temporary, minor, and not significant. Based on the nominal operational workforce of between 7 and 10 workers, impacts on traffic patterns during operation would be permanent but not significant.

6.3 Housing

Construction of the Adelphia Gateway Project would require a peak workforce of about 515 workers. About half the workforce (270 workers) would be concentrated in Delaware County, Pennsylvania, for construction of Marcus Hook Compressor Station, the new pipeline laterals, and associated meter stations. Of the 270 workers, about 108 would be non-local hires who would temporarily relocate to the Project area. The U.S. Census Bureau estimates that there were 5,431 vacant housing units available for rent in the counties that would be crossed by the Project (U.S. Census Bureau 2010a). In addition, Adelphia has identified 280 hotels and motels, and 44 recreation vehicle parks and campgrounds in the Project area.

Based on the number of available rental units, hotels/motels, recreation vehicle parks, and campgrounds in the Project area, we conclude that, even if all workers were non-local, 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. Between 7 and 10 workers would be hired permanently for operation of the Project. Therefore, we conclude the Project would have a negligible impact on housing in the Project area.

6.4 Public Services

Adelphia identified the existing inventory of service providers in the Project area, which includes: 30 hospitals, 70 fire departments, and 38 police departments. Although the need for medical, fire, and police services may increase slightly during construction activities, adequate public services exist in the Project area to handle a civil, criminal, and emergency event. Further, Adelphia 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.9.6).

Given the brief construction period, about 8 months, it is unlikely that families would accompany non-local workers to the Project area. However, over 630 schools

exist in the Project area (Public School Review 2018), with about 115 in Delaware County, Pennsylvania, where the majority of the workforce (about 270 workers) would be concentrated.

We find this inventory of public service providers sufficient to accommodate the influx of construction workers and their families during construction of the Project. Given the existing population of the Project area, we conclude the addition of 7 to 10 new permanent employees for operation of the Adelphia Gateway Project would not have an impact on public services.

6.5 Property Values

We received comments about potential adverse effects on property values resulting from the Project's construction and operation. 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 consider 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 or compressor stations and residential property values (Diskin *et al.* 2011, Foster 2016), 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.

Adelphia would compensate landowners for new easements along the pipeline routes and at the aboveground facilities, where applicable, as well as the temporary loss of land use associated with construction workspaces and any damages. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for facility construction and operation. Adelphia's acquisition of the Existing System would not require new easements. Affected landowners who believe that their property values have been negatively affected could appeal to the local tax agency for reappraisal and potential reduction of taxes.

Because Adelphia is proposing to utilize an existing system, a portion of which is currently in-service, and newly proposed facilities would be constructed within existing

facility sites or predominately on industrial/commercial land (78.6 percent), we conclude the Project would have no significant impact on property values.

6.6 Tax Revenue

Based on Commonwealth of Pennsylvania tax law, Adelphia 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 Adelphia'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 Project tax revenue into the counties that would be crossed by the Project in Pennsylvania would result from sales tax from the purchase of construction-related expenses and by the fuel, lodging, and food purchased by non-local construction workers. Adelphia estimates that about $7 million annually would be spent locally on the purchases of materials and for the operational payroll. The state of Delaware does not apply sales tax to the purchase of goods and services and does not allow cities or counties to assess any type of sales tax.

6.7 Environmental Justice

Environmental justice considers disproportionately high and adverse impacts on minority or low-income populations in the surrounding community resulting from the programs, policies, or activities of federal agencies. Items considered in the evaluation of environmental justice include human health or environmental hazards, the natural physical environment, and associated social, economic, and cultural factors.

According to the CEQ environmental justice guidance under NEPA (CEQ 1997) and *Promising Practices for EJ Methodologies in NEPA Reviews* (USEPA 2016), minorities are those groups that include American Indian or Alaskan Native; Asian or Pacific Islander; 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 (10 percent greater) than the minority population percentage in the general population or other appropriate unit of geographic analysis. The 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 reported income below the poverty level. Table B-17 provides a summary of the minority or low-income percentage of county populations within 1.0 mile of the proposed compressor stations.

Table B-17
Minority Populations and Poverty Levels in the Vicinity of the Proposed Compressor Stations

State/County/ Census Tract/ Block Group	White, not Hispanic or Latino	African-American	Hispanic or Latino	Asian	American Indian and Alaskan Native	Native Hawaiian and Pacific Islander	Two or More Races	Minority Populations	Children under the age of 17	Population Below Poverty
Quakertown Compressor Station										
Pennsylvania	77.7	11.0	6.6	3.1	0.2	0.0	2.2	22.3	21.2	13.3
Bucks County	85.2	3.9	4.9	4.4	0.1	0.0	1.8	14.8	21.4	5.9
Tract 102300										
Block Group 2	96.6	1.0	0.8	1.6	0.0	0.0	0.0	3.4	18.7	10.4
Tract 102700										
Block Group 2	92.9	3.7	0.7	2.2	0.5	0.0	0.0	7.1	14.4	4.9
Block Group 3	91.0	1.9	6.6	0.0	0.0	0.0	0.5	9.0	17.5	18.3
Tract 106401										
Block Group 1	93.0	0.7	0.8	3.6	0.0	0.0	1.8	7.0	31.9	1.2
Block Group 2	87.1	0.4	5.5	6.9	0.0	0.0	0.0	12.9	25.6	6.6
Tract 106402										
Block Group 1	98.1	1.0	0.8	0.0	0.0	0.0	0.0	1.9	31.4	1.7
Marcus Hook Compressor Station										
Delaware	63.5	21.7	8.8	3.7	0.4	0.0	2.8	36.5	21.8	12.0
New Castle County	59.2	24.4	9.4	5.2	0.2	0.0	2.6	40.8	22.2	11.4
Tract 010101										
Block Group 1	46.7	51.6	1.8	0.0	0.0	0.0	0.0	53.3	22.5	8.3
Block Group 2	32.9	52.2	3.4	1.4	2.2	0.0	10.7	67.1	33.9	10.4
Block Group 3	41.7	20.7	9.9	25.6	0.9	0.0	6.4	58.3	13.4	15.3
Tract 010104										
Block Group 1	61.6	27.2	6.5	0.9	0.0	0.0	5.5	38.4	26.7	15.4

Table B-17 (continued)
Minority Populations and Poverty Levels in the Vicinity of the Proposed Compressor Stations

State/County/ Census Tract/ Block Group	White, not Hispanic or Latino	African-American	Hispanic or Latino	Asian	American Indian and Alaskan Native	Native Hawaiian and Pacific Islander	Two or More Races	Minority Populations	Children under the age of 17	Population Below Poverty
Marcus Hook Compressor Station (continued)										
Pennsylvania	77.7	11.0	6.6	3.1	0.2	0.0	2.2	22.3	21.2	13.3
Delaware County	68.6	21.0	3.5	5.3	0.1	0.0	2.1	31.4	22.5	10.9
Tract 406600										
Block Group 1	83.9	14.8	0.0	0.0	0.0	0.0	1.3	16.1	15.6	24.1
Block Group 2	64.8	33.0	2.8	0.0	0.0	0.0	1.9	35.2	36.1	13.4
Tract 406700										
Block Group 2	82.9	11.2	0.2	0.8	0.0	0.0	4.9	17.1	29.1	17.3
Tract 406802										
Block Group 1	97.2	1.4	0.0	0.0	0.0	0.0	1.4	2.8	23.8	1.4
Block Group 2	59.3	34.4	2.8	0.0	0.0	0.0	4.9	40.7	21.4	24.1
Block Group 3	92.2	0.8	3.6	0.0	0.0	0.0	3.5	7.8	24.9	5.3

We received comments expressing concern for impacts on minority, low-income populations, and children under the age of 17 years; therefore, our analysis is based on block groups within 1.0 mile of the proposed aboveground facilities and includes the percentage of the total populations that are children under the age of 17 years. In Bucks County, Pennsylvania, minorities comprise 14.8 percent of the total population, slightly less than the state (22.3 percent). None of the six block groups within 1.0 mile of Quakertown Compressor Station have minority populations that are higher than 50 percent of the population nor are the populations meaningfully greater than the general population. The percentage of minorities in these block groups ranges from 3.4 to 12.9, lower than both Bucks County and the state of Pennsylvania.

The percentage of low-income individuals living in block groups within 1.0 mile of the Quakertown Compressor Station range from 1.2 to 18.3. Only Census Tract 102700, Block Group 3's percentage of low-income individuals (18.3 percent) is higher than the state (13.3 percent) and the county (5.9 percent). The other block groups are comparable to both the county and state's percent of low-income individuals.

In New Castle County, Delaware, and Delaware County, Pennsylvania minorities comprise 40.8 and 31.4 percent, respectively, of the total population, both greater than the state (22.3 percent). The percentage of minorities in these block groups ranges between 38.4 and 67.1 percent in New Castle County and between 2.8 and 40.7 percent in Delaware County. Three block groups within 1.0 mile of Marcus Hook Compressor Station have minority populations that are higher than 50 percent of the population, and which are meaningfully greater than the minority population of the corresponding county. These minority populations are predominately black (51.6 and 52.2 percent in block groups 1 and 2 of census tract 010101). In block group 3 the population is comprised of persons identifying their race as either Asian or African American (25.6 and 20.7 percent, respectively).

The percentage of low-income individuals living in block groups within 1.0 mile of the Marcus Hook Compressor Station range from 8.3 to 15.4 in New Castle County, Delaware, comparable to both the county and the state and range between 1.4 and 24.1 percent in Delaware County, Pennsylvania. Only Census Tract 406600, Block Group 1 and Census Tract 406802, Block Group 2's percentage of low-income individuals (both 24.1 percent) are higher than the state (13.3 percent) and the county (10.9 percent). The other block groups are comparable to both the county and state's percent of low-income individuals. Based on our analysis above, and per USEPA guidelines stated above, environmental justice populations exist within the study area.

The percentage of children 17 years of age or younger ranges from 14.4 to 31.9 percent in block groups within 1.0 mile of Quakertown Compressor Station in Bucks County, Pennsylvania. These percentages are comparable with the state of Pennsylvania (21.2 percent) and Bucks County (21.4 percent). The percentage of children 17 years of age or younger in block groups within 1.0 mile of the Marcus Hook Compressor Station

ranges between 13.4 and 33.9 percent in New Castle County, Delaware, and between 15.6 and 36.1 percent in Delaware County, Pennsylvania. These percentages are comparable with the state of Pennsylvania (21.2 percent), the State of Delaware (21.8 percent), New Castle County (22.2 percent), and Delaware County (22.5 percent). Based on consultation with the USEPA, we investigated schools and daycares within 1.0 mile of the proposed compressor stations. One school and one daycare were identified about 1.0 mile northeast and southeast, respectively, of the Marcus Hook Compressor Station. The closest daycare and school to the Quakertown Compressor Station were about 1.3 and 1.5 miles, respectively, northwest.

As described in section A.9, we have made several documents and notices about the Project available to the public. Overall, the Project would result in negligible to minor negative impacts and minor to negligible positive impacts on socioeconomic characteristics and economies in the Project area. As discussed throughout this EA, potentially adverse environmental effects associated with the Project would be minimized or mitigated, as applicable. Adelphia has worked to mitigate impacts on the human environment by incorporating existing pipeline systems into the proposed Project, collocating new facilities with existing facilities, and routing the proposed laterals predominately through industrial/commercial land (78.6 percent). Further, Adelphia is proposing to install about 3.3 miles (70 percent) of the pipeline laterals within existing roadways, and the Tilghman Lateral would be installed by the HDD method at nine locations.

As discussed in section B.5.5, the Project aboveground facilities would generally be constructed within existing rights-of-way, existing facility sites that are paved, contain similar infrastructure, and/or on land predominately classified as industrial/commercial land. Therefore, while the aboveground facilities would be visible as new features in the viewshed, they would be similar to the existing facilities at these sites. Area residents may be affected by traffic delays during construction of the Project. However, with Adelphia's commitment to implementing mitigation measures to alleviate any potential road congestion during construction through the establishment of detours, or the use of steel plates, and in consultation with transportation authorities, we conclude these impacts would be minor and short-term. Potential pollution emissions from the Project, when considered with background concentrations, would be below the National Ambient Air Quality Standards (NAAQS), which are designated to protect public health. Therefore, the Project would not have significant adverse air quality impacts on the low-income or minority populations in the Project area. Air quality impacts are discussed in more detail within section B.8.1. Temporary construction impacts on residences and businesses in proximity to construction work areas could include noise. As discussed in section B.8.2, noise levels resulting from construction would vary over time and would depend upon the number and type of equipment operating, the level of operation, and the distance between sources and receptors. Alternatively, operational noise associated with the two new compressor stations and five new meter stations would be persistent,

however Adelphia would be required to meet FERC's sound level requirements, which is discussed in detail in section B.8.2. With Adelphia's proposed mitigation measures and our recommendations in section B.8.2, the Project would not result in significant noise impacts on local residents and the surrounding communities.

In conclusion, as highlighted in table B-17, the populations in 1 of the block groups within 1.0 mile of the Quakertown Compressor Station and seven of the block groups within 1.0 mile of the Marcus Hook Compressor Station contain environmental justice populations. Potentially adverse environmental effects associated with the Project on surrounding communities, including environmental justice populations, would be minimized and/or mitigated, as applicable, and would not be high and adverse. However, vulnerable populations (i.e. groups with high asthma rates) may exist within the study area and disproportionate impacts on these populations could occur as they would be impacted more than the general population due to air quality impacts during construction and operation.[29] Section B.8.1 provides additional discussion of potential air and health effects on residents in proximity to the Project. Potential pollution emissions from the project, when considered with background concentrations, would be below the NAAQS, which are designated to protect public health, including sensitive populations such as children, the elderly, and asthmatics. Therefore, based on our analysis we conclude that the Project would not result in high and adverse impacts on vulnerable populations and would not have a disproportionately high and adverse impact on the remaining environmental justice populations within the study area.

7. Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires the FERC to take into account the effects of its undertakings on properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Adelphia, as a non-federal party, is assisting the Commission in meeting our obligations under Section 106 and the implementing regulations by preparing the necessary information, analyses, and recommendations, as authorized by 36 CFR 800.2(a)(3).

7.1 Cultural Resources Investigations

Pennsylvania

Adelphia initially contacted the Pennsylvania SHPO regarding the Marcus Hook, Quakertown, and Martin's Creek Project components, providing a Project description,

[29] It has been noted that asthma rates in African American populations tend to be higher than in white populations (U.S. Department of Health & Human Services 2018); therefore, due to demographics, there is a likelihood that populations vulnerable to asthma may exist in proximity to the compressor station.

mapping, a summary of background research, and photographs. As a result of the background research, Adelphia recommended that no archaeological field testing was necessary for these three Project components. Adelphia also recommended further study for three aboveground resources the Boundary Monument, Aniline Village/Penn-Del City, and Lawn Croft Cemetery [including the Goodley-Armstrong House]) adjacent to the Marcus Hook Compressor Station site; and three aboveground resources (Heinrich Plank Farm, Heinrich Plank Farm at 1115 Rich Hill Road, and Housekeeper/Frank/Clymer Farm) adjacent to the Quakertown facilities, including compressor and meter stations and the tap valve. In a September 26, 2017 letter, the Pennsylvania SHPO concurred with Adelphia's recommendations and requested Historic Resource Survey Forms (HRSF) be prepared for the aboveground resources, excluding the Boundary Monument.

In a December 28, 2017 letter to the SHPO, Adelphia provided Project updates, including the addition of the following Project components: Skippack Tap Valve,[30] Marcus Hook Compressor Station, Tilghman Lateral (including meter stations), the two MLVs, and the seven BAVs.[31] Information provided included a Project description, mapping, a summary of background research, photographs, and the HRSFs requested in the SHPO's September 26, 2017 letter. As a result of the background research, Adelphia recommended that further research was necessary to determine the need for archaeological survey of the Skippack Tap Valve, and the need for archaeological and aboveground survey of the MLVs and BAVs. Aboveground surveys were recommended for the Kulp and Cook Farms adjacent to the Skippack Tap Valve, and archaeological surveys were recommended for four locations along the Tilghman Lateral. Adelphia also stated that it would install a protective enclosure around the Boundary Monument prior to construction. In a letter dated January 11, 2018, the SHPO concurred with the recommendations regarding archaeological resources, and following review of the HRSFs, found the Lawn Croft Cemetery, Goodley-Armstrong House, Aniline Village, Heinrich Plank Farm, Heinrich Plank Farm at 1115 Rich Hill Road, and Housekeeper/Frank/Clymer Farm not eligible for the NRHP. The SHPO also requested HRSFs for the Kulp and Cook Farms, and indicated that no additional aboveground investigations were warranted for the Tilghman Lateral, the MLVs, and BAVs.

Per its most recent correspondence with the Pennsylvania SHPO on August 17, 2018 regarding Project modifications and background research for the BAV and MLV sites, Adelphia recommended archaeological surveys of six sites if new disturbance outside of the existing subsurface disturbance would be required. These facilities include: the Chester Creek, French Creek, and East Perkiomen Creek BAVs, the access

[30] This facility was originally proposed to be a meter station but in its August 10, 2018 filing, available on eLibrary under accession no. 20180813-5039, Adelphia modified the proposed facility to be a tap valve.

[31] In its filing on October 2, 2018, available on eLibrary under accession no. 20181002-5167, Adelphia removed the Pickering Creek BAV from the proposed Project.

road to the Schuylkill River BAV, and MLV 2. Adelphia indicated it would complete any required surveys. In addition, Adelphia indicated it was conducting an archaeological survey at the Transco Meter Station, and due to Project modifications, no survey would be required for the Skippack Tap Valve (including providing HRSFs for the Kulp and Cook Farms), and only one location would require archaeological testing on the Tilghman Lateral. In a letter dated September 14, 2018, the Pennsylvania SHPO agreed with these recommendations. Adelphia has not yet provided the survey report(s) for the above-mentioned areas requiring survey, or the SHPO's comments on the report(s).

We received comments from landowners concerned about potential impacts on the Middle Pickering Rural Historic District (which the originally proposed Pickering Creek BAV would have been located within), Oskar G. Stonorov House, and Bridge No. 178. Adelphia has removed the Pickering Creek BAV from the Project, therefore, there would be no impacts on these resources. In addition, we received comments from landowners concerned about potential visual and noise impacts on historic homes from the Quakertown Compressor Station. Visual and noise impacts are discussed in sections B.5.5 and B.8.2, respectively.

Lower Saucon Township expressed concern about the Project's impacts on the township's cultural and historic resources and requested to be a consulting party. No construction is proposed in this township; therefore, no cultural or historic resources would be affected and no consultation is necessary.

A landowner expressed concern about potential construction vibration impacts on his historic stone house/hotel. Vibration impacts are discussed in section B.8.2.

A landowner expressed concern about his historic farmhouse. In its January 11, 2018 letter, the Pennsylvania SHPO found this property (Cuce) not eligible for the NRHP.

A landowner expressed concern about impacts on the Churchill Cemetery. In its March 12, 2018 letter to the landowner, Adelphia indicated that the Project would have no direct impact on the cemetery as no construction is planned within or around the cemetery property.

Delaware

Adelphia contacted the Delaware SHPO regarding the Project, providing a Project description, mapping, a summary of background research, and photographs. As a result of the background research, Adelphia recommended that no archaeological field testing was necessary, and that two previously recorded aboveground resources (the Boundary Monument and Aniline Village/Penn-Del City) adjacent to the Parkway Lateral warranted further consideration. In a September 26, 2017 letter, the Delaware SHPO determined that Aniline Village should be treated as an NRHP-eligible district, but that

the Project would have no adverse effects on any of its qualifying characteristics. With regard to the Boundary Monument, the SHPO indicated that it should be protected from construction activities with a highly visible fence or other obstacles. Adelphia indicated it would avoid the Boundary Monument and provide/install protective barriers (bollards) around the Boundary Monument, pending approval of the landowner.

Adelphia completed an archaeological survey and aboveground cultural resources survey for the proposed Delmarva Meter Station, and provided the resulting reports to the FERC and the Delaware SHPO. No archaeological sites were identified. In a letter dated December 17, 2018, the SHPO concurred with the results of the archaeological survey report. The aboveground cultural resources survey identified one historic district, Hickman Row (listed on the NRHP), adjacent to the western boundary of the meter station site. Adelphia recommended that the meter station may have an adverse effect on the Hickman Row Historic District, which could be mitigated through installation of a vegetative buffer. In a letter dated December 7, 2018, the Delaware SHPO concurred with Adelphia's findings and suggested that Adelphia develop a treatment plan that includes a staggered double row of planted evergreens along the western boundary of the proposed Delmarva Meter Station. In section B.5.5, we provide additional information on the visual screening plan for the Delmarva Meter Station to mitigate impacts on residences along Parkway Avenue in proximity to the Delmarva Meter Station.

7.2 Native American Consultation

Adelphia sent initial consultation letters and follow-up letters to seven federally recognized Native American tribes (table B-18). To date, responses have been received from the Absentee Shawnee Tribe of Oklahoma, Delaware Nation, and the Delaware Tribe of Indians. We sent our NOI to these same seven tribes. No responses to our NOI have been received.

7.3 Unanticipated Discovery Plan

Adelphia has provided an Unanticipated Discovery Plan that would be implemented in the event that previously unreported archaeological sites or human remains were encountered during construction. The plan provides for the notification of interested parties, including the appropriate Native American tribes, in the event of any discovery. We requested revisions to the plan. Adelphia provided a revised plan which we find acceptable.

Table B-18 Native American Tribes Contacted About the Project		
Native American Tribe	**Consultation Request Dates[a]**	**Tribal Responses**
Absentee Shawnee Tribe of Oklahoma	August 28, 2017; August 17, 2018	October 4, 2018 – Provided no objection to the Project but did note tribal areas of interest, requested copies of archaeological survey reports completed to date and in the future, and requested to be notified of discoveries. Adelphia has agreed to provide the Tribe with copies of the requested reports upon completion.
Cayuga Nation	August 24, 2017; December 28, 2017; August 17, 2018	None filed to date.
Delaware Nation	August 24, 2017; December 28, 2017; August 17, 2018	October 3, 2017 - Concurred with Adelphia's findings and recommendations and requested notification of Project updates; January 23, 2018- Requested a Project status update and inquired about availability of the Lawn Croft Cemetery records; April 9, 2018 - Notified Adelphia of coordination with Lawn Croft Cemetery personnel; September 25, 2018 – concurred with the proposed project, provided information for protection of sites, and requested to be notified of discoveries.
Delaware Tribe of Indians	August 24, 2017; December 28, 2017; August 17, 2018	February 7, 2018 - Noted tribal areas of interest and requested archaeological surveys of each; April 6, 2018 - Requested electronic receipt of all archaeological survey reports. Adelphia has agreed to provide the Tribe with copies of the requested reports upon completion**.**
Eastern Shawnee Tribe of Oklahoma	August 24, 2017; December 28, 2017; August 17, 2018	None filed to date.
Oneida Nation of Wisconsin	August 24, 2017; December 28, 2017; August 17, 2018	None filed to date.
Onondaga Indian Nation	August 24, 2017; December 28, 2017; August 17, 2018	None filed to date.
[a] Dates in this column include initial Project consultation and subsequent consultations describing Project modifications.		

7.4 Compliance with the National Historic Preservation Act

Some cultural resources surveys are outstanding, and consultation with the SHPOs is not complete. Therefore, to ensure that FERC's responsibilities under the NHPA and implementing regulations are met, **we recommend that:**

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

a. for Pennsylvania, Adelphia files with the Secretary remaining cultural resources survey reports(s); site evaluation report(s), as required; avoidance/treatment plan(s), as required; and comments on the cultural resources reports and plans from the Pennsylvania SHPO;

b. for Delaware, Adelphia files with the Secretary the Delaware SHPO's comments on the visual screening plan for the Delmarva Meter Station;

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

d. FERC staff reviews and the Director of the OEP approves the cultural resources reports and plans, and notifies Adelphia 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

Air quality in the Project area would be affected by construction and operation of the Project. Although air emissions would be generated during construction and operation of the entire Project, the majority of air emissions associated with the Project would result from operation of the new Quakertown and Marcus Hook Compressor Stations. 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.

Existing Air Quality

The Project area for this air analysis includes Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania and New Castle County, Delaware. The climate of the Project area is characterized as continental, with cold to moderately cold winters and warm to hot summers. Maximum daily average temperatures peak at about 87.1degrees Fahrenheit in July and minimum average daily temperatures are typically lowest in January at 25.6 degrees Fahrenheit. Precipitation in the Project area varies,

with an average monthly high of 4.4 inches in July and 2.7 inches in February (NOAA 2015).

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The USEPA oversees the implementation of the CAA and establishes NAAQS to protect human health and welfare.[32] NAAQS have been developed for seven "criteria air pollutants", including nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), particulate matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}), and lead, and include levels for short-term (acute) and long-term (chronic) exposures. The NAAQS include two standards, which are primary and secondary. Primary standards establish limits that are considered to be protective of human health and welfare, including sensitive populations such as children, the elderly, and asthmatics. Secondary standards set limits to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings (USEPA 2018d).

States may adopt standards that are at least as stringent as the NAAQS. At the state level, the PADEP has adopted the NAAQS and state ambient air quality standards for total settled particulates, beryllium, fluorides, and hydrogen sulfide that are codified at Title 25 of the PAC Section 131.3. Delaware has adopted the NAAQS and state ambient air quality standards for total particulate matter, one-hour O_3, hydrocarbons, and hydrogen sulfide. The Delaware standards are codified at Title 7 of the Delaware Administrative Code (DAC), Section 1103.

The USEPA, and state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. The data are then averaged over a specific time period and used by regulatory agencies to determine compliance with the NAAQS and to determine if an area is in attainment (criteria pollutant concentrations are below the NAAQS), nonattainment (criteria pollutant concentrations exceed the NAAQS), or maintenance (area was formerly nonattainment and is currently in attainment). All of the counties in the Project area are designated as nonattainment for the 2015 and 2008 O_3 standards and maintenance for the 2006 $PM_{2.5}$ standard. In addition, Delaware County, Pennsylvania is designated as nonattainment for the 2012 $PM_{2.5}$ standard. All of the counties in the Project area are in attainment for all other criteria pollutants.

In addition, Delaware and Pennsylvania are within the Ozone Transport Region (OTR), which includes 11 states in the Northeast and the Mid-Atlantic, the District of Columbia, and parts of northern Virginia. Ozone transport from states in the OTR contributes to O_3 NAAQS violations in one or more other states. Stationary sources in

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

these states are subject to more stringent permitting requirements, and various regulatory thresholds are lower for the pollutants that form O_3, even if they meet the O_3 NAAQS. Ozone is not directly emitted into the atmosphere from an emissions source; it develops as a result of a chemical reaction between oxides of nitrogen (NO_x) and VOCs in the presence of sunlight. Therefore, NO_x and VOCs are often referred to as O_3 precursors and are regulated to control the potential for O_3 formation. Each state in the OTR is required to submit a State Implementation Plan and enact measures to limit emissions of O_3 precursors.

The USEPA defines air pollution to include GHGs, finding that the presence of GHGs in the atmosphere may endanger public health and welfare through climate change. GHGs occur in the atmosphere both naturally and as a result of fossil fuel combustion and land use change. As with any fossil fuel-fired project or activity, the Project would contribute GHG emissions. The primary GHGs that would be emitted by the Project are carbon dioxide (CO_2), methane, and nitrous oxide. Emissions of GHGs are typically quantified and regulated in units of CO_2 equivalents (CO_2e). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO_2. Thus, CO_2 has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.[33] There are no applicable ambient standards or emission limits for GHG under the CAA. Downstream emissions of GHGs from burning the new natural gas capacity for the Project are discussed in section B.10.

Federal Air Quality Requirements

The provisions of the CAA that are applicable to the Project are discussed below. The estimated potential operational emissions for the Quakertown and Marcus Hook Compressor Stations are presented in table B-21, below.

Prevention of Significant Deterioration and New Source Review

Proposed new or modified air pollutant emission sources must undergo a New Source Review (NSR) prior to construction or operation. Through the NSR permitting process, state and federal regulatory agencies review and approve project emissions increases or changes, emissions controls, and various other details to ensure air quality does not deteriorate as a result of new or modified existing emission sources. The three basic categories of NSR permitting are Prevention of Significant Deterioration (PSD),

[33] These 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 the USEPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

Nonattainment New Source Review (NNSR), and minor source NSR. PSD, NNSR, and minor source NSR are applicable to projects depending on the size of the proposed project, the projected emissions, and if the project is proposed in an attainment area or nonattainment/maintenance area. The PADEP administers the NSR and PSD program in Pennsylvania; the DNREC administers the program in Delaware.

PSD regulations define a major source as any source type belonging to a list of name source categories that have a potential to emit 100 tons per year (tpy) or more of any regulated pollutant or 250 tpy for sources not among the listed source categories. These are referred to as the PSD major source thresholds. Based on the estimated operating emissions presented in table B-21, major source NSR permits would not be required for the Project. Both the Quakertown and Marcus Hook Compressor Stations would be classified as new minor sources; as such, Adelphia would be required to obtain minor source air permits from the PADEP for each of these stations.

Title V Permitting

Title V is an operating air permit program run by each state for each facility that is considered a "major source." The major source threshold for an air emission source is 100 tpy for criteria pollutants, 10 tpy for any single hazardous air pollutant (HAP) and 25 tpy for total HAPs. Based on the potential emission rates for each stationary source facility presented in table B-21, the new Quakertown and Marcus Hook Compressor Stations would not meet the definition of a major source and would therefore not be required to obtain Title V major source permits.

New Source Performance Standards

The USEPA promulgates New Source Performance Standards (NSPS) for new, modified, or reconstructed stationary sources to control emissions to the level achievable by the best-demonstrated technology for stationary source types or categories as specified in the applicable provisions. The NSPS also establish fuel, monitoring, notification, reporting, and recordkeeping requirements.

NSPS Subpart JJJJ sets emission standards for NO_X, CO, and VOCs from new stationary spark ignition internal combustion engines. Subpart JJJJ would apply to the new compressor and emergency generator engines at the Quakertown and Marcus Hook Compressor Stations.

NSPS Subpart OOOOa sets fugitive leak monitoring and repair requirements for compressor stations. Subpart OOOOa would apply to the Quakertown and Marcus Hook Compressor Stations. Adelphia has stated that it would comply with all applicable requirements of these NSPS.

National Emission Standards for Hazardous Air Pollutants

The 1990 CAA amendments established a list of 189 HAPs, resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAP). The NESHAPs regulate HAP emissions from specific source types located at major or area sources of HAPs by setting emission limits, monitoring, testing, record keeping, and notification requirements.

The proposed Quakertown and Marcus Hook Compressor Stations would not be major sources of HAPs. Both stations would include the addition of new compressor and emergency generator engines, which would require compliance with NESHAP Subpart ZZZZ. Adelphia would comply with Subpart ZZZZ by meeting the requirements of NSPS JJJJ.

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 a county 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 NSR permitting. Ongoing operational emissions from the Project that are not subject to NSR permitting are limited to minor fugitive releases and blowdown/vented emissions that would not exceed general conformity applicability thresholds. Detailed construction emissions are presented in table B-19 and a comparison of the construction emissions to applicable general conformity thresholds are presented in

table B-20, below. Detailed emission calculations for the emission estimates identified in tables B-19 and B-20 were filed in Adelphia's August 31, 2018 submittal.[34] 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 USEPA'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 does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO_2e, for accounting and disclosure purposes in table B-19, below. Operational GHG emission estimates are presented, as CO_2e, in table B-21, below. Based on the emission estimates presented, actual GHG emissions from operation of the Quakertown and Marcus Hook Compressor Stations would likely exceed the 25,000-tpy reporting threshold and reporting requirements for the Mandatory Reporting Rule would therefore be applicable 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, and Delaware air quality standards, codified in the DAC. Specific regulations and their applicability are reviewed below. Adelphia submitted state permit applications addressing applicable regulations in 2018.

Pennsylvania

Air pollution control regulations are promulgated in Title 25 PAC, Sections 121 through 145. Federal programs that are incorporated into Pennsylvania's code include NESHAP, NSPS, and NSR. Pennsylvania has full delegation from the USEPA for air permitting programs. A Plan Approval from the PADEP is required prior to construction of the Quakertown and Marcus Hook Compressor Stations, which are minor sources subject to NSR review. Adelphia filed its Plan Approval applications on April 16, 2018 for the construction of the Quakertown and Marcus Hook Compressor Stations, and PADEP held a public hearing on December 4, 2018. A final Plan Approval issuance is pending.

In addition to controls for combustion emission sources, Title 25 PAC, Section 123.1 limits the emission of outdoor fugitive air contaminants. Sources that generate

[34] Detailed emissions calculations are available for public review on eLibrary under accession no. 20180831-5177.

fugitive dust must take all reasonable actions to prevent particulate matter 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.

Title 25 PAC, Section 123.2 prohibits fugitive particulate matter emissions into the outdoor atmosphere to the extent that the emissions are visible at the point the emissions pass outside a person's property. Title 25 PAC, 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 O_3, particulate matter, 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.

Delaware

Air pollution control regulations are promulgated in the Air Quality Management Section of Title 7 DAC, Sections 1101 through 1150. Federal programs that are incorporated into Delaware's code include NESHAP, NSPS, and NSR. Delaware has full delegation from the USEPA for air permitting programs. In addition, any equipment that will emit more than 10 pounds per day of air contaminants must have an operating permit in accordance with the requirements in Title 7 DAC, Section 1102. Adelphia submitted its air contaminant registration to the DNREC on August 6, 2018 for the Delmarva Meter Station. In addition to controls for combustion emission sources, Title 7 DAC, Section 1106 requires dust control measures to limit emissions of particulate matter from construction and materials handling.

General Impacts and Mitigation

Construction

Project construction would result in temporary, localized emissions that would last the duration of construction activities (i.e., up to 8 months). Exhaust emissions would be generated by the use of heavy equipment and trucks powered by diesel or gasoline engines. Exhaust emissions would also be generated by delivery vehicles and construction workers commuting to and from work areas.

Construction activities would also result in the temporary generation of fugitive dust due to vegetation clearing and grading, ground excavation, and driving on unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic and types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Construction emissions were estimated based on the fuel type and anticipated frequency, duration, capacity, and levels of use of various types of construction equipment. Construction emissions were calculated using emission factors provided in AP-42 data (USEPA 2018e) and the USEPA's NONROAD 2008 and MOVES2014a models. Estimated construction emissions for the Project are summarized by Project facility for each county in table B-19. These estimated emissions include exhaust emissions and fugitive dust from on-road and off-road construction equipment and vehicles and exhaust emissions from construction worker commutes and vehicles used to deliver equipment/materials to the site (see appendix I for a detailed breakdown of emissions for these categories).

Construction emissions shown in table B-19 are not expected to result in a violation or degradation of ambient air quality standards, and would not exceed applicable general conformity standards (see table B-20). Adelphia would minimize construction emissions by operating equipment on an as-needed basis, following equipment manufacturer operating recommendations to maximize fuel efficiency, and contractually requiring the construction contractor to minimize emissions by following local, state, and federal emission standards and air quality regulations, including limiting idling. Adelphia would take measures in its Fugitive Dust Plan to reduce fugitive emissions, including:

- application of dust suppressants (e.g., water from municipal sources or tackifiers) to disturbed work areas and unpaved access roads;
- employing construction equipment on an as needed basis;
- removal of spilled or tracked dirt and construction debris from paved streets; and
- reducing vehicle speeds on unpaved roads.

Construction emissions would occur over the duration of construction and would be emitted at different times and locations throughout the Project area. Construction emissions would be minor and would result in short-term, localized impacts in the immediate vicinity of the Project facilities. With the mitigation measures proposed by Adelphia, we conclude that air quality impacts from construction would be temporary and not result in significant impacts on local or regional air quality.

Table B-19
Summary of Estimated Emissions from Construction of the Project

Source	2019 Construction Emissions (tpy)							
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2e	HAPs
Northampton County, Pennsylvania								
Martins Creek Station	0.0	0.0	0.0	0.0	0.0	0.0	0.3	<0.1
Bucks County, Pennsylvania								
Quakertown Compressor Station	7.4	4.8	<0.1	0.5	2.3	0.8	2,110.8	0.2
Quakertown Meter Station	3.4	2.8	<0.1	0.2	1.1	0.3	1,124.0	0.1
Quakertown Tap Valve[a]	0.1	0.2	0.0	<0.1	6.4	0.7	45.4	<0.1
Montgomery County, Pennsylvania								
Skippack Tap Valve[a]	<0.1	0.2	<0.1	<0.1	6.4	0.7	45.4	<0.1
Perkiomen Creek BAV	<0.1	<0.1	0.0	0.0	0.6	0.6	12.6	<0.1
East Perkiomen Creek BAV	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
Chester County, Pennsylvania								
MLV 2	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
Paoli Pike BAV	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
French Creek BAV	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
Cromby BAV	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
Schuylkill River BAV	<0.1	<0.1	0.0	0.0	0.6	<0.1	12.6	<0.1
Delaware County, Pennsylvania								
Tilghman Lateral[b]	8.5	6.6	<0.1	0.2	8.4	1.3	2,952.6	0.2
Chester Creek BAV	<0.1	0.2	0.0	<0.1	6.4	0.7	45.4	<0.1
MLV 1	<0.1	0.2	0.0	<0.1	6.4	0.7	45.4	<0.1
Marcus Hook Compressor Station	6.8	4.7	<0.1	0.1	2.3	0.8	2,090.4	0.2
Transco Meter Station	3.1	2.7	<0.1	<0.1	1.1	0.3	1,110.5	0.1
Tilghman Meter Station	3.1	2.7	<0.1	<0.1	1.1	0.3	1,110.5	0.1
Monroe Meter Station	3.1	2.7	<0.1	<0.1	1.2	0.3	1,110.5	0.1
New Castle County, Delaware								
Parkway Lateral	2.9	2.7	<0.1	0.2	1.1	0.3	1,021.6	0.1
Delmarva Meter Station[c]	5.8	5.2	<0.1	0.5	1.5	0.5	677.6	0.1
Project Total	**44.6**	**36.0**	**0.1**	**1.8**	**49.9**	**8.7**	**13,578.6**	**1.1**

[a] Adelphia did not estimate construction emissions for the tap valves so we have conservatively applied emissions based on emissions reported for MLV 1 as a proxy.

[b] Adelphia's estimated emissions include the Ridge Lateral, which per its June 18, 2018 filing, was subsequently incorporated into the Tilghman Lateral. Therefore, we combined the estimated emissions for the Ridge and Tilghman Laterals to provide a conservative analysis.

[c] This meter station would include delivery interconnects to Columbia, Delmarva, and TETCO.

Table B-20
Comparison of Construction Emissions for the Project to General Conformity Thresholds[a,b]

Air Pollutant	Designated Area	Threshold (tpy)	Pollutant or Precursor	2019 Construction Emissions (tpy)
O_3	Northampton County, Pennsylvania	25[c]	VOC	0.0
		100	NOx	0.0
	Bucks County, Pennsylvania	25[c]	VOC	0.7
		100	NOx	10.8
	Montgomery County, Pennsylvania	25[c]	VOC	0.1
		100	NOx	<0.1
	Chester County, Pennsylvania	25[c]	VOC	0.0
		100	NOx	0.1
	Delaware County, Pennsylvania	25[c]	VOC	0.5
		100	NOx	24.6
	New Castle County, Delaware	25[c]	VOC	0.7
		100	NOx	8.7
$PM_{2.5}$	Northampton County, Pennsylvania	100	$PM_{2.5}$	0.0
	Bucks County, Pennsylvania	100	$PM_{2.5}$	1.8
	Montgomery County, Pennsylvania	100	$PM_{2.5}$	1.4
	Chester County, Pennsylvania	100	$PM_{2.5}$	0.4
	Delaware County, Pennsylvania	100	$PM_{2.5}$	4.3
	New Castle County, Delaware	100	$PM_{2.5}$	0.8

[a] General Conformity is only applicable to nonattainment or maintenance areas. Thresholds for each pollutant are based on the severity of the nonattainment areas or maintenance area where the Project is located. Pollutants and counties for which the Project would not require a General Conformity determination are not shown.

[b] The total may not equal the sum of the addends in table B-19 due to rounding.

[c] While the county is designated as marginal nonattainment for the 2015 O_3 standard, and this standard would apply to the General Conformity Determination of the Project, the area was previously designated as severe nonattainment. Therefore, as a conservative approach, the thresholds established for severe nonattainment areas is used for comparison with Project construction emissions.

Operations

Project operation would result in air emissions due to combustion at the Quakertown and Marcus Hook Compressor Stations, as well as fugitive and vented emissions at the compressor stations, meter stations, MLVs, BAVs, and along the pipeline laterals. Combustion emission-generating equipment at each Compressor Station would include:

- three 1,875 horsepower Caterpillar G3606 natural gas-fired reciprocating compressor engines; and

- one 670 horsepower Caterpillar G3412C natural gas-fired reciprocating emergency generator.

Table B-21 summarizes the annual operational emissions, in tpy, by facility and emissions source for the Project. These estimated emissions are based on manufacturers' data and assumptions that the compressor station engines operate at full load for an entire year (8,760 hours). The Quakertown and Marcus Hook Compressor Stations would not likely operate at capacity (i.e., full load) every day; therefore, table B-21 provides conservative, worst-case estimates of emissions. Fugitive emissions are minor leaks that would occur at valves, seals, and other piping components at the aboveground facilities and along the pipelines. Operational emissions along the existing mainline, existing 20-inch-diameter pipeline, Parkway Lateral, and Tilghman Lateral would be limited to non-combustion related fugitive emissions (see table B-21). In addition, vented emissions would be released at the BAVs in an emergency and at the MLVs for routine pipeline maintenance or in the event of an emergency. Maintenance and emergency blowdowns would also occur at the Quakertown and Marcus Hook Compressor Stations. Since providing the estimates of fugitive emissions provided in table B-21, Adelphia has specified its intent to increase the capacity of the Existing System. Although Adelphia did not propose any changes to the Project's design or compression, the greater capacity could result in higher vented emissions during emergency and planned releases at MLVs and BAVs. However, these releases would be infrequent and are not expected to significantly degrade local air quality.

Adelphia would implement measures to reduce fugitive emissions, including implementing operation and preventative maintenance practices consistent with manufacturer recommendations. Adelphia has stated that it intends to participate in the USEPA Natural Gas STAR Program. Adelphia is currently evaluating the scope of its participation in program components, but has expressed intent to incorporate the follow designs in its Project:

- recapture and recycle gas normally vented at compressor stations through the use of recovery piping;

- design the blow-off piping to be used as bypass piping; and

- utilize infrared cameras and organic vapor detectors (leak sniffers).

In addition, Adelphia would be required to comply with the USEPA's 40 CFR 98, Subpart W and with 40 CFR 60, Subpart OOOOa standards, which both require leak detection and repair programs. However, certain provisions from 40 CFR 60, Subpart OOOOa are formally being reconsidered by the USEPA, including the leak detection and repair programs. Adelphia would comply with all provisions from Subpart OOOOa that apply at the time the Project is completed. Fugitive methane emissions are a source of GHG emissions from the proposed Project.

Table B-21 Summary of Annual Operational Emissions (tpy)[a]								
Facility	**NO_x**	**SO_2**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**CO_2e**	**Total HAPs**
Pipeline Fugitive Emissions[b,c]	0.0	0.0	0.0	0.0	0.0	87.1	25,286.0	0.0
Meter Stations Fugitive Emissions[b,d]	0.0	0.0	0.0	0.0	0.0	8.5	1,810.0	0.0
Quakertown Compressor Station								
Proposed compressors	16.29	0.12	9.84	1.89	1.89	16.44	28,923	6.51
Proposed emergency generator	0.74	0	0.66	0.03	0.03	0.33	219	0.05
Proposed tanks	--	--	--	--	--	0.23	0.2	0.02
Fugitive emissions[b]	--	--	--	--	--	5.76	2,207	0.02
Total	**17.03**	**0.11**	**10.51**	**1.91**	**1.91**	**22.75**	**31,348**	**6.6**
Marcus Hook Compressor Station								
Proposed compressors	16.29	0.12	9.84	1.89	1.89	16.44	28,923	6.51
Proposed emergency generator	0.74	0	0.66	0.03	0.03	0.33	219	0.05
Proposed tanks	--	--	--	--	--	0.23	0.2	0.02
Fugitive emissions[b]	--	--	--	--	--	5.76	2,207	0.02
Total	**17.03**	**0.11**	**10.51**	**1.91**	**1.91**	**22.75**	**31,348**	**6.6**

[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] Fugitive emissions include venting/blowdown emissions.

[c] Including MLVs, BAVs, and tap valves along the existing mainline.

[d] Including new and existing Quakertown Meter Stations along the existing mainline, the new Delmarva Meter Station along the Parkway Lateral, and the new Monroe, Transco, and Tilghman Meter Stations along the Tilghman Laterals.

Air Quality Modeling

To assess air quality impacts from construction of the new Quakertown and Marcus Hook Compressor Stations on regional air quality, Adelphia conducted an ambient air quality analysis for NO_2, $PM_{2.5}$, PM_{10}, CO, and SO_2 using the USEPA's AERMOD program. The model estimates the predicted concentrations of criteria pollutants emitted from the compressor stations using conservative assumptions consistent with USEPA guidelines. Background concentrations from the nearest air monitors were then added to the predicted concentrations from the AERMOD analysis and the total was compared to the NAAQS. The results of the air quality modeling analysis are presented in table B-22. The results of Adelphia's modeling analysis indicate that the combined total of background and Project-related emissions would not

exceed the NAAQS, which are established to be protective of human health, including sensitive populations such as children, the elderly, and asthmatics.

Based on the estimated emissions from operation of the proposed Project facilities and review of the modeling analyses, we find that the Project would not cause or contribute to a violation of the NAAQS, which are protective of human health, including children, the elderly, and sensitive populations. While the Project would have minor impacts on local air quality during operation, we have determined that the Project would not result in significant impacts on air quality.

Table B-22
Predicted Air Quality Impacts for the Project

Facility / Pollutant	Average Period	NAAQS ($\mu g/m^3$)	Facility Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Facility Impact + Background ($\mu g/m^3$)
Quakertown Compressor Station					
CO	1-hour	40,000	389.7	1,833.0	2,222.7
	8-hour	10,000	211.0	1,260.2	1,471.2
SO_2	1-hour	196	0.7	55.9	56.6
	3-hour	1,300	0.7	55.9	56.6
	24-hour	260	0.5	18.6	19.1
	Annual	80	0.1	3.3	3.4
PM_{10}	24-hour	150	8.9	42.0	50.9
$PM_{2.5}$	24-hour	35	7.0	27.3	34.3
	Annual	12	1.4	10.5	11.9
NO_2	1-hour	188	93.3	82.2	175.5
	Annual	100	11.8	18.3	29.6
Marcus Hook Compressor Station					
CO	1-hour	40,000	354.7	1,718.4	2,073.1
	8-hour	10,000	281.7	1,374.7	1,656.4
SO_2	1-hour	196	0.5	23.6	24.1
	3-hour	1,300	0.5	23.6	21.4
	24-hour	260	0.5	13.4	13.9
	Annual	80	0.1	2.1	2.2
PM_{10}	24-hour	150	7.7	113.0	120.7
$PM_{2.5}$	24-hour	35	6.4	25.0	31.4
	Annual	12	1.2	10.0	11.2
NO_2	1-hour	188	72.6	83.4	156.0
	Annual	100	9.8	17.5	27.3

Impacts on Human Health

We received several comments from individuals and organizations concerned with air quality in the vicinity of the Project and the health effects associated with Project-related emissions. Generally, natural gas is composed of approximately 90 percent methane. When combusted, methane forms CO_2 and water vapor, comprising the majority of compressor station emissions. The CO_2 emissions, combustion-related emissions, including NO_x and CO, and the emissions associated with the majority of the remaining 10 percent of natural gas composition are shown in table B-21. With the exception of CO_2e, all of the compounds identified in table B-21 have known health impacts, and are therefore regulated by the USEPA through various components of the CAA. As described above, under the CAA, the USEPA established the NAAQS to protect human health (including sensitive subpopulations such as children or those with chronic illnesses) and public welfare. The air quality modeling completed by Adelphia indicates that the proposed compressor stations would not result in emissions that exceed the NAAQS or significantly contribute to a degradation of ambient air quality. The air quality model evaluates pollutant concentrations from the facility fenceline to a 20 kilometer (12.4 miles) radius from the emissions source; therefore, all nearby residences are included in the model.

Additionally, we received a comment recommending a human health risk assessment (risk assessment) be completed for the Project. FERC completed an independent human health risk assessment in the New Market EA.[35] The compressor stations in the New Market EA risk assessment were about twice as big as the proposed compressor stations in the Project and therefore emitted a greater volume of HAPs as compared to the proposed compressor stations. The risk assessment used conservative assumptions designed to overstate what any individual was likely to experience, and concluded that modeled HAPs emissions from both normal operations and blowdown events were below a level of health concern. The New Market EA provides additional detail on the methodologies and conclusions of the risk assessment. Based on the size of the proposed Adelphia compressor stations, and the results of the New Market EA, we do not believe that conducting a risk assessment specific to the Adelphia facilities is warranted.

One commenter expressed a concern with acute health impacts due to compressor station operation and blowdowns and cited a study that aggregated the emissions data for 18 Title V major source compressor stations that operate throughout New York. As described in section 8.1, the proposed Quakertown and Marcus Hook Compressor Stations are not Title V major sources; therefore, it is not appropriate to compare the emissions of larger facilities that emit a significantly greater volume of emissions as compared to a minor source. Additionally, the referenced study aggregates yearly

[35] Available on eLibrary under accession no. 20151020-4003.

emissions data for compressor stations that are distributed throughout the state of New York to make inferences about risk to human health. Air pollution modeling is typically evaluated on a county or regional scale that incorporates topography, terrain, ground cover, and historic weather data over a multi-year span to refine the air quality model and make it site-specific, considering local factors such as weather and wind patterns that contribute to pollutant dispersion. The air quality modeling completed by Adelphia incorporated these site-specific factors into their analysis. It is not appropriate to aggregate emissions for compressor stations that are separated by large distances, and do not have overlapping air quality impacts, to make conclusions regarding impacts on human health. Therefore, we believe that the site-specific air quality modeling reviewed above provides a more accurate representation of the predicted air quality impacts than the referenced study and do not recommend the study's use for evaluating the human health risk of a specific compressor station.

We also received several comments from individuals and organizations concerned with health effects associated with Project-related emissions of radon gas. Although radon can be entrained in fossil fuels, including natural gas reserves, natural gas processing helps reduce radon concentrations in pipeline-quality natural gas. The upstream processing that removes liquefied petroleum gas from the natural gas stream also removes radon. This is because radon and the two major components of liquefied petroleum gas, namely propane and ethane, have similar boiling points. Processing can remove an estimated 30 to 75 percent of the radon from natural gas (Johnson *et al.* 1973). The Project would use transmission-quality natural gas, which has already been processed and has had impurities (including radon) removed. Additionally, radon has a half-life, defined as the time it takes for the compound to decay to half its initial concentration, of only 3.8 days. The time needed to gather, process, store and deliver natural gas allows a portion of the radon, if present in small quantities after processing, to decay, thereby decreasing the amount of radon in the gas before being combusted in a compressor station or used in a residence. Therefore, we do not believe that radon would be present in the pipeline-quality gas in significant quantities that would result in health impacts on nearby populations.[36]

The Clean Air Council also submitted comments requesting that Adelphia revise the construction emissions estimates presented in its application, including changes in the software used to estimate the emissions and modifications of underlying assumptions.[37] FERC staff requested that Adelphia revise its construction emissions estimates based on a review of Adelphia's assessment and in response to the Clean Air Council comments in an environmental information request issued on July 17, 2018.[38] Adelphia's revised construction emissions estimates are presented in table B-19 and appendix I. The Clean

[36] For additional information on radon, refer to FERC's Atlantic Sunrise Project Final EIS at https://www.ferc.gov/industries/gas/enviro/eis/2016/12-30-16-FEIS.asp

[37] Available on eLibrary under accession no. 20180213-5358.

[38] Available on eLibrary under accession no. 20180717-3038.

Air Council also commented that Adelphia should participate in the USEPA's Natural Gas STAR Program to reduce methane emissions, and should implement emissions controls such as reinjection of blowdown gas. As described above, Adelphia has stated that it intends to participate in the USEPA Natural Gas STAR Program and has expressed its intent to incorporate design measures to reduce fugitive methane emissions. The Clean Air Council commented that upstream and downstream GHG impacts of the Project should be considered in the analysis. Downstream GHG emissions are addressed below; the development of natural gas and associated emissions are outside the scope of this EA.

Lastly, in order to ensure compliance with the CAA, Adelphia would be required to obtain air quality permits through the PADEP and DNREC, as described above. Based our analysis above, we conclude that construction and operation of the Project would not have a significant impact on air quality or human health and would not exceed the NAAQS, which are established to be protective of human health, including sensitive populations such as children, the elderly, and asthmatics.

Downstream GHG Emissions

The Project would result in direct and downstream GHG emissions and would contribute to global increases in GHG levels. GHG emissions from construction and operation were included in tables B-19 and B-21 as CO_2e. The proposed Project would result in the acquisition of the Existing System, including the existing mainline and 20-inch-diameter pipeline. These existing pipelines would deliver 175 million cubic feet per day and 350 million cubic feet per day, respectively, of existing capacity to the Martins Creek LLC Electric Plant and the Lower Mount Bethel Energy LLC Combined Cycle Electric Plant. The majority of these volumes are currently delivered to the power plants. The certification of the 20-inch-diameter pipeline and the northern 34.8 miles of the existing mainline would result in the transfer of ownership only, and would not result in increased GHG emissions. Adelphia's amended application did increase the proposed capacity of the existing mainline from 175 million cubic feet per day to 250 million cubic feet per day; the additional 75 million cubic feet per day would be delivered to the southern portion of the Project. The southern portion of the pipeline system would transport 250 million cubic feet per day of natural gas, of which 22.5 million cubic feet per day is subscribed by the Philadelphia Electric Company for an unspecified end use. Because the downstream emissions from the remainder of the southern portion of the Project are not designated to a specific user, and the end use of the natural gas is not identified by Adelphia, the downstream GHG emissions of the southern portion of the Project are not calculated.[39]

[39] The Parkway Lateral and Delmarva Meter Station, which are proposed to provide natural gas service to TETCO and Columbia, may serve Calpine Corporation's power plants; however, as of the time of the EA's publication no contract or precedent agreement exists to ascribe any particular capacity to this potential end user.

8.2 Noise and Vibration

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel (dB) on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 5 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (Bies and Hansen 1988).

Regulatory Noise Requirements

In 1974, the USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA 1974). This document provides information for state and local regulators to use in developing their own ambient noise standards. The USEPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSA). NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10 dBA nighttime penalty added prior to the logarithmic calculation of the L_{dn}, for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA. This noise requirement is also applied to temporary nighttime construction noise, unless ambient noise levels are greater than 55 dBA L_{dn}, in which case nighttime construction noise must be less than 10 dBA over ambient noise levels.

In addition to FERC's requirements, described above, state and local noise ordinances are relevant to the Project. The proposed Quakertown facilities would be on

the border of Richland Township and West Rockhill Township in Bucks County, Pennsylvania, both of which have established noise ordinances based on land use categories. The Quakertown facilities would be adjacent to residential, open, and agricultural land in the Richland Township and adjacent to residential, agricultural land within West Rockhill Township. Per the Richland Township noise ordinance, maximum permissible sound levels in residential, open, and agricultural land are established for daytime and nighttime activity (55 dBA and 50 dBA, respectively). Per the West Rockhill Township, permissible sound levels in agricultural and residential land must not exceed 60 dBA during the day and 55 dBA at night; permissible noise levels established for industrial land are higher.

Lower Chichester Township, where the Marcus Hook Compressor Station is proposed in industrial land, also has a noise ordinance based on land use categories. The permissible sound level for activities in industrial land is 70 dBA at all times. New Castle County, Delaware, which abuts the border of the proposed compressor station, has a land use categorized noise ordinance similar to that of Lower Chichester Township. The permissible sound level for activities in industrial districts is 85 dBA at all times.

Adelphia has stated that it would comply with all local noise ordinances during construction of the Project and would make all reasonable efforts during operations to comply. Therefore, because FERC's noise requirements are specific to individual NSAs, the local ordinances are not addressed further.

Ambient Noise Conditions

Generally, land use in the Project area is primarily industrial/commercial land; however, the Project would also affect residential, open, and forested land. Day and night noise data were collected by Adelphia at the NSAs nearest to the Quakertown facilities and Marcus Hook Compressor Station during December 12, and 13, 2017 and at monitoring locations relative to each HDD entry and exit location during June 13, and 15, 2018. The results of the noise surveys are presented in tables B-23 and B-24, below, as ambient sound levels.

General Impacts and Mitigation

Construction

Noise would be generated during construction of the Project. Construction activities, and especially pipeline construction, in any one area could last from several weeks to several months on an intermittent basis and would result in an increase in ambient noise. Construction of the Quakertown and Marcus Hook Compressor Stations would require a longer construction timeframe at a single location than other facilities planned for the Project. 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 rights-of-way and near aboveground facilities due to typical 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. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this impact would be temporary and local.

Adelphia anticipates that the majority of typical Project construction would occur during daylight hours, generally between the hours of 6:30 a.m. to 6:30 p.m. However, Adelphia states that certain construction activities, including drilling activities at HDD-5 and HDD-9 and pipeline pullback at the remaining HDD sites, would occur at night. Other activities often conducted at night include operation of pumps at dry-ditch waterbody crossings, hydrostatic testing, and tie-ins; these activities typically generate little noise and do not result in significant noise impacts. Adelphia may opt to perform these activities, that are minimally disruptive to nearby residents, at night.

Adelphia proposes to install the Tilghman Lateral using HDD construction methods at nine sites along the pipeline right-of-way (see table A-5). HDD construction would be conducted primarily during daytime hours. However, Adelphia would conduct 24-hour drilling at two of the nine HDD sites (HDD-5 and HDD-9). The remaining HDD sites would be completed during the daytime hours only. For all HDD activities, Adelphia would install residential-grade exhaust mufflers on all noise-generating combustion equipment used during HDD construction. In order to reduce noise impacts, Adelphia would also limit drilling operations to one HDD at a time for all HDDs within 0.5 mile. Adelphia estimates that each HDD would take 2 to 14 days to complete.

Adelphia estimated the noise impacts of HDD activities, including 24-hour HDD, at NSAs near each HDD site. The HDDs would be completed in densely populated areas with numerous NSAs near each HDD. Table B-23 shows the predicted noise impacts at the most impacted NSA near the HDD sites. Appendix J estimates the noise level impacts at the majority of NSAs or clusters of NSAs near the HDD sites. The distances and directions to the nearest NSAs from each of the nine HDD locations are also presented in table B-23 and appendix J, and are shown in appendix K-1.

Table B-23
Acoustical Survey and Analysis Summary for Horizontal Directional Drills at the NSAs with the Greatest Impacts[a]

NSA Most Impacted by Noise	Distance and Direction of NSA from HDD Location (entry/exit; feet)	Estimated L_{dn} due to Project Construction (dBA)	Existing Ambient L_{dn} (dBA)	L_{dn} of Construction plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dBA)[a]
HDD-1 Entry and Exit					
CS NSA-1a	121 northwest / 1, 889 southwest	72.1	68.2	73.6	5.4
HDD-2 Entry and Exit					
HDD NSA-3	3,025 northwest / 99 north	71.5	61.8	71.9	10.1
HDD-3 Entry and Exit					
HDD NSA-3	4,474 southwest / 107 north	70.7	61.8	71.2	9.4
HDD-4 Entry and Exit					
HDD NSA-10	143 northwest / 2,505 northwest	70.7	67.0	72.2	5.2
HDD-5 Entry and Exit					
HDD NSA-12	604 west / 1,197 northwest	68.0	63.6	69.4	5.8
HDD-6 Entry and Exit					
HDD NSA-16	118 north / 2,677 southwest	72.5	66.1	73.4	7.3
HDD-7 Entry and Exit					
HDD NSA-19	92 north / 1,599 southwest	74.3	70.1	75.7	5.6
HDD-8 Entry and Exit					
HDD NSA-28	1,933 northwest / 109 north	70.9	69.4	73.2	3.8
HDD-9 Entry and Exit					
HDD NSA-29	424 north / 851 northwest	70.1	65.7	71.5	5.8

[a] Noise is based on HDD drilling operations occurring during daytime periods only (with the exception of HDD 5 and HDD 9, which would occur 24 hours a day), with all combustion engines to be fitted with a residential-grade exhaust muffler, and where appropriate, low-noise equipment would be used.

While noise from HDD construction would exceed 55 dBA L_{dn} at the NSAs most affected near each drill, the majority of these HDDs would be completed during daytime hours to minimize impacts on nearby residents. However, HDD-5 and HDD-9 would be constructed over a 24-hour period. At these sites, because ambient sound levels exceed 55 dBA L_{dn}, HDD construction must not result in noise impacts greater than 10 dBA over ambient noise levels. The acoustical analysis in table B-23 indicates that construction noise at HDD 5 and HDD-9 would result in noise impacts that are 5.8 dBA greater than ambient noise levels at both sites, which is less than 10 dBA. Therefore, while residents in the Project area would be impacted by noise from Project construction, based on our analyses, the mitigation measures proposed (including daytime construction at most HDDs), and the temporary and short-term nature of construction, we conclude that construction of the Project would not result in significant noise impacts on local residents and the surrounding communities.

Operations

The new compressor stations would generate sound on a continuous basis (i.e., up to 24 hours per day) when operating. Some sound would also be generated by the operation of the new and existing meter stations. Noise impacts associated with the operation of these aboveground facilities would be limited to the vicinity of the facilities. The specific operational noise sources associated with these facilities and their estimated impact at the nearest NSAs are described below.

We received comments expressing concern regarding noise impacts at residences in the vicinity of the proposed compressor stations; the noise analysis addresses impacts at the NSAs nearest to each compressors station. Therefore, residences in the immediate vicinity of the Project facilities are included in this assessment. The Delaware Riverkeeper Network raised comments regarding noise from the compressor stations and pipelines; we also received comments expressing concern for impacts associated with vibration from operation of the proposed compressor stations. In addition to noise requirements, the Commission requires that applicants address vibration when proposing to construct compressor stations. The mitigation measures that Adelphia would implement to reduce noise to the levels required by FERC would also serve to reduce potential sources of vibration at the compressor stations. Through FERC's dispute resolution service helpline, we are aware that induced vibration, or a low frequency sound from pipelines, has occurred at a limited number of natural gas facilities in the over 300,000 miles of transmission pipeline in the Unites States. However, we are unaware of wide-scale cases of low frequency noise/vibration from natural gas transmission pipelines. With hundreds of thousands of residents near natural gas pipelines, we have seen no systemic evidence that natural gas pipelines are inducing low frequency noise effects on local residences. This appears to be an isolated issue that continues to be addressed through the dispute resolution service and landowner helpline.

Adelphia conducted ambient sound surveys and acoustical impact assessments for the nearest NSAs to the proposed Quakertown and Marcus Hook Compressor Stations and five meter stations.[40] The distances and directions to the nearest NSAs from the compressor and meter stations are presented in table B-24 and shown in appendix K-2.

Table B-24
Acoustical Analysis of the Proposed Compressor and Meter Stations

NSA	Distance and Direction of NSA	Existing Ambient L_{dn} (dBA)	L_{dn} Attributable to New Station (dBA)	Existing L_{dn} + L_{dn} of Proposed Changes (dBA)	Potential Increase Above Ambient (dBA)
Marcus Hook Compressor Station					
NSA-1a[a]	630 feet northwest	65.8	53.5	66.0	0.2
NSA-1b	530 feet northwest	65.8	52.2	66.0	0.2
NSA-2	2,780 feet northeast	63.2	40.8	63.2	0.0
Quakertown Compressor and Meter Stations[b]					
NSA-1	530 feet west	44.9	42.5	46.9	2.0
NSA-2	630 feet southeast	53.8	40.3	54.0	0.3
NSA-3	640 feet south	50.6	38.4	50.9	0.3
Delmarva Meter Station (with mitigation)					
MS NSA-1	312 feet north	59.5	54.2	60.6	1.1
Monroe Meter Station (no mitigation)					
NSA-15	686 feet northeast	67.0	58.2	67.5	0.5
Tilghman Meter Station (no mitigation)					
NSA-28	535 feet northwest	68.0	60.7	68.7	0.7
Transco Meter Station (no mitigation)					
CS NSA-2	1,293 feet northeast	63.2	51.9	63.5	0.3

[a] Daytime and nighttime ambient sound measurements for NSA-1a were collected at NSA-1b.

[b] Daytime and nighttime ambient sound measurements for NSA-1, NSA-2, and NSA-3 were collected at monitoring points Alt NSA-1, Alt NSA-2, and Alt NSA-3, respectively, as depicted in appendix K-2.

[40] The Delmarva Meter Station would include delivery interconnects to Columbia, Delmarva, and TETCO. Noise impact associated with the new Quakertown Meter Station was modeled with the proposed Quakertown Compressor Station.

Adelphia has committed to installation of the following noise control measures at the compressor stations based on its noise consultant's recommendations:

- hospital grade silencers;
- station piping below ground to the extent possible and acoustical lagging on aboveground pipes in proximity to the property boundary;
- an acoustically-insulated compressor building;
- a noise-attenuating enclosure for emergency generator; and
- inlet and discharge mufflers on intakes and exhausts on compressor buildings.

Based on the results in table B-24, and the mitigation measures committed to by Adelphia, the two new compressor stations would meet FERC's sound level requirements at the nearest NSAs. Additionally, the compressor stations would be in compliance with local noise ordinances. To ensure Project-related sound level impacts do not exceed our criterion, **we recommend that:**

- **Adelphia should file with the Secretary noise surveys for the Marcus Hook Compressor Station and Quakertown Compressor and Meter Stations no later than 60 days after placing the stations into service. If full power load condition noise surveys are not possible, Adelphia should file an interim survey at the maximum possible power load within 60 days of placing the stations into service and file the full power load survey within 6 months. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds an Ldn of 55 dBA at any nearby NSA, Adelphia should:**
  - **a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;**
  - **b. install additional noise controls to meet that level within 1 year of the in-service date; and**
  - **c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP no later than 60 days after it installs the additional noise controls.**

In addition to the operational sound level impacts discussed above, there would also be emergency blowdown events during which the compressor stations would generate additional sound for short periods of time. While routine compressor station

maintenance blowdowns are included in the estimates in table B-24, emergency blowdown events could occur once annually for a duration of 10 minutes and vents used for emergency blowdowns would not be fitted with silencers. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that they would result in significant impacts on nearby residents.

Adelphia also estimated the sound level impacts at the NSAs associated with operation of the meter stations and found that operation of the Transco, Monroe, and Tilghman Meter Stations would not be greater than the ambient sound level measured at the nearest NSAs. While operation of the Monroe and Tilghman Meter Stations would result in sound levels greater than 55 dBA L_{dn} at the nearest NSAs, the resulting increase in ambient sound levels would not be audible, and would be less than 1 dBA (see table B-24). Noise impacts from operation of the Delmarva Meter Station are predicted to be higher than ambient sound levels. To mitigate noise associated with operation of this meter station, Adelphia would implement one of the following noise reduction techniques based on its noise consultant's recommendations:

- use valves with low or ultra-noise trims;
- acoustically-insulate regulator buildings;
- install acoustical lagging on above-ground piping; and/or
- install low noise heaters.

Adelphia has not identified the specific mitigation measures it would implement to ensure compliance with our guideline that noise from operation of the Delmarva Meter Station not exceed 55 dBA L_{dn}. Therefore, **we recommend that:**

- **Prior to construction of the Delmarva Meter Station, Adelphia should file with the Secretary, for review and written approval by the Director of OEP, a description of the specific noise mitigation measures it would install at the Delmarva Meter Station and the associated noise levels predicted for full flow/load condition operations.**

It is our experience that meter stations can vary widely in terms of actual sound level impacts after being placed in service relative to the predicted impacts from these stations. In addition, the number of residences in proximity to meter stations further justifies the need for post-construction sound level surveys. To verify the accuracy of Adelphia's acoustical analyses and ensure sound levels do not exceed our criterion, **we recommend that**:

- **Adelphia should file with the Secretary noise surveys for the Transco, Monroe, Tilghman, and Delmarva Meter Stations no later than 60 days**

after placing the stations into service. If full flow/load condition noise surveys are not possible, Adelphia should file an interim survey at the maximum possible power load within 60 days of placing the stations into service and file the full flow/load survey within 6 months. If the noise attributable to operation of all equipment at each meter station under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Adelphia should:

a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;

b. install additional noise controls to meet that level within 1 year of the in-service date; and

c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP no later than 60 days after it installs the additional noise controls.

Finally, as described above for compressor stations, emergency blowdowns could be required at each MLV and BAV site along the Project. Noise impacts at these locations would be limited to the duration of the release relative to the specific emergency situation. Adelphia would design these facilities in accordance with USDOT-PHMSA regulation 192.179(c), which requires a rapid release. Installation of silencers would limit the amount of gas released, which could exacerbate the emergency situation. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that these events would be a significant contributor to operational sound levels from the Project.

The compressor units that Adelphia proposes would meet design standards defined by the American Petroleum Institute to limit pulsation, as well as design requirements to identify and minimize stresses due to pressure and/or temperature. Each engine unit would include sensors to monitor and avoid vibration, pulsation, and over stress materials. Associated piping would be similarly designed to minimize operational effects from pressure and temperature to reduce vibration. Construction methods, such as blasting and pile driving, which are published sources of ground vibration, are not proposed for this Project. Additionally, based on the soil borings collected at the compressor stations sites, the underlying soil material would also act to dampen minor vibrations cause by the operation of the compressors. Therefore, we do not expect the Project would result in any adverse vibration on nearby residents, NSAs, or historical structures.

Based on the analyses conducted, Adelphia's proposed mitigation measures, and our recommendations, we conclude that construction and operation of the Project would

not result in significant noise or vibration 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 Existing Pipeline

Numerous commenters expressed concern with the age of the Existing System and the conversion from fuel oil to natural gas on the southern segment of the existing mainline. IEC installed the existing mainline in the 1970s, however the 20-inch-diameter pipeline was installed in 2002. As reviewed in section A, after Adelphia acquires the Existing System, the northern segment of the existing mainline and the 20-inch-diameter pipeline would remain in operation as is and no changes are proposed. Alternatively, the southern segment of the existing mainline would require a conversion of service, which would result in the addition of compression and aboveground appurtenant facilities (see section A.4). In anticipation of the conversion of service, IEC completed numerous actions to ensure and verify the integrity of the southern segment of the existing mainline, including the following:

- review of design, construction, and operations and maintenance history;
- visual inspection of the rights-of-way, all aboveground segments, and select underground segments;
- correction of all known unsafe defects and conditions as required by USDOT-PHMSA;
- design pressure testing;

- Pipeline High Consequence Area (HCA) and Population Classification Analysis;[41]
- valve spacing analysis;
- pressure testing; and
- corrosion control review and modifications.

We also received comments from residents concerned with impacts on HCAs nearby. The Pipeline Safety Improvement Act of 2002 requires operators to develop and follow a written integrity management program that contains all of 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 HCAs, which are defined as areas where a gas pipeline accident could cause considerable harm to people and their property and that require an integrity management program to minimize the potential for an accident. Prior to operation of the southern segment, Adelphia would develop an Integrity Management Program, in conjunction with IEC. The Integrity Management Plan would outline the safety management, operations, maintenance, evaluation, and assessment processes that would be implemented to ensure Adelphia provide enhanced protection for HCAs. Additional detail on HCAs is provided below in section B.9.4.

Stakeholders, including the Pipeline Safety Coalition, recommended that Adelphia comply with recommendations in USDOT-PHMSA's Guidance for Pipeline Flow Reversals, Product Changes, and Conversion to Service (Guidance). Adelphia committed to complying with USDOT-PHMSA's Guidance for the southern segment of the existing mainline, where conversion would occur, and would submit its written procedures to the appropriate USDOT-PHMSA regional office. Additionally, IEC developed a Conversion to Service Plan that was submitted to USDOT-PHMSA in 2017.[42] This plan details the specific conversion requirements and what actions IEC has and would continue to take to ensure compliance. This plan details the component designs; construction, operation, and maintenance; and pressure testing records of the existing southern segment of the mainline.

9.2 Safety Standards

The USDOT-PHMSA is mandated to provide pipeline safety under 49 United States Code Chapter 601. USDOT-PHMSA administers the USDOT's national regulatory program to ensure the safe transportation of natural gas and other hazardous

[41] The Pipeline HCA and Population Classification Analysis is available on eLibrary under accession no. 20181002-5167.

[42] Available on eLibrary under accession no. 20181002-5167.

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. USDOT-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 enforcement of 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 USDOT-PHMSA's agent to inspect interstate facilities within its boundaries; however, the USDOT-PHMSA is responsible for enforcement actions. Delaware and Pennsylvania are authorized under Section 5(a) to assume all aspects of the safety program for intrastate, but not interstate facilities (USDOT-PHMSA 2018a).

The USDOT-PHMSA pipeline standards are published in 49 CFR 190 through 199. Part 192 specifically addresses natural gas pipeline safety issues. Under a MOU with FERC on Natural Gas Transportation Facilities, dated January 15, 1993, the USDOT-PHMSA has the exclusive authority to promulgate federal safety standards in the transportation of natural gas. Section 157.12(a)(9)(vi) of 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 USDOT-PHMSA in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. FERC accepts this certification and does not impose additional safety standards.

If FERC becomes aware of an existing or potential safety problem, there is a provision within the MOU to promptly alert the USDOT-PHMSA. 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 FERC's jurisdiction. FERC also participates as a member of the USDOT-PHMSA's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

9.3 Project Design Requirements

The piping and aboveground facilities associated with the Adelphia Gateway Project must be designed, constructed, operated, and maintained in accordance with the USDOT-PHMSA Minimum Federal Safety Standards in 49 CFR 192. The regulations

are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The USDOT-PHMSA specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Safety guidelines for the design and construction of compressor stations are established in 49 CFR 192 in addition to pipeline safety standards. Part 192.163 requires the location of each main compressor building of a compressor station be on a property under the control of the operator. The station must also be far enough away from adjacent property, not under control of the operator, to minimize the possibility of fire spreading to the compressor building from structures on adjacent properties. Part 192.163 also requires each building on a compressor station site be made of specific building materials and to have at least two separate and unobstructed exits. The station must be in an enclosed fenced area and must have at least two gates to provide a safe exit during an emergency.

The compressor station safety systems would be engineered with automated control systems to ensure the station and pipeline pressures are maintained within safe limits, and would include several additional over-pressure protection systems that provide an additional layer of safety to back-up the primary controls. The station would also have an automated emergency system that would shut down the station to prevent an incident should an abnormal operating condition occur, and, if appropriate, would evacuate the gas from the station piping at a safe location.

9.4 Pipeline Safety

In addition to the requirements reviewed above, the USDOT-PHMSA 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 more than 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 I locations must be installed with a minimum depth 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 (i.e., 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, 2, and 3 areas.[43] Adelphia would design, test, and operate sections of the pipeline by their designated pipeline class locations, in accordance with 49 CFR 192, Subpart G. Additionally, in all Class 3 locations, Adelphia would odorize gas for additional leak detection and safety. Throughout the life of the pipeline, Adelphia would monitor population changes near the pipeline in accordance with 49 CFR 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 rights-of-way results in a change in class location for the pipeline, Adelphia would reduce the MAOP, or replace the segment with pipe of sufficient grade and wall thickness, if required, in order to comply with USDOT-PHMSA requirements for the new class location.

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

- Current Class 3 and 4 locations;
- Any area in Class 1 or 2 locations where the potential impact radius is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle; or
- Any area in Class 1 or 2 locations where the potential impact circle includes an identified site (as described below).

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days per week for any 10 weeks in any 12-month period;

[43] Available on eLibrary under accession no. 20180618-5127.

or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Therefore, Adelphia would integrate these areas into its Integrity Management Plan as required by Section 192.91.

9.5 Project Operations

Parts 192.731 through 192.736 of 49 CFR establish safety guidelines for inspection, testing, and monitoring at compressor stations. Adelphia would inspect the facilities at least once per calendar year, at intervals not exceeding 15 months. Inspections would ensure that the facilities and pipeline systems are in good mechanical condition, set to control or relieve at the correct pressure consistent with the pressure limits in Part 192.201(a), and are properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.

Part 192.163 of 49 CFR requires that each compressor station have an emergency shutdown system (except for unattended field compressor stations of 1,000 horsepower or less) that must meet several specifications. The proposed Quakertown and Marcus Hook Compressor Stations would be equipped with automatic detection and emergency shutdown systems, including:

- flame detection that uses ultraviolet sensors;
- gas detection for detecting low concentrations of natural gas;
- emergency shutdowns to isolate the gas piping, stop equipment, and safely vent station gas; and
- individual unit shutdown systems in case of mechanical or electrical failure of a compressor unit system or component.

9.6 Emergencies

The USDOT-PHMSA 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. Adelphia has indicated its intent to develop and implement an Emergency Response Plan in accordance with the regulation, which requires that a plan be prepared prior to commencing operations for 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 USDOT-PHMSA 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 or facility emergency, and to coordinate mutual assistance. Adelphia would be required to develop an Emergency Response Plan and to 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. As part of USDOT-PHMSA requirements Adelphia must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas emergency and report it to appropriate public officials. Adelphia would provide the appropriate training to local emergency service personnel before the Project is placed in service.

9.7 Pipeline Accident Data

The USDOT-PHMSA requires that all operators of natural gas transmission pipelines notify the USDOT-PHMSA 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).[44]

[44] $50,000 in 1984 dollars is approximately $122,500 as of March, 2018 (U.S. Bureau of Labor Statistics 2018b).

During the 20-year period from 1998 through 2017, a total of 1,365 significant incidents were reported on more than 300,000 total miles of natural gas transmission pipelines nationwide (USDOT-PHMSA 2018b,c). Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table B-25 provides a distribution of the causal factors as well as the number of each incident by cause.

The dominant causes of pipeline incidents are pipeline material, weld, or equipment failure, and corrosion constituting 53.2 percent of all significant incidents. The pipelines included in the data set in table B-25 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain are time-dependent processes. Adelphia completed numerous actions, identified in section B.9.1, to verify the integrity of the southern segment of the existing mainline. Operation of the northern segment of the existing mainline would remain unchanged. The use of both an external protective coating and a cathodic protection, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially-protected pipe. The entirety of the Existing System already has cathodic protection, and the new laterals would have it as well, per USDOT-PHMSA requirements.

Table B-25
Natural Gas Transmission Pipeline Significant Incidents by Cause 1998-2017

Cause	Number of Incidents[a]	Percentage
Corrosion	324	23.7
Excavation[b]	198	14.5
Pipeline material, weld, or equipment failure	403	29.5
Natural force damage	148	10.8
Outside forces[c]	90	6.6
Incorrect operation	54	4.0
All other causes[d]	148	10.8
Total	**1,365**	-

[a] All data gathered from USDOT-PHMSA's Significant Incident files, December 11, 2018 (USDOT-PHMSA 2018d).
[b] Includes third party damage.
[c] Fire, explosion, vehicle damage, previous damage, intentional damage.
[d] Miscellaneous causes or unknown causes.

Outside forces, excavation, and natural forces are the cause of 31.9 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; 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, older pipelines comprise 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-26 provides a breakdown of outside force incidents by cause.

Since 1982, operators have been required to participate in "One-Call" public utility systems in populated areas to minimize unauthorized excavation activities near pipelines. The "One-Call" system 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. Adelphia would participate in the Pennsylvania and Delaware One-Call systems.

Table B-26
Outside Forces Incidents by Cause 1998-2017[a]

Cause	Number of Incidents	Percent of Outside Force Incidents
Third party excavation damage	160	36.7
Operator excavation damage	26	6.0
Unspecified excavation damage / previous damage	12	2.8
Heavy rain / floods	78	17.9
Earth movement	29	6.7
Lightning / temperature / high winds	30	6.9
Natural force (other) / unspecified natural force	11	2.5
Vehicle (not engaged with excavation)	52	11.9
Fire / explosion	10	2.3
Previous mechanical damage	6	1.4
Fishing or maritime activity/maritime equipment	9	2.1
Intentional damage	1	0.2
Electrical arcing from other equipment / facility	1	0.2
Unspecified / other outside force	11	2.5
Total	436	-

[a] Excavation, outside force, and natural force from table B-25 (USDOT-PHMSA 2018d).

9.8 Impact on Public Safety

Adelphia would comply with all applicable USDOT-PHMSA 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-25 include pipeline failures of all magnitudes with widely varying consequences. Table B-27 below presents the average annual injuries and fatalities that occurred on natural gas transmission pipelines in the 5-year period between 2013 and 2017.

Table B-27
Injuries and Fatalities - Natural Gas Transmission Pipelines

Year[a]	Injuries	Fatalities
2013	2	0
2014	1	1
2015	16	6
2016	3	3
2017	3	3

[a] All data gathered from USDOT-PHMSA Significant incident files, May 1, 2018 (USDOT-PHMSA 2018b).

The majority of fatalities from pipelines are due to incidents with local distribution pipelines not regulated by 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 FERC-regulated natural gas transmission pipelines.

The nationwide total of accidental fatalities from various anthropogenic and natural hazards are listed in table B-28 to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously because individual exposures to hazards are not uniform among all categories. The 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 fatalities from natural hazards such as lightning, tornadoes, or floods.

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1998 to 2017, there were an average

of 68 significant pipeline incidents, 9 injuries, and 3 fatalities per year (USDOT-PHMSA 2018d).

Table B-28
Nationwide Accidental Deaths[a]

Type of Accident	Annual No. of Deaths
All accidents	123,706
Motor vehicle	43,945
Poisoning	29,846
Falls	22,631
Injury at work	5,025
Drowning	3,443
Fire, smoke inhalation, flames	3,286
Floods[b]	85
Lightning[b]	44
Tornadoes[b]	69
Tractor turnover[c]	238
Natural gas distribution lines[d]	11
Natural gas transmission pipelines[d]	3

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

[b] NOAA National Weather Service, Office of Climate, Water and Weather Services, 30-year average (1988-2017) http://www.weather.gov/om/hazstats.shtml.

[c] Bureau of Labor Statistics, 2016 Census of Occupational Injuries.

[d] USDOT-PHMSA Significant Incident files, May 1, 2018. http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelineincidenttrends, 20-year average.

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

10. Cumulative Impacts

European settlers reached Pennsylvania and Delaware in the early 17th century. Today, about 12.8 million people reside in Pennsylvania and another 1 million in Delaware (U.S. Census Bureau 2018b). This includes 3.1 million people in the counties where Adelphia is proposing to construct and operate the new proposed facilities (U.S. Census Bureau 2018a). Previous activities in the vicinity of the Project have resulted in impacts on forest cover, fragmentation, and composition; however, a significant portion of this Project is located in previously-cleared and maintained utility rights-of-way or developed, commercial/industrial land. The Project is located in the Middle Atlantic

Coastal Plain and the Northern Piedmont Ecoregions. The Northern Piedmont ecoregion is an area of plains, open valleys, and low, rounded hills historically dominated by Appalachian oak, while the Atlantic Coastal Plain ecoregion consists of vast, flat, low-lying expanses with a number of terraces and scarps between the regional fall line to the west and the Atlantic Ocean to the east (USEPA 2013, Woods *et al.* 1999, American Bird Conservancy 1999).

In accordance with NEPA and FERC policy, we identified other actions in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment. A cumulative effect is the impact on the environment 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. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over time. 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.

Our cumulative impact analysis for the Project generally follows the methodology set forth in relevant guidance (CEQ 2005, USEPA 1999). Under these guidelines, inclusion of other projects in the analysis is based on identification of impacts on environmental resources from other projects that would directly or indirectly result in similar effects as the proposed Project. The cumulative impacts analysis includes those past, present, and reasonably foreseeable projects meeting the following three criteria:

- the action impacts a resource area potentially affected by the Project;
- the action causes this impact within all, or part of, the Project area; and
- the action causes this impact within all, or part of, the timespan for the potential impact for the Project.

As discussed in section A.4, our EA focuses on the portions of the Existing System that would require ground disturbance to accommodate the conversion from transporting oil to transporting natural gas, as well as the new facilities, which include: two pipeline laterals, two compressor stations, five meter stations, two MLVs, seven BAVs, two tap valves, and four pig launcher/receiver facilities.

10.1 Geographic Scope of Cumulative Impacts

Our cumulative impacts analysis considers actions that impact environmental resources affected by the proposed action, within all or part of the Project area affected by the proposed action (i.e., geographic scope), and within all or part of the time span of the impacts. Actions outside the geographic scope are generally not evaluated because

their potential to contribute to a cumulative impact diminishes with increasing distance from the Project. Based on the conclusions and determinations reached in section B; Adelphia's implementation of impact avoidance, minimization, and mitigation measures as described in our Plan, and Adelphia's 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 proposed compressor stations, meter stations, and new pipeline laterals.

Based on the impacts of the Project as identified and described in the EA and as consistent with CEQ guidance, we have determined the following resource-specific geographic scopes listed in table B-29, are appropriate to assess cumulative impacts.

Table B-29
Geographic Scope for Cumulative Impact Analysis

Environmental Resource	Geographic Scope
Soils and Geology	Limits of Project disturbance / construction workspaces
Groundwater, Wetlands, Vegetation, Wildlife	Watershed boundary (HUC 12 watershed)
Surface Water Resources	HUC 12 watershed
Cultural Resources	0.5-mile from centerline
Land Use and Recreation	1-mile radius
Visual	0.25 mile and existing visual access points (e.g., road crossings)
Noise - Operations	1-mile radius
Noise - Construction	0.25 mile from pipeline or aboveground facilities 0.5 mile from HDD or direct pipe installation
Socioeconomics	Affected counties and municipalities
Environmental Justice	Not analyzed further as no impacts from the Project are anticipated
Air Quality – Construction	0.25 mile from pipeline or aboveground facilities
Air Quality – Operation	50 kilometers (31 miles) of the Project.

- Project construction and restoration measures, including erosion control devices, are designed to confine impacts on geologic and soil resources to the project workspaces. Therefore, we evaluated potential cumulative impacts on soils and geological resources within the same construction footprint as the Project.

- Impacts on surface waters and wetlands can result in downstream sedimentation or turbidity, and therefore while impacts on water resources and wetlands could extend outside of the workspaces, they would also be contained to a relatively small area. 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. HUC-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 Adelphia Gateway Project would cross 11 HUC-12 subwatersheds, including a total area of about 294,355 acres (see table B-6).

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 to plant seed dispersion areas or individual home ranges for species with potential to occur in the Project area, but would generally be contained to a relatively small area. We believe the watershed scale is most appropriate to evaluate impacts as it provides a natural boundary and a geographic proxy to accommodate general wildlife habitat and ecology characteristics in the Project area. Therefore, we evaluated projects within the HUC-12 watersheds crossed by the Project.

    - Impacts on socioeconomic conditions could include entire counties, as demographic statistics are generally assessed on a county basis.

    - Impacts on land use and recreation would be restricted to the construction workspaces and the immediate surrounding vicinity, generally within 1.0 mile.

    - Impacts on visual receptors associated with pipelines would occur generally within 0.25-mile and at existing visual access points (e.g., road crossings). For aboveground facilities, impacts would occur at the distance that the tallest feature at the planned facility would be visible from receptors in the Project area.

    - 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 resources within the area of potential affect, 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.

    - For long-term impacts on air quality over the lifetime of the facilities due to Project operation, we adopted the distance used by the USEPA for cumulative modeling of large PSD sources during permitting (40 CFR 51, appendix W) which is a 31-mile, or 50-kilometer, radius of the Quakertown or Marcus Hook Compressor Stations. We evaluated current and proposed sources that overlap in time and location with construction activities and those with potentially significant long-term stationary emission sources within the geographic scopes for all emissions other than CO2e. GHG emissions do not cause local impacts, it's the combined concentration in the atmosphere that causes climate impacts (see climate change section) and these are fundamental global impacts that

feedback to localized climate change impacts. Thus, the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional.

- 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, and 0.5 mile for HDD locations. For long-term/operational impacts, we evaluated current and proposed sources within 1 mile of the compressor stations or meter stations.

10.2 Other Projects Considered

As discussed in section A.4, construction in Northampton County, Pennsylvania, would be limited to installation of a fence at the existing Martins Creek Station that would result in limited and discrete ground disturbance, no cumulative impacts are expected and no future developments were researched for that area.

Several commenters raised concerns regarding cumulative impacts due to the number of other pipelines planned for construction or which are currently operational in the Project area. 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-30. The projects identified in table B-30 are within the resource-specific geographic scopes and are primarily located near the Parkway and Tilghman Laterals, or are large pipeline projects that cross or are in close proximity to the Adelphia Gateway Project. These projects include 2 FERC-jurisdictional projects, 3 utility projects, 2 roadway improvement projects, 21 industrial/commercial projects, 9 residential projects, and 2 remediation projects.

Table B-30
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
FERC Jurisdictional Projects						
Greater Philadelphia Expansion Project Enbridge's Texas Eastern Transmission, LP[b]	Delaware County, Pennsylvania	Proposed with a target in-service of April 2021	Unknown	3 miles from Tilghman Lateral	Replacement of existing pipeline and new pipeline looping to expand the current system to transport up to 475 million cubic feet per day.	Water Resources, Vegetation, Wildlife, Socioeconomics, Operational Air Quality
PennEast PennEast Pipeline Company, LLC	Northampton County, Pennsylvania	Approved, construction is pending	1,588 acres	Would cross the 20-inch-diameter pipeline and existing mainline	Construction and operation of about 120.2 miles of 12-, 24-, and 36-inch-diameter pipeline, a new up to 47,700 horsepower compressor station, 8 new metering and regulating stations, 11 MLVs, and 4 launcher / receiver facilities in Pennsylvania and New Jersey.	This project is entirely outside of the geographic scope of the proposed Project (including for air quality), with the exception of the Martins Creek Station, which is within the corresponding HUC-12 watersheds, but is already in operation and would be considered the environmental baseline. Due to a large number of public comments about this project, it's included here for comparison purposes only.
Utility Projects						
Mariner East II Project Sunoco, LP[c]	Chester and Delaware Counties, Pennsylvania	Under construction with target in-service of 2019	281 acres	2 miles from the Tilghman Lateral	Construction of a 20-inch-diameter pipeline to transport natural gas liquids. Activities in Delaware County, Pennsylvania are limited to a new meter station and pipeline.	Water Resources, Vegetation, Wildlife, Socioeconomics, Operational Air Quality

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
Utility Projects (continued)						
Sunoco Projects	Marcus Hook, Pennsylvania	Authorized by PADEP Plan Approvals	Unknown	Less than 2 miles from the Tilghman Latera	Multiple planned over the past 3 years. Most recently this includes installation of cryogenic propane and ethane storage and offloading facilities.	Water Resources, Vegetation, Wildlife, Socioeconomics, Operational Air Quality
Non-jurisdictional Facilities associated with the Adelphia Gateway Project	Bucks and Delaware Counties, Pennsylvania; New Castle County, Delaware	Local Utility Providers	Unknown	0.0 miles from Adelphia's proposed compressor and meter stations	Electrical power upgrades to accommodate Adelphia's proposed aboveground facilities, including the Quakertown facilities, Marcus Hook Compressor Station, and Delmarva, Monroe, Tilghman, and Transco Meter Stations.	All Resources except Air Quality and Noise during operations
Transportation Projects						
Chestnut St./Morton Ave.	City of Chester, Pennsylvania	Underway, expected to be completed in December 2019	N/A	1.6 miles from Tilghman Lateral	Intersection Channelization, Signal and Vertical Clearance Improvements	Water Resources, Socioeconomics
Market Street Bridge PennDOT	Marcus Hook, Pennsylvania	Recently completed (September 2018)[e]	1.0 acre	0.2 mile from the Tilghman Lateral	Bridge replacement over the AMTRAK line.	Water Resources, Socioeconomics, Noise during construction only
Industrial / Commercial Projects						
Agilyx Corporation	Chester, Pennsylvania	Unknown	5.0 acres	0.5 mile from Tilghman Lateral	Redevelop existing industrial site into a plastics-to-oil site	Water Resources, Socioeconomics, Operational Air Quality, Construction Noise[d]
American Heritage Federal Credit Union (11057)	Richland Township, Pennsylvania	Planned	4.4 acres	3.3 miles from Quakertown facilities	Consolidate two parcels to create a 4.4-acre parcel and construct a bank and retail/office building.	Water Resources, Vegetation, Wildlife, Socioeconomics

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
Industrial / Commercial Projects (continued)						
Bible Baptist Church of Bucks County (10642- D)	Richland Township, Pennsylvania	Planned	20.9 acres	4.2 miles from Quakertown facilities	A multi-phase construction effort to construction a church and parking to accommodate 173 spaces.	Water Resources, Vegetation, Wildlife, Socioeconomics
Cogeneration Facility Kimberly-Clark	Chester, Pennsylvania	Planned	58 acres	1.1 miles from Tilghman Lateral	Construction of a gas-fired steam plant	Water Resources, Socioeconomics, Operational Air Quality
Delcora PS-6 Phase II	Chester, Pennsylvania	Proposed	24 acres	0.1 mile from the Tilghman Lateral	Construction of new access drive and equalizer tank at wastewater treatment facility	Water Resources, Vegetation, Wildlife, Visual, Socioeconomics, Air Quality, Noise
Evonik Industries	City of Chester, Pennsylvania	Unknown	1.4 acres	0.1 mile from Tilghman Lateral	Develop 1.4 acres with an 1,800 square feet addition.	Water Resources, Vegetation, Wildlife, Land Use, Visual, Socioeconomics, Construction Air Quality, Noise[d]
Linde Claymont Linde Americas	Claymont, Pennsylvania	Under construction, expected to be completed in 2019	10 acres	0.3 mile from the Marcus Hook Compressor Station	Replacement of an existing air separation unit. No new emissions.	Water Resources, Socioeconomics
Long Irons	Upper Chichester Township, Pennsylvania	Planned	15 acres	2.4 miles from Tilghman Lateral	Construction of a golf driving range and simulation facility.	Water Resources, Vegetation, Wildlife, Socioeconomics
Lot 5, Chichester Business Park	Lower Chichester, Pennsylvania	Unknown	5.5 acres	0.2 mile north of the Transco Meter Station	Development of 63,000 square feet of office and commercial space.	Water Resources, Vegetation, Wildlife, Land Use, Visual, Socioeconomics, Construction Air Quality, Construction Noise[d]

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
Industrial / Commercial Projects (continued)						
Mount Pleasant Baptist Church	Upper Chichester Township, Pennsylvania	Recently completed	1.2 acres	0.9 mile from Tilghman Lateral	Additional Parking area for existing church	Water Resources, Vegetation, Wildlife, Land Use
Naceville Materials[f,g]	West Rockhill Township, Pennsylvania	Unknown	10 acres	3.4 miles from the Quakertown facilities	Expansion of an existing quarry.	Water Resources, Vegetation, Wildlife, Socioeconomics
New Hudson Facades Phase 1A	Upper Chichester Township, Pennsylvania	Planned	12.9 acres	0.3 mile from Tilghman Lateral	Expansion of an existing warehouse.	Water Resources, Vegetation, Wildlife, Socioeconomics
Northfield Business Campus, Lot 3 (8800-J)	Richland Township, Pennsylvania	Planned	85.4 acres	4.1 miles from Quakertown facilities	Construct three commercial buildings totaling 130,800 sq. ft.	Water Resources, Vegetation, Wildlife, Socioeconomics
Northfield Business Campus, Lots 1&2 (8800-K)	Richland Township, Pennsylvania	Planned	11.7 acres	4.2 miles from Quakertown facilities	Construct commercial buildings totaling up to 80,600 sq. ft. of space.	Water Resources, Vegetation, Wildlife, Socioeconomics
Park 309 (12011- A)	Richland Township, Pennsylvania	Unknown	23.2 acres	3.8 miles from Quakertown facilities	Construct 2 warehouses totaling 260,200 square feet of industrial space on three parcels totaling 23.2 acres.	Water Resources, Vegetation, Wildlife, Socioeconomics
Project ID: 20170455	Wilmington, Delaware	Unknown	1.02 acres	1.2 miles from Delmarva Meter Station	Demolish existing building and construct a 4,345 square-foot car wash with required improvements.	Water Resources, Vegetation, Wildlife, Socioeconomics
Project ID: 20180353	Claymont, Delaware	Unknown	6.1 acres	1.0 mile from Delmarva Meter Station	Construction of a 759 square foot enclosure.	Water Resources, Vegetation, Wildlife, Socioeconomics
Ranson Fuel, LLC (12259)	Springfield Township, Pennsylvania	Unknown	1.1 acres	6.0 miles from Quakertown facilities	Redevelop an existing 1.1-acre lot to add 2,400 square feet of office space and outside storage. Existing structures will be demolished.	Water Resources, Vegetation, Wildlife, Socioeconomics

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
Rick's Tree Service - Garage	Aston Township, Pennsylvania	Unknown	Unknown	2.2 miles from Tilghman Lateral	Develop an 8,000 square feet garage	Water Resources, Vegetation, Wildlife, Socioeconomics
Willowbrook Clubhouse	Upper Chichester Township, Pennsylvania	Planned	17.5 acres	1.2 miles from Transco Meter Station	Construction of a club house.	Water Resources, Vegetation, Wildlife, Socioeconomics
Woodshaven-Kruse Park (Project ID: 20170383)	Claymont, Delaware	Unknown	3,000 square feet	0.8 mile from Delmarva Meter Station	Construction of a 3,000 square feet maintenance building and associated improvements.	Water Resources, Vegetation, Wildlife, Land Use, Socioeconomics
Residential Projects						
Boice Tract (12288)	East Rockhill Township, Pennsylvania	Unknown	1.8 acres	4.8 miles from Quakertown facilities	Subdivide 17.2-acre lot and construct a dwelling unit on proposed lot 2.	Water Resources, Vegetation, Wildlife, Socioeconomics
Creek View Crossing (8952- C)	Richland Township, Pennsylvania	Planned	28.1 acres	1.6 miles from Quakertown facilities	Subdivide a 28.1 -acre tract into 38 lots and establish.68 acres of open space.	Water Resources, Vegetation, Wildlife, Socioeconomics
Fonthill Court (12300)	Richland Township, Pennsylvania	Planned	11.1 acres	3.5 miles from Quakertown facilities	Construct 59 attached single-family dwellings on an 11.1-acre tract of land with 30 off-street parking spaces.	Water Resources, Vegetation, Wildlife, Socioeconomics
Green Top Mobile Home Park[f]	Bucks County, PA	Planned	Unknown	0.9 mile from the Quakertown facilities	Originally approved in 2010, this project would add 21 mobile homes at an existing mobile home park.	Water Resources, Vegetation, Wildlife, Land Use, Socioeconomics
Murgia (12292)	Quakertown Borough, Pennsylvania	Planned	35,342 sq. ft.	2.8 miles from Quakertown facilities	Subdivide 35,342 sq. ft. parcel into three parcels and construct three dwellings and one detached garage.	Water Resources, Vegetation, Wildlife, Socioeconomics
Phoebe Richland Health Care Center (12263)	Richland Township, Pennsylvania	Unknown	20.5 acres	4.4 miles from Quakertown facilities	Construct 84 units of independent living senior housing within three buildings on 20.5-acre lot with 128 parking spaces.	Water Resources, Vegetation, Wildlife, Socioeconomics,

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected
Residential Projects (continued)						
Project ID:20170777	Wilmington, Delaware	Unknown	Unknown	1.1 miles from Delmarva Meter Station	Resubdivision of four blocks into a mix of single family detached, manor homes, townhouses, condominiums, duplex, and open space parcels.	Water Resources, Vegetation, Wildlife, Socioeconomics
Schaffer (11060- A)	Springfield Township, Pennsylvania	Planned	3.5 acres	6.3 miles from Quakertown facilities	Subdivide into two single- family lots and construct a single-family detached dwelling is proposed on Lot 2 totaling 3.5 acres.	Water Resources, Vegetation, Wildlife, Socioeconomics
Seigel (12314)	Richland Township, Pennsylvania	Planned	5.0 acres	2.0 miles from Quakertown facilities	Subdivided into three lots and future development of two single family detached residential dwellings.	Water Resources, Vegetation, Wildlife, Socioeconomics
Remediation Projects						
RCRA Facility Site - Monroe Energy	Trainer, Pennsylvania	Corrective actions underway	350 acres	0.0 mile from Tilghman Lateral	The USEPA initiated a RCRA Facility Assessment at the site in 1989. The site is contaminated with benzene, toluene, ethyl benzene, total xylene, semi-volatile organic compounds, arsenic, chromium, and lead (USEPA 2018a). Corrective action is still underway at the site and includes quarterly sampling events.	Soils, Water Resources
Superfund site - Metro Container Corporation	Trainer, Pennsylvania	Active investigation and remediation	10.4 acres	0.0 mile from Tilghman Lateral	This Superfund site was added to the National Priorities List by the USEPA in 2012. Soil and groundwater at the site are contaminated with PCBs, inorganic elements, PAH, and VOCs (USEPA 2018a). The USEPA is planning additional source area removal at the site to remove buried containment structures and piping systems which contain sludge and non-aqueous phase liquids (GHD 2015).	All resources during active remediation only as there is not operational component associated this project

Table B-30 (continued)
Proposed Projects with Potential Cumulative Impacts in the Geographic Scope[a]

Project and Proponent	Location	Status	Project Size	Closest Known Distance to Project	Description	Resource(s) Potentially Cumulatively Affected

[a] Projects were initially identified by Adelphia in its application and in table 1.11-1 of its supplemental filing (available on eLibrary under accession no. 20180831-5207). Project details were validated using aerial imagery and independent research.

[b] Enbridge 2018.

[c] Energy Transfer Partners 2015 and Reading Eagle 2018.

[d] Because construction schedule is unknown, impacts are conservatively assumed to overlap in geographic scope with the proposed Project

[e] PennDOT 2018

[f] Comment letter available on eLibrary under accession no. 20181029-0007.

[g] Montgomery News-Herald 2017.

In addition to projects identified in table B-30 above, Adelphia identified additional industrial/commercial, residential, and transportation projects within the geographic scope of the proposed MLVs and BAVs, including: 29 residential development projects (single family and multi-family), 31 industrial/commercial projects, 4 PennDOT projects, 2 institutional projects, 1 development project with both commercial and residential components, and 1 municipal project. Because the proposed MLVs and BAVs would require limited ground disturbance within an existing right-of-way, we conclude that construction and operation of these facilities would only contribute minimal cumulative impacts; therefore, we did not evaluate these facilities further. However, the Paoli Pike BAV would result in temporary and permanent impacts on an exceptional value wetland, designated as suitable habitat for the bog turtle (see section B.4.1), therefore this facility is included in our analysis of cumulative impacts on wetlands and special status species. Seven projects, which were identified to be within the geographic scope of the Tilghman Lateral (5), Transco Meter Station (1), or Quakertown facilities (1), submitted final land development plans to the respective county planning departments in 2017, thus we assume these projects have subsequently been constructed and are captured in the current environmental conditions. Therefore, these projects are not included in this cumulative impacts analysis.

As discussed in section B, the proposed Project would result in impacts on soils, water resources, vegetation, and wildlife (including federally and state listed threatened and endangered species), socioeconomics (including environmental justice), land use, visual resources, cultural resources, air, and noise.

10.3 Soils

Construction activities for the Adelphia Gateway Project would include clearing, grading, excavation, backfilling, and movement of construction equipment may affect soils within the Project site. Given Adelphia's proposed use of existing pipeline systems, collocation of new facilities with existing facilities, and routing the proposed laterals predominately through industrial/commercial land (78.6 percent) and within roadways (3.3 miles), the Project's contribution to cumulative impacts on soils would predominately be associated with disturbance of contaminated soils during construction.

Two sites with active clean-up or ongoing monitoring for contamination were identified in proximity to the Project, with the greatest potential for cumulative impacts associated with the Metro Container and Monroe Energy sites (see section B.1.2). Cumulative impacts would occur where soils are encumbered by these site's ongoing corrective actions and construction of the Tilghman Lateral. Adelphia would minimize incremental impacts on soils through implementation of FERC's Plan. In addition, Adelphia would develop E&SCP, which would be reviewed and approved by the Delaware County Conservation District. Because the nature of the actions being taken at the Metro Container and Monroe Energy Sites specifically would focus on remediation, we expect mitigation measures to avoid spreading or transport of contamination

associated with those projects would be implemented, thereby avoiding or minimizing incremental impacts on soils. 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

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 permanent impacts on wetlands.

All of the projects identified in table B-30 are within one of the subwatersheds that would be crossed by the Adelphia Gateway Project, with the exception of the Kimberly-Clark cogeneration facility. Projects that involve ground disturbance and/or vegetation clearing have the greatest 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 Adelphia Gateway Project, when considered with other projects in the vicinity that overlap in construction schedule and geographic scope, could result in cumulative impacts on water resources and wetlands.

As described above, one RCRA Corrective Action site and one USEPA Superfund site were identified in the vicinity of the Project along the Tilghman Lateral (see section B.1.2). These sites have known contamination and are undergoing cleanup and remediation activities (USEPA 2018b,c). The RCRA and Superfund sites are within the Delaware River Streamflow Zone/New Jersey Coastal Plains Aquifer sole source aquifer zone (USEPA 2018c). The industrial/commercial projects identified in table B-30 that would require ground disturbances, along with the proposed Project, have the greatest potential to encounter groundwater contamination and thus to contribute to cumulative impacts on water quality.

The Project may result in impacts on surface waters and wetlands through sedimentation and erosion from construction workspaces, inadvertent returns due to HDDs, and inadvertent spills. These impacts would be temporary and would be minimized through the implementation of trenchless construction methods (i.e., HDD) and adherence to our Plan, Adelphia's Procedures and IRCP. In total, the Project would result in permanent impacts on less than 0.1 acre of wetlands associated with operation of the proposed aboveground facilities along the existing mainline. The projects listed in table B-30 would likely be required to implement common construction best management practices, such as the installation of silt fence and adherence to spill prevention measures that would reduce potential impacts on water resources and wetlands. Additionally, some

of these projects may be required to comply with mitigation requirements and conditions in their CWA Section 401 and 404 permits for wetland and water quality impacts. Therefore, based on the mitigation measures stated above, and the limited scope of the proposed Project, we conclude that cumulative impacts on water resources and wetlands from the Project in consideration with other projects would be minor, temporary, and not 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-6). As stated above, all but one of the projects in table B-30 is within the defined geographic scope for vegetation and wildlife. Projects that involve replacement of existing infrastructure or redeveloping existing properties with limited adjacent or on-site vegetation habitat that would not be considered quality habitat are not expected to contribute discernably to cumulative impacts on vegetation or wildlife. Similarly, much of the land in the vicinity of the pipeline laterals is previously disturbed industrial land that does not provide quality wildlife habitat. However, the pipeline projects (Greater Philadelphia Expansion, Mariner East II, and Sunoco) and the Chichester Business Park development would result in impacts on vegetation within the HUC-12 watersheds that would be crossed by the Project. The proponents for the Greater Philadelphia Expansion Project, which is a FERC-regulated project like Adelphia, would be required to minimize impacts on vegetation and wildlife habitat by implementing the measures consistent with our Plan and its Procedures. Following construction Adelphia would restore vegetated areas within temporary workspace, as well as within the permanent rights-of-way, such that these areas could continue to function as wildlife habitat.

Cumulative impacts on federally and state listed threatened and endangered species and federal species of concern could occur if other federal, state, or private 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 from future state or private projects subject to Section 7 consultation would affect those species. We conclude that the Project's cumulative impacts, in addition to the other projects listed in table B-30, 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 facilities. Pipelines are buried underground and thus allow for most of the land to return to its preexisting use and condition following construction. Therefore, with the exception of the permanent rights-of-way (including a permanent conversion of forested land to

herbaceous cover), construction and operation of the proposed pipeline laterals would have minor, temporary effects on existing and future land use. The Marcus Hook Compressor Station and Monroe and Tilghman Meter Stations would be constructed on lots within existing industrial facility sites. Although the lots are currently used for industrial purposes, the use of the parcels would increase during construction and operation of these facilities (e.g., increased vehicle traffic, noise). The proposed Quakertown facilities and Delmarva Meter Station would be constructed adjacent to existing station facilities. The Transco Meter Station would be located in close proximity to industrial infrastructure of a similar nature. Similarly, the new MLVs and BAVs would be constructed within the right-of-way of the existing mainline. Construction of these facilities would result in the conversion of a small amount of open land (less than 0.1 acre) to industrial land and add a small visual impact.

Temporary workspace areas would be restored in accordance with our Plan, and Adelphia's Procedures and E&SCP, as well as individual landowner agreements. As discussed in section B.5.5, Adelphia has committed to mitigating visual impacts from the Quakertown facilities with visual screening and use of strategic color schemes for buildings. With Adelphia's commitment and our recommendation in section B.5.5, construction and operation of these stations would add minimally to the visual impacts, therefore, the Project's overall contribution to cumulative effects on the existing viewshed would be negligible.

Projects with new, aboveground facilities generally have greater impacts on land use than the operational impacts of a pipeline. The PennDOT and industrial/commercial projects (with the exception of the Chichester Business Park) are generally replacements of, or minor modifications to, existing infrastructure and would result in negligible impacts on land use. Given the industrial and urban nature of Delaware County, Pennsylvania and New Castle County, Delaware, the development of the industrial/commercial and residential projects in these counties would not likely result in adverse impacts on the existing land use.

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

10.7 Socioeconomics

All of the projects in table B-30 are in part or in whole within the same counties crossed by the Adelphia Gateway Project. The greatest potential for cumulative impacts on population, employment, local services, and tax revenues would be where the other projects are under construction at the same time as the Adelphia Gateway Project. These counties would likely see a temporary increase in population from non-local workers

relocating to these areas during the construction of the Project, as well as for any concurrently constructed projects.

Local workers employed by the projects would likely live in the vicinity of the projects components they are working on; outside workers would be expected to stay in the counties crossed by the Project to be near their worksites. Local communities would benefit from increased spending by construction crews at restaurants, hotels, and retailers. Additionally, taxes are paid to affected counties during construction. Construction-related impacts from the proposed Project on employment and tax revenues would generally be temporary and minor; the other projects identified in in table B-30 would likely have economic impacts during construction, including those projects typical of ongoing urban/metropolitan development. As discussed in section B.6, the Adelphia Gateway Project would have negligible socioeconomic impacts during operation and therefore would not contribute to cumulative impacts on population, employment, and local services.

Construction of the proposed Project could result in minor, temporary impacts on some roads due to construction within the roadway and the movement of heavy equipment and personnel. Concurrent construction of the proposed Project and other projects in the vicinity could result in a temporary and minor cumulative impact on transportation due to increased use of roadways. Given Adelphia's commitment to implement mitigation measures to ensure traffic safety and maintain traffic flow, and similar actions that are likely to be taken by other project proponents, we conclude that cumulative impacts on traffic during the 8-month construction period would be minor. Operation of the Project would not contribute to any long-term cumulative impact on the transportation infrastructure, because only a small number of new permanent employees, a maximum of 10, would be required.

10.8 Cultural Resources

Of the projects identified in table B-30, only the remediation projects would have construction footprints that overlap with the Project; however, no cultural resources have been identified within the survey corridor where these projects would overlap. 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.

10.9 Air Quality

The proposed Project would result in short-term impacts on air quality as a result of construction in the vicinity of the Project, as discussed in section B.8.1. Specifically, use of heavy equipment would generate emissions of air pollutants and fugitive dust,

which would result in short-term emissions that would be highly localized, temporary, and intermittent.

Construction of the projects listed in table B-30 that are within 0.5-mile of the Adelphia Gateway Project and would have overlaying construction schedules could contribute to cumulative impacts on regional air quality. Similar to the proposed Project, construction of these projects would involve the use of heavy equipment that would generate short-term emissions that would be highly localized, temporary, and intermittent. Each project identified in table B-30 would be required to meet applicable state and federal air quality standards to avoid significant impacts on air quality.

Table B-20, in section B.8.1, shows the construction emissions anticipated for the Adelphia Gateway Project compared with applicable general conformity thresholds. Cumulative construction emissions from these projects and concurrent construction of the proposed Project facilities in Delaware County, Pennsylvania would not be expected to result in an exceedance of applicable general conformity thresholds; however, concurrent construction would result in temporary, localized cumulative emissions from construction vehicles and equipment that would last for the duration of the construction period. As discussed in section B.8.1, impacts from construction and operation of the Adelphia Gateway Project would not result in any violation of applicable ambient air quality standards, and impacts from construction would be temporary.

During Project operation, emissions from the proposed Project, and in particular the two new compressor stations, would result in impacts on air quality. As discussed in section B.8.1, emissions from Project operation would not contribute to a violation of the NAAQS, and would not cause or significantly contribute to a degradation of ambient air quality. Numerous projects listed in table B-30 would also result in ongoing, operational emissions of air pollutants; however, each of the projects identified in table B-30 above would be required to meet all applicable federal and state air quality standards that are designed to avoid significant impacts on air quality. Additionally, the FERC-jurisdictional projects were required to have undergone state-level air quality permitting, which would require air quality modeling that shows that the projects would not result in a degradation in air quality or an exceedance of the NAAQS. Therefore, we conclude that the Project would not result in significant cumulative impacts on regional air quality.

10.10 Climate Change

Climate change is the change in climate over time, and cannot be represented by single annual events or individual anomalies. While a single large flood event or particularly hot summer are not strong indications of climate change, a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change. However, recent research has begun to attribute certain extreme weather events to climate change (U.S. Global Change Research Program [USGCRP] 2018).

Climate change is 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, and as a result, the U.S. and the world are warming; global sea level is rising and acidifying; and certain extreme weather events are becoming more frequent and more severe.

The following are observations of environmental impacts that may be attributed to climate change (USGCRP 2018):

- global average temperature has increased by about 1.8 degree Fahrenheit from 1901 to 2016; emissions of greenhouse or heat-trapping gases are the dominant cause of this increase;

- ocean heat content has increased at all depths and surface waters have warmed by a rate of about 1.3 degree Fahrenheit per century;

- the world's oceans are currently absorbing more than 25 percent of the CO_2 emitted to the atmosphere annually from human activities, making them more acidic;

- rising temperatures and precipitation alter the habitats of vectors (mosquitoes, ticks, rodents, and fleas) that transmit a variety of human diseases;

- large projected lost wages and the number of working hours due to temperature extremes will occur under high emissions scenarios, and the Project area would experience higher than average impacts; and

- low-income and minority communities are often already overburdened with poor environmental conditions and may be disproportionately affected by, and less resilient to, the health impacts of climate change.

PADEP has developed a Pennsylvania Climate Action Plan (PADEP 2018j), which has the following projections of climate impacts within the state:

- more frequent extreme weather events, including large storms, periods of drought, heat waves, heavier snowfalls, and an increase in overall precipitation variability, with increased infrastructure disruption and need for emergency management;

- increased risks of injury and death from extreme weather events;

- increased human health risks from air pollution, diminished water quality, and heat stress such as exacerbated asthma or increased water-borne illnesses;

- changing pest, weed, and disease management challenges for farmers and livestock producers;

- increased demand for energy, particularly during warmer summer months, meaning higher energy costs for consumers and increased strain on the grid to provide reliable power; and

- more frequent flooding and associated disruptions due to sea level rise in communities and cities in the Delaware River Basin, including the city of Philadelphia.

Additionally, the State of Delaware has published the Delaware Climate Change Impact Assessment in 2014 (Delaware Department of Natural Resources and Environmental Control, Division of Energy and Climate 2014) that outlines the existing and projected impacts of climate change in the state, such as:

- annual and seasonal temperatures in Delaware have already increased by 2 degrees Fahrenheit since 1900;

- higher summer temperatures (days over 95 degrees Fahrenheit) and longer growing seasons already are being recorded;

- average temperatures are expected to increase another 2.5 to 4.5 degrees Fahrenheit by mid-century (2050) and by as much as 8 degrees Fahrenheit by 2100 (late-century);

- the number of very hot days (over 95degrees Fahrenheit) is expected to increase and heat waves are projected to become longer and more frequent;

- average precipitation is expected to increase by about 10 percent by 2100 (late-century);

- heavy rainstorms are expected to become more frequent and more intense, with an increasing number of very wet days with 2 inches or more of rainfall; and

- statewide, between 8 percent and 11 percent of the state's land area (including wetlands) could be inundated by a sea level rise of 0.5 meters to 1.5 meters, respectively

Our analysis presents the 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).

The construction and operation, as well as downstream emissions from newly created Project capacity, would increase the atmospheric concentration of GHGs, in

combination with past and future emissions from all other sources, and contribute incrementally to future climate change impacts. However, burning natural gas emits less CO_2 compared to other fuel sources (e.g., fuel, oil, or coal). 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 Pennsylvania and Delaware.

We received comments that the Commission should employ the Social Cost of Carbon (SCC) tool to inform its environmental review for the Project. We recognize that the SCC methodology does constitute a tool that can be used to estimate incremental physical climate change impacts, either on the national or global scale. The integrated assessment models underlying the SCC tool were developed to estimate certain global and regional physical climate change impacts due to incremental GHG emissions under specific socioeconomic scenarios. However, the Commission has previously indicated[45] that it is not appropriate for use in our project-specific analyses for the following reasons: (1) the incorporation of the SCC tool into our review under NEPA cannot meaningfully inform the Commission's decision whether and how to authorize a proposed project under the NGA; (2) the Commission does not use monetized cost-benefit analyses as part of the review under NEPA or the decision under the NGA; and (3) the SCC tool has methodological limitations (e.g., different discount rates introduce substantial variation in results and no basis exists to designate a particular monetized value as significant) that limit the tool's usefulness in the review under NEPA and the decision under the NGA. As such, FERC staff did not use the SCC tool in this NEPA analysis.

10.11 Noise

Noise impacts would occur during construction of the proposed Project; however, operational noise impacts would be limited to the vicinity of the new aboveground facilities (see table A-1). Sound level impacts during construction would be highly localized and attenuate quickly as the distance from the sound source increases. Construction of PennDOT's bridge replacement project, as well as other projects within 0.25 mile of the Project that may overlap in construction schedule with the proposed Project and could result in cumulative noise impacts on nearby residents. However, based on the short-term and temporary nature of construction-related activities, our noise recommendation for HDD drilling, and Adelphia's commitment to construct primarily during the daytime hours, impacts from the Project are not expected to significantly contribute to cumulative impacts on noise levels during construction.

[45] Order on Remand Reinstating Certificate and Abandonment Authorization, Southeast Market Pipelines Project (SMP Project) CP14-554-002, CP15-16-003, CP15-17-002, March 14, 2018.

As discussed in section B.8.2, Project operation would result in noise impacts on nearby residents at the aboveground facilities, including the compressor stations, meter stations, MLVs, and BAVs. No projects were identified within the geographic scope of the Quakertown Compressor and Meter Stations, BAVs, or MLVs that would result in cumulative impacts on noise due to Project operation; therefore, these Project components are not discussed further. Multiple projects listed in table B-30 would likely result in operational noise that, in addition to the proposed Project, may contribute cumulatively to noise impacts in the vicinity of the Tilghman Lateral and the Transco and Delmarva Meter Stations. However, based on Adelphia's commitment to install specific noise control measures, and our recommendation that would ensure that the FERC noise criterion of 55 dBA would not be exceeded, Project operation would contribute negligibly to cumulative impacts on noise levels.

10.12 Conclusions on Cumulative Impacts

We conclude that with the implementation of our recommendations that would further mitigate environmental impacts, in addition to the mitigation measures that Adelphia has committed to implementing, impacts associated with the Project would be relatively minor. Therefore, we anticipate that the Project may contribute to cumulative impacts either negligibly or to a minor degree 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 and aboveground facility alternatives, and minor route variations. 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.

We received a comment from the USEPA and numerous stakeholders regarding the need to evaluate alternatives to the proposed Project, including alternatives not within the jurisdiction of FERC (e.g., use of renewable energy sources) and which would not meet the Project's stated objection.

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 USEPA and PennDOT; 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 we have comparable data, 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 of the Project cannot be considered as an acceptable replacement for the Project. All of the alternatives considered here are able to meet the Project's purpose of providing about 250 and 350 million cubic feet per day of natural gas per day on the northern segment of the existing mainline and the 20-inch-diameter pipeline, respectively, as well as adding 250 million cubic feet per day of natural gas capacity on the southern segment of the existing mainline and including two new laterals. As proposed, the Project would increase service to industrial facilities in the Philadelphia area, serve additional markets in the northeastern U.S., and maintain service to existing power plants.

The second evaluation criteria are feasibility and practicality. 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 methods 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.

Lastly, 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 impacts 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 Adelphia's application, the Project would not be built and the environmental impacts identified in this EA would not occur. Under this alternative, Adelphia would not provide additional natural gas supplies to the industrial area of Philadelphia or to new markets in the northeastern U.S. If the No-action Alternative is selected, other natural gas transmission companies could propose to construct similar facilities to meet the demand for the additional volume of natural gas. Such actions could result in impacts similar to or likely greater than the Project (given the amount of use of existing systems that is proposed by Adelphia). For these reasons, we are not recommending the no-action alternative.

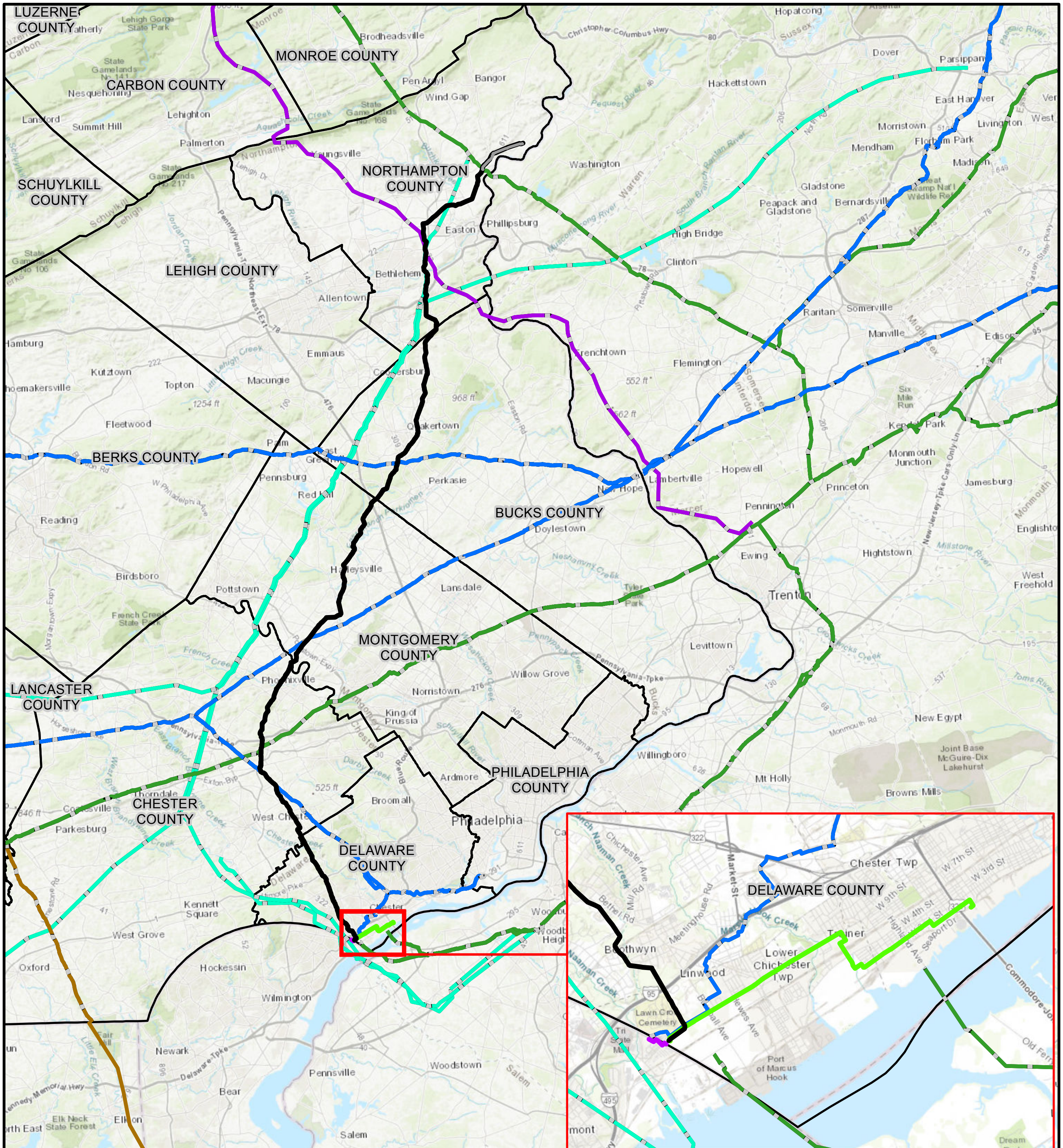
3. System Alternatives

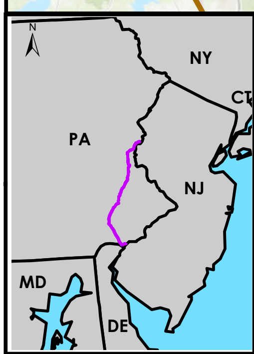
System alternatives would generally use existing, modified, or proposed pipeline systems to meet the purpose and need of the Adelphia Gateway Project. Although modifications or additions to existing or proposed pipeline systems may be required, implementation of a system alternative would deem it unnecessary 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.

We identified existing natural gas transmission pipelines in the Project area that could possibly be used as system alternatives. Columbia, TETCO, Transco, Eastern Shore Natural Gas, and PennEast operate or plan to operate transmission pipeline systems in the Project area (see figure 5). The Project, as proposed, would deliver natural gas to Columbia, TETCO, Transco, Delmarva, and the Philadelphia Electric Company via interconnects at the Delmarva, Transco, or Tilghman Meter Stations (see section A.4). Eastern Shore Natural Gas recently received FERC's approval to expand its system to meet increasing demand which delivers natural gas to the Delmarva Peninsula and Pennsylvania.[46] PennEast, also recently received FERC's approval to construct a new 120-mile-long interstate natural gas pipeline from Luzerne County in northeastern Pennsylvania to Mercer County, New Jersey, with 90 percent of its capacity subscribed.[47]

[46] FERC Docket No. CP15-498.

[47] FERC Docket No. CP15-588.


LUZERNE COUNTY
MONROE COUNTY
CARBON COUNTY
SCHUYLKILL COUNTY
NORTHAMPTON COUNTY
LEHIGH COUNTY
BERKS COUNTY
BUCKS COUNTY
MONTGOMERY COUNTY
LANCASTER COUNTY
CHESTER COUNTY
PHILADELPHIA COUNTY
DELAWARE COUNTY
Brodheadsville
Pen Argyl
Bangor
Wind Gap
Hackettstown
Dover
Parsippany
East Hanover
Morristown
Mendham
Florham Park
Livingston
Washington
Gladstone
Peapack and Gladstone
Bernardsville
Phillipsburg
Easton
High Bridge
Clinton
Bethlehem
Allentown
Raritan
Somerville
Manville
Edison
Frenchtown
Flemington
Emmaus
Macungie
Kutztown
Topton
Fleetwood
Hamburg
Quakertown
Perkasie
Lambertville
New Hope
Hopewell
Pennington
Princeton
Kendall Park
Monmouth Junction
Jamesburg
Doylestown
Ewing
Hightstown
Englishtown
West Freehold
Reading
Pennsburg
Red Hill
Birdsboro
Pottstown
Harleysville
Lansdale
Trenton
Levittown
Phoenixville
Norristown
Willow Grove
King of Prussia
New Egypt
Willingboro
Mt Holly
Joint Base McGuire-Dix Lakehurst
Browns Mills
Ardmore
Coatesville
Parkesburg
Thorndale
West Chester
Broomall
Philadelphia
Kennett Square
West Grove
Oxford
Hockessin
Wilmington
Newark
Pennsville
Woodstown
Bear
Elkton
Salem
Chester Twp
DELAWARE COUNTY
Trainer
Lower Chichester Twp
Boothwyn
Linwood
Port of Marcus Hook



Legend

- Columbia
- Eastern Shore
- Transco
- PennEast
- Texas Eastern
- Existing 18-Inch-Diameter Mainline
- Existing 20-Inch-Diameter Mainline
- Proposed Parkway Lateral
- Proposed Tilghman Lateral
- County Boundary

0 5 10
Miles

N

Scale: 1:750,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

System Alternatives

FIGURE 5

Adelphia's stated Project purpose is to deliver natural gas to the markets in southeastern Pennsylvania, including the greater Philadelphia area and the Wilmington, Delaware metro area. The southeastern Pennsylvania area includes the Marcus Hook industrial complex along the Delaware River between Philadelphia and Wilmington. The existing pipeline systems stated above are fully subscribed to existing contract commitments and cannot provide the additional capacity proposed by Adelphia's Project. Therefore, in order to use these existing systems to provide the additional natural gas proposed by the Project, each would require construction or pipeline looping to expand current capacity. Expansion of these systems would likely require more ground disturbance than Adelphia's proposed Project, which is predominately of an existing system. Therefore, none of these pipeline systems would offer a significant environmental advantage, and we do not consider them to be preferable alternatives to the Adelphia Gateway Project.

4. Major Route Alternatives

Major route alternatives include those that deviate from the proposed route for a significant distance and provide a substantially different pathway from the source area to the delivery area. Major route alternatives would involve a new pipeline route that would still interconnect with the same existing pipeline systems, potentially at different locations, but would ultimately provide natural gas to the same proposed facilities. Because the Parkway and Tilghman Laterals are short in distance, in comparison, alternatives for these Project facilities are evaluated in minor route variations in section C.5.

During the scoping process, several comments were received regarding the safety of converting the southern segment of the existing mainline from transporting fuel oil to natural gas and the preference of using a pipeline constructed with the intent of transporting natural gas. Therefore, we have analyzed two major alternatives to using the existing mainline. The Replacement Alternative would involve replacing existing pipe along the southern segment of the existing mainline, which currently transports fuel oil. The Looping Alternative would involve installation of a new pipeline within or immediately adjacent to the existing right-of-way for the southern segment. Table C-1 provides a comparison of environmental impacts of the proposed route and the two alternatives.

Table C-1
Major Route Alternatives to the Southern Segment of the Existing Mainline

Resource	Proposed Southern Segment[a]	Replacement Alternative	Looping Alternative
New pipeline length (miles)	0	49.4	49.4
New compressor stations	1	0	0
Total new compression (horsepower)	5,625	N/A	N/A
Construction impacts (acres)[b]	7.6	359.3	538.9
Operational impacts (acres)[c]	179.7 (existing right-of-way)	179.7 (existing right-of-way)	179.7 (existing right-of-way) plus 89.9 (new right-of-way)
Total wetlands affected (acres)[a]	0.0	15.5	17.4
PFO (acres)[a]	0.0	6.7	11.5
PEM and/or PSS (acres)[a]	0.0	8.8	5.9
Total waterbodies crossed	0	80	82
Major waterbody crossings (>100 feet)	0	3	3
Scenic rivers	0	1	1
Existing residences within ≤ 50 feet of construction work area	0	517	560

[a] The data provided for the proposed route is based on desktop data to allow for consistent comparison of data types between the proposed route and alternatives. As such, resources identified during field surveys and discussed in section B may not be included in this table.

[b] Construction acres for the proposed Project are based on the areas of disturbance proposed along the southern segment of the existing mainline, which include the Quakertown facilities, Skippack Tap Valve, two MLVs, and seven BAVs. The construction impacts for the Replacement Alternative and the Looping Alternative are estimated based on assumed 60-foot and 90-foot-wide construction rights-of-way, respectively.

[c] Operation acres estimated based on assumed 30-foot-wide permanent easements for the proposed Project and Replacement Alternative and a 15-foot-wide permanent easement for the Looping Alternative.

While these two alternatives would allow Adelphia to install larger diameter pipeline or utilize a pipeline design that would avoid the need for new compression along the southern segment, each would impact additional resources as compared to the proposed Project. Overall, construction impacts associated with the alternative routes would be greater given the need to disturb lands for pipeline installation versus the limited areas of ground disturbance for Adelphia's proposed Project. Further, both alternatives would result in greater impacts on wetlands and waterbodies including the Schuylkill River, a designated scenic river, and would require work in proximity to more residences than the proposed Project. Any pipeline system would be required to meet pipeline standards whether it is a new build, modified existing pipeline system, or a combination thereof. As discussed in section B.8.1, the proposed compressor station would not result in a degradation in air quality or an exceedance of the NAAQS. Similarly, any compressor station considered under an alternative scenario would be required to meet these air quality standards. Section B.9 provides detail on pipeline

safety requirements, as well as additional information on the safety of the conversion from fuel oil to natural gas.

Based on these factors, neither the Replacement Alternative nor the Looping Alternative are found to provide an environmental advantage to the proposed Project; therefore, they are not further considered.

5. Minor Route Variations

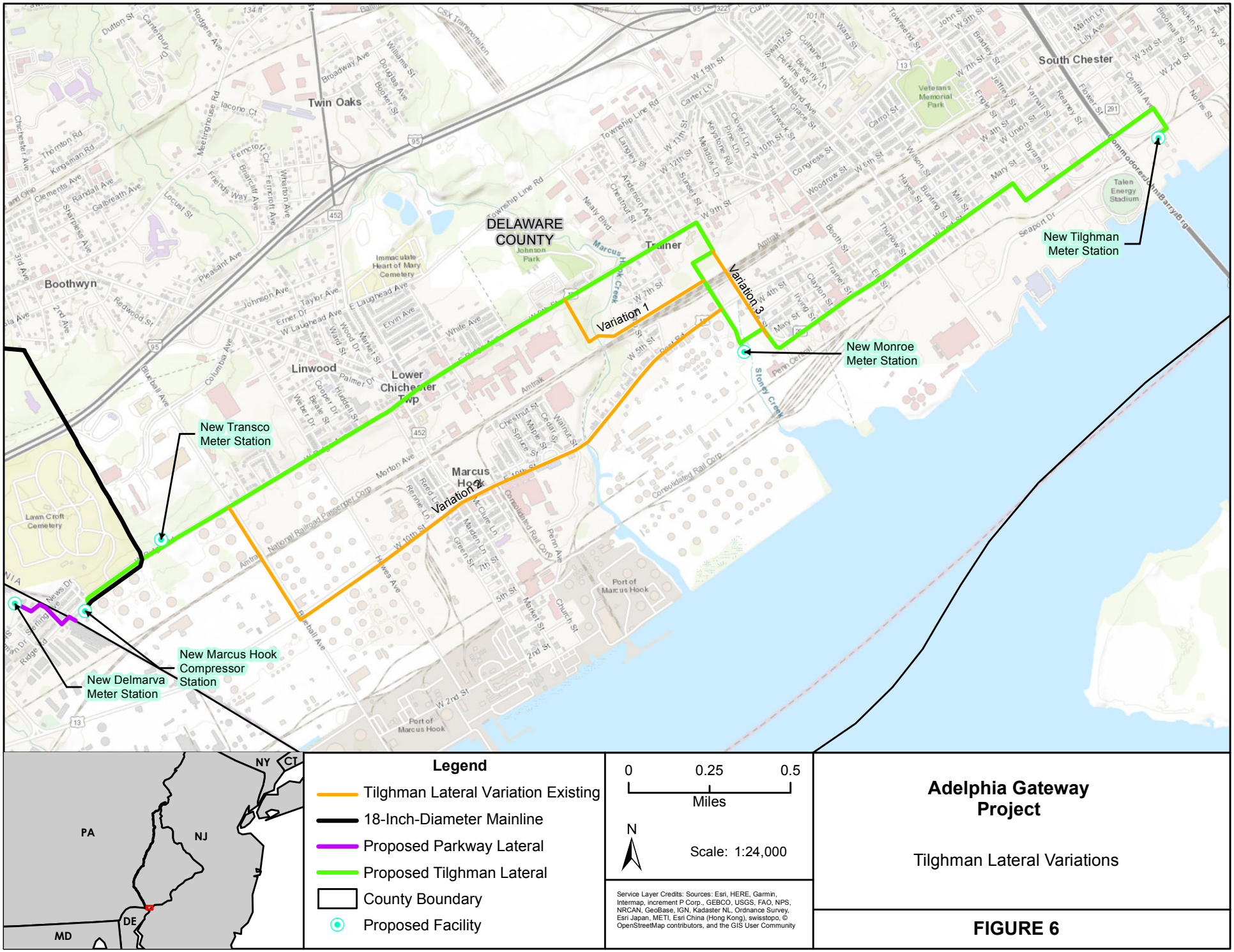
Minor route variations typically involve minor shifts in the pipeline alignment to avoid a site-specific resource issue or concerns and are generally smaller in scale and shorter than major route alternatives. We analyzed three variations for the Tilghman Lateral.

5.1 Tilghman Lateral Variation

We received comments regarding concerns with pipeline construction in a densely populated areas and in an industrialized area where the potential exists to encounter soil and groundwater contamination. Therefore, three variations were reviewed for the Tilghman Lateral. The proposed route of the Tilghman Lateral is 4.4 miles in total length through a developed area that is a mix of industrial and residential properties. The variations both generally follow existing rights-of-way and/or utility corridors (see figure 6).

Tilghman Lateral Variation 1

The Tilghman Lateral Route Variation 1 (Variation 1) was reviewed in an effort to parallel the route with a railroad and powerline right-of-way, to minimize the need for in-road construction and associated lane closures and detours along Ridge Road. Overall, Variation 1 would be shorter in length than the proposed route by about 0.1 mile, but would impact 1.8 additional acres of forested land, including forested wetlands. Both the proposed route and Variation 1 would cross Marcus Hook Creek. However, the alternative route would be closer to about 20 residences along Burton, Chestnut, Holly, and Main, Streets, as close as 155 feet, compared to the proposed route's proximity of about 450 feet. Further, construction of Variation 1 would require clearing of forested land between the residences and the railroad that currently serves as a visual and noise buffer. Given the proximity to more residences and long-term impacts associated with removal of the trees, including in forested wetlands, we conclude that the Tilghman Lateral Variation 1 does not provide a significant environmental advantage over the Project and is not considered further.



Adelphia Gateway Project

Tilghman Lateral Variations

FIGURE 6

Tilghman Lateral Variation 2

Similar to Variation 1, Tilghman Lateral Variation 2 (Variation 2) was reviewed as an alternate to the proposed route, to avoid construction within and adjacent to Ridge Road. Variation 2 would turn southward on Blueball Avenue, then turn northeast on Philadelphia Pike (State Road 13). This variation would be similar in length to the Tilghman Lateral; however, it would be in proximity to several densely populated areas where State Road 13 transitions to 10th Street, which would result in it being within 100 feet of about 82 more residences than the Tilghman Lateral. Therefore, the Tilghman Lateral Variation 2 does not provide a significant environmental advantage over the Project and is not considered further.

Tilghman Lateral Variation 3

Tilghman Lateral Route Variation 3 (Variation 3) would be based on the same route as the proposed lateral but would include an HDD that begins at about MP 2.3 on Ridge Road, about 390 feet northeast of the proposed Lateral, which would avoid impacts developed properties between Post Road and West 2nd Street (Highway 291). The HDD exit point, however, would be constrained by development, resulting in its location on the Metro Container Corporation Superfund site (discussed on section B.1.2). For this reason, we conclude that the Tilghman Lateral Variation 3 does not provide a significant environmental advantage to the proposed route, and we do not recommend it.

6. Aboveground Facility Alternatives

Adelphia would construct two new compressor stations (Quakertown and Marcus Hook), five new meter stations (Delmarva, Monroe, Tilghman, Transco, and Quakertown) seven BAVs and two MLVs. During development of the Project, Adelphia preferred to site all new aboveground facilities along the Existing System at sites that were already developed with industrial or natural gas infrastructure facilities. This approach resulted in the site locations proposed for the Quakertown facilities, Marcus Hook Compressor Station, and the Delmarva, Monroe, and Tilghman Meter Stations. Additionally, both compressor stations are proposed at existing facility sites that Adelphia would own following the acquisition of the Existing System from IEC. For all aboveground facilities, including the meter stations, Adelphia would have to obtain easements prior to construction.

During Project scoping, no significant concerns, environmental issues, or alternative sites were identified by FERC staff or stakeholders for the Transco, Monroe, and Tilghman Meter Stations, the Marcus Hook Compressor Station, or five of the BAVs. Because our alternatives analysis are comment and resource driven, we have not evaluated alternatives for these sites, and our assessment of alternative sites is limited to the new Quakertown facilities, MLV 1, MLV 2, Paoli Pike BAV, and Perkiomen Creek BAV.

6.1 Quakertown Compressor Station Site Alternatives

Adelphia identified three existing, developed sites for the proposed Quakertown Compressor and Meter Stations, which include: Cromby, Salford, and Quakertown. As part of the design process, Adelphia completed hydraulic modeling to identify the optimal location for a new compressor station along the existing mainline with a goal of minimizing the amount of compression required for the Project and to maintain operational pressure on the system. The results of the hydraulic modeling identified the optimal placement of the new compressor station should be between MP 46.4 and MP 51.9. Adelphia chose the proposed location, which is owned by IEC, at the existing meter station at MP 49.4 based on this information, as the preferred site for the Quakertown Compressor and Meter Stations. We received numerous comments from stakeholders, including nearby residents, who raised concerns for the proposed site's proximity to residences and historic homes. As such, we identified two additional alternative sites (Alternatives 1 and 2) within the optimal range identified by the hydraulic model. These site alternatives, along with the Cromby and Salford Alternative sites are depicted in figure 7. Alternative layout configurations at the proposed site for the Quakertown Compressor Station are reviewed below. Table C-2 provides comparison data between the proposed site and the alternative compressor station sites. We evaluated potential alternative locations within the optimal range of compression south of the proposed Quakertown site, but found that potential sites would all be closer to residential properties than the proposed site and were not evaluated further.

Alternatives 1 and 2 are both within the optimal range identified by the model and thus would require the same compression which would result in the same volume of air emissions as the proposed Quakertown Compressor Station. The alternative sites would also be further from residences, as compared to the proposed site. However, Alternatives 1 and 2 are non-developed sites, which would require site preparation including clearing and grading, as well as construction of a new access road or expansion of an existing access road, respectively. Also, the location of these sites, north of the existing Quakertown facility, would require construction of a new meter station and a new pipeline segment to transport the natural gas from the respective alternative site to MP 49.4, where the southern segment of the existing mainline begins. Further, locating the compressor station north of the proposed site would not negate the need for the new meter station at the existing Quakertown facility. In total, Alternatives 1 and 2 would impact a total of 10.5 and 15.0 acres, including 9.3 and 2.0 acres of forested land, respectively. Therefore, given: 1) Adelphia's ability to utilize the existing infrastructure at the proposed site; 2) the limited amount of land to be disturbed during construction; 3) the ability to accommodate both the Quakertown Compressor and Meter Stations within the existing facility fenceline; 4) and the fact that the alternatives would still require installation of aboveground facilities at the proposed meter station site, we conclude that compressor station Alternative 1 and Alternative 2 do not provide a significant environmental advantage over the Project and are not considered further.

Table C-2
Quakertown Compressor Station Alternatives

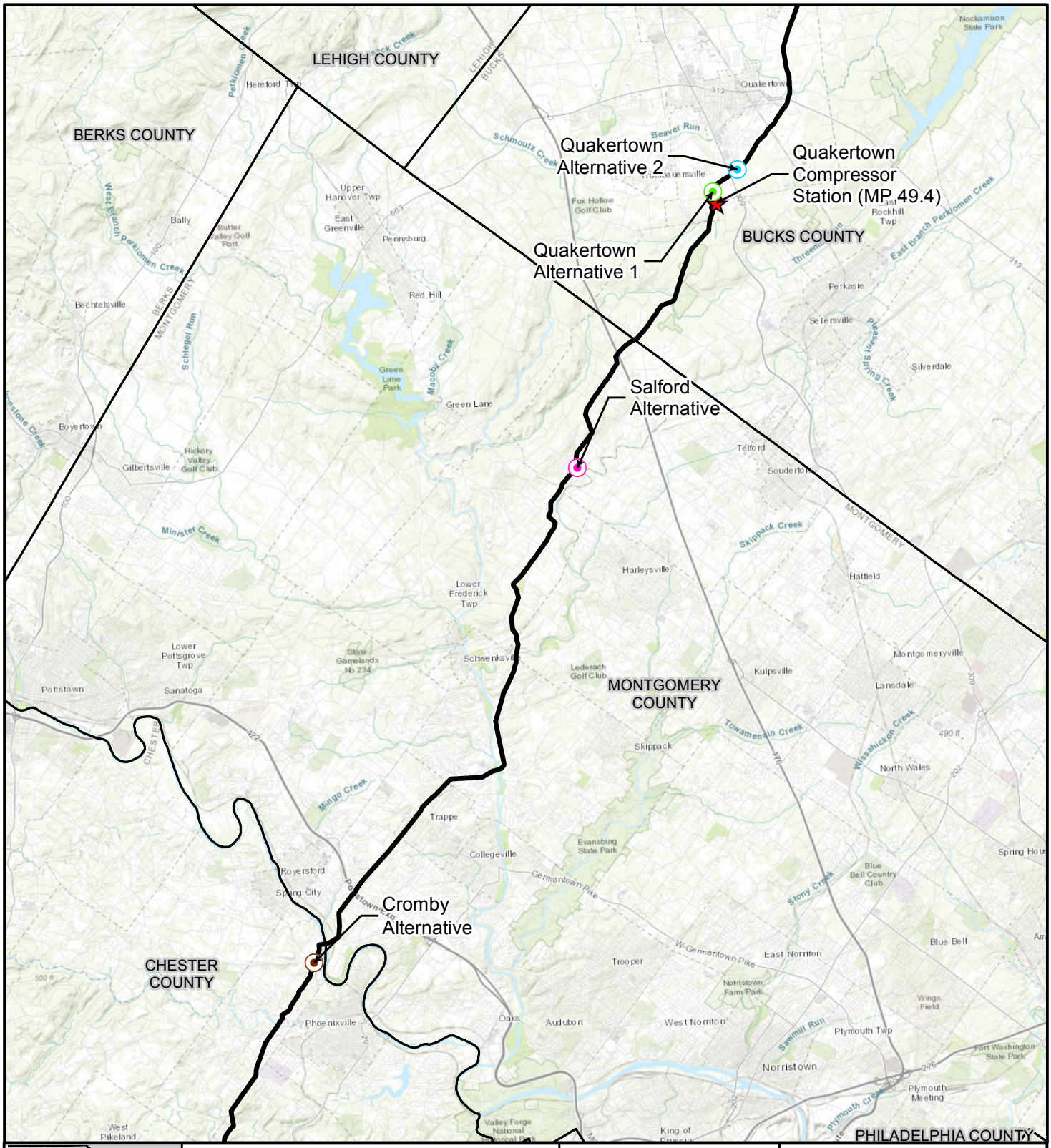
Resource	Proposed (MP 49.4)	Alternative 1 (MP 49.6)	Alternative 2 (MP 50.2)	Cromby Alternative (MP 27.3)	Salford Alternative (MP 41.9)
Compressor Station					
Construction acres	3.7	7.6	7.0	7.5	2.3
Operation acres	1.2	2.3	2.3	2.3	2.3
Compression required (horsepower)	5,625	5,625	5,625	10,650	7,170
Pipeline Facilities					
Additional pipeline (miles)	N/A	0.4	1.1	N/A	N/A
Additional pipeline - construction (acres)[a]	N/A	2.9	8.0	N/A	N/A
Additional pipeline - operations (acres)[b]	N/A	1.5	4.0	N/A	N/A
Nearest residence (feet)	425	600	800	1,100	740[c]
Total Land Use Impacts (acres)					
Cultivated crops	0.1	0.0	5.1	7.5	< 0.1
Pasture / hay	0.7	0.0	2.1	0.0	1.6
Grassland	0.0	0.0	0.0	0.0	0.1
Shrub / scrub	1.0	0.0	2.5	0.0	0.0
Forested	0.1	9.3	2.0	0.0	0.0
Developed	2.1	1.2	3.3	0.3	2.4

[a] Construction acres for the additional pipeline are based on a 60-foot-wide construction right-of way.

[b] Operations acres for the additional pipeline are based on a 30-foot-wide permanent right-of way.

[c] Adelphia identified a residence approximately 159 feet south of the Salford Alternative Site, however based on our research we have identified the structure as a commercial business, specifically Derstines Embroidery.

A compressor station at the Cromby Alternative would be outside of the fenceline of the existing Cromby station (about 27 feet by 57 feet) on a parcel to the north about 1,000 feet. Further, the Cromby Alternative site would be immediately adjacent to the Schuylkill River Trail (see section B.5.3). Similar to the proposed site, the Salford Alternative is an existing industrial facility (Salford Reheat Station) that would be acquired by Adelphia with purchase of the Existing System, and which is sufficient in size to allow placement of a compressor station within the existing facility fenceline. However, this alternative site is about 159 feet north of a commercial business. Ultimately, both the Cromby and Salford Alternatives would be sited further from the closest residence than the proposed site, but would require additional compression, which would result in more air emissions. Additionally, locating the compressor station at the Cromby or Salford Alternative sites would not negate the need for the new meter station at the existing Quakertown facility. Based on these findings, we conclude that the Cromby and Salford Alternatives do not provide a significant environmental advantage over the Project. Therefore, we are not considering these alternatives further.


LEHIGH COUNTY
BERKS COUNTY
BUCKS COUNTY
MONTGOMERY COUNTY
CHESTER COUNTY
PHILADELPHIA COUNTY
Quakertown Alternative 2
Quakertown Compressor Station (MP 49.4)
Quakertown Alternative 1
Salford Alternative
Cromby Alternative
Legend
Quakertown Compressor Station
Quakertown Alternative 1
Quakertown Alternative 2
Cromby Alternative
Salford Alternative
Existing 18-Inch-Diameter Mainline
County Boundary
0 2 4
Miles
N
Scale: 1:200,000
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013
NY
PA
NJ
MD
DE
CT
Adelphia Gateway Project
Quakertown Compressor Station Alternatives
FIGURE 7

6.2 Quakertown Compressor Station Layout Alternatives

As discussed above, we received comments from nearby residents who raised concerns for the proposed location of the Quakertown Compressor Station within the existing facility fenceline. One resident inquired about the ability to locate the new Project facilities on the other side the existing station, just to the north, to increase the distance to residences and minimize impacts from noise and on the existing viewshed. Based on these comments, we reviewed three layout alternatives to the proposed Quakertown Compressor Station.[48] Each alternative would require land disturbance outside of the existing facility fenceline, which would result in greater overall impacts than the proposed configuration (between 0.8 to 2.3 additional acres). Additionally, the configurations to the east and west side of the existing station would be closer to residences in the respective directions, while the configuration to the north side of the existing station would impact wetlands. Based on these findings, we did not further evaluate any of the layout alternatives because none provided a significant environmental advantage over the Project.

6.3 Electric Compressors

In order to minimize air emissions, we evaluated the feasibility of using electric motor-driven compressor units in lieu of the proposed natural gas-fired compressor units at the Quakertown and Marcus Hook Compressor Stations. Several factors were considered in evaluating the type of unit to install, including: proximity to existing electric power sources; the need for new or modified electric power sources or transmission facilities; the need for additional ancillary facilities, such as substations; the ability of power companies to design, permit, and construct new facilities in a timeframe reasonably close to the Project; additional environmental impacts associated with construction of new facilities; and the ability to comply with emissions standards during operations at each site.

Although technically feasible, use of electric units would increase acres of impact to install about 0.7 mile of an additional dedicated feeder connection from the nearest substation, and expansion of the compressor station site to accommodate a larger main transformer, auxiliary transformer, additional electrical equipment, and additional generators for backup power.

Finally, gas-driven engines are generally preferred by operators over electric compression for providing reliable, uninterrupted natural gas transmission because the fuel supply does not require a third party for operation and is not subject to electrical outage. Gas-driven emergency generators with capacity to power electric motor-driven compressors would be infeasible, and would be significantly larger than the proposed

[48] Appendix 10A of Adelphia's application includes figures for each of the layout alternatives, and is available on eLibrary under accession no. 20180112-5115.

turbines. Additionally, although local air emissions from electric-driven compressors would be lower than those from natural gas driven compressors, use of electric-driven compressors would result in a higher load on the electric power grid and higher emissions from the electric power generating stations. For these reasons, we conclude that an electric motor-driven compressor unit at the proposed Quakertown and Marcus Hook Compressor Stations would not offer a significant environmental advantage over the proposed gas-driven turbines.

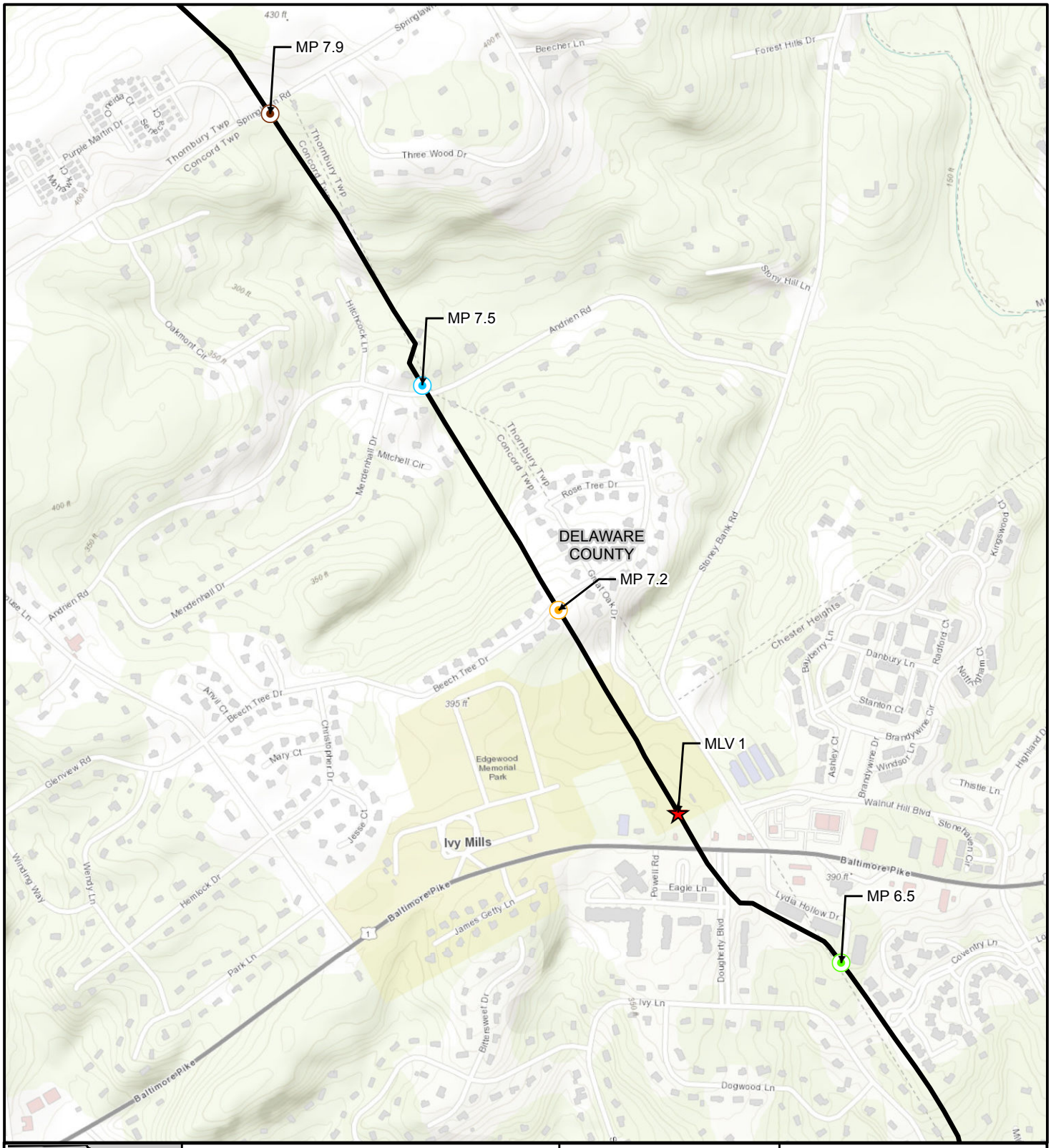
6.4 Other Appurtenant Aboveground Facilities

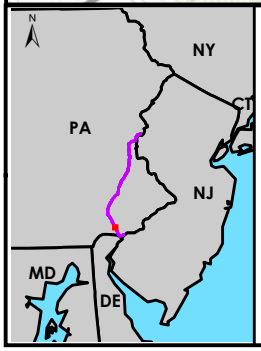
We received comments from local and county representatives, non-governmental organizations, residents, and other stakeholders expressing concern for the location of the new MLVs and several of the BAVs. The commenters' concerns were regarding health risks associated with noise and vibration, as well as air emissions from emergency blowdown events given the proximity of these facilities to residences, businesses, and schools. Commenters also question the ability of local service providers to adequately respond to emergencies, and raise concerns for impacts on wildlife and nearby water resources.

The MLVs and BAVs would be installed within the rights-of-way of the existing mainline. All of the BAVs would be at sites that currently have aboveground pipeline facilities. The new MLVs, which are required by USDOT-PHMSA regulations to be installed along natural gas pipelines, are proposed at sites along the southern segment of the existing mainline that have existing aboveground facilities or are in industrial uses. We reviewed alternative locations for the two new MLVs and two BAVs.

MLV 1 Alternatives

According to USDOT-PHMSA requirements, MLV 1 must be between MP 5.5 and 8.0. The proposed MLV 1 is just north of Pike Road at about MP 6.8; alternative locations were reviewed at MPs 6.5, 7.2, 7.5, and 7.9 (see figure 8). Each alternative would be in the existing right-of-way, and each would require a similar amount of space for construction and operation to the proposed location. The proposed location for MLV 1 and the alternative site at MP 7.9 would be the furthest from residences (167 and 175 feet, respectively) as compared to the alternatives at MPs 6.5, 7.2, and 7.5 (at distances ranging from 25 to 78 feet). Based on concerns raised by commenters, as described above, the proposed site for MLV 1 would maximize the distances to nearby residences. With all other factors being similar, these MLV alternatives do not provide a significant environmental advantage over the proposed MLV 1.





Legend

- Mainline Valve 1
- Existing 18-Inch-Diameter Mainline
- County Boundary

Alternative Sites

- MP 6.5
- MP 7.2
- MP 7.5
- MP 7.9

0 500 1,000
Feet

N

Scale: 1:12,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

MLV 1 Site Alternatives

FIGURE 8

MLV 2 Alternatives

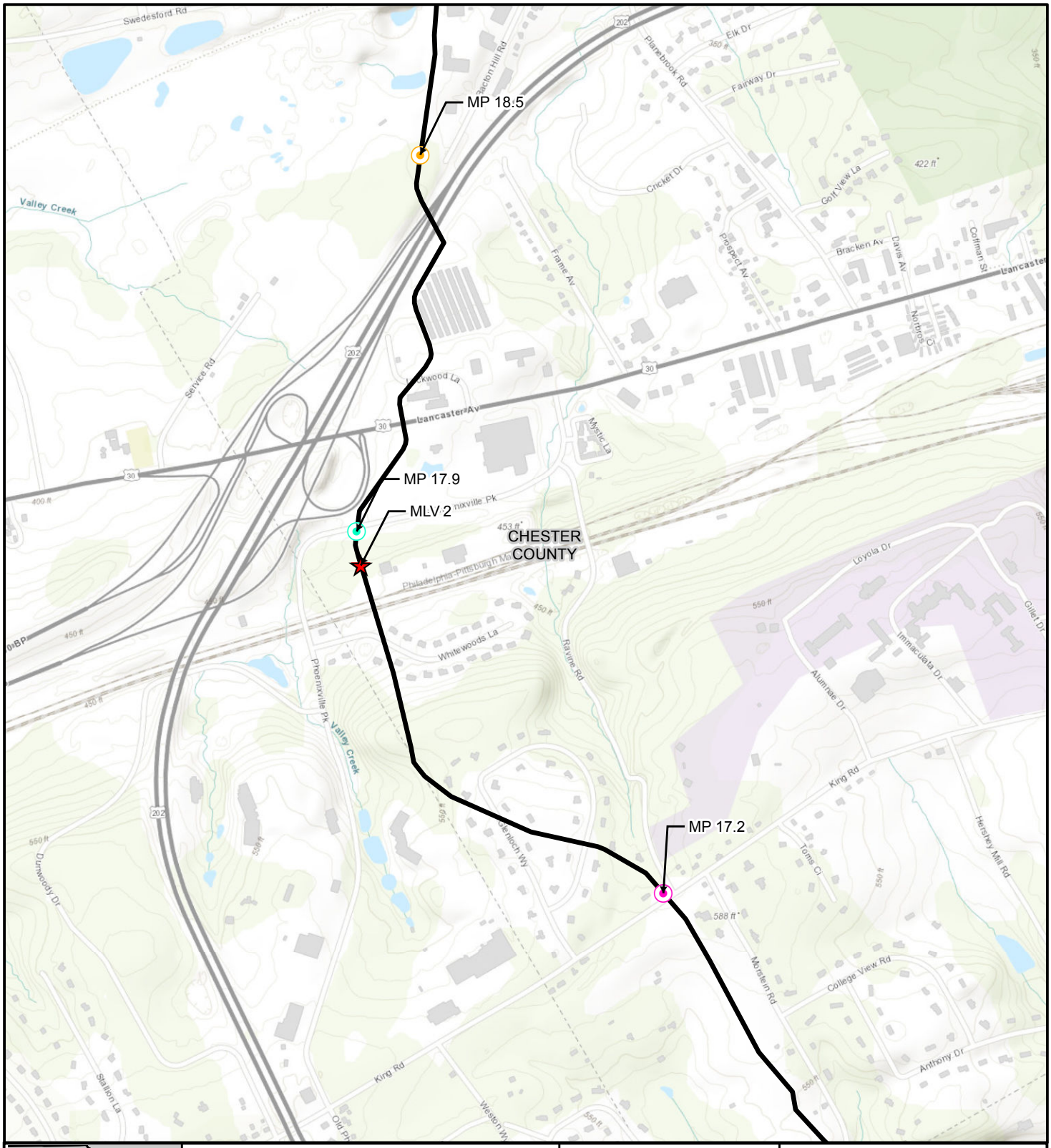
USDOT-PHMSA regulations require that MLV 2 be between MPs 17.1 and 18.9. The proposed MLV 2 is at MP 17.9 in the existing right-of-way within an industrialized area. Alternative MLV sites were reviewed at MPs 17.2, 17.9 (235 feet north of the proposed MLV 2 location), and 18.5 (see figure 9). Each alternative would also be in the existing right-of-way and alternatives at MPs 17.9, and 18.5 would be in close proximity to industrial areas, while the alternative at MP 17.2 would be in a residential area. The alternative site at MP 17.9 would be constrained during construction due to steep side slopes. The alternative at MP 18.5 could encounter contaminated soils from the industrial activities during construction. Based on these factors, none of MLV alternatives provide a significant environmental advantage over the proposed MLV 2.

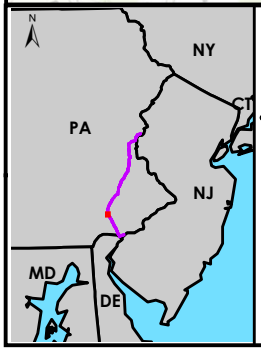
Paoli Pike BAV Alternatives

We evaluated alternatives to the Paoli Pike BAV site in an effort to avoid impacts on a wetland that could provide potential habitat for bog turtles. To maintain compliance with USDOT-PHMSA regulations, Adelphia stated that the valve could be moved no more than about 0.3 mile north or 4.7 miles south of the proposed location. Locations to the north would also be within wetland habitat for the bog turtle and would result in the BAV being closer to residences, as compared to the proposed location. Therefore, no alternatives to the north were considered further.

The BAV could be as far south as MP 9.8; however, the Chester Creek BAV is at MP 9.5; therefore, Adelphia determined that for optimal operation, alternatives for the Paoli Pike BAV would be between the existing location (at MP 14.5) and MP 13.0.[49] We evaluated four alternative locations for the Paoli Pike BAV based on criteria such as being at least 300 feet from wetlands and waterbodies to avoid potential impacts on bog turtles and close proximity to existing access roads (see figure 10).

[49] Per 49 CFR 192.179 a blowdown valve is required between each MLV and have capacity to release the natural gas as rapidly as practicable.





Legend

- Mainline Valve 2
- Existing 18-Inch-Diameter Mainline
- County Boundary

Alternative Sites

- MP 17.2
- MP 17.9
- MP 18.5

0 500 1,000
Feet

N

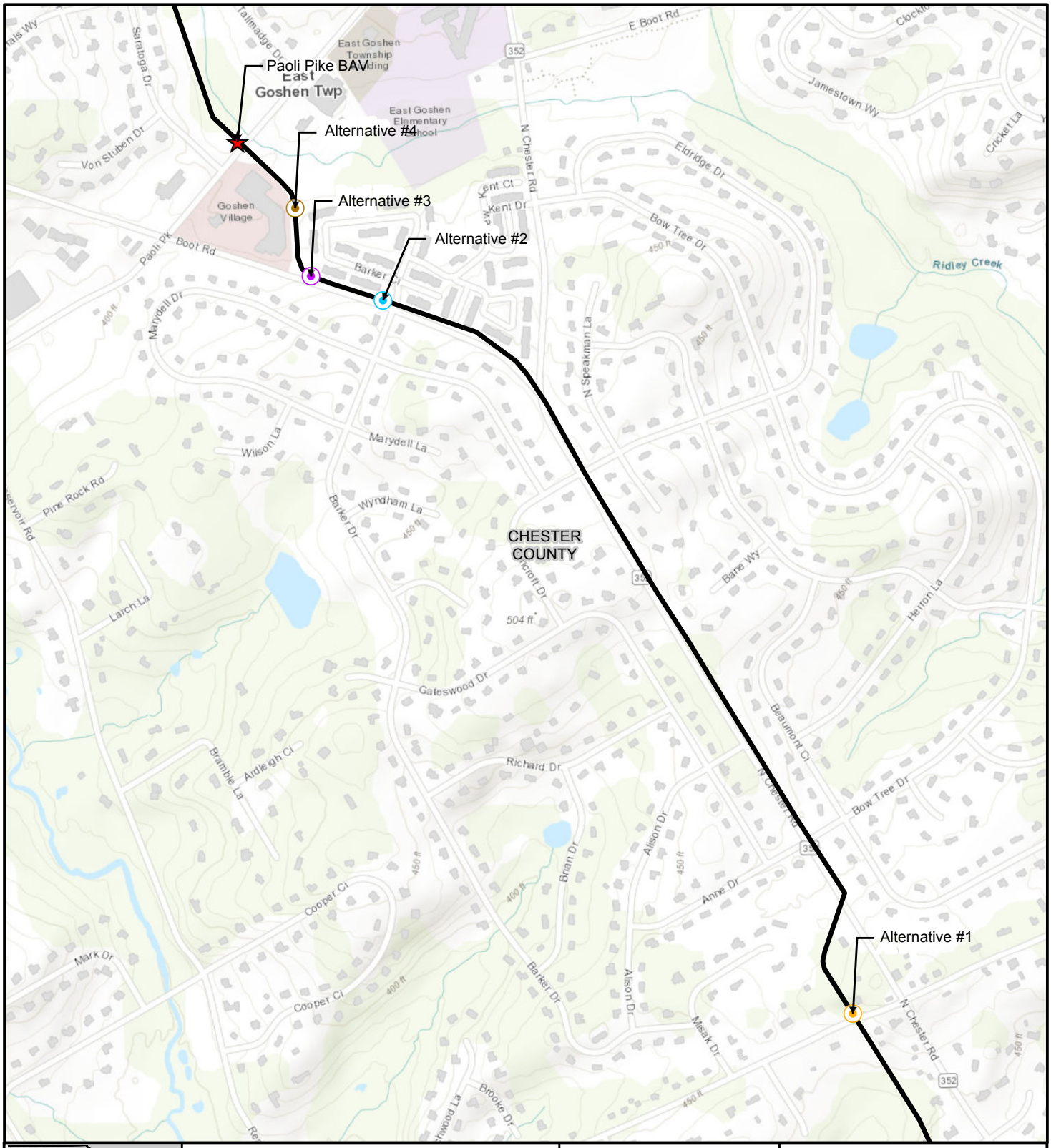
Scale: 1:12,000

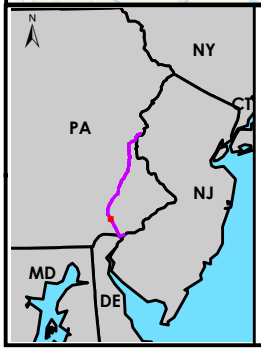
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

MLV 2 Site Alternatives

FIGURE 9





Legend

- Paoli Pike BAV
- Existing 18-Inch-Diameter Mainline
- County Boundary

Alternative Sites

- Site #1
- Site #2
- Site #3
- Site #4

0 500 1,000
Feet

N

Scale: 1:10,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Paoli Pike BAV
Site Alternatives

FIGURE 10

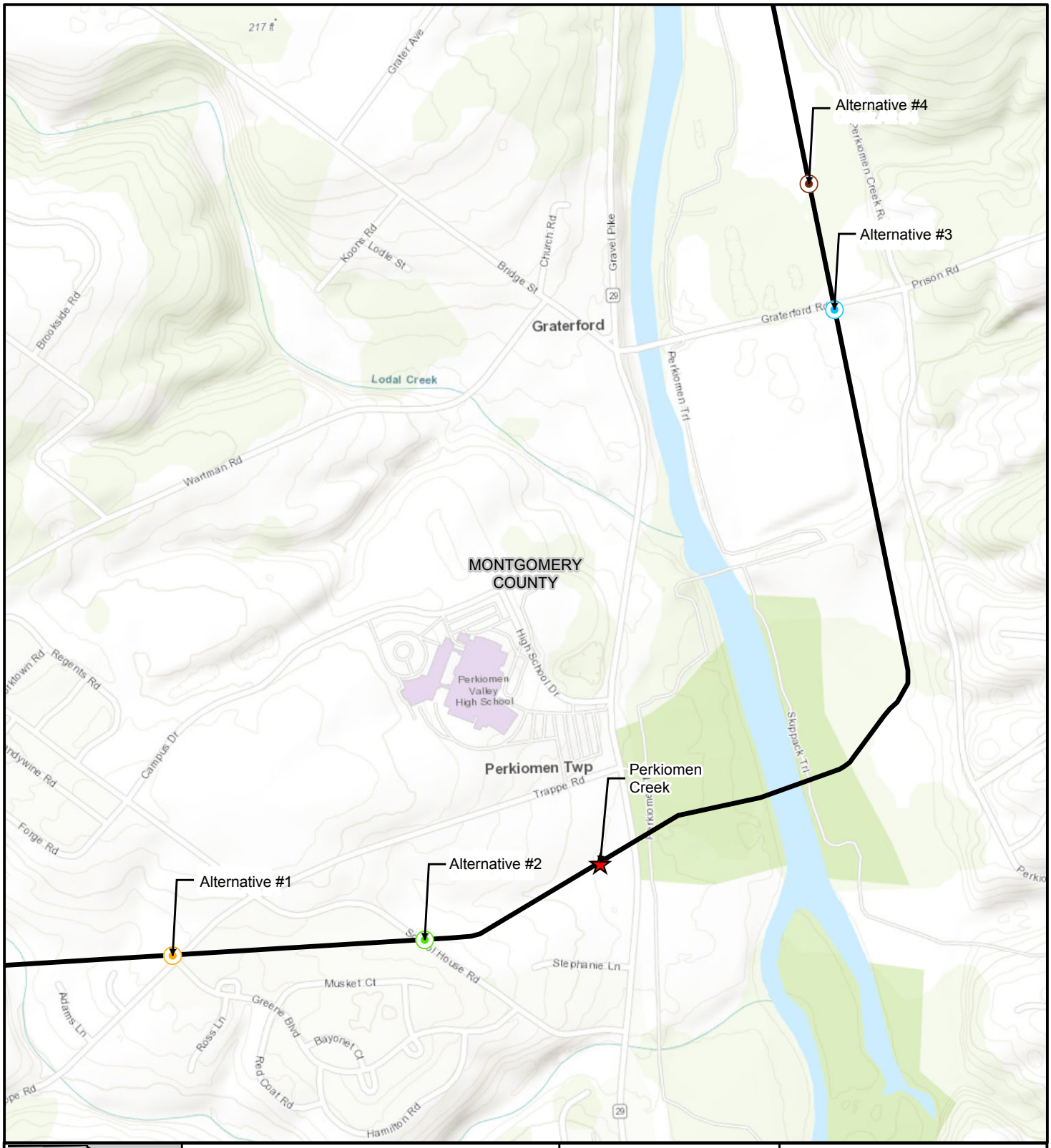
The area south of the Paoli Pike BAV is densely developed by residential property. Each alternative is closer in proximity (ranging from 65 to 175 feet) to more residences, as compared to the proposed site, which would be 357 feet from the closest residence. While all of alternative sites to the south would avoid impacts on wetlands, construction activities at the existing site would still occur to remove the existing valve, which would result in similar temporary impacts as those required to install the Paoli Pike BAV at the proposed location. While the alternatives would avoid potential bog turtle habitat, to construct one of the alternatives, the amount of land disturbance would be doubled (as Adelphia would remove the existing facility and install the BAV at an alternative location) and the alternatives would be closer to residences. For these reasons, we conclude that the alternative sites do not provide a significant environmental advantage over the proposed Paoli Pike BAV site.

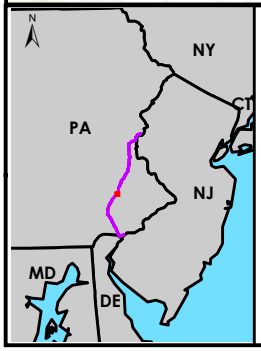
Perkiomen Creek BAV Alternatives

We evaluated alternatives to the Perkiomen Creek BAV site in an effort to avoid impacts on a wetland, a nearby park, and township offices. To maintain compliance with USDOT-PHMSA regulations, Adelphia stated that the valve could be moved no further than about 1.4 miles north and 1.3 miles south of the proposed location. The two alternative sites identified within the optimal location to the north would be on land owned by Montgomery County and designated within Perkiomen Park (see figure 11). The two alternative sites to the south would be closer to residential properties as compared to the proposed site. As with Paoli Pike, choosing an alternative site would not preclude construction activities that would still be required at the existing facility site. As discussed further in section B.2.3, impacts on wetlands at the proposed BAV location would be temporary and limited to construction. Therefore, we conclude that the alternatives do not provide a significant environmental advantage over the proposed Perkiomen Creek BAV.

7. Conclusion

We reviewed alternatives to Adelphia's proposal based on our independent analysis. Although all of the system, variation, and aboveground facility alternatives we evaluated appear to be technically feasible, none provide a significant environmental advantage over the Project design. Therefore, we conclude that the proposed Project, as modified by our recommendations in section D of this EA, is the preferred alternative to meet Project objectives.





Legend

- Perkiomen Creek BAV
- Existing 18-Inch-Diameter Mainline
- County Boundary

Alternative Sites

- Site #1
- Site #2
- Site #3
- Site #4

0 500 1,000
Feet

N

Scale: 1:10,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Perkiomen Creek BAV
Site Alternatives

FIGURE 11

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis contained within this EA, we have determined that if Adelphia 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. Adelphia 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. Adelphia 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 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 ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction,** Adelphia 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,** Adelphia 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.

   Adelphia'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. Adelphia'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. Adelphia 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**, Adelphia shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Adelphia must file revisions to the plan as schedules change. The plan shall identify:

    a. how Adelphia 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 Adelphia 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 Adelphia 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 Adelphia's organization having responsibility for compliance;

    g. the procedures (including use of contract penalties) Adelphia 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. Adelphia shall employ at least two EIs. 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, Adelphia 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 Adelphia'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;

    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 Adelphia from other federal, state, or local permitting agencies concerning instances of noncompliance, and Adelphia's response.

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

10. Adelphia 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 rights-of-way and other areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service,** Adelphia 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 Adelphia 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**, Adelphia should file with the Secretary, for review and written approval by the Director of the OEP, a Karst Monitoring Plan for the Existing System. The plan shall include:

    a. frequency and duration of monitoring;

    b. conditions requiring remedial action; and

    c. the karst remediation measures Adelphia will implement along the Existing System.

13. **Prior to construction**, Adelphia shall file with the Secretary a final HDD feasibility assessment regarding the potential misalignment of the drilled hole through unconsolidated overburden/bedrock interface(s) along the HDD alignments. Adelphia shall also include in the assessment an evaluation of the potential for hydrofracture

and an inadvertent return using the U.S. Army Corps of Engineers' Delft method[50] (or an equivalent method) for drilling through unconsolidated material, and/or a qualitative analysis for an inadvertent return through bedrock utilizing rock quality designation values obtained from the bedrock cores.

14. **Prior to construction**, Adelphia shall file with the Secretary the Final SAP for the Parkway and Tilghman Laterals, including any USEPA and PADEP comments on the SAP, for review and written approval by the Director of OEP. The Final SAP shall include:

    a. a clear definition of the number of samples, depth of sample collection, and analysis for each sampling location;

    b. a commitment to plug and abandon borings/monitoring wells in accordance with state and federal guidelines;

    c. sampling every 100 feet near the PADEP contaminated sites listed in table B-3 of the EA and expanded analytical testing to include known contaminants;

    d. addition of PCBs to the SAP for soil and groundwater samples collected adjacent to the Metro Container Corporation site; and

    e. site-specific plans for construction in areas of contamination, based on USEPA and PADEP consultations that include:

        (1) the extent of contamination in relation to construction work areas;

        (2) description of the contamination plumes (i.e., migrating, stable), where available;

        (3) identification of areas where Project construction (including HDDs) could create a preferential migration path for contamination; and

        (4) proposed mitigation measures developed in consultation with the USEPA and PADEP.

15. **Prior to construction**, Adelphia shall file with the Secretary a revised IRCP, for review and written approval by the Director of OEP, which addresses containment and cleanup measures for inadvertent releases in areas of contamination.

16. **Prior to construction**, Adelphia shall file with the Secretary, for review and written approval by the Director of OEP, results of consultation with the PADEP and the

[50] *Recommended Guidelines for Installation of Pipelines beneath Levees using Horizontal Directional Drilling*, prepared for USACE, Kimberlie Staheli [*et al.*], April 1998.

Delaware County Conservation District to identify an alternative stormwater management configuration at the Transco Meter Station that would not result in impacts on nearby wetlands.

17. **Prior to construction**, Adelphia shall file with the Secretary, for review and written approval by the Director of OEP, site-specific justification for operational use of AR-33.97-01 for access to the Perkiomen Creek BAV, or identify an alternative access route for use during operation that avoids impacts on wetlands.

18. Adelphia shall **not begin construction** of the Project **until**:

    a. FERC staff completes ESA Section 7 consultations with the USFWS; and

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

19. **Prior to construction**, Adelphia shall confirm in a filing with the Secretary that it will install super silt fence barrier at the Schuylkill River BAV during the inactive period of the eastern red belly turtle (October 15 – April 15), and if this timing window cannot be met, then Adelphia will have a qualified biologist on-site to conduct a clearance survey prior to construction.

20. **Prior to construction**, Adelphia shall file with the Secretary, for review and written approval by the Director of OEP:

    a. results of consultation with the applicable managing entity for the portion of the Schuylkill River Trail that will be impacted by construction and operation of the Schuylkill River BAV, generally between MPs 27.3 and 28.1 of the existing mainline, including copies of any correspondence; and

    b. mitigation measures that Adelphia will implement during construction and operation, including signage for trail users.

21. **Prior to construction**, Adelphia shall file with the Secretary a copy of PADEP's CZMA determination for the Adelphia Gateway Project.

22. **Prior to construction**, Adelphia shall file with the Secretary, for review and written approval by the Director of OEP, site-specific visual screening plans for the Quakertown Compressor and Meter Stations, developed in consultation with West Rockhill Township, and the Delmarva Meter Station. The plans should include photo simulations of the resulting viewshed from the perspective of nearby visual receptors.

23. **Prior to construction**, Adelphia shall identify parking areas for construction workers at the Marcus Hook Compressor Station and for the two new laterals and associated

meter stations and file the information with the Secretary for review and written approval by the Director of OEP.

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

    a. for Pennsylvania, Adelphia files with the Secretary remaining cultural resources survey reports(s); site evaluation report(s), as required; avoidance/treatment plan(s), as required; and comments on the cultural resources reports and plans from the Pennsylvania SHPO;

    b. for Delaware, Adelphia files with the Secretary the Delaware SHPO's comments on the visual screening plan for the Delmarva Meter Station;

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

    d. FERC staff reviews and the Director of the OEP approves the cultural resources reports and plans, and notifies Adelphia 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."**

25. Adelphia shall file with the Secretary noise surveys for the Marcus Hook Compressor Station and Quakertown Compressor and Meter Stations **no later than 60 days** after placing the stations into service. If full power load condition noise surveys are not possible, Adelphia shall file an interim survey at the maximum possible power load **within 60 days** of placing the stations into service and file the full power load survey **within 6 months**. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Adelphia shall:

    a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;

    b. install additional noise controls to meet that level **within 1 year** of the in-service date; and

    c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP **no later than 60 days** after it installs the additional noise controls.

26. **Prior to construction** of the Delmarva Meter Station, Adelphia shall file with the Secretary, for review and written approval by the Director of OEP, a description of the specific noise mitigation measures it will install at the Delmarva Meter Station and the associated noise levels predicted for full flow/load condition operations.

27. Adelphia shall file with the Secretary noise surveys for the Transco, Monroe, Tilghman, and Delmarva Meter Stations **no later than 60 days** after placing the stations into service. If full flow/load condition noise surveys are not possible, Adelphia shall file an interim survey at the maximum possible power load **within 60 days** of placing the stations into service and file the full flow/load survey **within 6 months**. If the noise attributable to operation of all equipment at each meter station under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Adelphia shall:

    a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;

    b. install additional noise controls to meet that level **within 1 year** of the in-service date; and

    c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP **no later than 60 days** after it installs the additional noise controls.

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B.S., Geology, Stephen F. Austin State University, 2011.

B.S., Mathematics, Stephen F. Austin State University, 2011.

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
MAPS OF THE ADELPHIA PROJECT

APPENDIX A-1

COUNTY & STATE	NEW CASTLE COUNTY, DELAWARE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE		LOWER CHICHESTER TOWNSHIP
R/W NO.	DE-NE-003.0 · DE-NE-003.1	PA-DE-025.1 · PA-DE-024.0

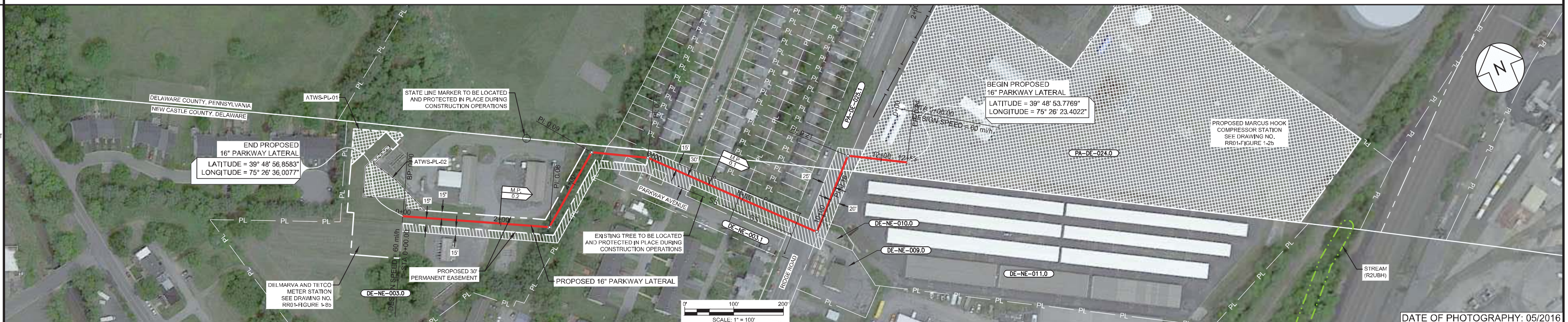
OWNERSHIP	M.P. 0.24	M.P. 0.14	PARKWAY AVENUE M.P. 0.06	RIDGE ROAD M.P. 0.02	M.P. 0.00

FOOTAGE

TERRAIN

LEGEND

- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
- FOREIGN PIPELINE
- POWER LINE
- TELEPHONE LINE
- BURIED CABLE (UG)
- FENCE LINE
- GAS LINE
- SEWER LINE
- WATER LINE
- RAILROAD
- ROAD CENTERLINE
- DITCH CENTERLINE
- PROPERTY LINE
- PIPE CHANGE
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM

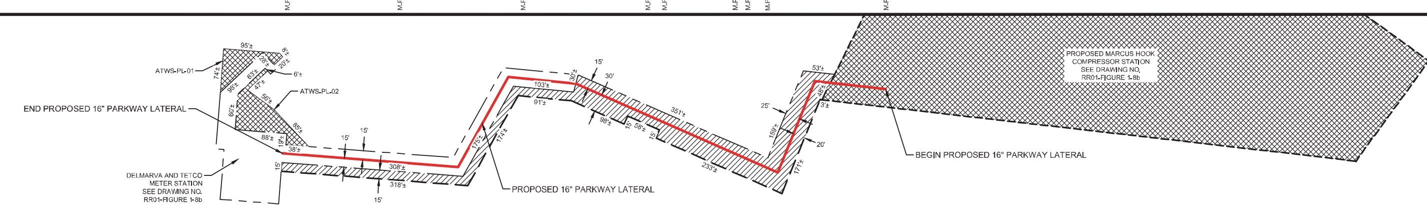


CODE CLASS

STATIONING

- M.P. 0.24 END PROPOSED 16" PARKWAY LATERAL
- M.P. 0.20
- M.P. 0.14 END PARKWAY AVENUE
- M.P. 0.10
- M.P. 0.09 OVERHEAD POWER LINE
- M.P. 0.06 OVERHEAD POWER LINE
- M.P. 0.06 BEGIN PARKWAY AVENUE
- M.P. 0.06 ℄ RIDGE ROAD
- M.P. 0.00 BEGIN PROPOSED 16" PARKWAY LATERAL

WORKSPACE



MATERIAL

PROFILE

NOTES:
NO PERMANENT EASEMENT FOR PIPELINE PERMITTED WITHIN ROAD RIGHT-OF-WAY LIMIT.
WETLANDS SURVEY PROVIDED BY NV5.

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977

GENERAL NOTES

1. = PERMANENT EASEMENT
2. = TEMPORARY WORKSPACE
3. = ADDITIONAL TEMPORARY WORKSPACE
4. = WETLAND (SURVEYED)
5. = WETLAND (NWI)
6. = STREAMS (SURVEYED)
7. = STREAMS (NWI)

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2			NOT USED				
1	06/18/2018	PLH	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" PARKWAY LATERAL
FROM M.P. 0.00 TO M.P. 0.24
DELAWARE COUNTY, PENNSYLVANIA
NEW CASTLE COUNTY, DELAWARE

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR10-FIGURE 1-6	3

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	LOWER CHICHESTER TOWNSHIP
R/W NO.	PA-DE-024.0 / PA-DE-025.0 / PA-DE-025.1
OWNERSHIP	M.P. 0.00 / M.P. 0.04 / M.P. 0.34 / RIDGE ROAD / M.P. 0.54
FOOTAGE	
TERRAIN	

LEGEND

- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
- FOREIGN PIPELINE
- POWER LINE
- TELEPHONE LINE
- BURIED CABLE (UG)
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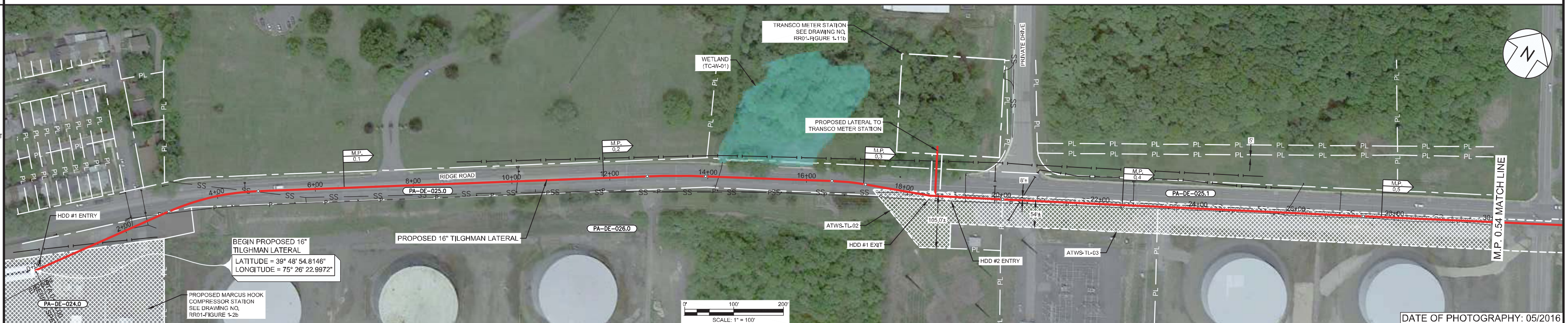
- WATER LINE
- RAILROAD
- ROAD CENTERLINE
- DITCH CENTERLINE
- PROPERTY LINE
- PIPE CHANGE
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM

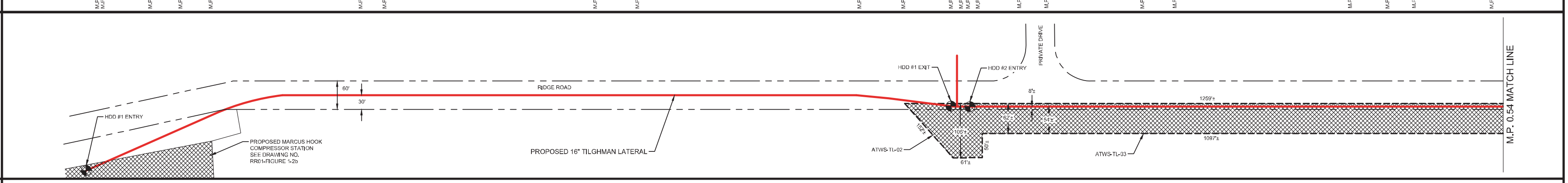


CODE CLASS

STATIONING

- M.P. 0.00 BEGIN PROPOSED 16" TILGHMAN LATERAL
- M.P. 0.00 HDD #1 ENTRY
- M.P. 0.03 TRANSCO PIPELINE CROSSING
- M.P. 0.04 OVERHEAD POWER LINE
- M.P. 0.05 OVERHEAD POWER LINE
- M.P. 0.09 STORM DRAIN / SANITARY SEWER LINE
- M.P. 0.10
- M.P. 0.19 STORM DRAIN
- M.P. 0.20
- M.P. 0.27 STORM DRAIN
- M.P. 0.30
- M.P. 0.34 SANITARY SEWER
- M.P. 0.35 HDD #1 EXIT
- M.P. 0.36 HDD #2 ENTRY
- M.P. 0.36 OVERHEAD POWER LINE
- M.P. 0.38 TRANSCO PIPELINE CROSSING
- M.P. 0.39 DELAWARE PIPELINE CROSSING
- M.P. 0.40
- M.P. 0.43 STORM DRAIN
- M.P. 0.49 OVERHEAD POWER LINE
- M.P. 0.50
- M.P. 0.51 STORM DRAIN
- M.P. 0.54 MATCH LINE

WORKSPACE

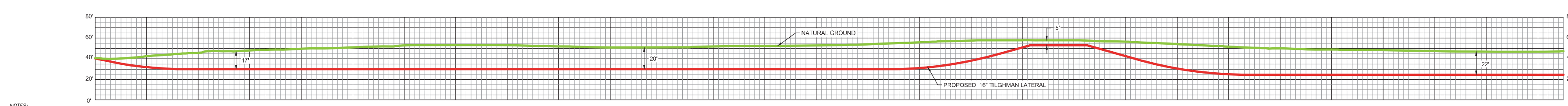


MATERIAL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

PROFILE



NOTES:
NO PERMANENT EASEMENT FOR PIPELINE PERMITTED WITHIN ROAD RIGHT-OF-WAY LIMIT.
WETLANDS SURVEY PROVIDED BY NV5.

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 50'

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209

GENERAL NOTES

1. = PERMANENT EASEMENT
2. = TEMPORARY WORKSPACE
3. = ADDITIONAL TEMPORARY WORKSPACE
4. = WETLAND (SURVEYED)
5. = WETLAND (NWI)
6. = STREAMS (SURVEYED)
7. = STREAMS (NWI)

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

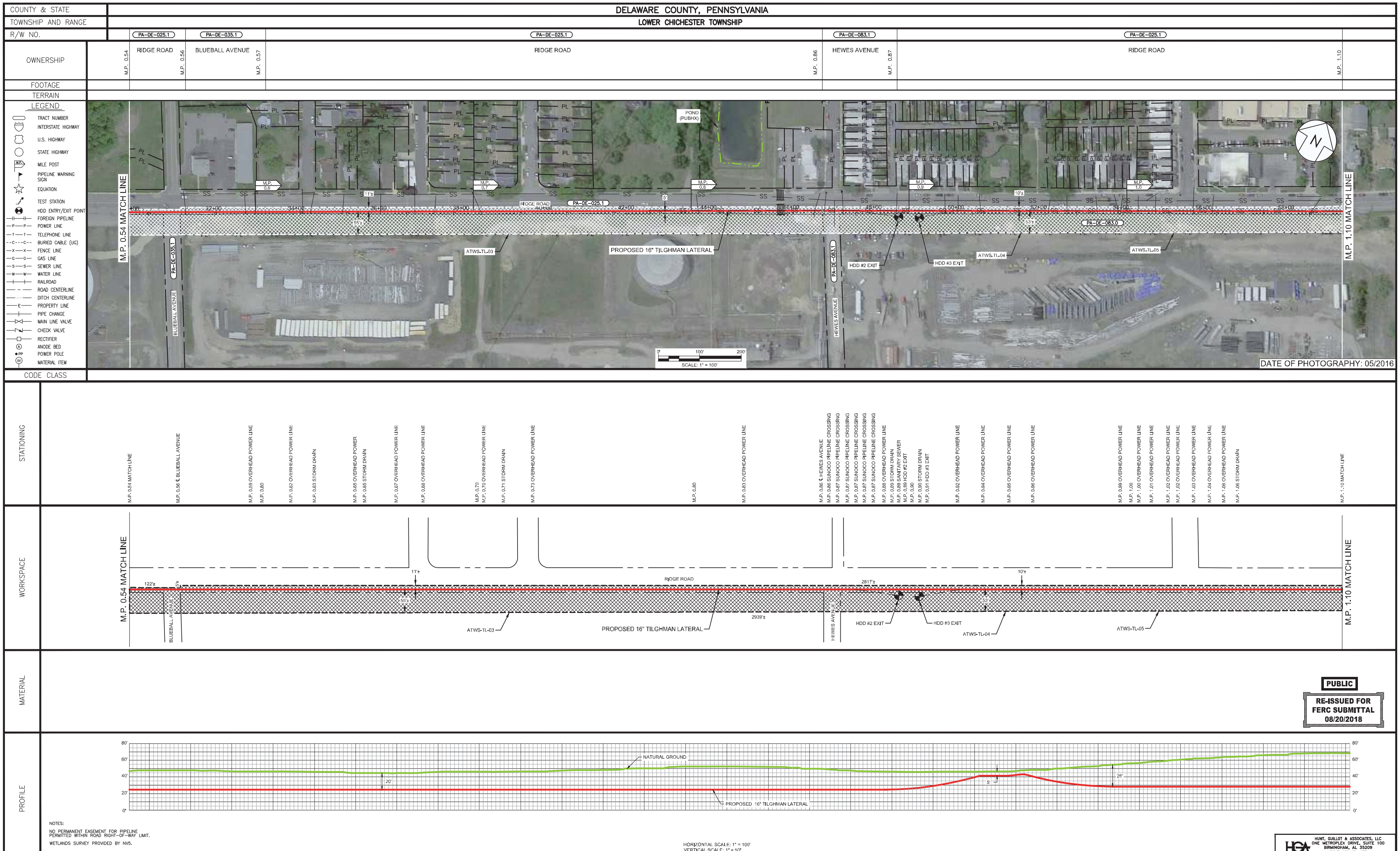
DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 0.00 TO M.P. 0.54
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-1	3



NOTES:

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HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

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7. = STREAMS (NWI)

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 0.54 TO M.P. 1.10
DELAWARE COUNTY, PENNSYLVANIA

SCALE: AS SHOWN | DRAWING NUMBER: RR01-FIGURE 1-9-2 | REV: 3

8/22/2018 8:49 AM KEYMAN, JACKIE

RR01 - FIGURE 1-9-2

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	LOWER CHICHESTER TOWNSHIP AND TRAINER BOROUGH

R/W NO.	PA-DE-025.1	PA-DE-094.1	PA-DE-025.1	PA-DE-100.1	PA-DE-025.1	PA-DE-127.1	PA-DE-025.1	PA-DE-166.1	PA-DE-025.1
OWNERSHIP	RIDGE ROAD	GREEN STREET	RIDGE ROAD	STATE HIGHWAY 452 / MARKET STREET	RIDGE ROAD	YATES AVENUE	RIDGE ROAD	LINWOOD STREET	RIDGE ROAD
	M.P. 1.10 – M.P. 1.13	M.P. 1.13 – M.P. 1.14	M.P. 1.14 – M.P. 1.17	M.P. 1.17 – M.P. 1.18	M.P. 1.18 – M.P. 1.36	M.P. 1.36 – M.P. 1.37	M.P. 1.37 – M.P. 1.56	M.P. 1.56 – M.P. 1.57	M.P. 1.57 – M.P. 1.66
FOOTAGE									
TERRAIN									

LEGEND

- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
- FOREIGN PIPELINE
- POWER LINE
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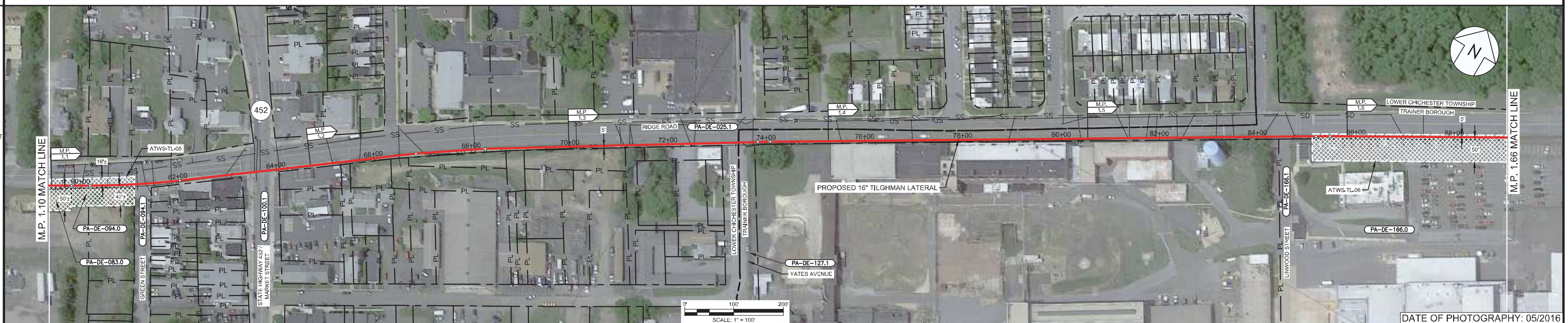
- DITCH CENTERLINE
- PROPERTY LINE
- PIPE CHANGE
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM

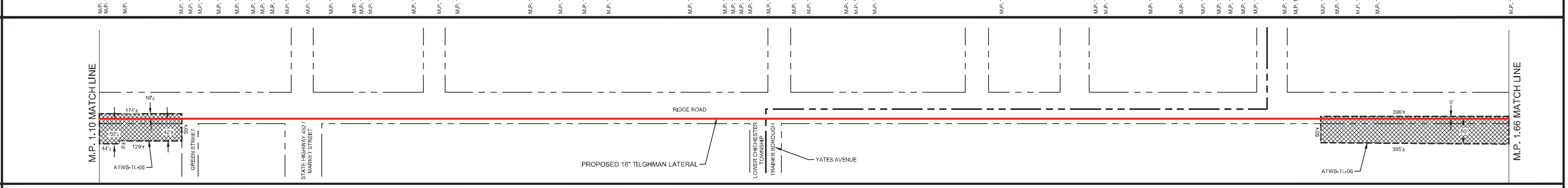


CODE CLASS

STATIONING

M.P. 1.10 MATCH LINE; M.P. 1.10; M.P. 1.11 OVERHEAD POWER LINE; M.P. 1.13 ℄ GREEN STREET; M.P. 1.13 SANITARY SEWER LINE; M.P. 1.13 OVERHEAD POWER LINE; M.P. 1.14 OVERHEAD POWER LINE; M.P. 1.15 OVERHEAD POWER LINE; M.P. 1.16 UNDERGROUND ELECTRIC LINE; M.P. 1.16 WATER LINE; M.P. 1.16 OVERHEAD POWER LINE; M.P. 1.17 OVERHEAD POWER LINE; M.P. 1.18 ℄ STATE HIGHWAY 452 / MARKET STREET; M.P. 1.19 OVERHEAD POWER LINE; M.P. 1.20; M.P. 1.20 OVERHEAD POWER LINE; M.P. 1.20 WATER LINE; M.P. 1.21 SANITARY SEWER LINE; M.P. 1.23 OVERHEAD POWER LINE; M.P. 1.24 OVERHEAD POWER LINE; M.P. 1.26 OVERHEAD POWER LINE; M.P. 1.27 STORM DRAIN; M.P. 1.29 OVERHEAD POWER LINE; M.P. 1.30; M.P. 1.33 OVERHEAD POWER LINE; M.P. 1.35 UNDERGROUND ELECTRIC LINE; M.P. 1.35 OVERHEAD POWER LINE; M.P. 1.35 STORM DRAIN; M.P. 1.35 STORM DRAIN; M.P. 1.36 ℄ YATES AVENUE; M.P. 1.37 OVERHEAD POWER LINE; M.P. 1.37 OVERHEAD POWER LINE; M.P. 1.40 OVERHEAD POWER LINE; M.P. 1.40; M.P. 1.43 OVERHEAD POWER LINE; M.P. 1.46 OVERHEAD POWER LINE; M.P. 1.50 OVERHEAD POWER LINE; M.P. 1.50; M.P. 1.52 OVERHEAD POWER LINE; M.P. 1.54 OVERHEAD POWER LINE; M.P. 1.54 OVERHEAD POWER LINE; M.P. 1.55 OVERHEAD POWER LINE; M.P. 1.55 OVERHEAD POWER LINE; M.P. 1.56 OVERHEAD POWER LINE; M.P. 1.56 OVERHEAD POWER LINE; M.P. 1.57 OVERHEAD POWER LINE; M.P. 1.57 ℄ LINWOOD STREET; M.P. 1.58 OVERHEAD POWER LINE; M.P. 1.59 OVERHEAD POWER LINE; M.P. 1.60; M.P. 1.61 OVERHEAD POWER LINE; M.P. 1.66 MATCH LINE

WORKSPACE

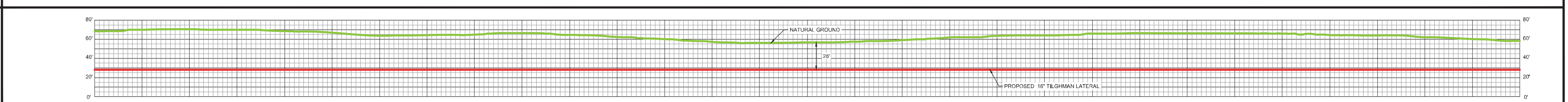


MATERIAL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

PROFILE



NOTES:
NO PERMANENT EASEMENT FOR PIPELINE PERMITTED WITHIN ROAD RIGHT-OF-WAY LIMIT.
WETLANDS SURVEY PROVIDED BY NV5.

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 50'

HGA HUNT, GUILLOT & ASSOCIATES, LLC ONE METROPLEX DRIVE, SUITE 100 BIRMINGHAM, AL 35209 PHONE: 205-970-4977 FIRM # PA 4004148

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NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 1.10 TO M.P. 1.66
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-3	3

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	TRAINER BOROUGH
R/W NO.	PA-DE-025.1 / PA-DE-174.1 / PA-DE-025.1 / PA-DE-216.1 / PA-DE-025.1
OWNERSHIP	M.P. 1.66 RIDGE ROAD M.P. 1.96 / MAIN STREET M.P. 1.97 / RIDGE ROAD M.P. 2.06 / CHESTNUT STREET M.P. 2.07 / RIDGE ROAD M.P. 2.22
FOOTAGE	
TERRAIN	

LEGEND
- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
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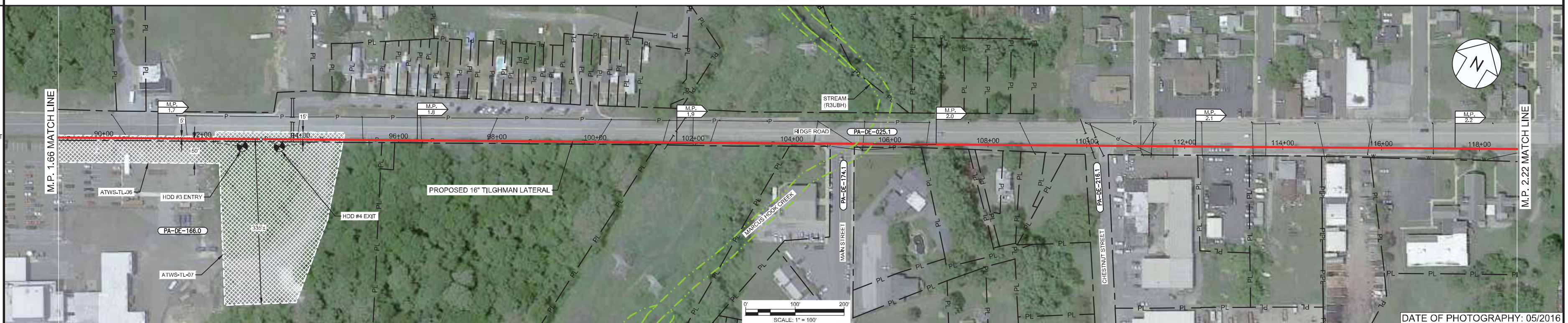
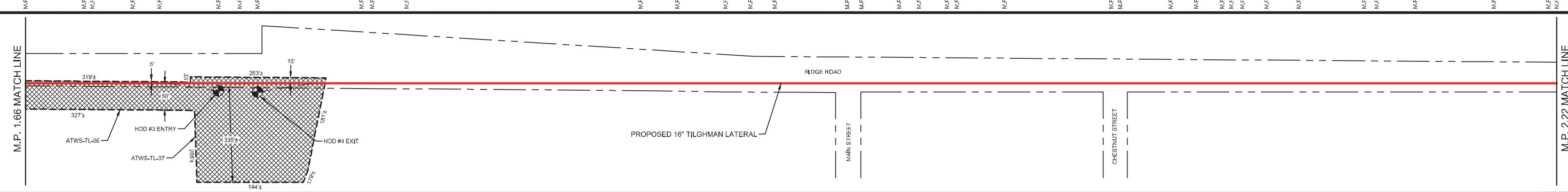
- WATER LINE
- RAILROAD
- ROAD CENTERLINE
- DITCH CENTERLINE
- PROPERTY LINE
- PIPE CHANGE
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM



CODE CLASS

STATIONING: M.P. 1.66 MATCH LINE; M.P. 1.68 OVERHEAD POWER LINE; M.P. 1.68 OVERHEAD POWER LINE; M.P. 1.70; M.P. 1.71 OVERHEAD POWER LINE; M.P. 1.73 HDD #3 ENTRY; M.P. 1.74 STORM DRAIN; M.P. 1.75 HDD #4 EXIT; M.P. 1.78 MIPC PIPELINE; M.P. 1.78 MIPC PIPELINE; M.P. 1.80; M.P. 1.89 OVERHEAD POWER LINE; M.P. 1.90; M.P. 1.92 OVERHEAD POWER LINE; M.P. 1.92 ETP PIPELINE CROSSING; M.P. 1.93 SANITARY SEWER LINE; M.P. 1.97 ℄ MAIN STREET; M.P. 1.98 ℄ STREAM; M.P. 1.98 OVERHEAD POWER LINE; M.P. 1.99 OVERHEAD POWER LINE; M.P. 2.00; M.P. 2.00 OVERHEAD POWER LINE; M.P. 2.02 OVERHEAD POWER LINE; M.P. 2.06 OVERHEAD POWER LINE; M.P. 2.06 ℄ CHESTNUT STREET; M.P. 2.08 WILLIAMS PIPELINE; M.P. 2.09 TGPL PIPELINE; M.P. 2.10; M.P. 2.10 OVERHEAD POWER LINE; M.P. 2.10 SANITARY SEWER LINE; M.P. 2.11 OVERHEAD POWER LINE; M.P. 2.13 OVERHEAD POWER LINE; M.P. 2.15 OVERHEAD POWER LINE; M.P. 2.15 SANITARY SEWER; M.P. 2.17 OVERHEAD POWER LINE; M.P. 2.20; M.P. 2.22 OVERHEAD POWER LINE; M.P. 2.22 MATCH LINE

WORKSPACE

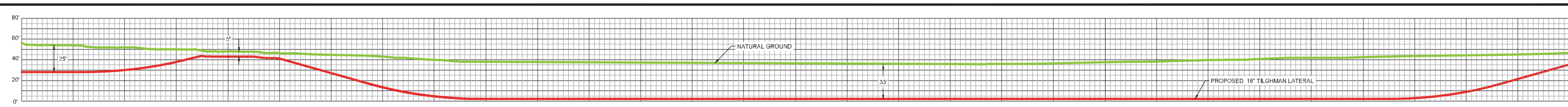


MATERIAL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

PROFILE



NOTES:
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HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 50'

HUNT, GUILLOT & ASSOCIATES, LLC
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4. = WETLAND (SURVEYED)
5. = WETLAND (NWI)
6. = STREAMS (SURVEYED)
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BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
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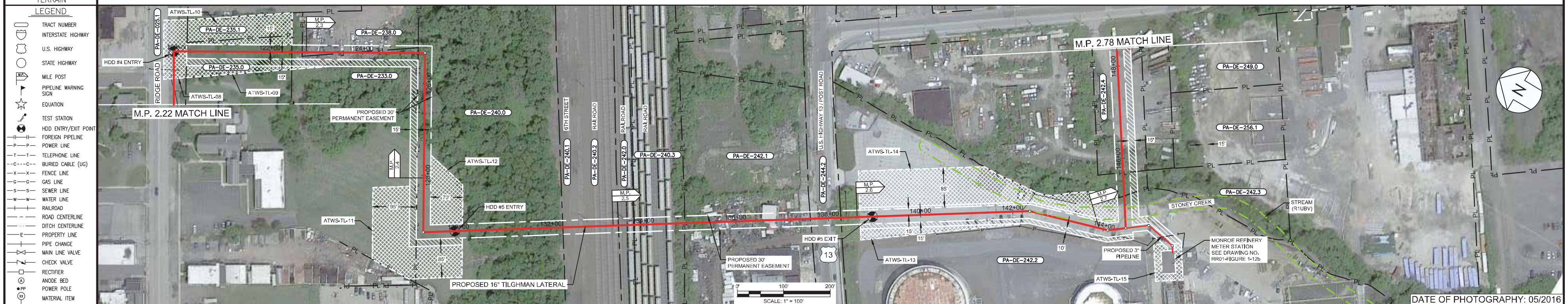
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

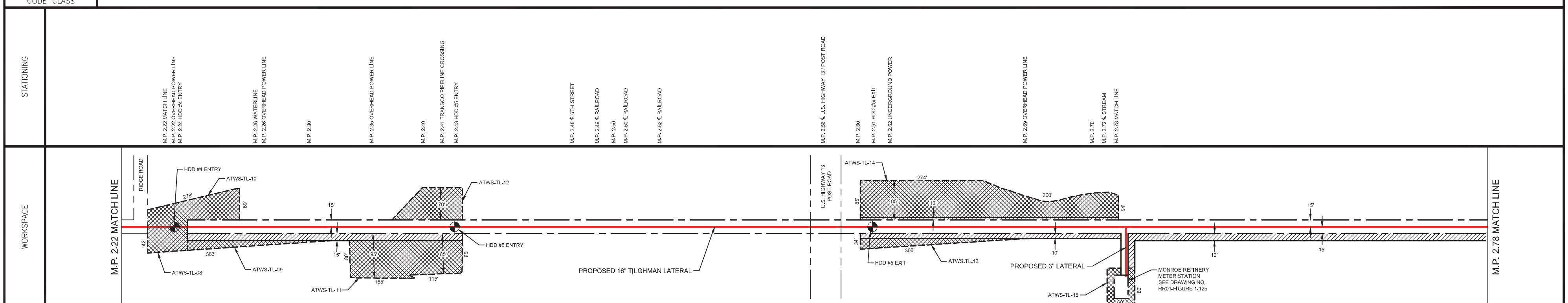
ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 1.66 TO M.P. 2.22
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-4	3

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	TRAINER BOROUGH
R/W NO.	PA-DE-025.1, PA-DE-235.0, PA-DE-233.0, PA-DE-238.0, PA-DE-233.0, PA-DE-240.0, PA-DE-240.1, PA-DE-240.2, PA-DE-242.0, PA-DE-240.3, PA-DE-242.1, PA-DE-244.2, PA-DE-242.2, PA-DE-242.4
OWNERSHIP	RIDGE ROAD; 6TH STREET; RAILROAD; RAILROAD; RAILROAD; U.S. HIGHWAY 13 / POST ROAD



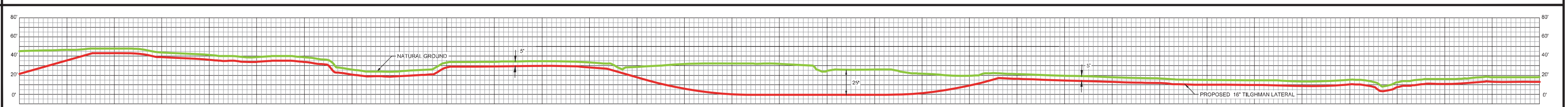
CODE CLASS



MATERIAL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018



NOTES:

NO PERMANENT EASEMENT FOR PIPELINE PERMITTED WITHIN ROAD RIGHT-OF-WAY LIMIT.

WETLANDS SURVEY PROVIDED BY NV5.

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 50'

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

GENERAL NOTES

1. = PERMANENT EASEMENT
2. = TEMPORARY WORKSPACE
3. = ADDITIONAL TEMPORARY WORKSPACE
4. = WETLAND (SURVEYED)
5. = WETLAND (NWI)
6. = STREAMS (SURVEYED)
7. = STREAMS (NWI)

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

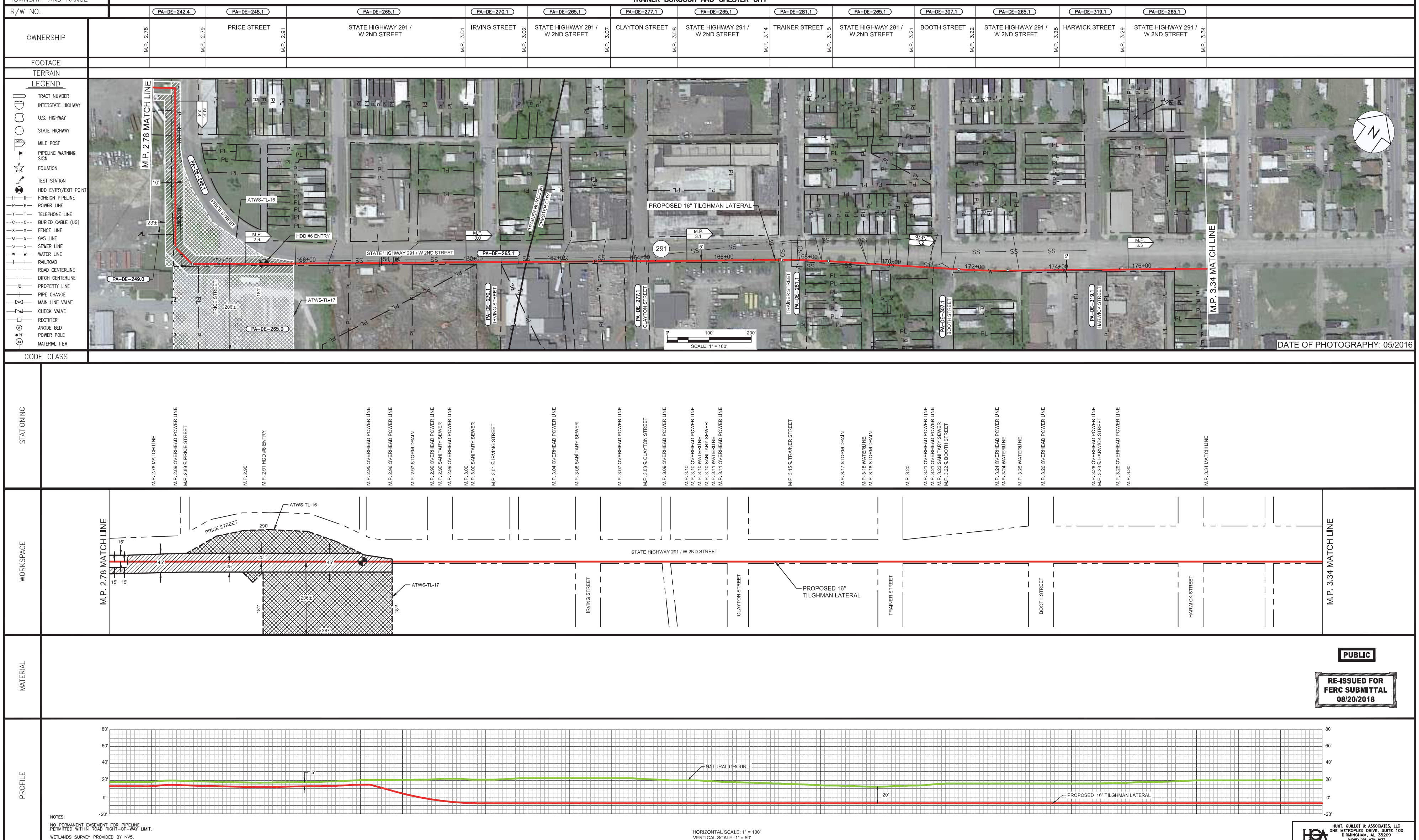
DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 2.22 TO M.P. 2.78
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-5	3

8/22/2018 11:14 AM FOWLER, MATT

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	TRAINER BOROUGH AND CHESTER CITY



NOTES:

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WETLANDS SURVEY PROVIDED BY NV5.

HORIZONTAL SCALE: 1" = 100'
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HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

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BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 2.78 TO M.P. 3.34
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-6	3

RR01 - FIGURE 1-9-6

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	CHESTER CITY

R/W NO.	PA-DE-265.1	PA-DE-330.1	PA-DE-265.1	PA-DE-342.1	PA-DE-265.1	PA-DE-354.1	PA-DE-265.1	PA-DE-373.1	PA-DE-285.1	PA-DE-379.1	PA-DE-265.1	PA-DE-388.1	PA-DE-265.1	PA-DE-391.1	PA-DE-265.1	PA-DE-407.1	PA-DE-265.1	PA-DE-418.1	PA-DE-265.1
OWNERSHIP	M.P. 3.34	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.35	THURLOW STREET	M.P. 3.36	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.38	GRACE STREET	M.P. 3.39	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.42	HIGHLAND AVENUE	M.P. 3.43	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.46	LEWIS STREET	M.P. 3.47	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.49	HAYES STREET	M.P. 3.50	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.52	BUNTING STREET	M.P. 3.53	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.55	MILLS STREET	M.P. 3.57	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.62	WARD STREET	M.P. 3.64	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.69	PALMER STREET	M.P. 3.70	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.73
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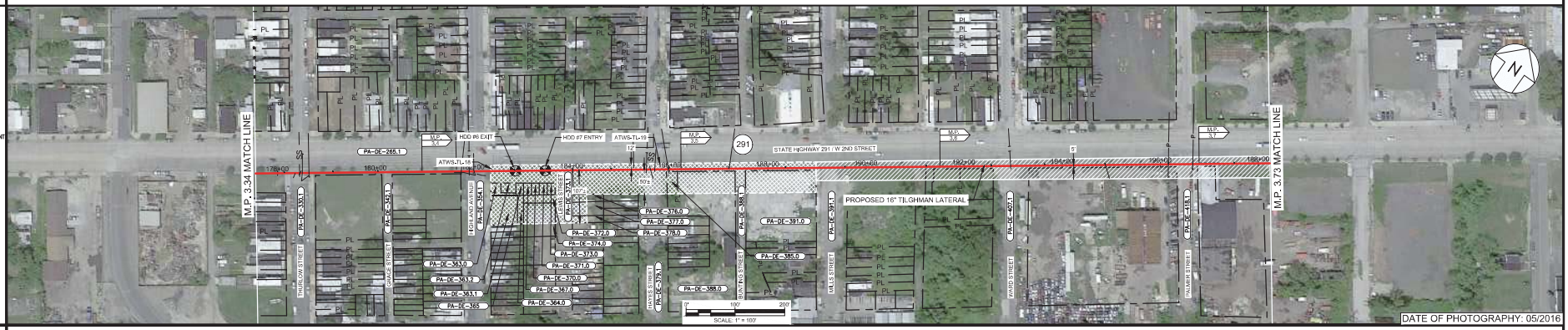
FOOTAGE

TERRAIN

LEGEND

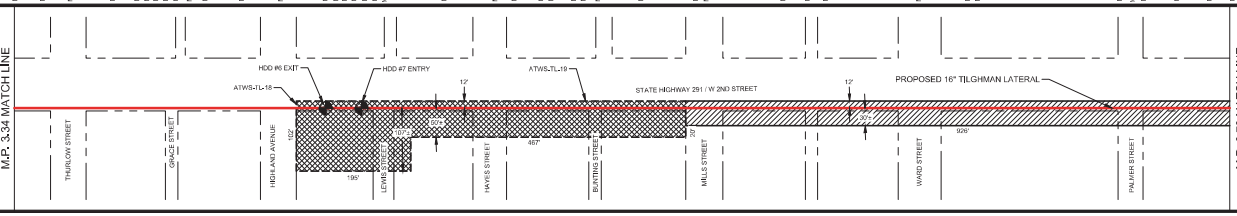
- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
- FOREIGN PIPELINE
- POWER LINE
- TELEPHONE LINE
- BURIED CABLE (UG)
- FENCE LINE
- GAS LINE
- SEWER LINE
- WATER LINE
- RAILROAD
- ROAD CENTERLINE
- DITCH CENTERLINE
- PROPERTY LINE
- PIPE CHANGE
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM



CODE CLASS

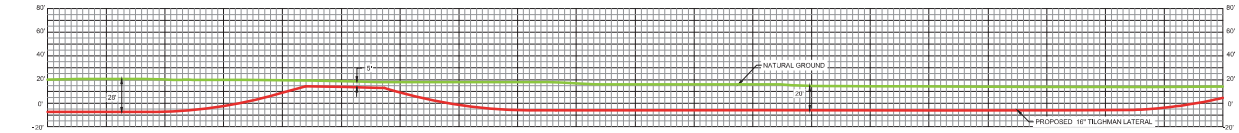
STATIONING

WORKSPACE



MATERIAL

PROFILE



NOTES:
NO PERMANENT EASEMENT FOR PIPELINE PERMITTED WITHIN ROAD RIGHT-OF-WAY LIMIT.
WETLANDS SURVEY PROVIDED BY NVS.

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

GENERAL NOTES

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7. = STREAMS (NWI)

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
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0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

HART, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004468

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 3.34 TO M.P. 3.73
DELAWARE COUNTY, PENNSYLVANIA

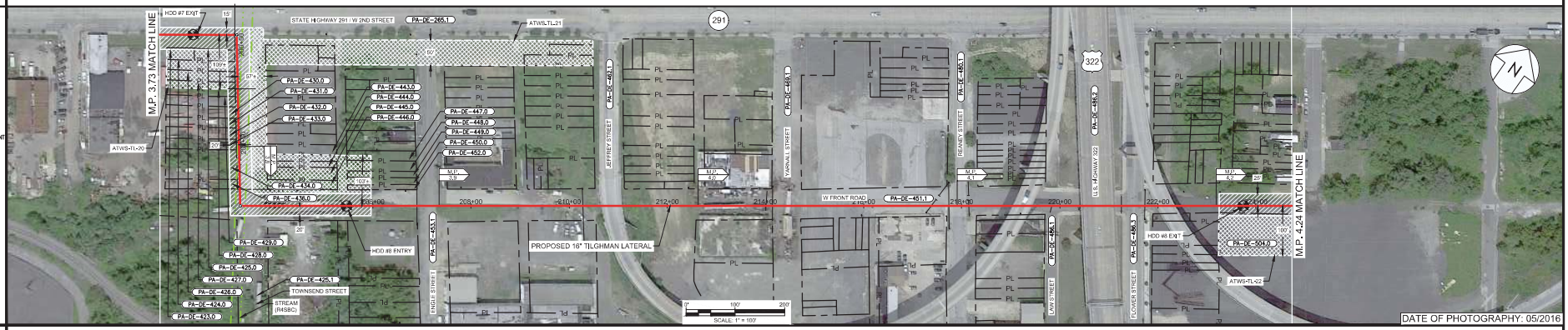
SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-7	3

RR01 - FIGURE 1-9-7

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	CHESTER CITY
R/W NO.	PA-DE-285.1 · PA-DE-425.1 · PA-DE-451.1 · PA-DE-453.1 · PA-DE-451.1 · PA-DE-462.1 · PA-DE-451.1 · PA-DE-469.1 · PA-DE-451.1 · PA-DE-480.1 · PA-DE-451.1 · PA-DE-486.1 · PA-DE-451.1 · PA-DE-486.2 · PA-DE-451.1 · PA-DE-486.3 · PA-DE-451.1
OWNERSHIP	M.P. 3.73 · STATE HIGHWAY 291 / W 2ND STREET · M.P. 3.76 · TOWNSEND STREET · M.P. 3.84 · W FRONT ROAD · M.P. 3.89 · ENGLE STREET · M.P. 3.91 · W FRONT ROAD · M.P. 3.96 · JEFFREY STREET · M.P. 3.97 · W FRONT ROAD · M.P. 4.03 · YARNALL STREET · M.P. 4.04 · W FRONT ROAD · M.P. 4.10 · REANEY STREET · M.P. 4.11 · W FRONT ROAD · M.P. 4.14 · LAW STREET · M.P. 4.15 · W FRONT ROAD · M.P. 4.16 · U.S. HIGHWAY 322 · M.P. 4.17 · W FRONT ROAD · M.P. 4.17 · FLOWER STREET · M.P. 4.18 · W FRONT ROAD · M.P. 4.24
FOOTAGE	
TERRAIN	
CODE CLASS	

LEGEND

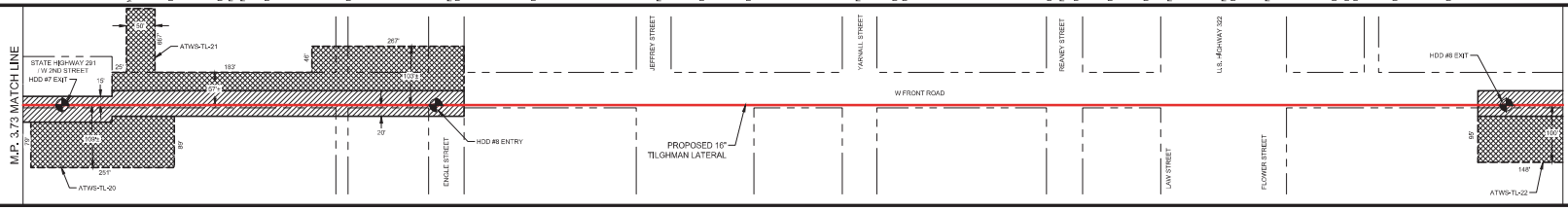
TRACT NUMBER · INTERSTATE HIGHWAY · U.S. HIGHWAY · STATE HIGHWAY · MILE POST · PIPELINE WARNING SIGN · EQUATION · TEST STATION · HDD ENTRY/EXIT POINT · FOREIGN PIPELINE · POWER LINE · TELEPHONE LINE · BURIED CABLE (UG) · FENCE LINE · GAS LINE · SEWER LINE · WATER LINE · RAILROAD · ROAD CENTERLINE · DITCH CENTERLINE · PROPERTY LINE · PIPE CHANGE · MAIN LINE VALVE · CHECK VALVE · RECTIFIER · ANODE BED · POWER POLE · MATERIAL ITEM



STATIONING

M.P. 3.73 MATCH LINE · M.P. 3.74 HDD #7 EXIT · M.P. 3.80 · M.P. 3.81 & STREAM · M.P. 3.83 & TOWNSEND STREET · M.P. 3.84 OVERHEAD POWER LINE · M.P. 3.87 HDD #8 ENTRY · M.P. 3.89 & ENGLE STREET · M.P. 3.90 · M.P. 3.92 OVERHEAD POWER LINE · M.P. 3.97 & JEFFREY STREET · M.P. 3.98 OVERHEAD POWER LINE · M.P. 4.00 · M.P. 4.04 & YARNALL STREET · M.P. 4.09 OVERHEAD POWER LINE · M.P. 4.09 OVERHEAD POWER LINE · M.P. 4.10 · M.P. 4.10 & REANEY STREET · M.P. 4.11 OVERHEAD POWER LINE · M.P. 4.12 OVERHEAD POWER LINE · M.P. 4.13 OVERHEAD POWER LINE · M.P. 4.14 & LAW STREET · M.P. 4.15 & U.S. HIGHWAY 322 · M.P. 4.16 & SANITARY SEWER · M.P. 4.17 & FLOWER STREET · M.P. 4.19 STORM DRAIN · M.P. 4.20 OVERHEAD POWER LINE · M.P. 4.20 · M.P. 4.21 HDD #8 EXIT · M.P. 4.24 MATCH LINE

WORKSPACE

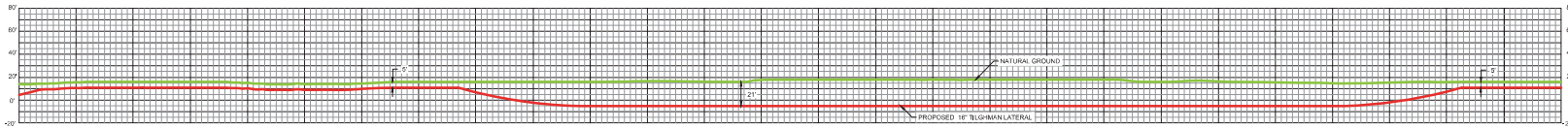


MATERIAL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

PROFILE



NOTES:
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BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
3	08/20/2018	JSK	RE-ISSUED FOR FERC				
2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	08/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

HART, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004AB

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 3.73 TO M.P. 4.24
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-8	3

RR01 - FIGURE 1-9-8

COUNTY & STATE	DELAWARE COUNTY, PENNSYLVANIA
TOWNSHIP AND RANGE	CHESTER CITY
R/W NO.	PA-DE-451.1 · PA-DE-507.1 · PA-DE-531.1 · PA-DE-531.2 · PA-DE-532.0
OWNERSHIP	M.P. 4.24 · W FRONT ROAD · M.P. 4.14 · CENTRAL AVENUE · M.P. 4.30 · RAILROAD · M.P. 4.37 · DELAWARE AVENUE · M.P. 4.39 · M.P. 4.41
FOOTAGE	
TERRAIN	

LEGEND

- TRACT NUMBER
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- MILE POST
- PIPELINE WARNING SIGN
- EQUATION
- TEST STATION
- HDD ENTRY/EXIT POINT
- FOREIGN PIPELINE
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- WATER LINE
- RAILROAD
- ROAD CENTERLINE
- DITCH CENTERLINE
- PROPERTY LINE
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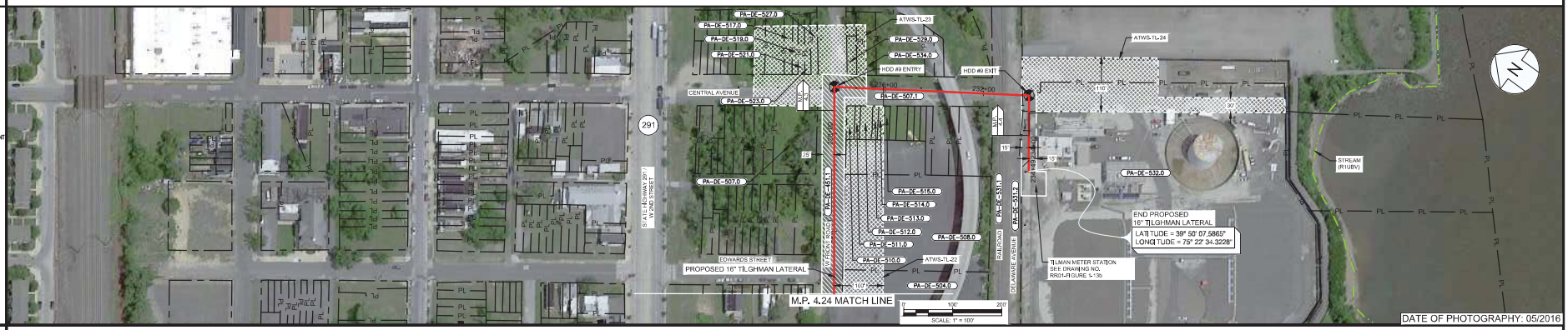
- MAIN LINE VALVE
- CHECK VALVE
- RECTIFIER
- ANODE BED
- POWER POLE
- MATERIAL ITEM

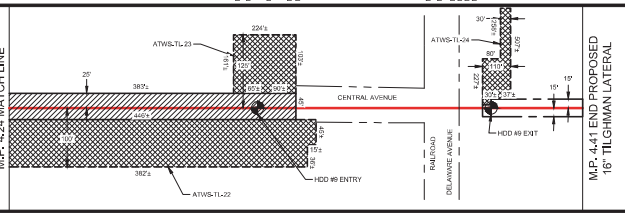


CODE CLASS

STATIONING

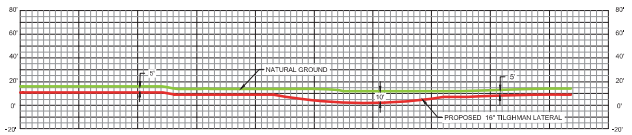
M.P. 4.24 MATCH LINE · M.P. 4.25 E EDWARDS STREET · M.P. 4.30 · M.P. 4.35 E CENTRAL AVENUE · M.P. 4.41 HDD #9 ENTRY · M.P. 4.37 E RAILROAD · M.P. 4.38 E DELAWARE AVE · M.P. 4.39 HDD #9 EXIT · M.P. 4.40 · M.P. 4.41 PROPOSED POWERLINE · M.P. 4.41 END PROPOSED 16" TILGHMAN LATERAL

WORKSPACE



MATERIAL

PROFILE



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PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

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BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DRAWING TITLE	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
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2	08/10/2018	JSK	REVISED FOR FERC DATA REQUEST 2				
1	06/18/2018	JWP	RE-ISSUED FOR FERC				
0	12/29/2017	PLH	ISSUED FOR FERC				

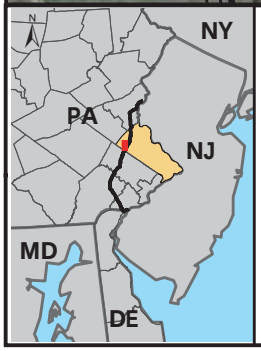
DRAWN BY	PLH	11/14/17
DESIGNED BY	PLH	11/14/17
CHECKED BY	RJB	12/21/17
APPROVED BY	MEH	12/21/17
NGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

HART, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004468

ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 4.24 TO M.P. 4.41
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	RR01-FIGURE 1-9-9	3

APPENDIX A-2



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Facility Sites

0 50 100
Feet

N

Scale: 1:2,000

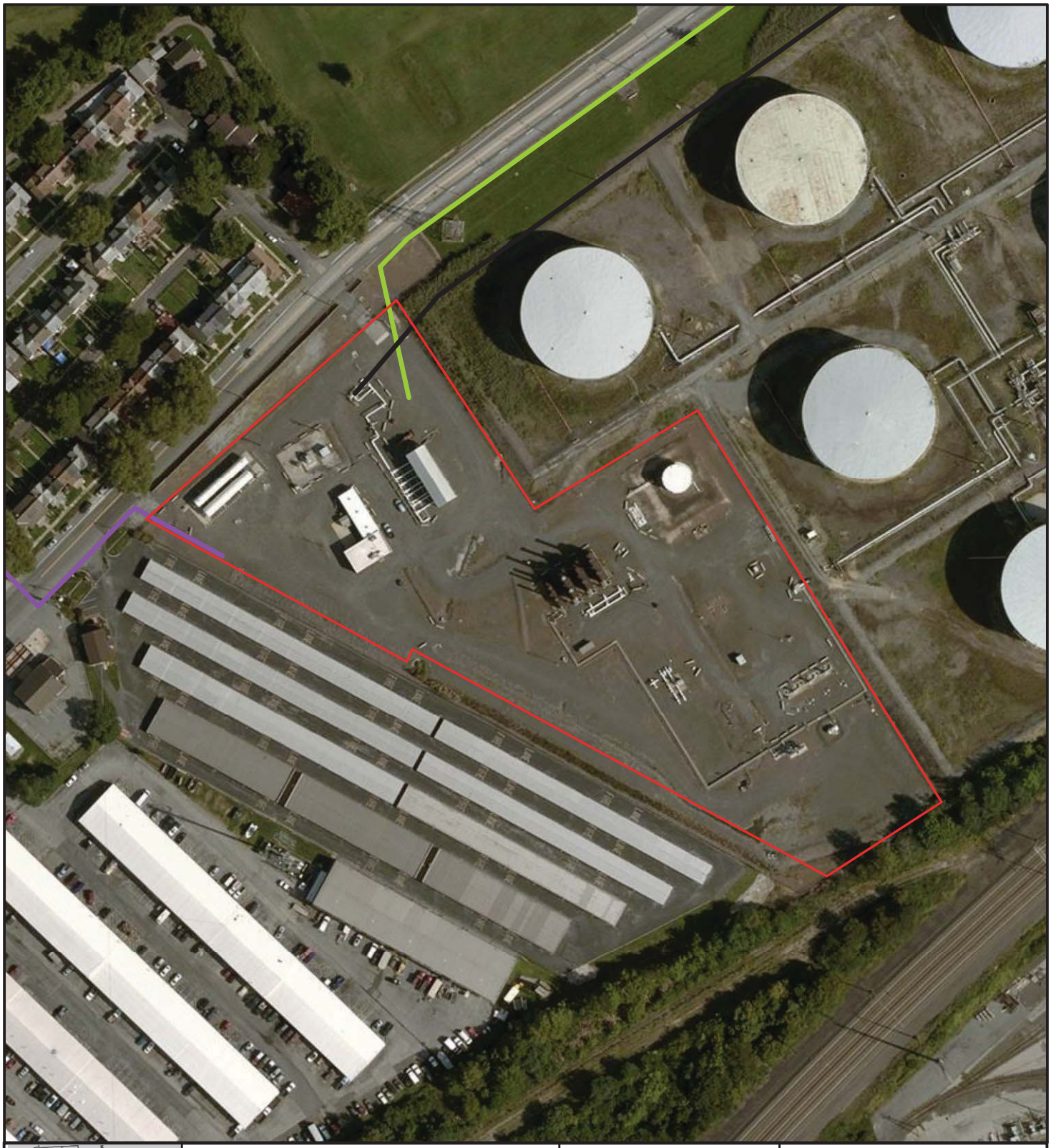
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

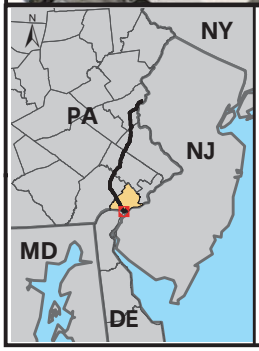
Adelphia Gateway Project

Proposed Quakertown Facilities

Bucks County, PA

APPENDIX A





Legend

- Existing 18-Inch-Diameter Mainline
- Proposed Parkway Lateral
- Proposed Tilghman Lateral
- Proposed Compressor Station and Wareyard

0 50 100
Feet

N

Scale: 1:2,000

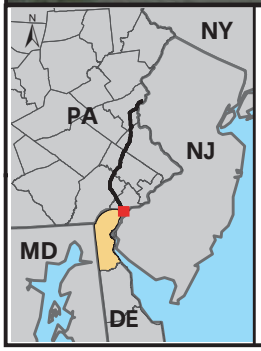
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Marcus Hook Compressor Station and Wareyard

Delaware County, PA

APPENDIX A



Legend

- Proposed Parkway Lateral
- ATWS
- Proposed Meter Station

0 25 50
Feet

N

Scale: 1:800

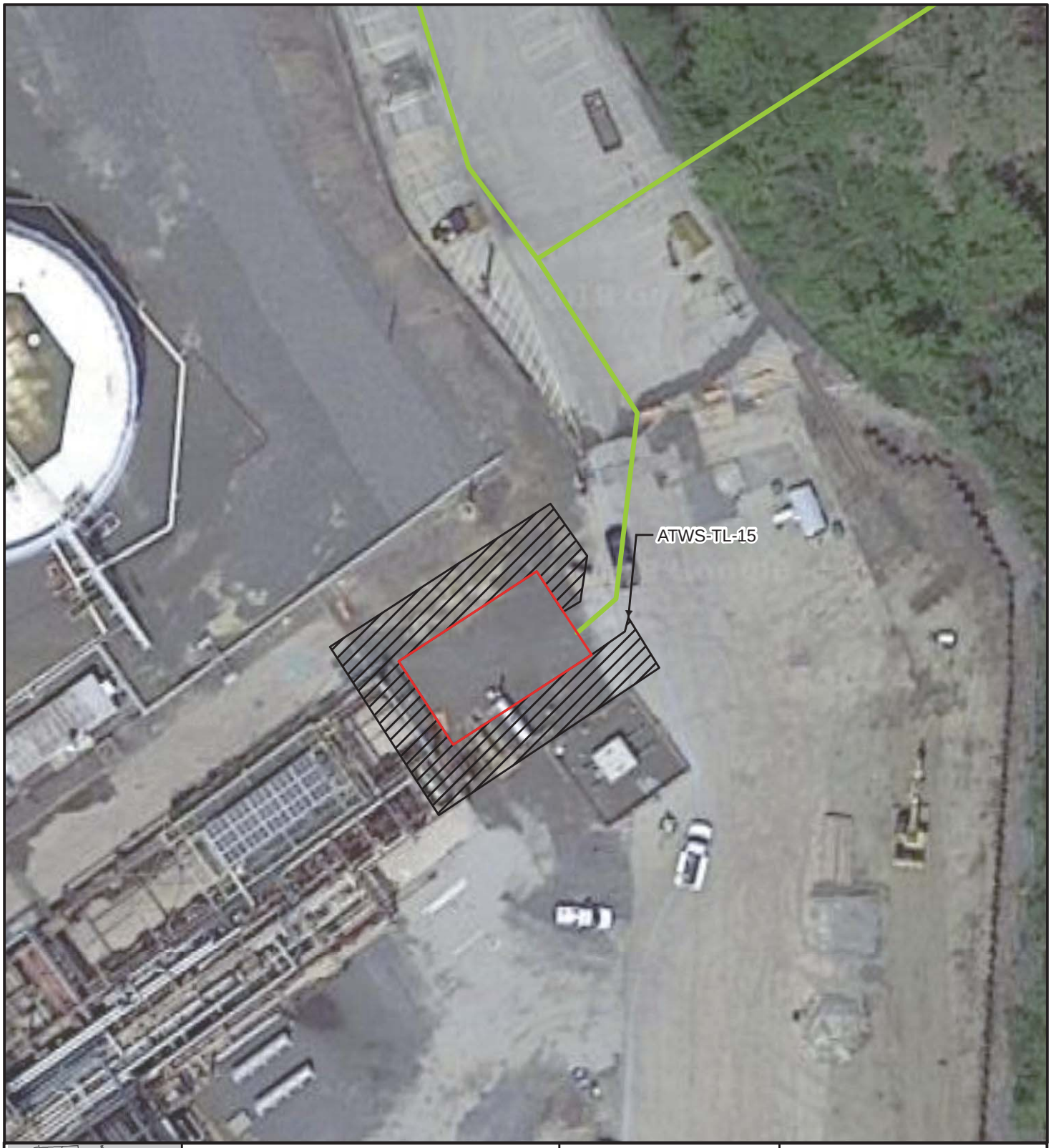
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

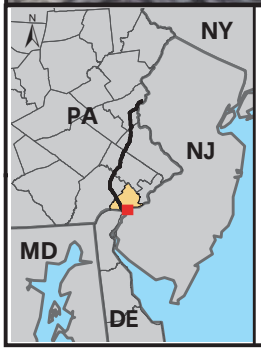
Adelphia Gateway Project

Proposed Delvarva Meter Station

New Castle County, DE

APPENDIX A





Legend

- Proposed Tilghman Lateral
- ATWS
- Proposed Meter Station

0 25 50

Feet

N

Scale: 1:500

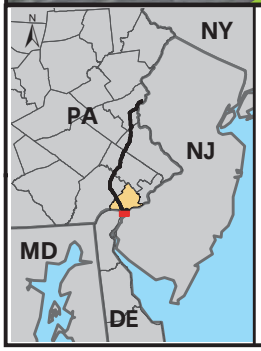
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Monroe Meter Station

Delaware County, PA

APPENDIX A



Legend

- Proposed Tilghman Lateral
- ATWS
- Access
- Proposed Meter Station

Note: We recommend in section B.2.2 that Adelphia identify an alternative stormwater management configuration.

0 25 50
Feet

N

Scale: 1:800

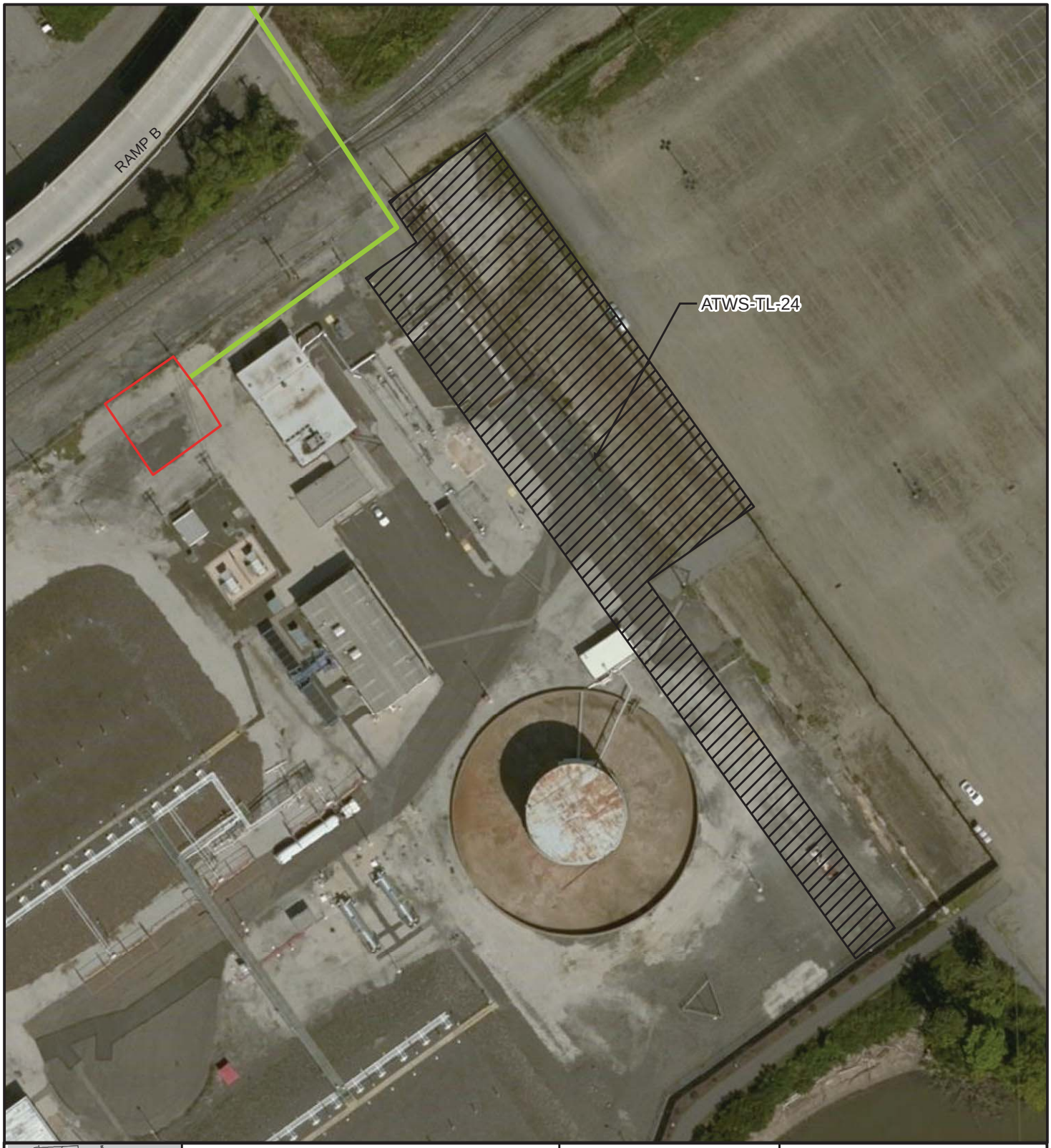
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

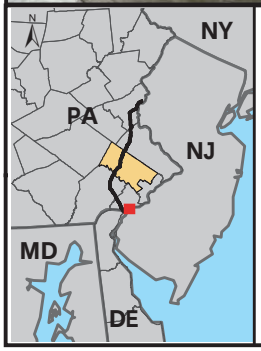
Adelphia Gateway Project

Transco Meter Station

Delaware County, PA

APPENDIX A





Legend

- Proposed Tilghman Lateral
- ATWS
- Proposed Meter Station

0 25 50
Feet

N

Scale: 1:1,000

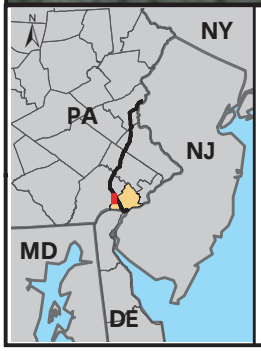
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Tilghman Meter Station

Delaware County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:500

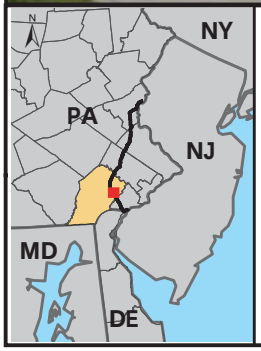
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Chester Creek BAV

Delaware County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Temporary Access
- Proposed Valve Site
- Permanent Access

0 25 50
Feet

N

Scale: 1:500

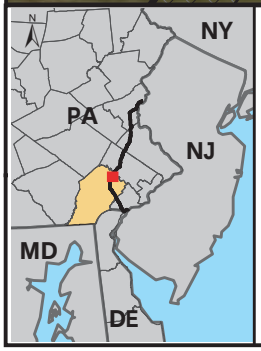
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Paoli Pike BAV

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50

Feet

N

Scale: 1:500

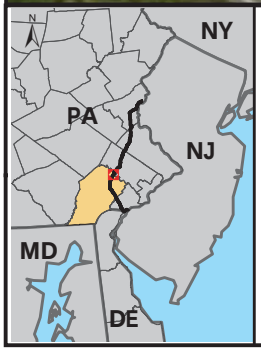
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed French Creek BAV

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50

Feet

N

Scale: 1:500

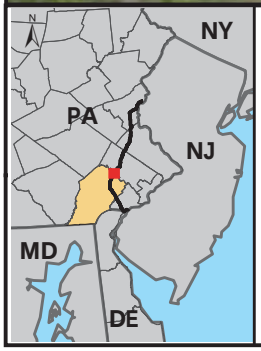
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Cromby Station BAV

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:500

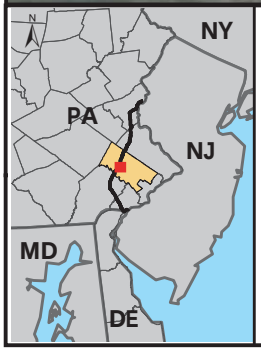
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Schuylkill River BAV

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:500

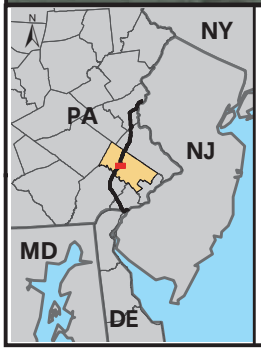
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Perkiomen Creek BAV

Montgomery County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:500

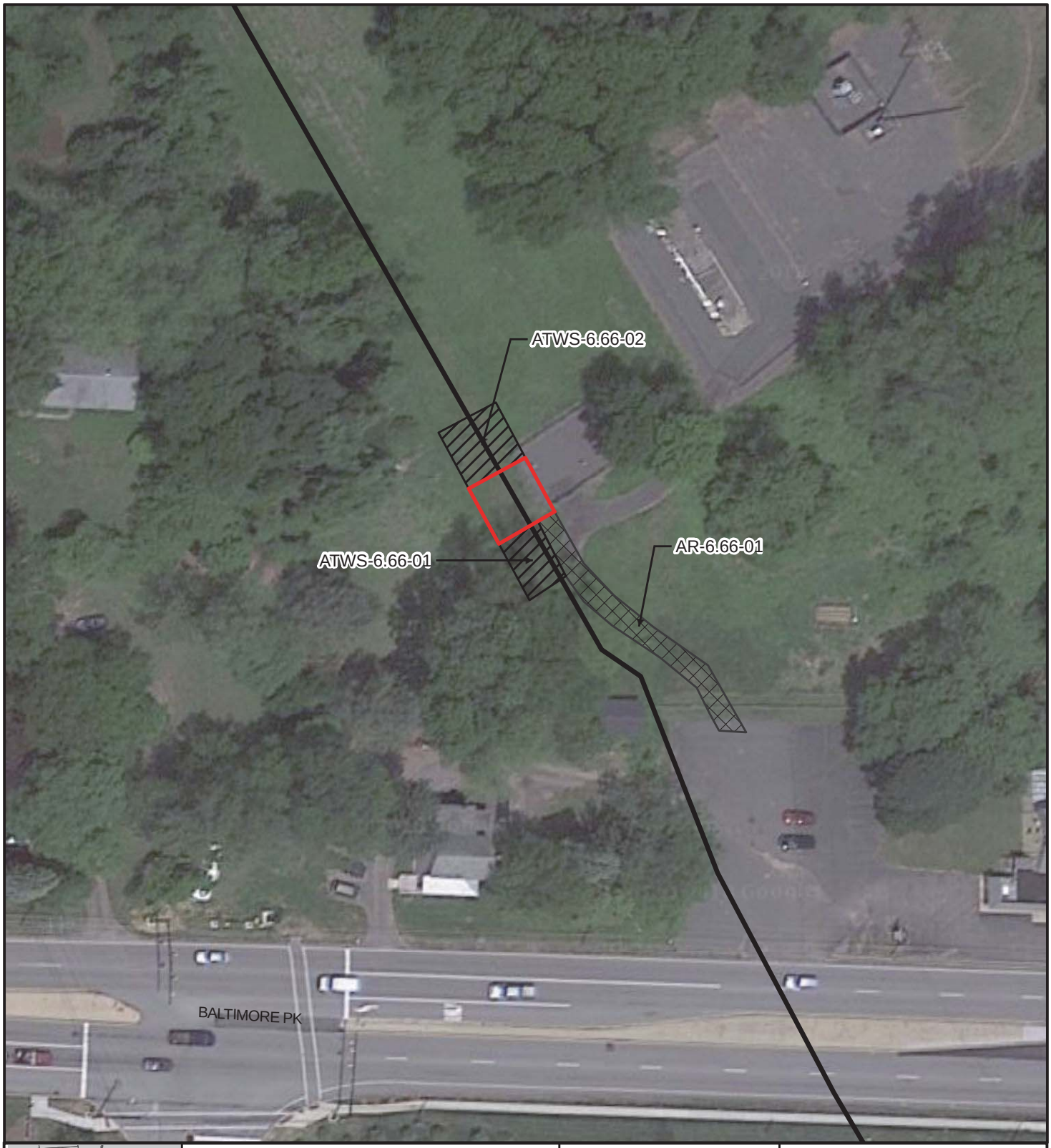
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

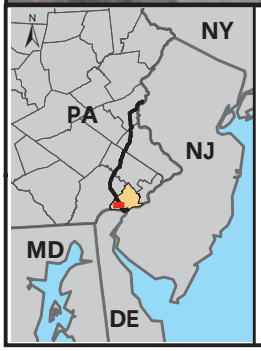
Adelphia Gateway Project

Proposed East Perkiomen Creek BAV

Montgomery County, PA

APPENDIX A





Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Proposed Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:800

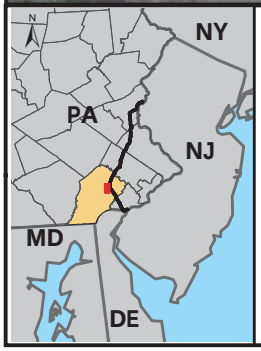
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed New
MLV 1 at MP 6.66

Delaware County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Proposed Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:856

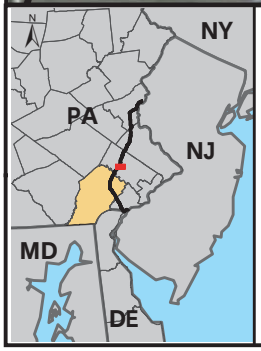
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed New
MLV 2 at MP 17.92

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- ATWS
- Access
- Proposed Valve Site

0 25 50
Feet

N

Scale: 1:500

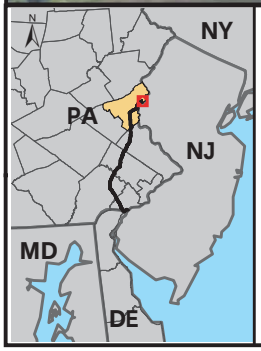
Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Proposed Skippack Tap Valve Site

Chester County, PA

APPENDIX A



Legend

- Existing 18-Inch-Diameter Mainline
- Existing 20-Inch Diameter Mainline
- Access
- Existing Facility
- Proposed Fenced Area

0 250 500
Feet

N

Scale: 1:7,000

Basemap Source: Esri, DeLeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China, Esri Thailand, Tom Tom, 2013

Adelphia Gateway Project

Martins Creek Station

Northampton County, PA

APPENDIX A

APPENDIX B
LOCATION OF ADDITIONAL TEMPORARY WORKSPACES

Appendix B Location of Additional Temporary Workspaces			
Project Facility	**Project Milepost[a]**	**ATWS Size (Acres)[b]**	**Land Use Type**
Pipeline Facilities			
Parkway Lateral[c]			
--	--	--	--
Tilghman Lateral			
ATWS-TL-01	0.3	0.6	Forest
ATWS-TL-02	0.3	0.4	Commercial / Industrial
ATWS-TL-03	0.4	4.2	Commercial / Industrial
ATWS-TL-04	0.9	0.2	Commercial / Industrial
ATWS-TL-05	0.9	1.6	Commercial / Industrial
ATWS-TL-06	1.6	1.3	Commercial / Industrial / Forest
ATWS-TL-07	1.8	1.3	Commercial / Industrial / Forest
ATWS-TL-08	2.3	0.1	Commercial / Industrial
ATWS-TL-09	2.3	0.1	Forest
ATWS-TL-10	2.3	0.3	Forest
ATWS-TL-11	2.4	0.5	Open land
ATWS-TL-12	2.4	0.2	Open land
ATWS-TL-13	2.6	0.1	Commercial / Industrial
ATWS-TL-14	2.6	1.0	Commercial / Industrial
ATWS-TL-15	2.7	0.3	Commercial / Industrial
ATWS-TL-16	2.9	1.2	Commercial / Industrial
ATWS-TL-17	2.9	1.4	Commercial / Industrial
ATWS-TL-18	3.5	0.8	Residential
ATWS-TL-19	3.5	0.2	Commercial / Industrial
ATWS-TL-20	3.8	1.4	Residential
ATWS-TL-21	3.8	1.0	Commercial / Industrial
ATWS-TL-22	4.2	0.7	Commercial / Industrial / Open Land
ATWS-TL-23	4.3	0.7	Commercial / Industrial
ATWS-TL-24	4.4	0.9	Commercial / Industrial
Aboveground Facilities			
Delmarva Meter Station[d]			
ATWS-PL-01	0.3	0.1	Commercial / Industrial
ATWS-PL-02	0.3	0.1	Commercial / Industrial
New Facilities along the Existing Mainline			
ATWS-6.66-01	6.7	<0.1	Open land
ATWS-6.66-02	6.7	<0.1	Open land
ATWS-9.53-01	9.5	0.1	Open land
ATWS-9.53-02	9.5	<0.1	Open land
ATWS-14.46-01	14.5	<0.1	Commercial / Industrial
ATWS-14.46-02	14.5	<0.1	Open land
ATWS-17.92-01	17.9	<0.1	Open land
ATWS-17.92-02	17.9	<0.1	Open land
ATWS-25.74-01	25.7	<0.1	Open land

Appendix B (continued) Location of Additional Temporary Workspaces			
Project Facility	**Project Milepost[a]**	**ATWS Size (Acres)[b]**	**Land Use Type**
New Facilities along the Existing Mainline (continued)			
ATWS-25.74-02	25.7	<0.1	Open land
ATWS-27.34-01	27.3	<0.1	Commercial / Industrial
ATWS-27.34-02	27.3	0.2	Commercial / Industrial
ATWS-28.04-01	27.3	<0.1	Open land
ATWS-28.04-02	27.3	<0.1	Open land
ATWS-33.97-01	34.0	<0.1	Open land
ATWS-33.97-02	34.0	<0.1	Open land
ATWS-36.68-01	36.7	<0.1	Commercial / Industrial
ATWS-36.68-02	36.7	<0.1	Commercial / Industrial
ATWS-QCS-01	49.4	1.0	Open land
ATWS-QCS-02	49.4	0.6	Open land
ATWS-MCS-01	84.2	2.5	Commercial / Industrial
ATWS-35.95-01	36.0	<0.1	Open land
ATWS-35.95-02	36.0	<0.1	Open land

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

[b] Impact totals have been rounded for presentation purposes. Impacts greater than 0.01 and less than 0.05 are reported as <0.1.

[c] No ATWS is proposed for the Parkway Lateral Project facilities.

[d] Locations for ATWS associated with the Delmarva Meter Station would be associated with Parkway Lateral Milepost Locations

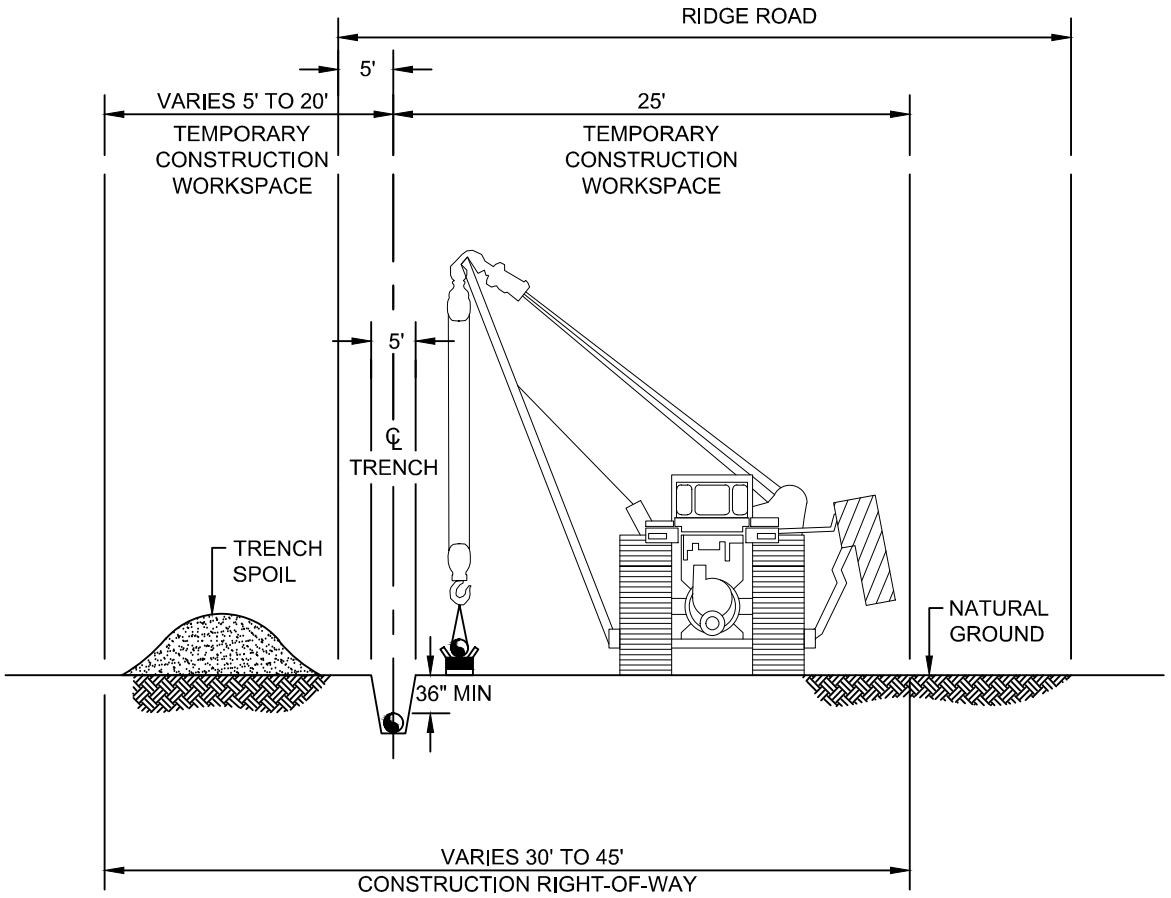
APPENDIX C
MODIFICATIONS TO THE FERC PROCEDURES FOR THE PROJECT

Appendix C Modifications to the FERC Procedures for the Project						
Project Facility	**ATWS/ Facility ID**	**Feature ID (Type)**	**Section in FERC Procedures**	**Description of Modification**	**Justification**	**Additional Mitigation**
Pipeline Facilities						
Tilghman Lateral–Stoney Creek Crossing	ATWS-TL-14	Stoney Creek (intermittent stream)	V.B.2	ATWS within 50 feet of waterbody	Limited usable areas available in Monroe area due to existing industrial facilities. Crossing location selected in coordination with landowner to avoid existing and proposed facilities.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Compressor Stations						
Quakertown Compressor Station	ATWS-QCS-01	QCS-W-01 (PEM/PSS wetlands)	VI.B.1.a	ATWS in wetland	Limited usable areas available with amenable landowners.	Adelphia would install timber mats in wetland areas. Double row erosion and sediment controls would be installed. Refueling would be limited in accordance with the Procedures.
Quakertown Compressor Station	ATWS-QCS-01	WL-QTSC-WA (PFO wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Limited usable areas available with amenable landowners.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Quakertown Compressor Station	ATWS-QCS-01	Pond at Quakertown Compressor Station	V.B.2	ATWS within 50 feet of waterbody	Limited usable areas available with amenable landowners.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Meter and Regulator Stations						
Transco Meter Station	ATWS-TL-01	TC-W-01 (PEM/PSS/PFO wetlands)	VI.B.1.a	ATWS within 50 feet of wetland	Station location selected based on least impactful interconnection location. Station sizing based on counterparties specifications for safe station design.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Transco Meter Station	Diversion Ditch	TC-W-01 (PEM/PSS/PFO wetlands)	VI.B.3.b	Stormwater discharge into wetland	Due to topography, lack of existing stormwater infrastructure, and adjacent roadways, an overland diversion channel would be used to manage stormwater runoff.	To be included in Adelphia's Erosion and Sediment Control Plan to be submitted to the Delaware County Conservation District.
Blowdown Assembly Valves						
Chester Creek BAV	ATWS-9.53-01	CC-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.

Appendix C (continued) Modifications to the FERC Procedures for the Project						
Project Facility	**ATWS/ Facility ID**	**Feature ID (Type)**	**Section in FERC Procedures**	**Description of Modification**	**Justification**	**Additional Mitigation**
Blowdown Assembly Valves (continued)						
Chester Creek BAV	ATWS-9.53-02	CC-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Paoli Pike BAV	ATWS-14.46-01	PP-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Paoli Pike BAV	BAV	PP-W-01 (PEM wetland)	VI.A.6	Aboveground facility in wetlands.	The existing facility is within a wetland and will be modified for the Project, resulting in a permanent fill of 0.01 acre of wetlands.	No additional measures proposed. Adelphia would be required to minimize or mitigate for impacts in accordance with its USACE permit.
Paoli Pike BAV	ATWS-14.46-01	Ridley Creek (perennial stream)	V.B.2	ATWS within 50 feet of waterbody	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Paoli Pike BAV	ATWS-14.46-02	PP-W-01 (PEM wetland)	VI.B.1.a;	ATWS in wetland	Workspace to support modification of existing facility.	Adelphia would install timber mats in wetland areas. Double row erosion and sediment controls would be installed. Refueling would be limited in accordance with the Procedures.
Paoli Pike BAV	ATWS-14.46-02	Ridley Creek (perennial stream)	V.B.2	ATWS within 50 feet of waterbody	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Paoli Pike BAV	Access Road AR-14.46.01	PP-W-01 (PEM wetland)	VI.B.1.a;	Access road in wetland (construction only)	Access road to support modification of existing facility.	Adelphia would install timber mats and geotextile fabric in wetland areas during construction. Double row erosion and sediment controls would be installed. Refueling would be limited in accordance with the Procedures. Following construction Adelphia would restore the modified portion of the access road, including the portion within the wetland.
Schuylkill River BAV	ATWS-28.04-01	SR-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Schuylkill River BAV	ATWS-28.04-02	SR-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace on both sides of the valve needed to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.

Appendix C (continued) Modifications to the FERC Procedures for the Project						
Project Facility	**ATWS/ Facility ID**	**Feature ID (Type)**	**Section in FERC Procedures**	**Description of Modification**	**Justification**	**Additional Mitigation**
Blowdown Assembly Valves (continued)						
Perkiomen Creek BAV	ATWS-33.97-02	PC-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
Perkiomen Creek BAV	Access Road AR-33.07.01	PC-W-01 (PEM wetland)	VI.B.1.c	Access road in wetland	Access road to support modification of existing facility.	Adelphia would install timber mats in wetland areas during construction. Double row erosion and sediment controls would be installed. Refueling would be limited in accordance with the Procedures. Adelphia is not proposing any mitigation during operation, see our recommendation in section 2.3 of the EA.
East Perkiomen Creek BAV	ATWS-36.68-01	EP-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
East Perkiomen Creek BAV	ATWS-36.68-02	EP-W-01 (PEM wetland)	VI.B.1.a	ATWS within 50 feet of wetland	Workspace to support modification of existing facility.	Adelphia would install double row erosion and sediment controls. Refueling would be limited in accordance with the Procedures.
East Perkiomen Creek BAV	BAV	PP-W-01 (PEM wetland)	VI.A.6	Aboveground facility in wetlands.	The existing facility is within a wetland and will be modified for the Project, resulting in a permanent fill of less than 0.01 acre of wetlands.	No additional measures proposed. Adelphia would be required to minimize or mitigate for impacts in accordance with its USACE permit.

APPENDIX D
TYPICAL CONSTRUCTION FIGURES



BEGIN	END
M.P. 0.02	M.P. 0.05

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 1

STANDARD WORK CORRIDOR
CO-LOCATED WITH RIDGE ROAD

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148
DE 4361

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED	MEH			
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

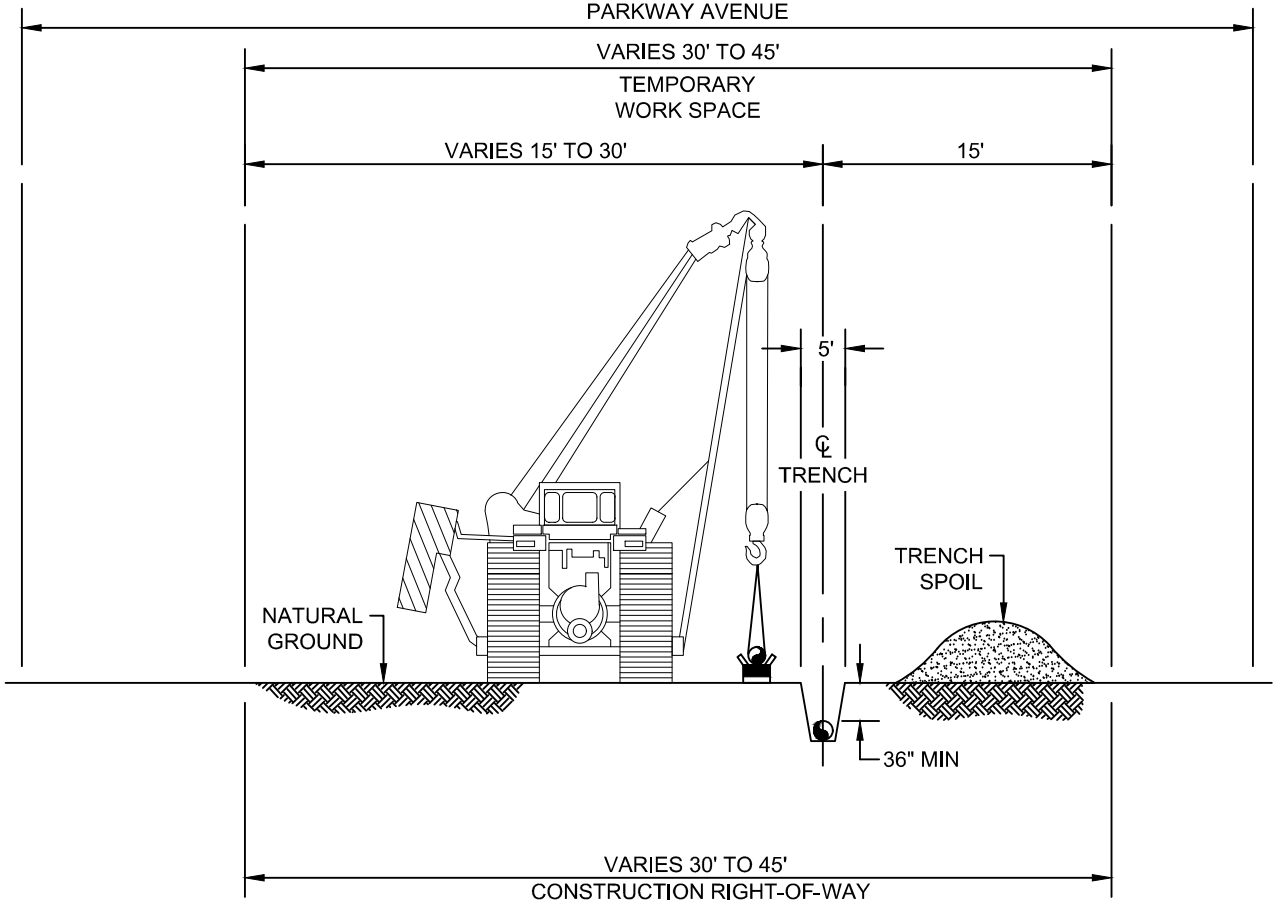
DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" PARKWAY LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR10-FIGURE 1-7-1	3

8/20/2018 2:38 PM
KEYMAN, JACKIE

RR01 - FIGURE 1-7-1



BEGIN	END
M.P. 0.05	M.P. 0.13

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 2

STANDARD WORK CORRIDOR

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148
DE 4361

REV	DESCRIPTION	CHK	DATE	APP	DATE
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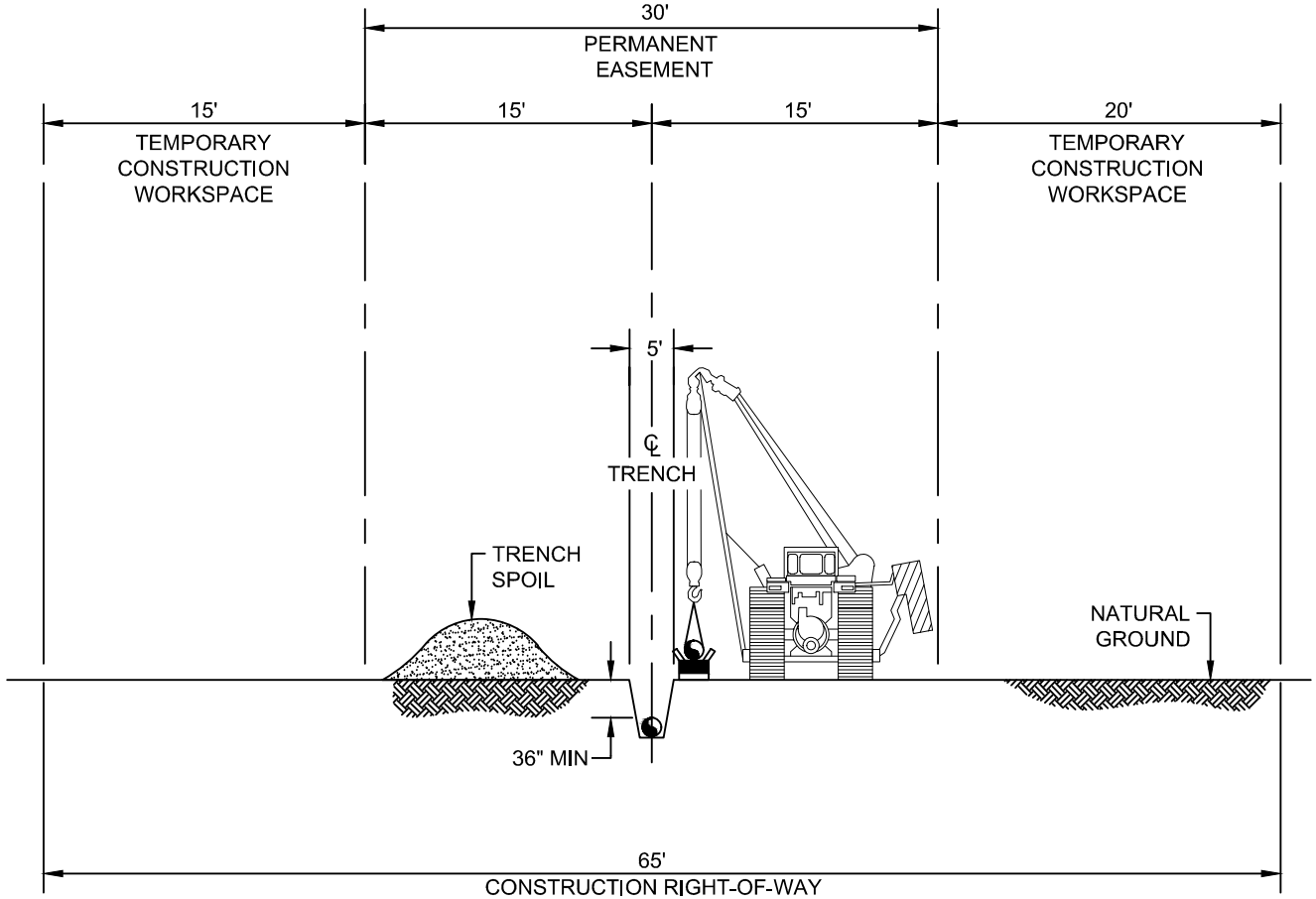
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" PARKWAY LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR10-FIGURE 1-7-2	3

8/20/2018 2:50 PM
FOWLER, MATT



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M.P. 0.13	M.P. 0.24

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 3

STANDARD WORK CORRIDOR

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148
DE 4361

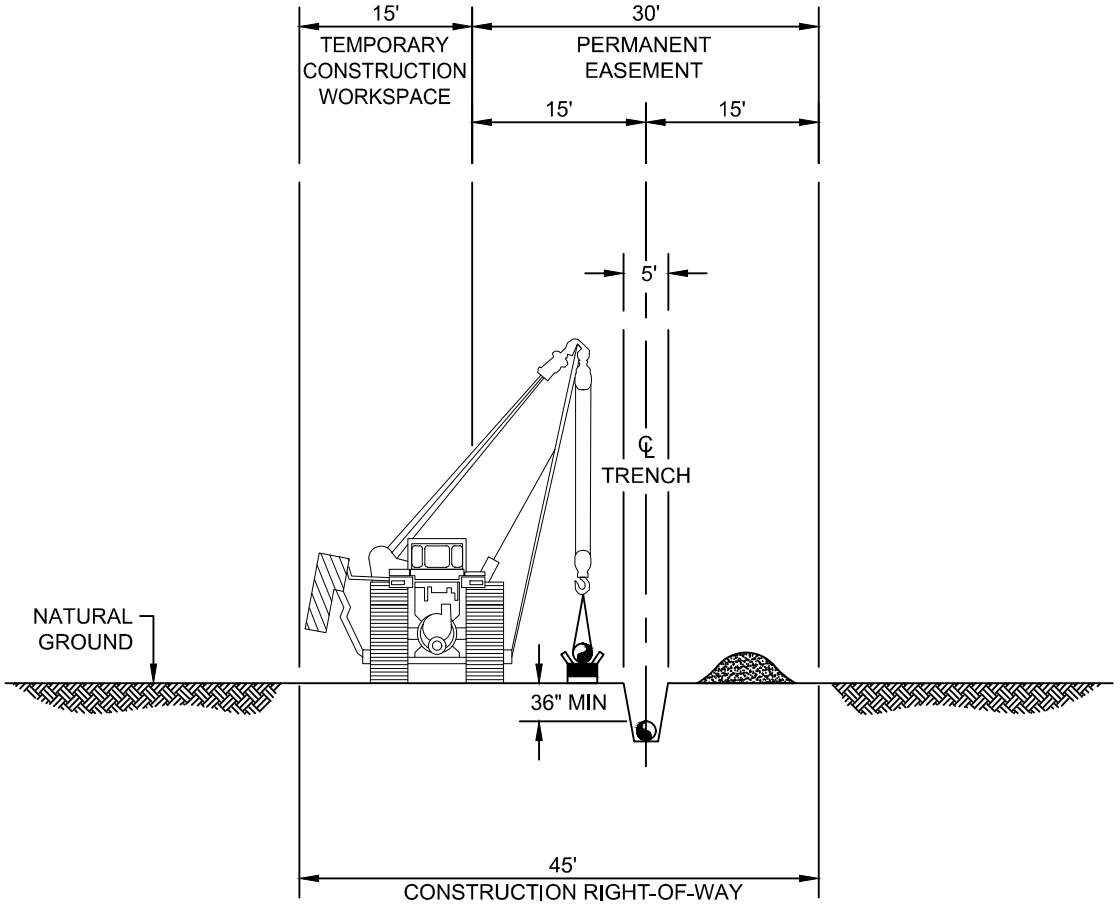
REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED				
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" PARKWAY LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR10-FIGURE 1-7-3	3

8/20/2018 2:40 PM
KEYMAN, JACKIE



BEGIN	END
M.P. 2.25	M.P. 2.42
M.P. 2.74	M.P. 2.82

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 1

STANDARD WORK CORRIDOR

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/10/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

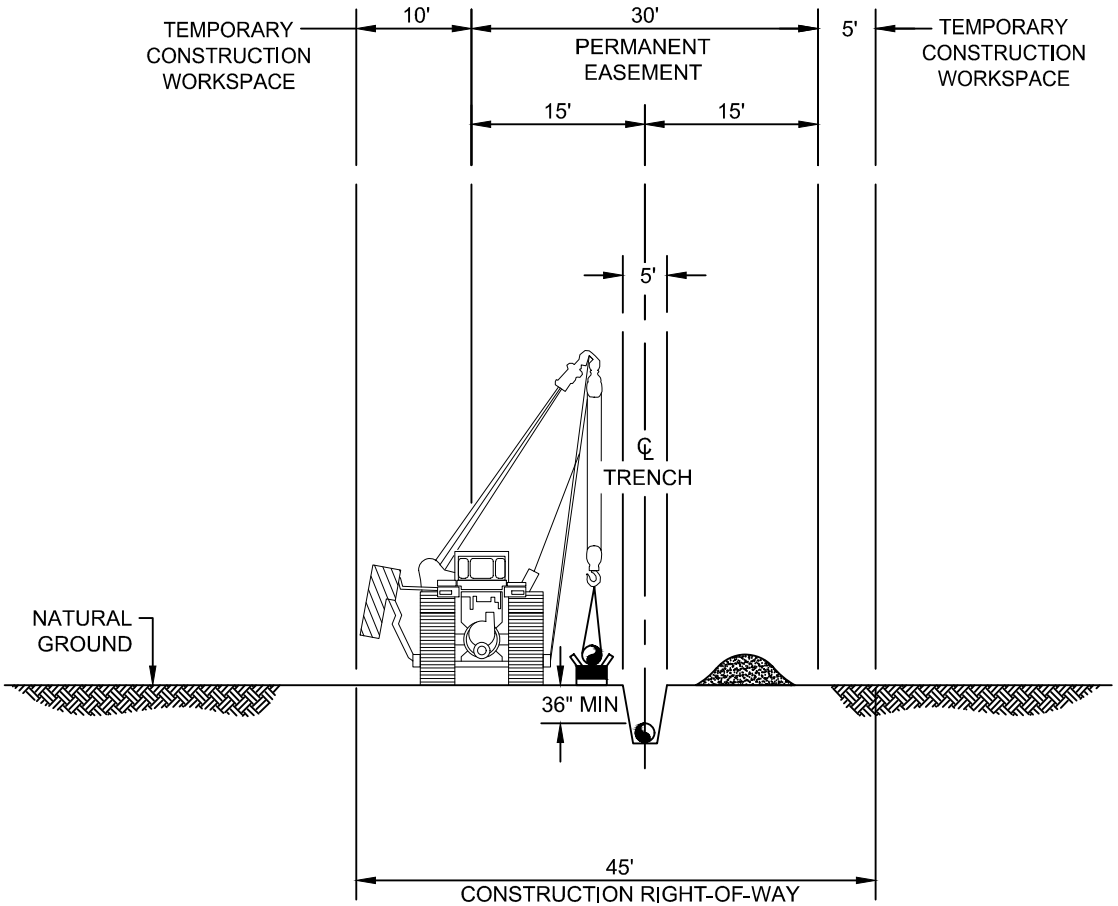
REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/10/2018	RCH	08/10/2018
2	NOT USED				
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" TILGHMAN LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR01-FIGURE 1-10-1	3

8/20/2018 2:47 PM
KEYMAN, JACKIE



BEGIN	END
M.P. 2.61	M.P. 2.74

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 2

STANDARD WORK CORRIDOR

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

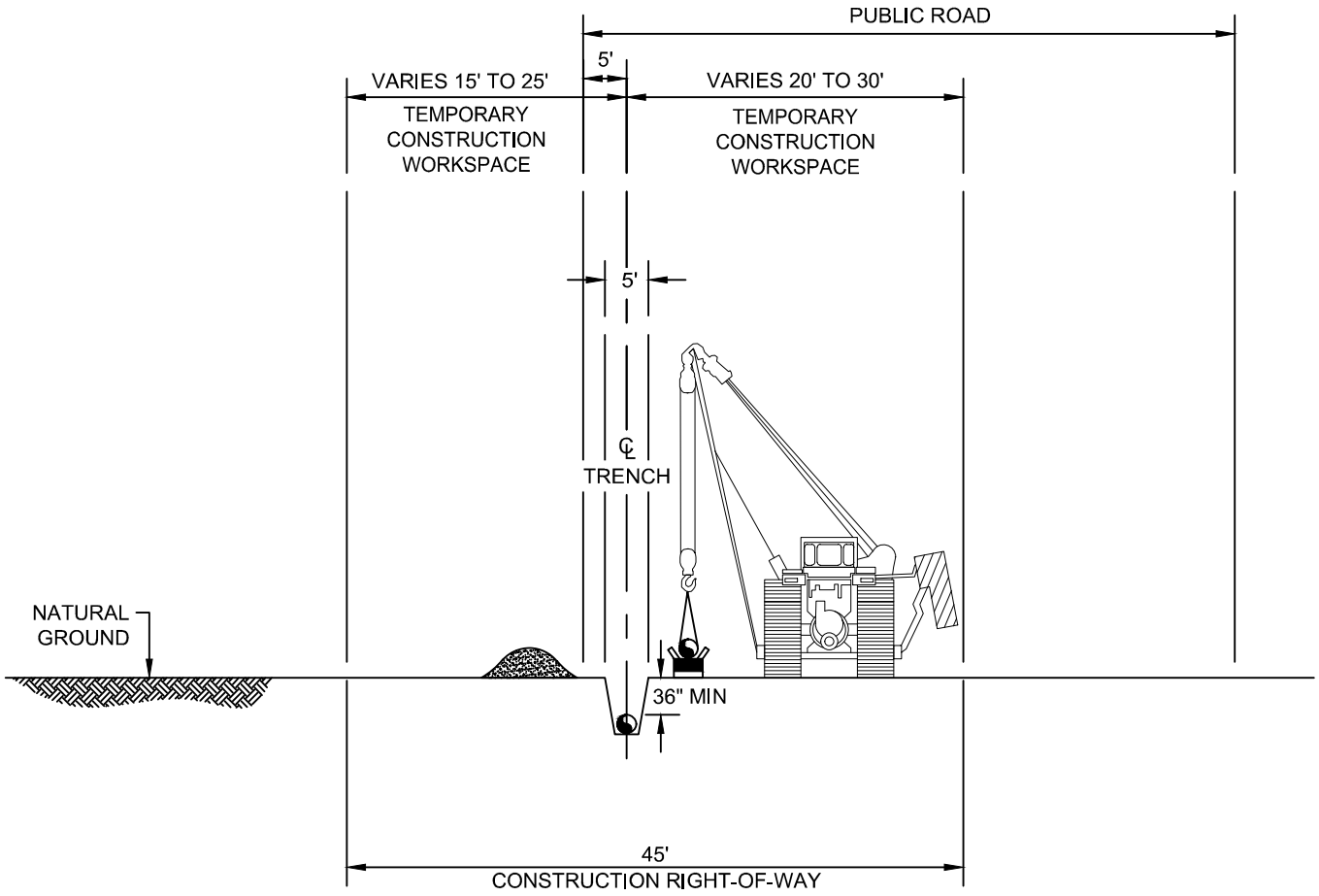
REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED				
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" TILGHMAN LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR01-FIGURE 1-10-2	3

8/20/2018 2:48 PM
KEYMAN, JACKIE



BEGIN	END
M.P. 2.82	M.P. 2.92
M.P. 3.73	M.P. 3.87
M.P. 4.20	M.P. 4.32

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 3

STANDARD WORK CORRIDOR
CO-LOCATED WITH PUBLIC ROAD

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

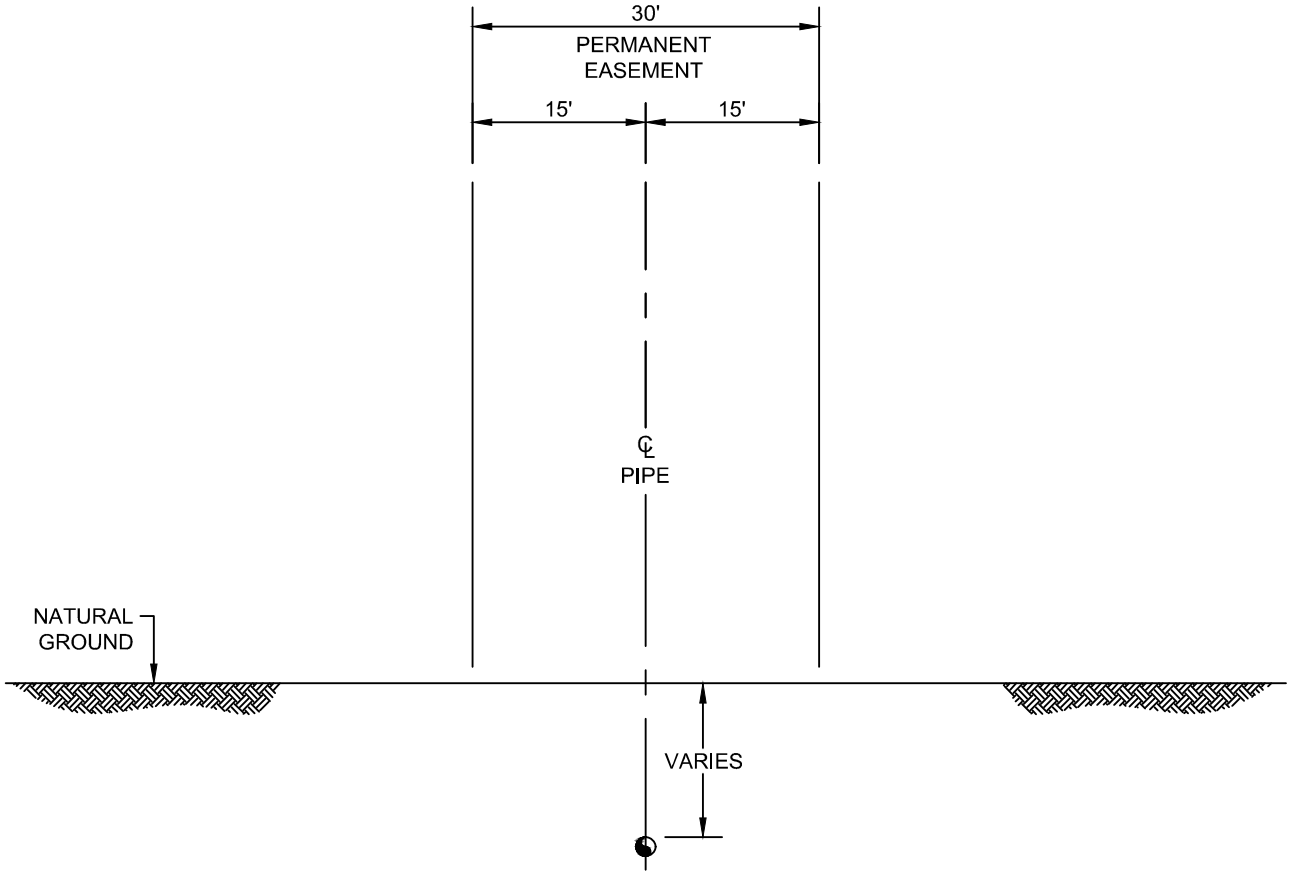
REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED				
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" TILGHMAN LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR01-FIGURE 1-10-3	3

8/20/2018 2:49 PM
KEYMAN, JACKIE



BEGIN	END
M.P. 2.43	M.P. 2.61
M.P. 4.38	M.P. 4.41

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 4

STANDARD WORK CORRIDOR
HORIZONTAL DIRECTIONAL DRILL

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED				
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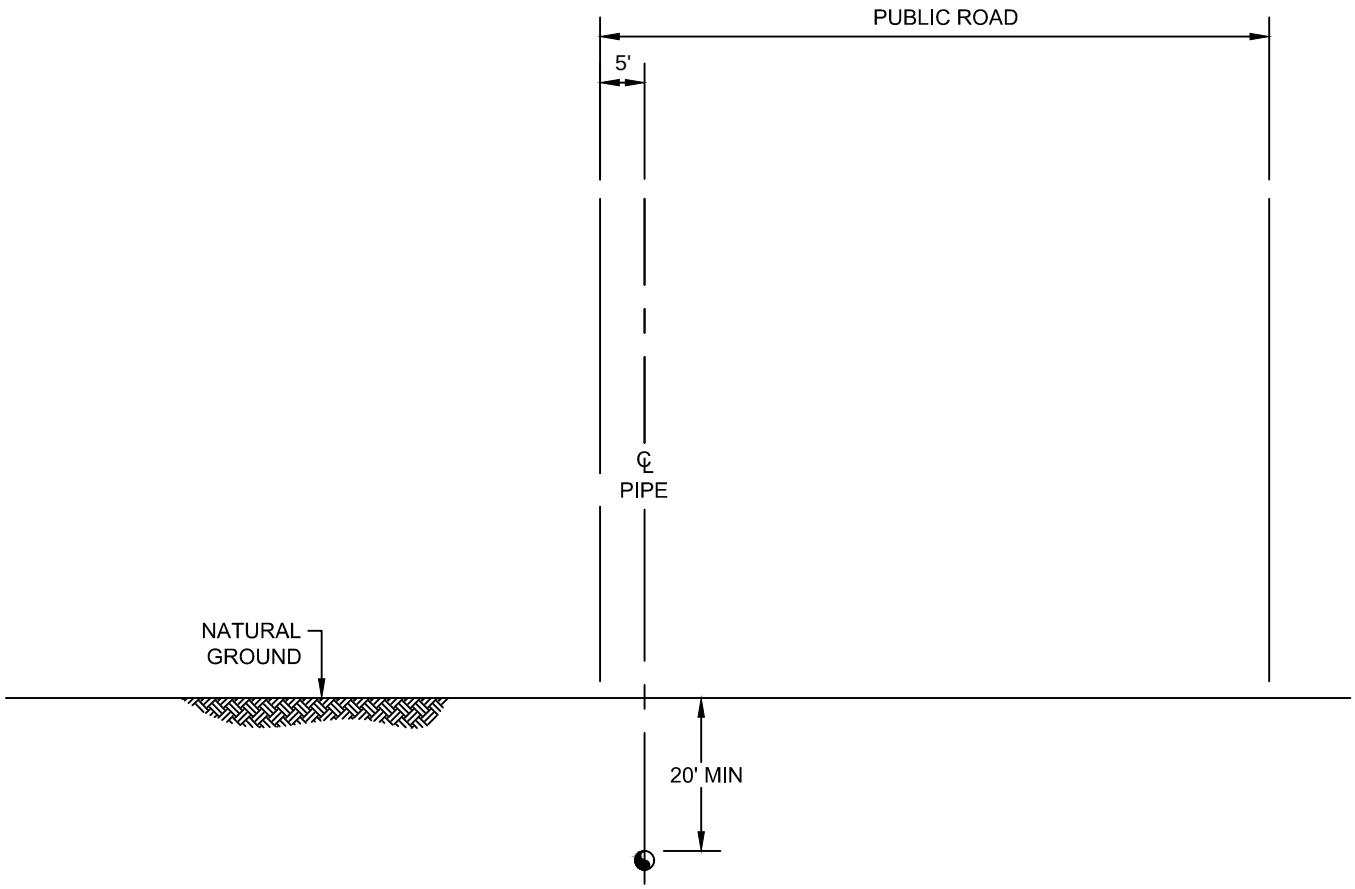
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" TILGHMAN LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	RR01-FIGURE 1-10-4	3

8/20/2018 2:49 PM
KEYMAN, JACKIE



BEGIN	END
M.P. 0.00	M.P. 2.25
M.P. 2.92	M.P. 3.73
M.P. 3.87	M.P. 4.20
M.P. 4.32	M.P. 4.38

TYPICAL CONSTRUCTION RIGHT-OF-WAY NO. 5

STANDARD WORK CORRIDOR
HORIZONTAL DIRECTIONAL DRILL
CO-LOCATED WITH PUBLIC ROAD

PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 06/18/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

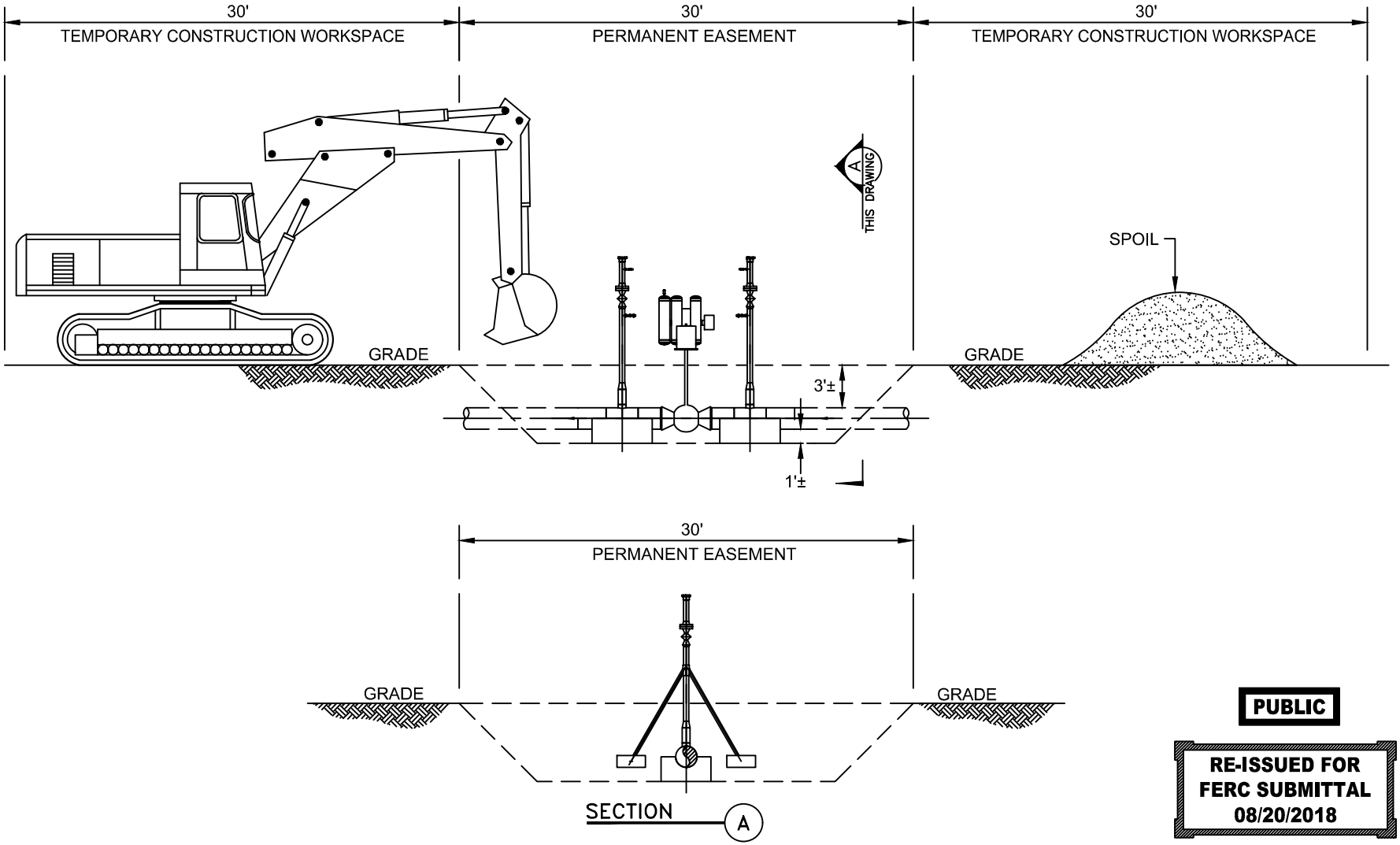
REV	DESCRIPTION	CHK	DATE	APP	DATE
1	RE-ISSUED FOR FERC	MEH	06/18/2018	RCH	06/18/2018
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
PROPOSED 16" TILGHMAN LATERAL

SCALE	DRAWING NUMBER	REV
N.T.S.	8.A17022-TYP-01-05	1

6/14/2018 11:44 AM HUMPHREY, PERRY



PUBLIC

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

TYPICAL CONSTRUCTION RIGHT-OF-WAY

STANDARD WORK CORRIDOR

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/2018
2	NOT USED				
1	NOT USED				
0	NOT USED				

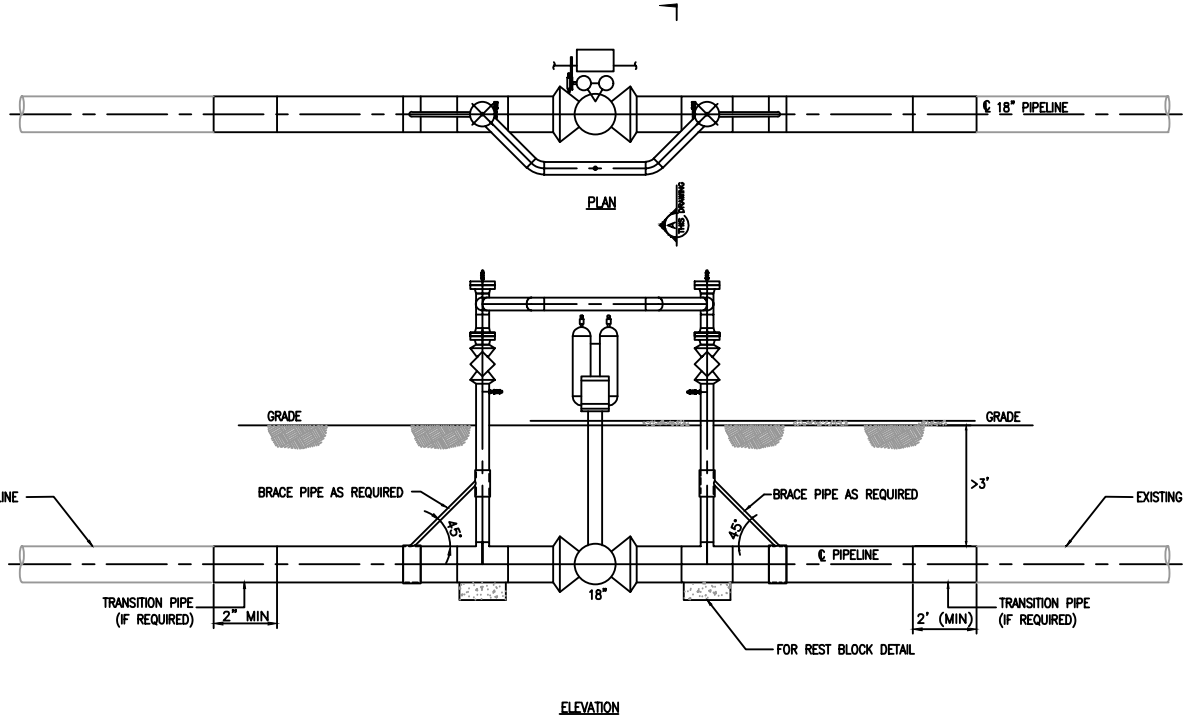
DRAWN BY	PLH	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

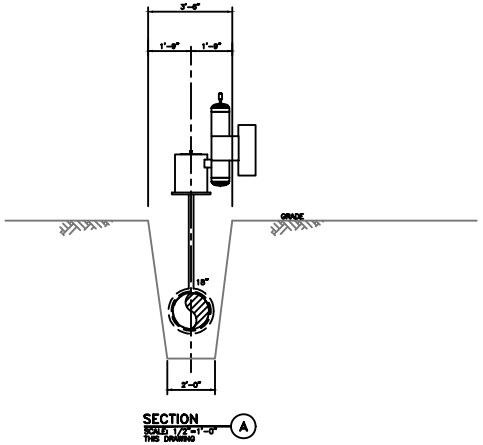
HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

ADELPHIA GATEWAY, LLC
TYPICAL ROW CROSS SECTION
MLV BLOWDOWN ASSEMBLIES

SCALE	DRAWING NUMBER	REV
N.T.S.	RR01-FIGURE 1-26	3

8/20/2018 2:16 PM FOWLER, MATT





RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/18	RCH	08/20/18
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DRAWN BY	GLP	12/21/17
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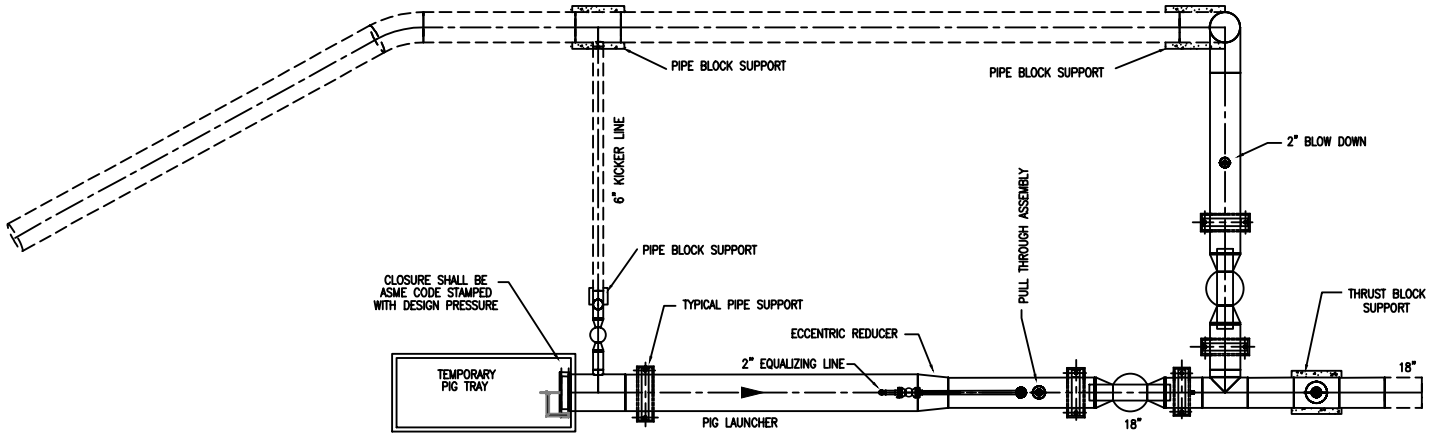
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL
18" MAINLINE VALVE

SCALE	DRAWING NUMBER	REV
N.T.S.	8.A17022-TYP-02-01	3

8/20/2018 2:53 PM
KEYMAN, JACKIE

RR01 - FIGURE 1-24-1



PLAN

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/18	RCH	08/20/18
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DRAWN BY	JSK	12/21/17
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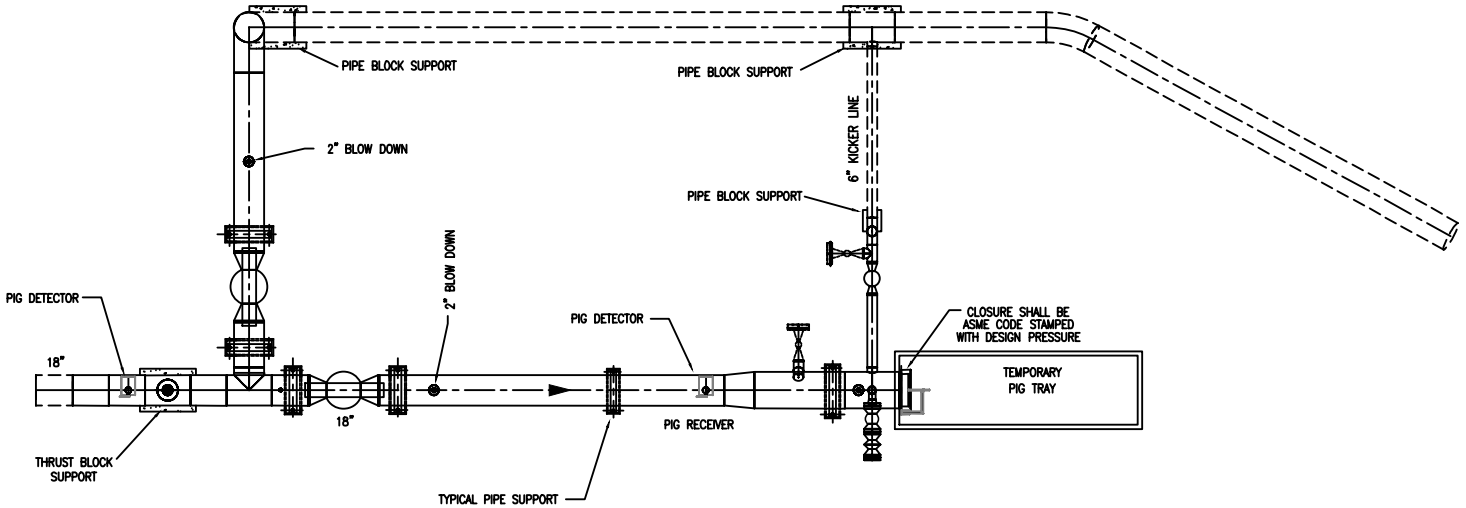
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

ADELPHIA GATEWAY, LLC
TYPICAL 18" PIG LAUNCHER

SCALE	DRAWING NUMBER	REV
N.T.S.	8.A17022-TYP-02-02	3

8/20/2018 2:54 PM
KEYMAN, JACKIE

RR01 - FIGURE 1-25-1



PLAN

RE-ISSUED FOR FERC SUBMITTAL 08/20/2018

HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM #: PA 4004148

REV	DESCRIPTION	CHK	DATE	APP	DATE
3	RE-ISSUED FOR FERC	MEH	08/20/2018	RCH	08/20/18
2	NOT USED				
1	NOT USED				
0	ISSUED FOR FERC	MEH	12/29/17	RCH	12/29/17

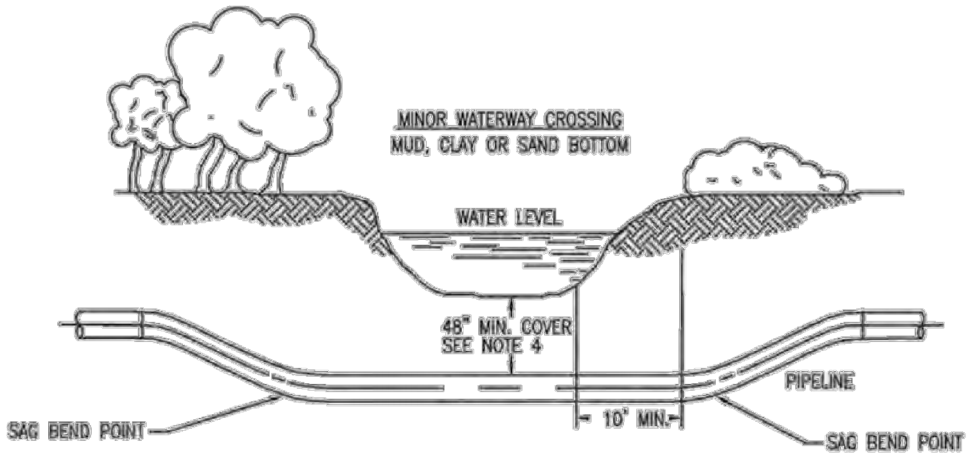
DRAWN BY	JSK	12/21/17
DESIGNED BY	JSK	12/21/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

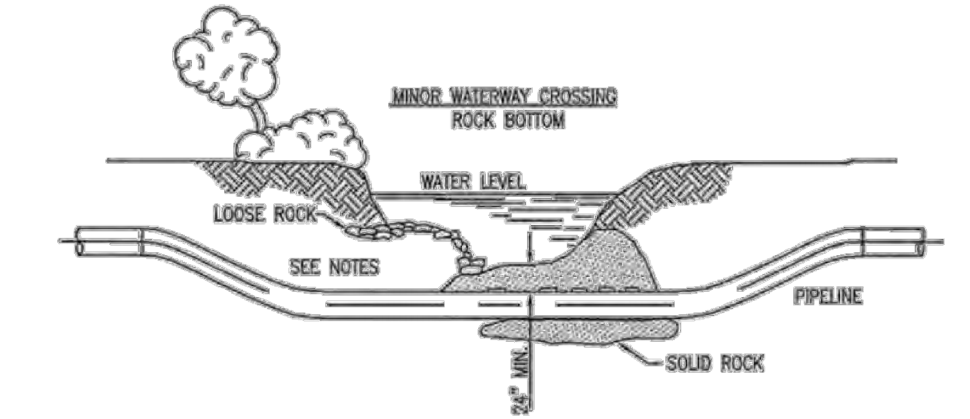
ADELPHIA GATEWAY, LLC
TYPICAL 18" PIG RECEIVER

SCALE	DRAWING NUMBER	REV
N.T.S.	8.A17022-TYP-02-03	3

8/20/2018 2:55 PM
KEYMAN, JACKIE

RR01 - FIGURE 1-25-2





NOTES:

1. THIS DRAWING IS APPLICABLE TO ALL SMALL STREAM, DITCH, CANAL CROSSINGS NOT SHOWN INDIVIDUALLY DESIGNED ON ACCOMPANYING DRAWINGS.
2. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
3. PIPE SHALL BE LEVEL UNDER STREAM CHANNEL AT THE MINIMUM COVER REQUIRED.
4. NORMAL PIPE DEPTH TO BE A MINIMUM OF 48". BUT MAY BE DECREASED TO 24" IF SOLID ROCK IS ENCOUNTERED. CONTRACTOR SHALL REFER TO SECTION C1150 OF KINDER MORGAN CONSTRUCTION STANDARDS.
5. INSTALLATION OF EQUIPMENT BRIDGES AND EXCAVATION OF PIPE TRENCH SHALL COMPLY WITH ALL ENVIRONMENTAL PERMIT REQUIREMENTS AND REGULATIONS. CONTRACTOR SHALL REFER TO SECTION C1260 OF THE KINDER MORGAN CONSTRUCTION STANDARDS.
6. INSTALLATION OF RIVER WEIGHTS SHALL BE DETERMINED BY COMPANY REPRESENTATIVE AND SHALL BE DESIGNED TO ACHIEVE MINIMUM SPECIFIC GRAVITY OF 1.15.
7. CANAL CROSSINGS MAY BE INSTALLED BY SLICK BORING AS DESIGNATED BY COMPANY REPRESENTATIVE.
8. SAG BENDS SHALL BE LOCATED SO THAT THE BEGINNING OF THE BEND IS A MINIMUM OF 10' FROM TOE OF SLOPE UNLESS OTHERWISE APPROVED BY COMPANY REPRESENTATIVE.

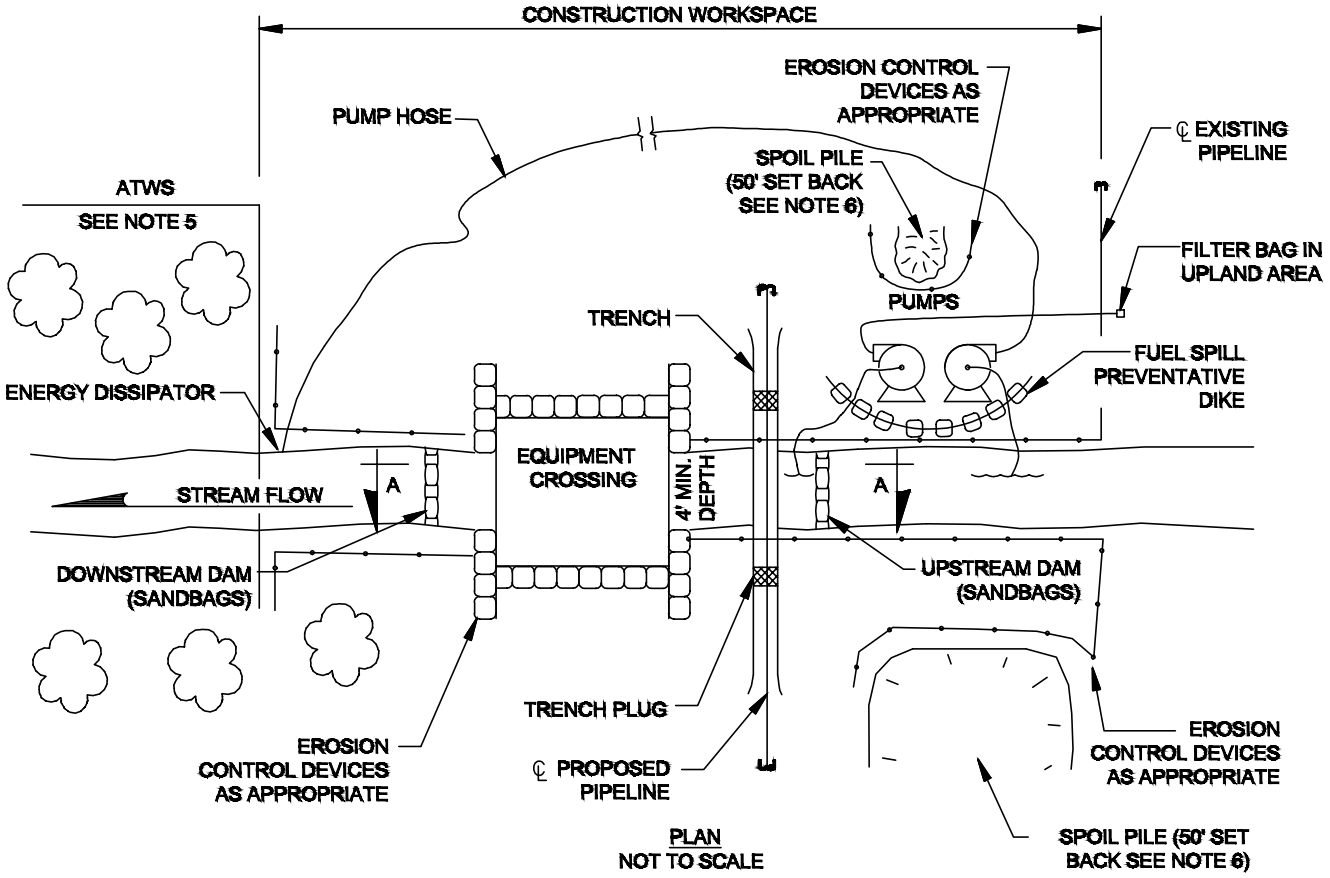
NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

ENG. RECORD		DATE
DRAWN BY:		
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NONE		
PROJECT ID:		
FILE NAME:		

ADELPHIA GATEWAY, LLC

STREAM CROSSING

DWG. NO. 8.A17022.01.0-STREAM CROSSING



PLAN
NOT TO SCALE

NOTES:

1. SET UP PUMP AND HOSE AS SHOWN, OR USE OTHER PRACTICAL ALTERNATIVES. PUMP SHOULD HAVE TWICE THE PUMPING CAPACITY OF ANTICIPATED FLOW.
2. CONTRACTOR TO ENSURE A SUFFICIENT NUMBER OF ACTIVE AND BACKUP PUMPS TO MAINTAIN THE CAPACITY OF THE STREAM FLOW AT ALL TIMES DURING INSTALLATION.
3. ALL INTAKE HOSES WILL BE SCREENED.
4. DISMANTLE DOWNSTREAM DAM, THEN UPSTREAM DAM. KEEP PUMP RUNNING TO MAINTAIN STREAM FLOW.
5. THE REQUIRED SETBACK FOR ATWS IS 50' FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
6. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 50' FROM THE TOP OF BANK.
7. STRAW BALES, WADDLES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.
8. THIS METHOD WILL NOT BE USED IN A HQ/EV WATERSHED UNLESS SPECIFICALLY APPROVED ON A SITE SPECIFIC.
9. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 ' OF TOP OF BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
10. BYPASS PUMP INTAKE SHALL BE MAINTAINED A SUFFICIENT DISTANCE FROM THE BOTTOM TO PREVENT PUMPING OF CHANNEL BOTTOM MATERIALS.
11. WATER ACCUMULATING WITHIN THE WORK AREA WILL BE PUMPED TO A FILTER BAG PRIOR TO DISCHARGING INTO ANY RECEIVING SURFACE WATER. (SEE FB TYP.)
12. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100' BACK FROM TOP OF STREAM BANK.
13. ALL EXCESS EVACUATED MATERIAL WILL BE IMMEDIATELY REMOVED FROM THE STREAM CROSSING AREA.
14. ALL DISTURBED AREAS WITHIN 50' OF TOP OF BANK SHALL BE BLANKETED AND MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
15. TRENCH PLUGS SHALL BE INSTALLED WITHIN THE TRENCH ON BOTH SIDES OF THE STREAM CHANNEL.

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
			REVISIONS		

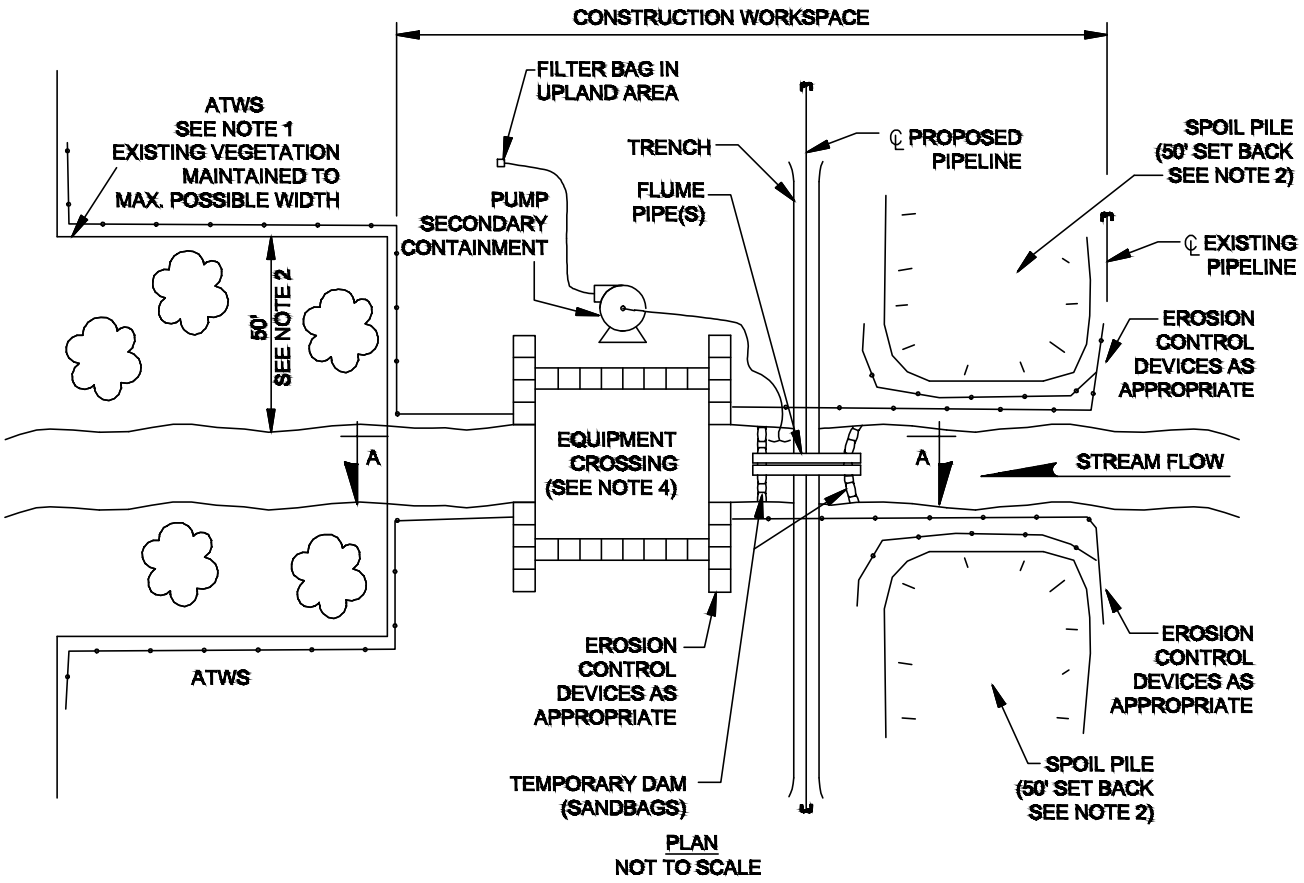
ENG. RECORD		DATE
DRAWN BY:		
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NONE		
PROJECT ID:		
FILE NAME:		

ADELPHIA GATEWAY, LLC

DRY WATERBODY CROSSING PUMP-AROUND

DWG. NO. 8.A17022.01.0-DAM AND PUMP

RR01 - FIGURE 1-26-1



PLAN
NOT TO SCALE

NOTE:

1. THE REQUIRED SET BACK FOR ATWS IS 50' FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
2. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 50' FROM THE TOP OF BANK.
3. EQUIPMENT BRIDGE SHALL REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
4. STRAW BALES, WADDLES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORKDAY DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.
5. FLUME SHOULD BE SIZED TO HANDLE FLOW AND SUFFICIENT IN LENGTH TO ACCOMMODATE WIDENING TRENCH TO PREVENT FAILURE.
6. THIS METHOD WILL NOT BE USED IN A HQ/EV WATERSHED UNLESS SPECIFICALLY APPROVED ON A SITE SPECIFIC.
7. GRUBBING SHALL NOT TAKE PLACE WITHIN 50' OF TOP OF BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
8. WATER ACCUMULATING WITHIN THE WORK AREA WILL BE PUMPED TO A FILTER BAG PRIOR TO DISCHARGING INTO ANY RECEIVING SURFACE WATER. (SEE FB TYP.)
9. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100' BACK FROM TOP OF STREAM BANK.
10. ALL EXCESS EVACUATED MATERIAL WILL BE IMMEDIATELY REMOVED FROM THE STREAM CROSSING AREA.
11. ALL DISTURBED AREAS WITHIN 50' OF TOP OF BANK SHALL BE BLANKETED AND MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
12. PIPE CULVERT FOR ACCESS ROAD AND FLUME PIPE MAY BE ONE CONTINUOUS PIPE.
13. TRENCH PLUGS SHALL BE INSTALLED WITHIN THE TRENCH ON BOTH SIDES OF THE STREAM CHANNEL.

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.

REVISIONS

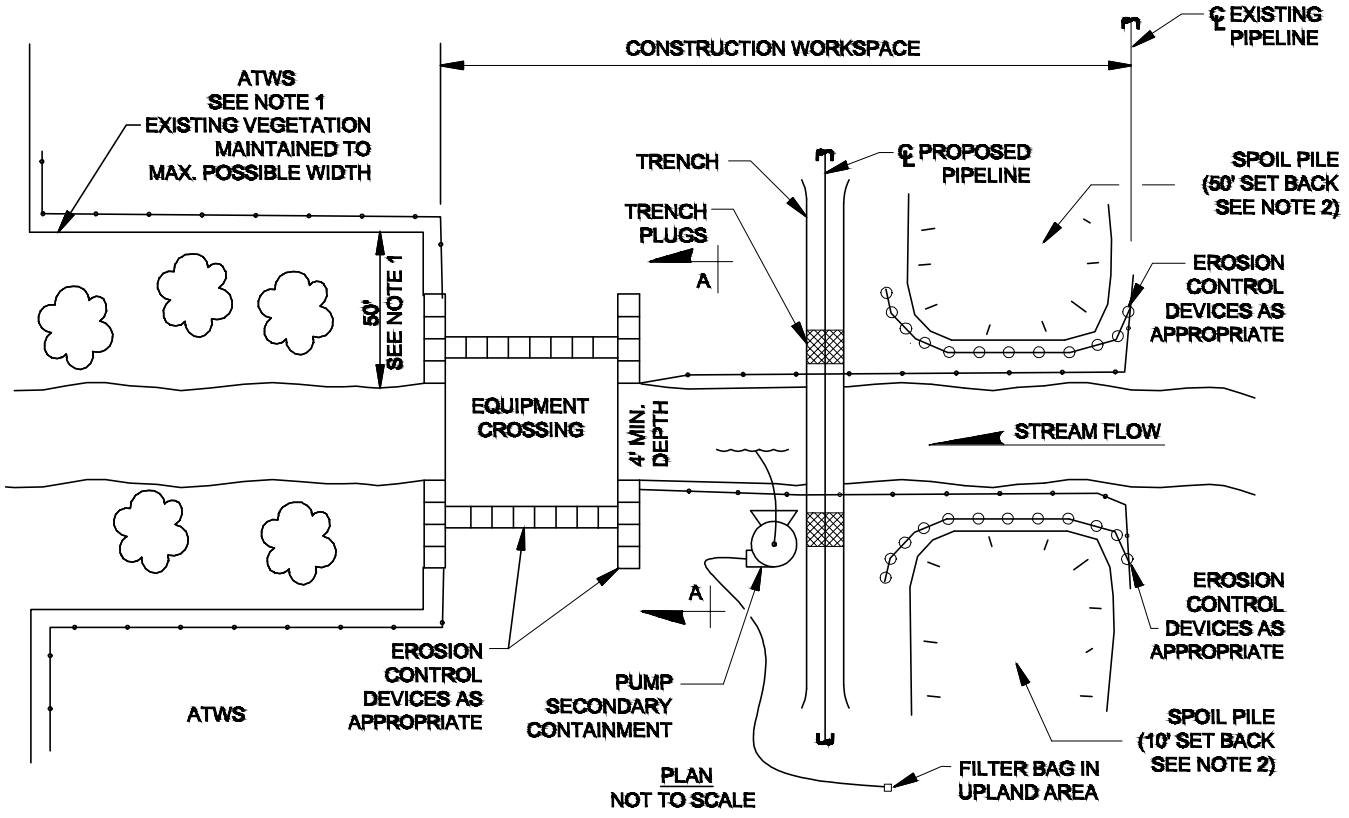
ENG. RECORD		DATE
DRAWN BY:		
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NONE		
PROJECT ID:		
FILE NAME:		

ADELPHIA GATEWAY, LLC

TYPICAL DRY WATERBODY CROSSING FLUMED

DWG. NO. 8.A17022.01.0-FLUME CROSSING

RR01 - FIGURE 1-26-2



NOTE:

1. THE REQUIRED SETBACK FOR ATWS IS 50' FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
2. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 50' FROM THE TOP OF BANK.
3. EQUIPMENT BRIDGE TO REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
4. STRAW BALES, WADDLES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.
5. IF WATER IS PRESENT, A TYPICAL CREEK CROSSING (DRY) WILL BE USED. MAINLINE CONSTRUCTION, IF NO FLOW IS PRESENT AT THE TIME OF CONSTRUCTION, MAY BE USED WITH THE APPROVAL OF THE EI.
6. THIS METHOD WILL NOT BE USED IN A HQ/EV WATERSHED UNLESS SPECIFICALLY APPROVED ON A SITE SPECIFIC.
7. GRUBBING SHALL NOT TAKE PLACE WITHIN 50' OF TOP OF BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
8. WATER ACCUMULATING WITHIN THE WORK AREA WILL BE PUMPED TO A FILTER BAG PRIOR TO DISCHARGING INTO ANY RECEIVING SURFACE WATER. (SEE FB TYP.)
9. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100' BACK FROM TOP OF STREAM BANK.
10. ALL EXCESS EVACUATED MATERIAL WILL BE IMMEDIATELY REMOVED FROM THE STREAM CROSSING AREA.
11. ALL DISTURBED AREAS WITHIN 50' OF TOP OF BANK SHOULD BE BLANKETED AND MATTED WITHIN 72 HOURS OF INITIAL DISTURBANCE UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
12. SEE SITE SPECIFIC FIGURES FOR ROW WIDTH AND OFFSET FROM EXISTING PIPELINE.

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.

REVISIONS

ENG. RECORD		DATE
DRAWN BY:		
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NONE		
PROJECT ID:		
FILE NAME:		

ADELPHIA GATEWAY, LLC

TYPICAL WET WATERBODY CROSSING

DWG. NO. 8.A17022.01.0-WET CROSSING

RR01 - FIGURE 1-26-3

APPENDIX E
ROADS AND RAILROAD CROSSINGS ASSOCIATED WITH THE PROJECT

Appendix E Roads and Railroads Crossed by the Project		
Road or Railroad Name	**Milepost[a]**	**Proposed Crossing Method[b]**
Parkway Lateral		
Parkway Avenue	0.1	open cut[c]
Ridge Road	0.2	open cut[c]
Tilghman Lateral[d]		
Ridge Road[e]	0.3	open cut
Blueball Avenue	0.6	N/A
Hewes Avenue	0.9	N/A
State Highway 452/Market Street	1.2	HDD
Yates Avenue	1.4	HDD
Chesnut Street	2.1	HDD
6th Street	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Railroad	2.5	HDD
Post Road	2.6	HDD
Us Highway 13 / Post Road	2.6	HDD
Irving Street	3.0	HDD
Clayton Street	3.1	HDD
Trainer Street	3.2	HDD
Booth Street	3.2	HDD
Harwick Street	3.3	HDD
Thurlow Street	3.4	HDD
Highland Avenue	3.4	HDD
Lewis Street	3.5	N/A
Hayes Street	3.5	N/A
Bunting Street	3.5	N/A
Mills Street	3.6	N/A
Ward Street	3.6	N/A
Palmer Street	3.7	N/A
State Highway 291/ W. 2nd Street	3.8	HDD/Pull String
Townsend Street	3.8	N/A
Engle Street	3.9	HDD/Pull String
Highway 322 Off Ramp/Jeffrey Street	4.0	HDD
Yarnall Street	4.1	HDD

Appendix E Roads and Railroads Crossed by the Project		
Road or Railroad Name	**Milepost[a]**	**Proposed Crossing Method[b]**
Tilghman Lateral (continued)		
W Front Road	4.2	HDD
Law Street	4.2	HDD
Highway 322 Off Ramp	4.1	HDD
Reaney Street	4.1	HDD
U.S. Highway 322	4.2	HDD
Highway 322 On Ramp	4.2	HDD
Central Avenue	4.3	HDD
Highway 322 On Ramp	4.4	HDD
Railroad	4.4	HDD
Delaware Avenue	4.4	HDD

[a] Approximate milepost location.

[b] Crossing methods listed as N/A would not be crossed by the lateral but would be encumbered by associated construction workspace (temporary workspace and/or ATWS).

[c] The pipeline lateral would be installed within this roadway.

[d] This list of crossings does not include the portions of the Tilghman Lateral that will be installed via HDD within Ridge Road. These areas are reported in table A-5, in section A of this EA.

[e] A pipeline to connect the Tilghman Lateral to the Transco Meter Station would be installed via open cut across this road.

APPENDIX F
EXISTING UTILITIES CROSSED BY THE PROJECT

Appendix F Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Pipeline Facilities		
Parkway Lateral		
0.06	Overhead line	PECO Energy Company
0.09	Overhead line	PECO Energy Company
Tilghman Lateral		
0.02	Transcontinental pipeline crossing	Williams Transcontinental Pipeline
0.04	Storm drain	Marcus Hook Borough Stormwater
0.04	Storm drain	Marcus Hook Borough Stormwater
0.05	Overhead line	PECO Energy Company
0.08	Storm drain	Marcus Hook Borough Stormwater
0.08	Sewer line	Delaware County Regional Water Authority
0.19	Storm drain	Marcus Hook Borough Stormwater
0.26	Storm drain	Marcus Hook Borough Stormwater
0.34	Sewer line	Delaware County Regional Water Authority
0.36	Overhead line	PECO Energy Company
0.37	Transcontinental pipeline crossing	Williams Transcontinental Pipeline
0.38	Delaware pipeline crossing	Delaware Pipeline Company, LLC
0.42	Storm drain	Marcus Hook Borough Stormwater
0.48	Overhead line	PECO Energy Company
0.50	Storm drain	Marcus Hook Borough Stormwater
0.59	Overhead line	PECO Energy Company
0.62	Storm drain	Marcus Hook Borough Stormwater
0.62	Overhead line	PECO Energy Company
0.64	Overhead line	PECO Energy Company
0.65	Storm drain	Marcus Hook Borough Stormwater
0.66	Overhead line	PECO Energy Company
0.68	Overhead line	PECO Energy Company
0.69	Overhead line	PECO Energy Company
0.70	Storm drain	Marcus Hook Borough Stormwater
0.72	Overhead line	PECO Energy Company
0.82	Overhead line	PECO Energy Company
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.

Appendix F (continued) Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Tilghman Lateral (continued)		
0.86	Sunoco pipeline crossing	Sunoco Pipeline, L.P.
0.88	Storm drain	Marcus Hook Borough Stormwater
0.88	Overhead line	PECO Energy Company
0.89	Storm drain	Marcus Hook Borough Stormwater
0.89	Sewer line	Delaware County Regional Water Authority
0.91	Overhead line	PECO Energy Company
0.94	Overhead line	PECO Energy Company
0.94	Overhead line	PECO Energy Company
0.95	Overhead line	PECO Energy Company
0.98	Overhead line	PECO Energy Company
0.99	Overhead line	PECO Energy Company
1.01	Overhead line	PECO Energy Company
1.02	Overhead line	PECO Energy Company
1.02	Overhead line	PECO Energy Company
1.03	Overhead line	PECO Energy Company
1.03	Overhead line	PECO Energy Company
1.05	Overhead line	PECO Energy Company
1.06	Storm drain	Marcus Hook Borough Stormwater
1.11	Overhead line	PECO Energy Company
1.12	Sewer line	Delaware County Regional Water Authority
1.12	Overhead line	PECO Energy Company
1.13	Overhead line	PECO Energy Company
1.13	Overhead line	PECO Energy Company
1.14	Overhead line	PECO Energy Company
1.15	Underground power	PECO Energy Company
1.16	Water line	Chester Water Authority
1.16	Overhead line	PECO Energy Company
1.17	Overhead line	PECO Energy Company
1.19	Overhead line	PECO Energy Company
1.20	Sewer line	Delaware County Regional Water Authority
1.20	Water line	Chester Water Authority
1.20	Overhead line	PECO Energy Company
1.23	Overhead line	PECO Energy Company
1.24	Overhead line	PECO Energy Company
1.25	Overhead line	PECO Energy Company
1.26	Storm drain	Marcus Hook Borough Stormwater
1.28	Overhead line	PECO Energy Company

Appendix F (continued) Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Tilghman Lateral (continued)		
1.32	Overhead line	PECO Energy Company
1.34	Underground power	PECO Energy Company
1.34	Storm drain	Marcus Hook Borough Stormwater
1.34	Overhead line	PECO Energy Company
1.35	Storm drain	Marcus Hook Borough Stormwater
1.37	Overhead line	PECO Energy Company
1.37	Overhead line	PECO Energy Company
1.39	Overhead line	PECO Energy Company
1.43	Overhead line	PECO Energy Company
1.45	Overhead line	PECO Energy Company
1.49	Overhead line	PECO Energy Company
1.52	Overhead line	PECO Energy Company
1.54	Overhead line	PECO Energy Company
1.54	Overhead line	PECO Energy Company
1.54	Overhead line	PECO Energy Company
1.55	Overhead line	PECO Energy Company
1.56	Overhead line	PECO Energy Company
1.56	Overhead line	PECO Energy Company
1.57	Overhead line	PECO Energy Company
1.58	Overhead line	PECO Energy Company
1.59	Overhead line	PECO Energy Company
1.60	Overhead line	PECO Energy Company
1.67	Overhead line	PECO Energy Company
1.68	Overhead line	PECO Energy Company
1.71	Overhead line	PECO Energy Company
1.73	Storm drain	Marcus Hook Borough Stormwater
1.77	Monroe Interstate Pipeline Company crossing	Monroe Interstate Pipeline Company
1.77	Monroe Interstate Pipeline Company crossing	Monroe Interstate Pipeline Company
1.89	Overhead line	PECO Energy Company
1.92	Energy Transfer Partners pipeline crossing	Energy Transfer Partners
1.92	Overhead line	PECO Energy Company
1.93	Sewer line	Delaware County Regional Water Authority
1.97	Overhead line	PECO Energy Company
1.99	Overhead line	PECO Energy Company
1.99	Overhead line	PECO Energy Company
2.02	Overhead line	PECO Energy Company

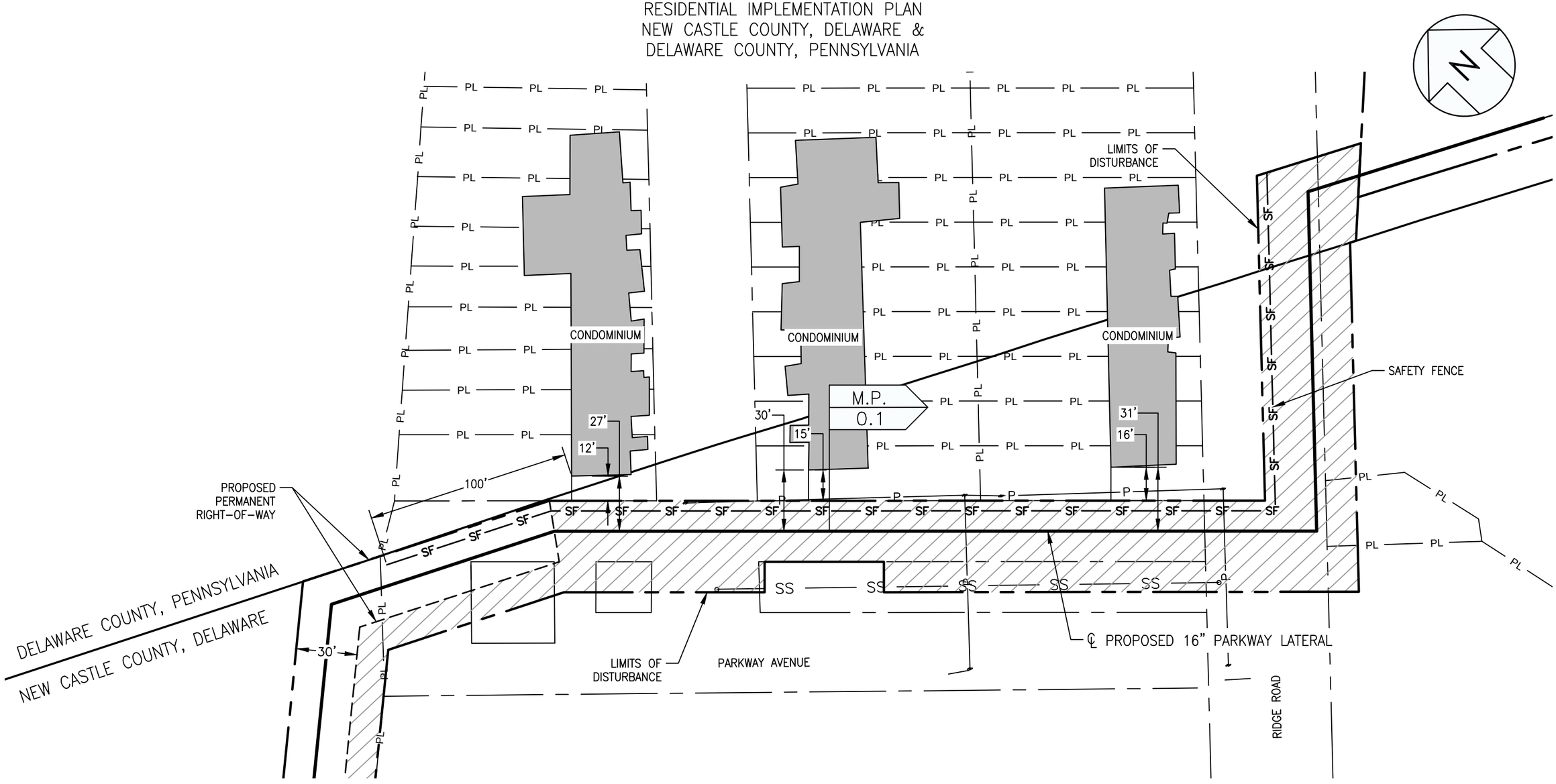
Appendix F (continued) Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Tilghman Lateral (continued)		
2.06	Overhead line	PECO Energy Company
2.08	Williams pipeline crossing	Williams Transcontinental Pipeline
2.08	Tennessee Gas Pipeline Company crossing	Tennessee Gas Pipeline Company, L.L.C.
2.10	Sewer line	Delaware County Regional Water Authority
2.10	Overhead line	PECO Energy Company
2.10	Overhead line	PECO Energy Company
2.12	Overhead line	PECO Energy Company
2.14	Overhead line	PECO Energy Company
2.15	Sewer line	Delaware County Regional Water Authority
2.17	Overhead line	PECO Energy Company
2.21	Overhead line	PECO Energy Company
2.25	Water line	Chester Water Authority
2.26	Overhead line	PECO Energy Company
2.35	Overhead line	PECO Energy Company
2.40	Transcontinental Pipeline crossing	Williams Transcontinental Pipeline
2.62	Underground power	PECO Energy Company
2.69	Overhead line	PECO Energy Company
2.89	Overhead line	PECO Energy Company
2.94	Overhead line	PECO Energy Company
2.96	Overhead line	PECO Energy Company
2.97	Storm drain	Marcus Hook Borough Stormwater
2.98	Sewer line	Delaware County Regional Water Authority
2.98	Overhead line	PECO Energy Company
2.99	Overhead line	PECO Energy Company
3.00	Sewer line	Delaware County Regional Water Authority
3.04	Overhead line	PECO Energy Company
3.04	Sewer line	Delaware County Regional Water Authority
3.06	Overhead line	PECO Energy Company
3.08	Overhead line	PECO Energy Company
3.09	Overhead line	PECO Energy Company
3.10	Sewer line	Delaware County Regional Water Authority
3.10	Overhead line	PECO Energy Company
3.10	Water line	Chester Water Authority

Appendix F (continued) Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Tilghman Lateral (continued)		
3.10	Water line	Chester Water Authority
3.16	Storm drain	Marcus Hook Borough Stormwater
3.17	Storm drain	Marcus Hook Borough Stormwater
3.17	Water line	Chester Water Authority
3.20	Overhead line	PECO Energy Company
3.21	Sewer line	Delaware County Regional Water Authority
3.21	Overhead line	PECO Energy Company
3.23	Overhead line	PECO Energy Company
3.23	Water line	Chester Water Authority
3.24	Water line	Chester Water Authority
3.26	Overhead line	PECO Energy Company
3.27	Overhead line	PECO Energy Company
3.29	Overhead line	PECO Energy Company
3.34	Overhead line	PECO Energy Company
3.37	Sewer line	Delaware County Regional Water Authority
3.37	Overhead line	PECO Energy Company
3.37	Water line	Chester Water Authority
3.37	Water line	Chester Water Authority
3.37	Water line	Chester Water Authority
3.38	Overhead line	PECO Energy Company
3.41	Gas line	PECO Energy Company
3.43	Storm drain	Marcus Hook Borough Stormwater
3.44	Overhead line	PECO Energy Company
3.44	Gas line	PECO Energy Company
3.44	Water line	Chester Water Authority
3.48	Overhead line	PECO Energy Company
3.51	Sewer line	Delaware County Regional Water Authority
3.51	Natural gas pipeline	PECO Energy Company
3.51	Water line	Chester Water Authority
3.52	Overhead line	PECO Energy Company
3.54	Overhead line	PECO Energy Company
3.56	Overhead line	PECO Energy Company
3.58	Overhead line	PECO Energy Company
3.58	Water line	Chester Water Authority
3.64	Overhead line	PECO Energy Company
3.65	Water line	Chester Water Authority
3.68	Overhead line	PECO Energy Company

Appendix F (continued) Existing Utilities Crossed by the Project		
Nearest Milepost[a]	**Utility Type**	**Owner**
Tilghman Lateral (continued)		
3.71	Overhead line	PECO Energy Company
3.72	Overhead line	Unknown
3.84	Overhead line	PECO Energy Company
3.91	Overhead line	PECO Energy Company
3.98	Overhead line	PECO Energy Company
4.05	Overhead line	PECO Energy Company
4.05	Overhead line	PECO Energy Company
4.11	Overhead line	PECO Energy Company
4.12	Overhead line	PECO Energy Company
4.12	Overhead line	PECO Energy Company
4.16	Sewer line	Delaware County Regional Water Authority
4.18	Storm drain	Marcus Hook Borough Stormwater
4.19	Overhead line	PECO Energy Company
4.40	Overhead line	PECO Energy Company
4.43	Conduit	PECO Energy Company
4.42	Natural gas pipeline	PECO Energy Company
[a] Approximate location.		

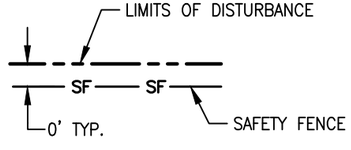
APPENDIX G
SITE-SPECIFIC PLANS FOR RESIDENCES WITHIN 25 FEET OF PROJECT WORK AREAS

RESIDENTIAL IMPLEMENTATION PLAN
NEW CASTLE COUNTY, DELAWARE & DELAWARE COUNTY, PENNSYLVANIA



LEGEND

- ℄ PROPOSED PIPELINE
- PROPOSED PERMANENT RIGHT-OF-WAY
- LIMITS OF DISTURBANCE
- SF — SAFETY FENCE
- PL — PROPERTY LINE
- DWELLING WITHIN 10'
- DWELLING BETWEEN 10'-25'
- DWELLING GREATER THAN 25'
- OTHER STRUCTURE



SAFETY FENCE TO BE INSTALLED AT THE LIMITS OF DISTURBANCE.

0 50' 100'

SCALE: 1"=50'

FOR DISCUSSION PURPOSES ONLY 10/01/18

REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	HGA	10/01/2018		

REVISION

DRAWN BY	JWP	09/20/18
DESIGNED BY	HGA	09/20/18
CHECKED BY		
APPROVED BY		
HGA JOB NO.		
PLOT SCALE	1"=50'	
MODEL ID		

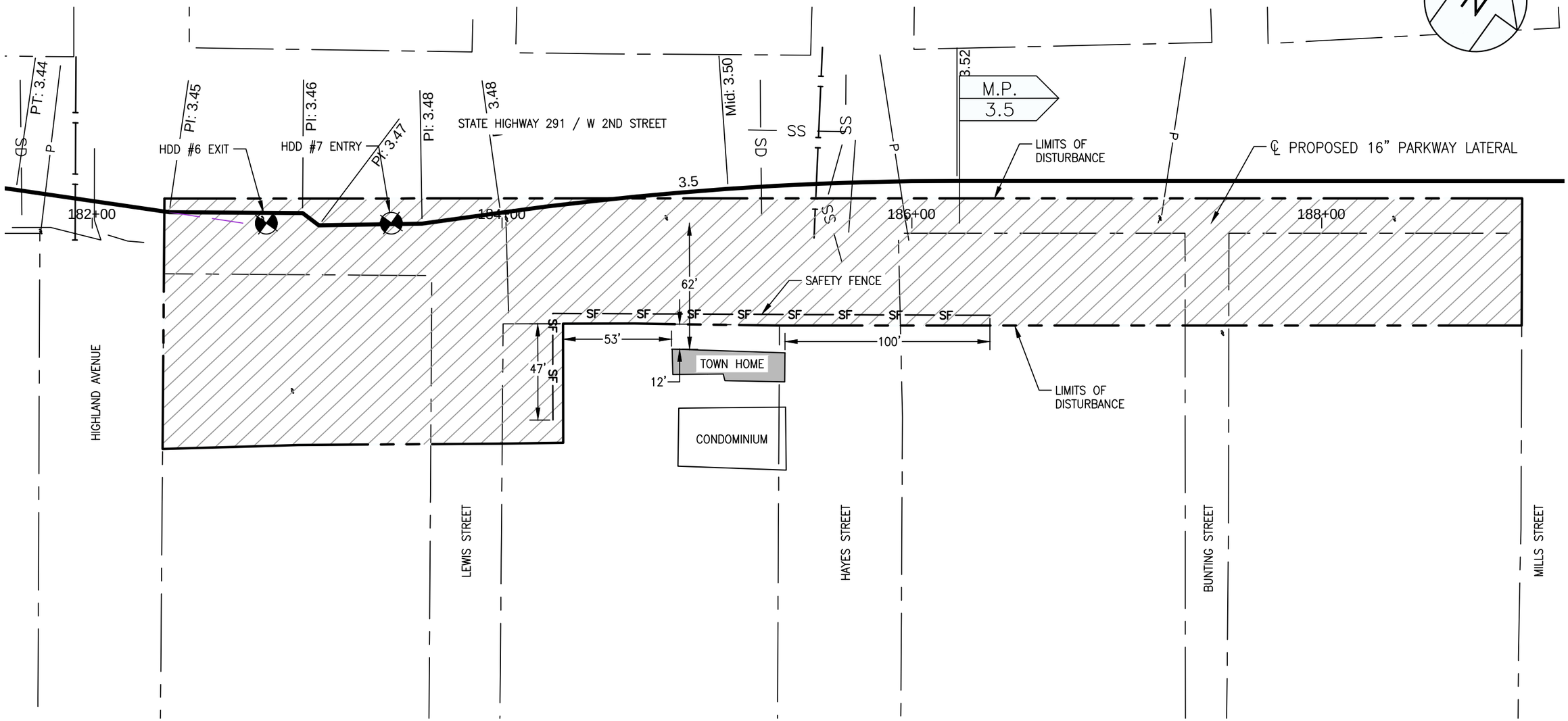
HGA
www.hga-llc.com
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
T: 205-970-4977
FIRM #: AL CA-4334-E

ADELPHIA GATEWAY, LLC
RESIDENTIAL IMPLEMENTATION PLAN
PROPOSED 16" PARKWAY LATERAL
NEW CASTLE CO., DELAWARE & DELAWARE CO., PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	8.A17022.12.0-RCP-001	

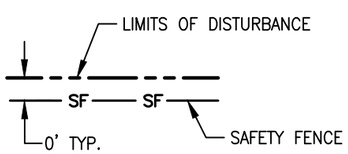
10/1/2018 3:46 PM
MCFALL, JOHN

RESIDENTIAL IMPLEMENTATION PLAN
DELAWARE COUNTY, PENNSYLVANIA



LEGEND

- ℄ PROPOSED PIPELINE
- PROPOSED PERMANENT RIGHT-OF-WAY
- LIMITS OF DISTURBANCE
- SF — SAFETY FENCE
- PL — PROPERTY LINE
- DWELLING WITHIN 10'
- DWELLING BETWEEN 10'-25'
- DWELLING GREATER THAN 25'
- OTHER STRUCTURE



SAFETY FENCE TO BE INSTALLED AT THE LIMITS OF DISTURBANCE.

0 50' 100'

SCALE: 1"=50'

FOR DISCUSSION PURPOSES ONLY 10/01/18

REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	HGA	10/01/2018		

REVISION

DRAWN BY	JWP	09/20/18
DESIGNED BY	HGA	09/20/18
CHECKED BY		
APPROVED BY		
HGA JOB NO.		
PLOT SCALE	1"=50'	
MODEL ID		

HGA
www.hga-llc.com
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
T: 205-970-4977
FIRM #: AL CA-4334-E

ADELPHIA GATEWAY, LLC
RESIDENTIAL IMPLEMENTATION PLAN
PROPOSED 16" PARKWAY LATERAL
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	8.A17022.12.0-RCP-002	

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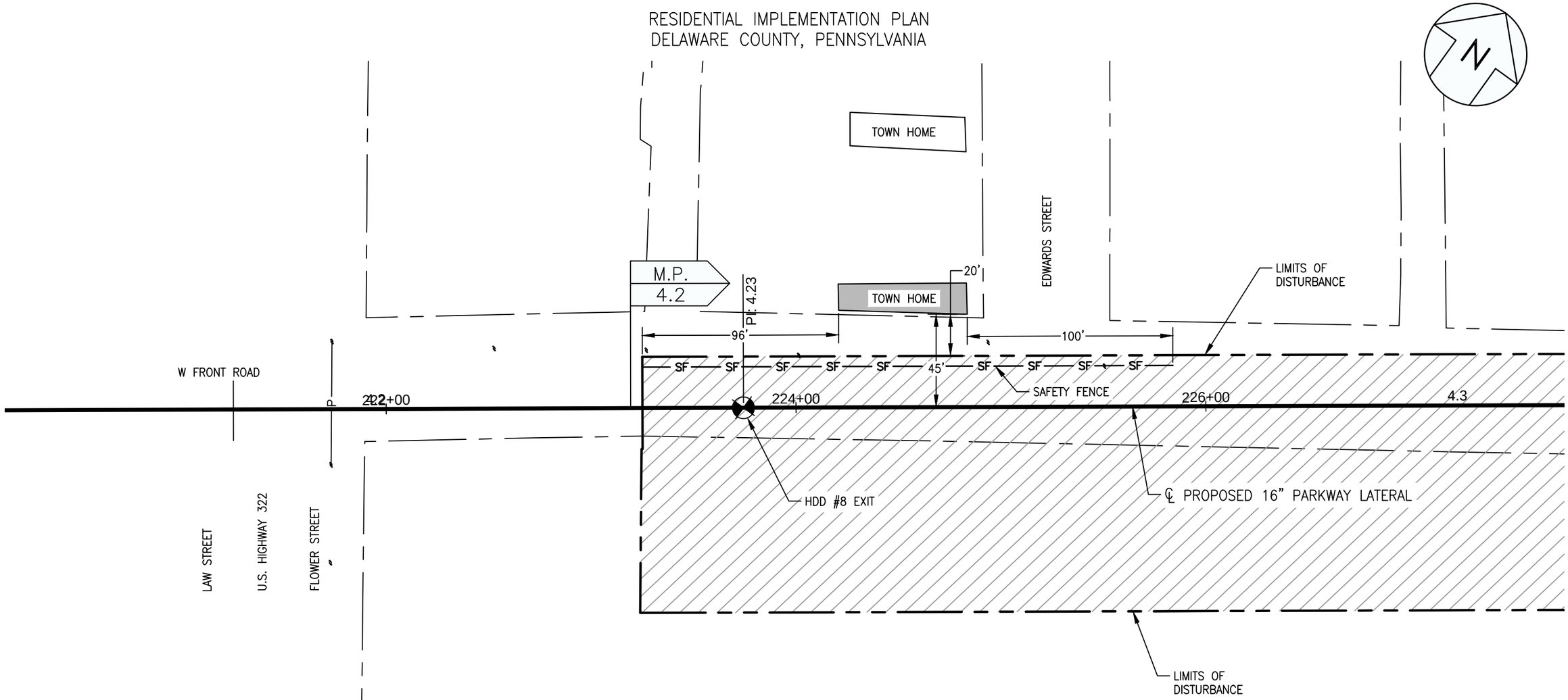
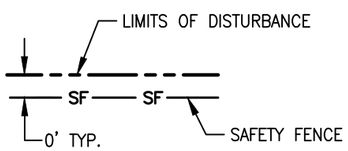
MCFALL, JOHN

RESIDENTIAL IMPLEMENTATION PLAN
DELAWARE COUNTY, PENNSYLVANIA

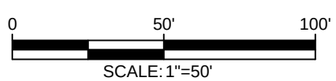


LEGEND

- ℄ PROPOSED PIPELINE
- PROPOSED PERMANENT RIGHT-OF-WAY
- LIMITS OF DISTURBANCE
- SF — SAFETY FENCE
- PL — PROPERTY LINE
- DWELLING WITHIN 10'
- DWELLING BETWEEN 10'-25'
- DWELLING GREATER THAN 25'
- OTHER STRUCTURE



SAFETY FENCE TO BE INSTALLED AT THE LIMITS OF DISTURBANCE.



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REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	HGA	10/01/2018		

REVISION

DRAWN BY	JWP	09/20/18
DESIGNED BY	HGA	09/20/18
CHECKED BY		
APPROVED BY		
HGA JOB NO.		
PLOT SCALE	1"=50'	
MODEL ID		

HGA
www.hga-llc.com
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
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FIRM #: AL CA-4334-E

ADELPHIA GATEWAY, LLC
RESIDENTIAL IMPLEMENTATION PLAN
PROPOSED 16" PARKWAY LATERAL
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	8.A17022.12.0-RCP-003	

10/1/2018 3:50 PM
MCFALL, JOHN

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] Federal Energy Regulatory Commission; Adelphia Pipeline

Project Name: Adelphia Gateway Project

Project Location: North Hampton, Delaware, Chester, Montgomery, and Bucks Counties Pennsylvania and New Castle County, Delaware.

Basic Project Description : The proposed Adelphia Gateway Project consists of existing and newly constructed facilities. Adelphia would purchase and existing system currently owned and operated by IEC. Adelphia proposes to construct two 16-inch-diameter lateral pipeline, one 3-inch diameter pipeline, two compressor stations, five meter stations, eight blowdown assembly valves, and two mainline valves. Construction activities would include the clearing and grading of approximately 3.5 acres of forested habitat within the Project area.

[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	3.5 acres	
If known, estimated acres[5] of forest conversion from April 1 to October 31		
If known, estimated acres of forest conversion from June 1 to July 31[6]		
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.

[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.

Signature: _  _____ Date Submitted: 01/04/2019

APPENDIX I
CONSTRUCTION AIR EMISSIONS

Table 9.1-9 Summary of General Conformity Applicability Analysis

Project Element	NO_2 Standards		Ozone 8-hr Standards				$PM_{2.5}$ Standards			PM_{10} Standards	SO_2 Standards		CO Standards
	2010	1971	2008 NO_X	2008 VOC	1997 NO_X	1997 VOC	2012	2006	1997	1987	2010	1971	1971
Bucks County, PA													
Quakertown Compressor Station													
Estimated 2018 emissions (tpy)	7.36	7.36	7.36	0.47	7.36	0.47	0.84	0.84	0.84	2.32	0.01	0.01	4.79
Quakertown Meter Station													
Estimated 2018 emissions (tpy)	3.44	3.44	3.44	0.24	3.44	0.24	0.29	0.29	0.29	1.11	0.01	0.01	2.80
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**10.80**	**10.80**	**10.80**	**0.72**	**10.80**	**0.72**	**1.13**	**1.13**	**1.13**	**3.43**	**0.02**	**0.02**	**7.59**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Chester County, PA													
Paoli Pike Blowdown Station													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04
French Creek Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04
Main Line Valve 2													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04
Pickering Creek Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04
Cromby Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.59	0.00	0.00	0.04
Schuylkill River Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04

Table 9.1-9 Summary of General Conformity Applicability Analysis

Project Element	NO_2 Standards		Ozone 8-hr Standards				$PM_{2.5}$ Standards			PM_{10} Standards	SO_2 Standards		CO Standards
	2010	1971	2008 NO_X	2008 VOC	1997 NO_X	1997 VOC	2012	2006	1997	1987	2010	1971	1971
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**0.13**	**0.13**	**0.13**	**0.01**	**0.13**	**0.01**	**0.36**	**0.36**	**0.36**	**3.51**	**0.00**	**0.00**	**0.26**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Montgomery County, PA													
Skippack Meter Station													
Estimated 2018 emissions (tpy)	3.07	3.07	3.07	0.24	3.07	0.24	0.28	0.28	0.28	1.10	0.01	0.01	2.69
Perkiomen Creek Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.58	0.58	0.58	0.58	0.00	0.00	0.04
East Pekiomen Blowdown													
Estimated 2018 emissions (tpy)	0.02	0.02	0.02	0.00	0.02	0.00	0.06	0.06	0.06	0.58	0.00	0.00	0.04
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**3.11**	**3.11**	**3.11**	**0.25**	**3.11**	**0.25**	**0.93**	**0.93**	**0.93**	**2.27**	**0.01**	**0.01**	**2.78**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Delaware County, PA													
Transco Meter Station Construction													
Estimated 2018 emissions (tpy)	3.07	3.07	3.07	0.06	3.07	0.06	0.28	0.28	0.28	1.11	0.01	0.01	2.73
Marcus Hook Compressor Station													
Estimated 2018 emissions (tpy)	6.79	6.79	6.79	0.11	6.79	0.11	0.84	0.84	0.84	2.34	0.01	0.01	4.74
Tilghman Meter Station													
Estimated 2018 emissions (tpy)	3.07	3.07	3.07	0.06	3.07	0.06	0.28	0.28	0.28	1.10	0.01	0.01	2.73
Tilghman Lateral Pipeline Construction													
Estimated 2018 emissions (tpy)	6.15	6.15	6.15	0.11	6.15	0.11	1.07	1.07	1.07	7.67	0.01	0.01	4.55
Ridge Lateral Pipeline Construction													
Estimated 2018 emissions (tpy)	2.30	2.30	2.30	0.04	2.30	0.04	0.20	0.20	0.20	0.69	0.00	0.00	2.03
Chester Creek Blowdown Construction													
Estimated 2018 emissions (tpy)	0.07	0.07	0.07	0.01	0.07	0.01	0.65	0.65	0.65	6.42	0.00	0.00	0.22
Main Line Valve 1 Construction													
Estimated 2018 emissions (tpy)	0.07	0.07	0.07	0.01	0.07	0.01	0.65	0.65	0.65	6.42	0.00	0.00	0.22
Monroe Meter Station Construction													
Estimated 2018 emissions (tpy)	3.07	3.07	3.07	0.06	3.07	0.06	0.29	0.29	0.29	1.16	0.01	0.01	2.73

Table 9.1-9 Summary of General Conformity Applicability Analysis

Project Element	NO_2 Standards		Ozone 8-hr Standards				$PM_{2.5}$ Standards			PM_{10} Standards	SO_2 Standards		CO Standards
	2010	1971	2008 NO_X	2008 VOC	1997 NO_X	1997 VOC	2012	2006	1997	1987	2010	1971	1971
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Nonattainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**100**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**24.59**	**24.59**	**24.59**	**0.44**	**24.59**	**0.44**	**4.26**	**4.26**	**4.26**	**26.90**	**0.05**	**0.05**	**19.93**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Northampton County, PA													
Martins Creek Station													
Estimated 2018 emissions (tpy)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Newcastle County, DE													
Parkway Lateral Meter Stations Construction[3]													
Estimated 2018 emissions (tpy)	5.82	5.82	5.82	0.46	5.82	0.46	0.48	0.48	0.48	1.54	0.01	0.01	5.24
Parkway Lateral Pipeline Construction													
Estimated 2018 emissions (tpy)	2.91	2.91	2.91	0.23	2.91	0.23	0.28	0.28	0.28	1.13	0.01	0.01	2.66
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attainment**	**Maintenance**	**Maintenance**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**25**	**25**	**25**	**25**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**8.74**	**8.74**	**8.74**	**0.68**	**8.74**	**0.68**	**0.75**	**0.75**	**0.75**	**2.68**	**0.02**	**0.02**	**7.90**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Construction Project Triggers General Conformity Requirements? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

1. County is inside the Ozone Transport Region (OTR).
2. PA Air Regulations specify that a major source of ozone (NO_x and VOC as precursors) in Bucks, Montgomery and Delaware Counties are those with potential emissions greater than 25 tpy.

APPENDIX J

ACOUSTICAL SURVEY AND ANALYSIS SUMMARY FOR HORIZONTAL DIRECTIONAL DRILLS

Appendix J Acoustical Survey and Analysis Summary for Horizontal Directional Drills							
HDD Segment	**NSA**	**Distance and Direction of NSA from HDD Location**		**Estimated Ldn from HDD Activities (dBA)**	**Existing Ambient Ldn (dBA)**	**Estimated Total Ldn (dBA)**	**Predicted Change from Existing Ambient Ldn (dBA)**
		Entry	**Exit**				
HDD 1 Entry & Exit	CS NSA1a	121 northwest	1889 southwest	72.1	68.2	73.6	5.4
	CS NSA1b	258 northwest	1656 southwest	65.5	68.2	70.1	1.9
	HDD NSA1	230 west	2058 southwest	66.5	68.2	70.4	2.2
	CS NSA2	3158 northwest	1307 northwest	48.2	68.6	68.6	0.0
HDD 2 Entry & Exit	CS NSA2	1302 northwest	1745 southwest	51.9	68.6	68.7	0.1
	HDD NSA2	2804 northwest	256 west	63.5	61.8	65.7	3.9
	HDD NSA3	3025 northwest	99 north	71.5	61.8	71.9	10.1
	HDD NSA4	3234 northwest	217 northwest	64.7	61.8	66.5	4.7
	HDD NSA5	4309 northwest	1306 east	50.4	61.4	61.7	0.3
HDD 3 Entry & Exit	HDD NSA2	4695 southwest	278 west	62.3	61.8	65.0	3.2
	HDD NSA3	4474 southwest	107 north	70.7	61.8	71.2	9.4
	HDD NSA4	4265 southwest	198 northwest	66.1	61.8	67.4	5.6
	HDD NSA5	3239 southwest	1284 east	51.1	61.4	61.8	0.4
	HDD NSA6	997 southwest	3446 northwest	55.3	64.6	65.1	0.5
	HDD NSA7	189 north	4569 northwest	68.1	64.6	69.7	5.1
	HDD NSA8	975 east	5322 northwest	52.1	64.6	64.8	0.2
HDD 4 Entry & Exit	HDD NSA6	3644 southwest	1028 southwest	53.1	64.6	64.9	0.3
	HDD NSA7	2527 southwest	169 north	67.0	64.6	68.9	4.3
	HDD NSA8	1817 southwest	947 east	52.5	64.6	64.9	0.3
	HDD NSA9	257 northwest	2865 northwest	65.6	67.0	69.3	2.3
	HDD NSA10	143 northwest	2505 northwest	70.7	67.0	72.2	5.2
	HDD NSA11	587 southwest	2035 northwest	58.3	67.0	67.5	0.5
	HDD NSA12	1112 southwest	1703 east	54.8	63.6	64.1	0.5
HDD 5 Entry & Exit	HDD NSA10	716 north	1626 north	65.4	67.0	69.3	2.3
	HDD NSA11	549 northwest	1478 northwest	67.6	67.0	70.3	3.3
	HDD NSA12	604 west	1197 northwest	68.0	63.6	69.4	5.8
	HDD NSA13	1127 southeast	601 east	66.1	67.0	69.6	2.6
	HDD NSA14	1392 southwest	1148 west	62.0	64.8	66.6	1.8
	HDD NSA15	1604 southeast	796 southeast	63.7	67.0	68.7	1.7

Appendix J (continued)
Acoustical Survey and Analysis Summary for Horizontal Directional Drills

HDD Segment	NSA	Distance and Direction of NSA from HDD Location		Estimated Ldn from HDD Activities (dBA)	Existing Ambient Ldn (dBA)	Estimated Total Ldn (dBA)	Predicted Change from Existing Ambient Ldn (dBA)
		Entry	Exit				
HDD 6 Entry & Exit	HDD NSA15	372 northwest	2859 southwest	62.2	67.0	68.2	1.2
	HDD NSA16	118 north	2677 southwest	72.5	66.1	73.4	7.3
	HDD NSA17	551 northwest	2209 southwest	58.9	66.1	66.9	0.8
	HDD NSA18	2649 northwest	142 northwest	68.6	70.1	72.4	2.3
	HDD NSA19	2794 northwest	99 north	71.4	70.1	73.8	3.7
	HDD NSA20	2900 northwest	171 northwest	66.9	70.1	71.8	1.7
	HDD NSA21	2752 northwest	101 south	71.4	66.5	72.6	6.1
	HDD NSA22	2960 northwest	208 east	65.1	70.1	71.3	1.2
HDD 7 Entry & Exit	HDD NSA18	173 northwest	1744 southwest	69.0	70.1	72.6	2.5
	HDD NSA19	92 north	1599 southwest	74.3	70.1	75.7	5.6
	HDD NSA20	140 northwest	1493 southwest	70.9	70.1	73.5	3.4
	HDD NSA21	111 south	1646 southwest	72.9	70.1	74.7	4.6
	HDD NSA22	171 east	1433 southwest	69.2	70.1	72.7	2.6
	HDD NSA23	1124 northwest	488 west	58.9	70.1	70.4	0.3
	HDD NSA24	1605 northwest	204 south	65.3	66.5	68.9	2.4
	HDD NSA25	1951 northwest	394 east	59.8	66.5	67.3	0.8
	HDD NSA26	1592 northwest	441 northwest	59.2	66.5	67.2	0.7
HDD 8 Entry & Exit	HDD NSA24	313 west	2112 southwest	63.8	66.5	68.4	1.9
	HDD NSA25	205 north	1765 southwest	67.6	66.5	70.1	3.6
	HDD NSA27	1462 northwest	652 northwest	56.5	69.4	69.6	0.2
	HDD NSA28	1933 northwest	109 north	70.9	69.4	73.2	3.8
HDD 9 Entry & Exit	HDD NSA28	438 west	654 northwest	70.2	69.4	72.8	3.4
	HDD NSA29	424 north	851 northwest	70.1	65.7	71.5	5.8
	HDD NSA30	825 northwest	1103 northwest	65.3	65.7	68.5	2.8

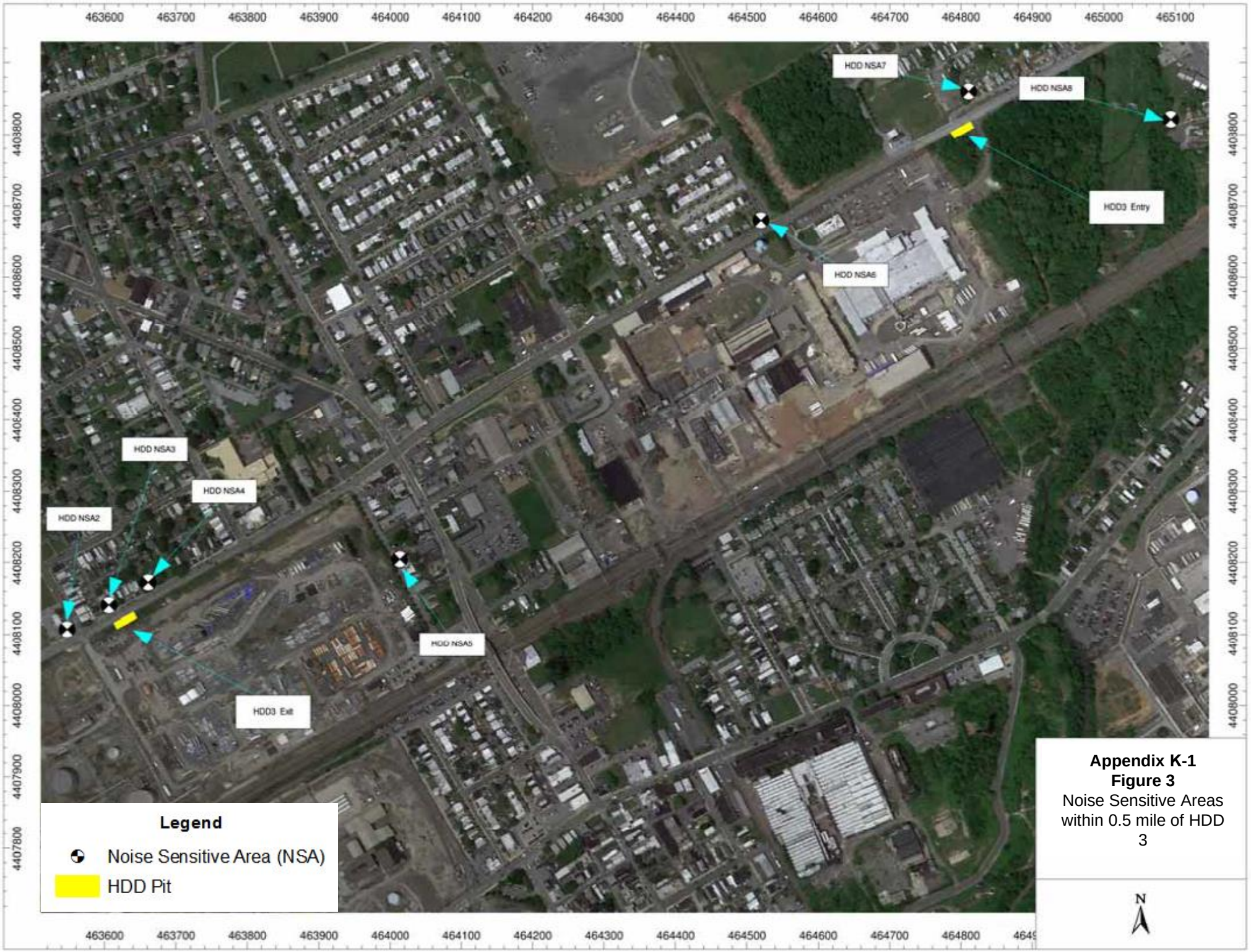
[a] Noise is based on HDD drilling operations occurring 24 hours a day, with all combustion engines to be fitted with a residential-grade exhaust muffler, and where appropriate, low-noise equipment would be used; this is applicable all HDDs with the exception of HDD 5 and HDD 9, for which mitigation would be based on HDD drilling operations occurring during daytime periods only, with all combustion engines to be fitted with a residential-grade exhaust muffler, and where appropriate, low-noise equipment would be used

APPENDIX K
NEAREST NOISE SENSITIVE AREAS TO THE PROJECT

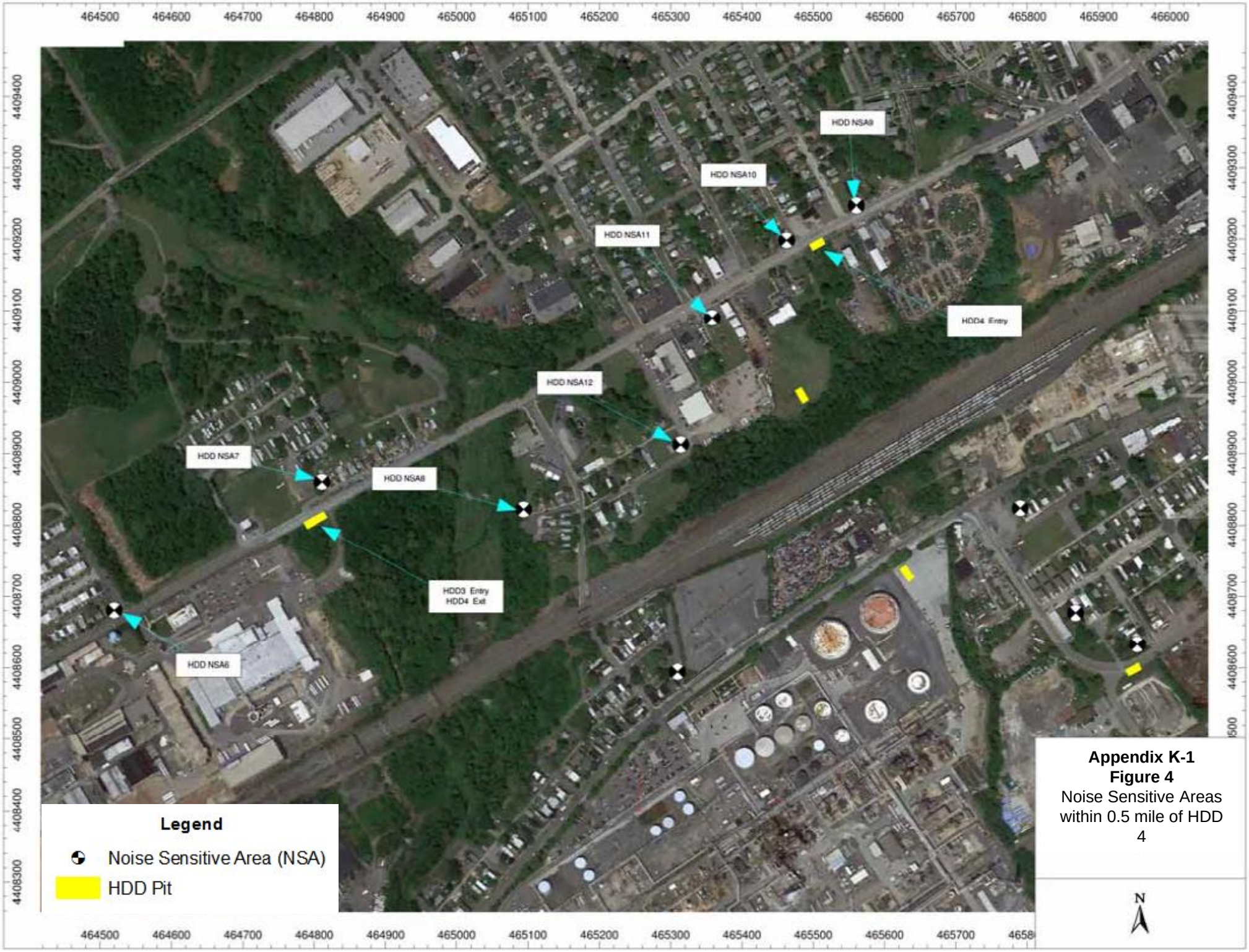
APPENDIX K-1

Appendix K-1
Figure 1
Noise Sensitive Areas within 0.5 mile of HDD 1

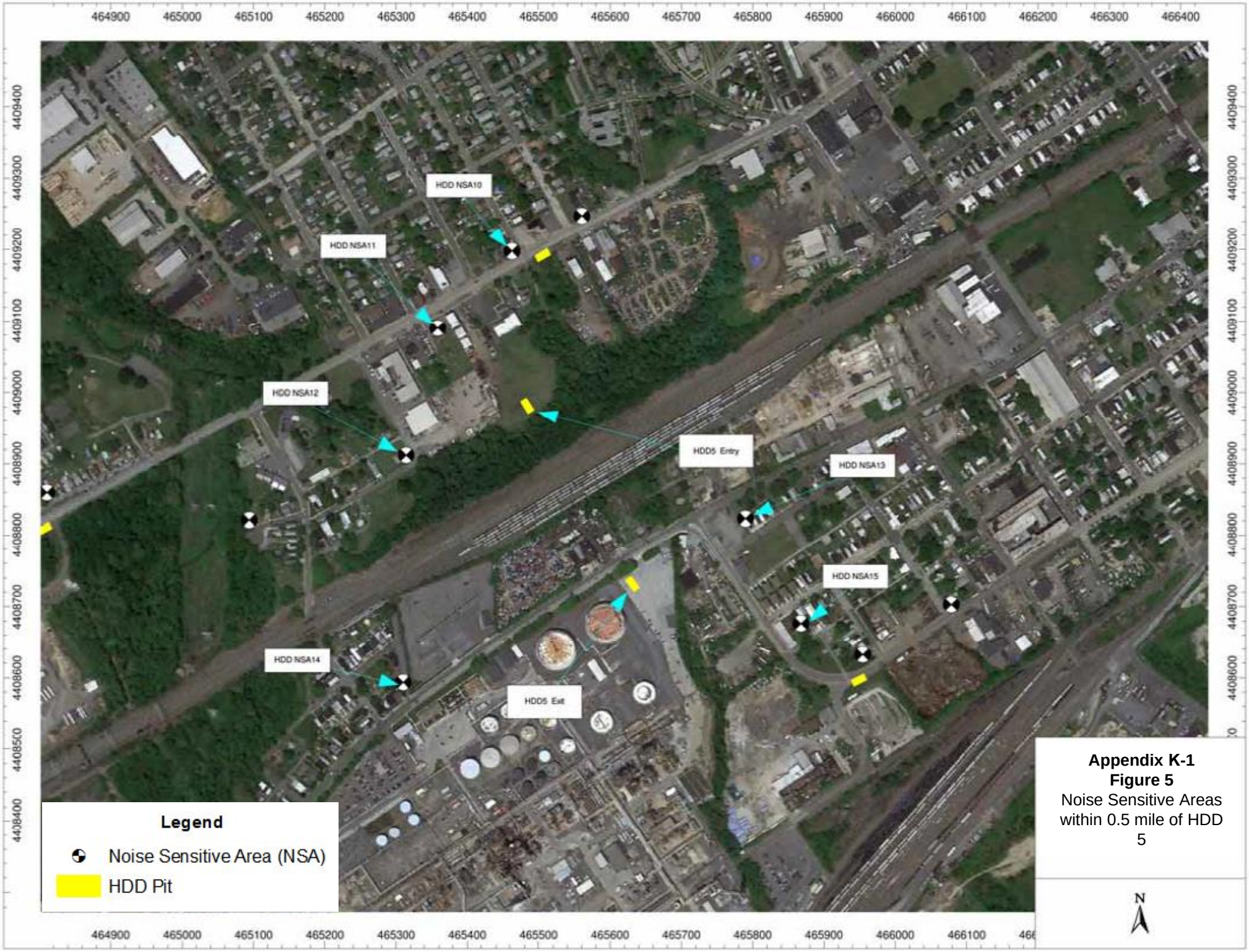
Appendix K-1
Figure 2
Noise Sensitive Areas within 0.5 mile of HDD 2



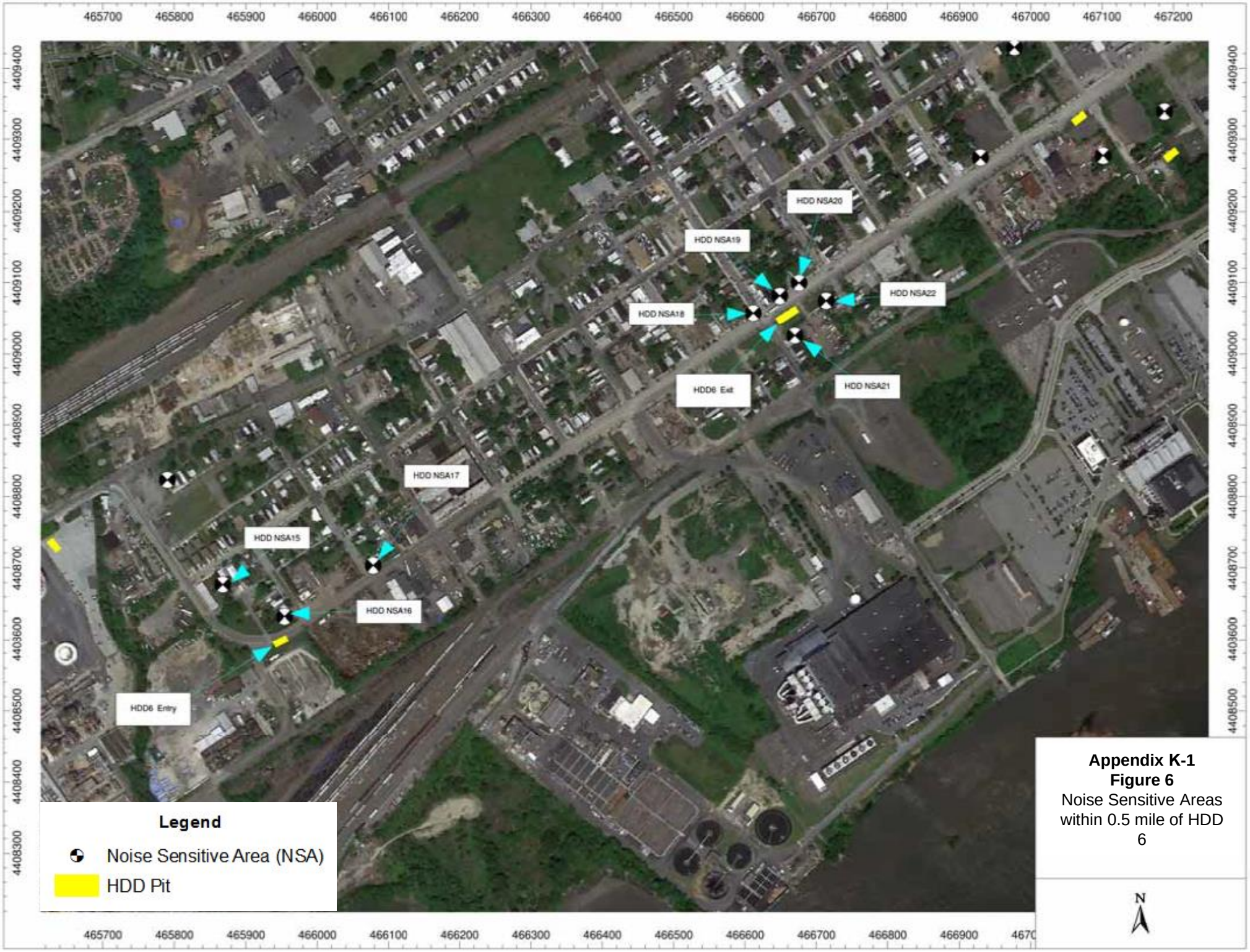
Appendix K-1
Figure 3
Noise Sensitive Areas within 0.5 mile of HDD 3



Appendix K-1
Figure 4
Noise Sensitive Areas within 0.5 mile of HDD 4

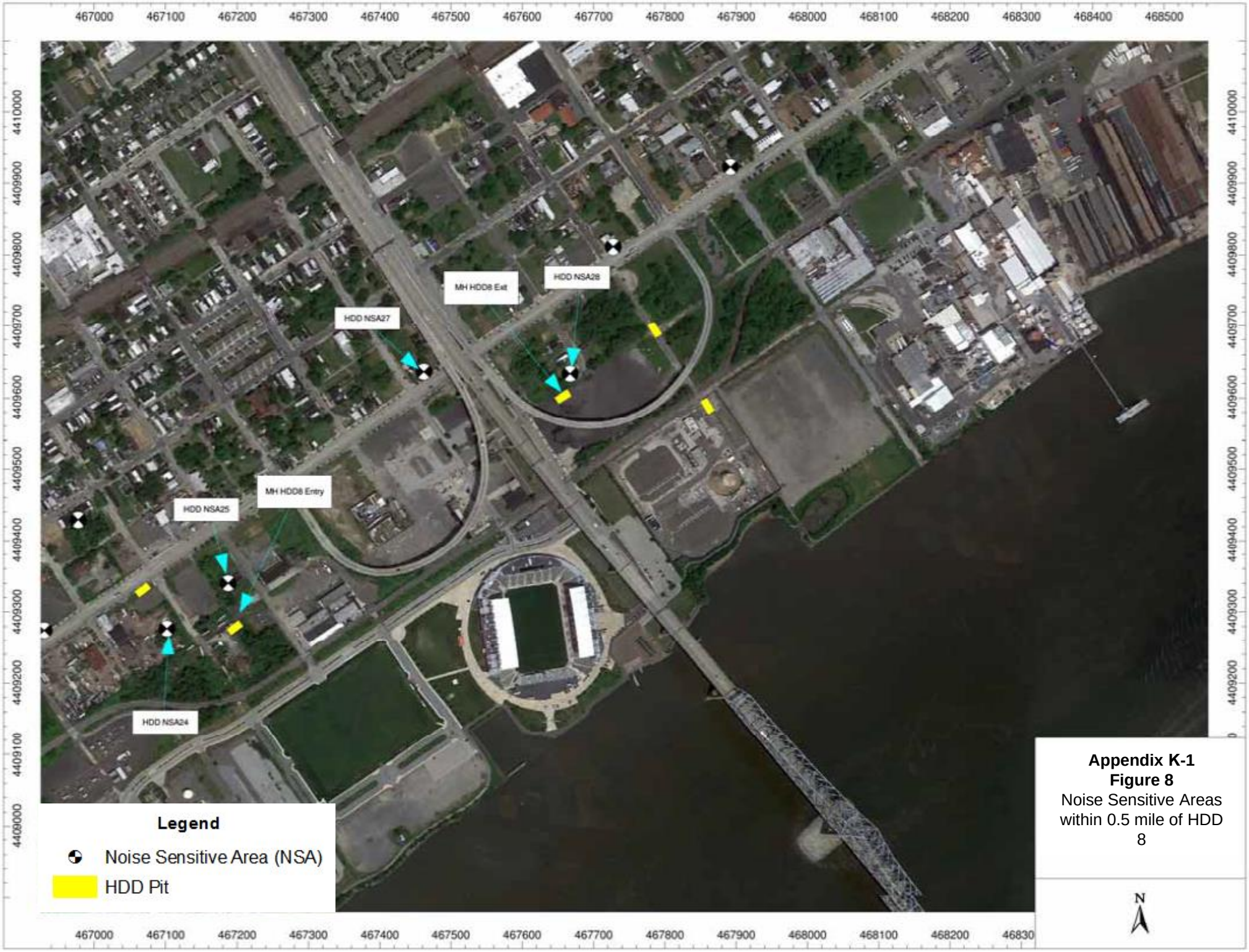


Appendix K-1
Figure 5
Noise Sensitive Areas within 0.5 mile of HDD 5



Appendix K-1
Figure 6
Noise Sensitive Areas within 0.5 mile of HDD 6

Appendix K-1
Figure 7
Noise Sensitive Areas within 0.5 mile of HDD 7



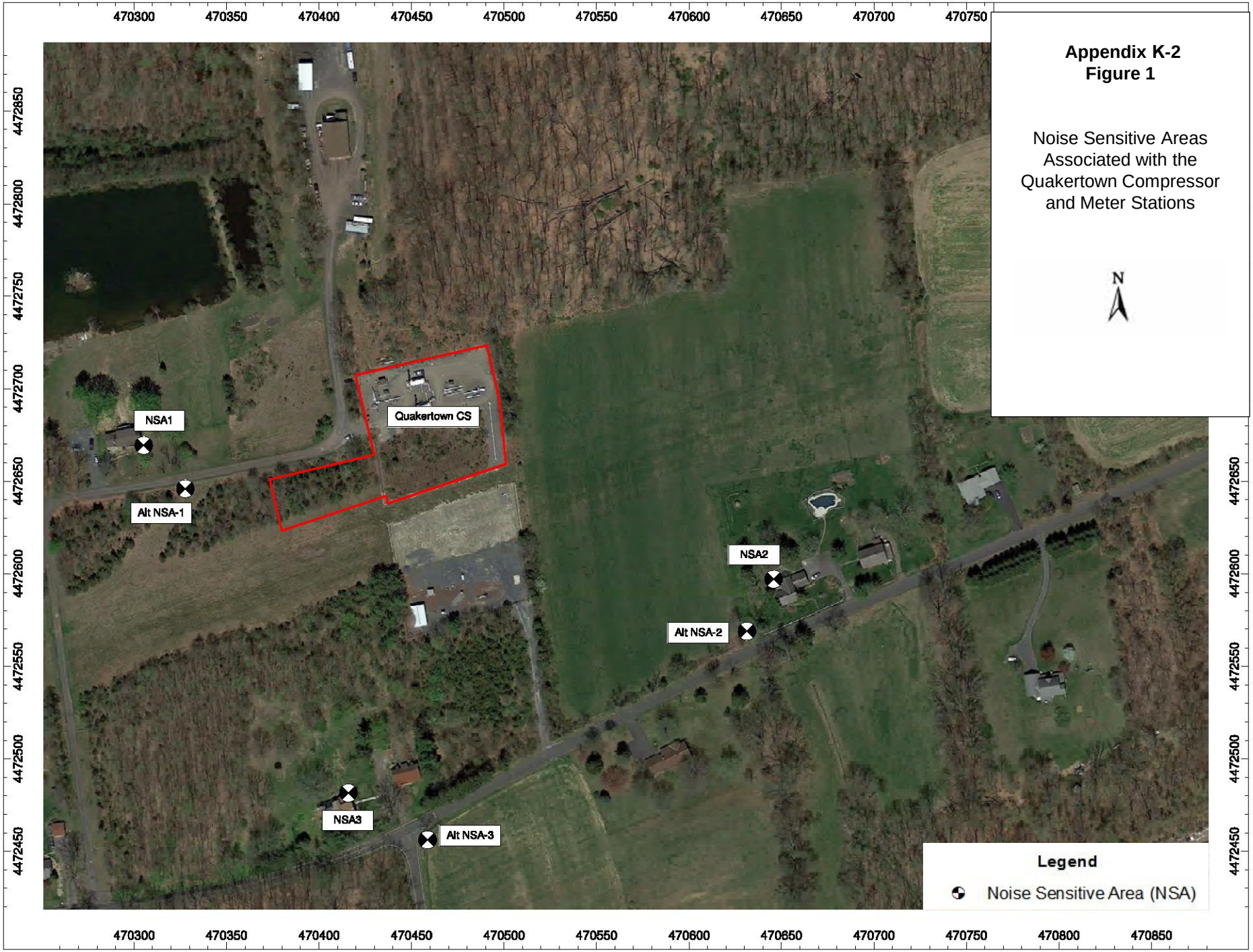
Appendix K-1
Figure 8
Noise Sensitive Areas within 0.5 mile of HDD 8

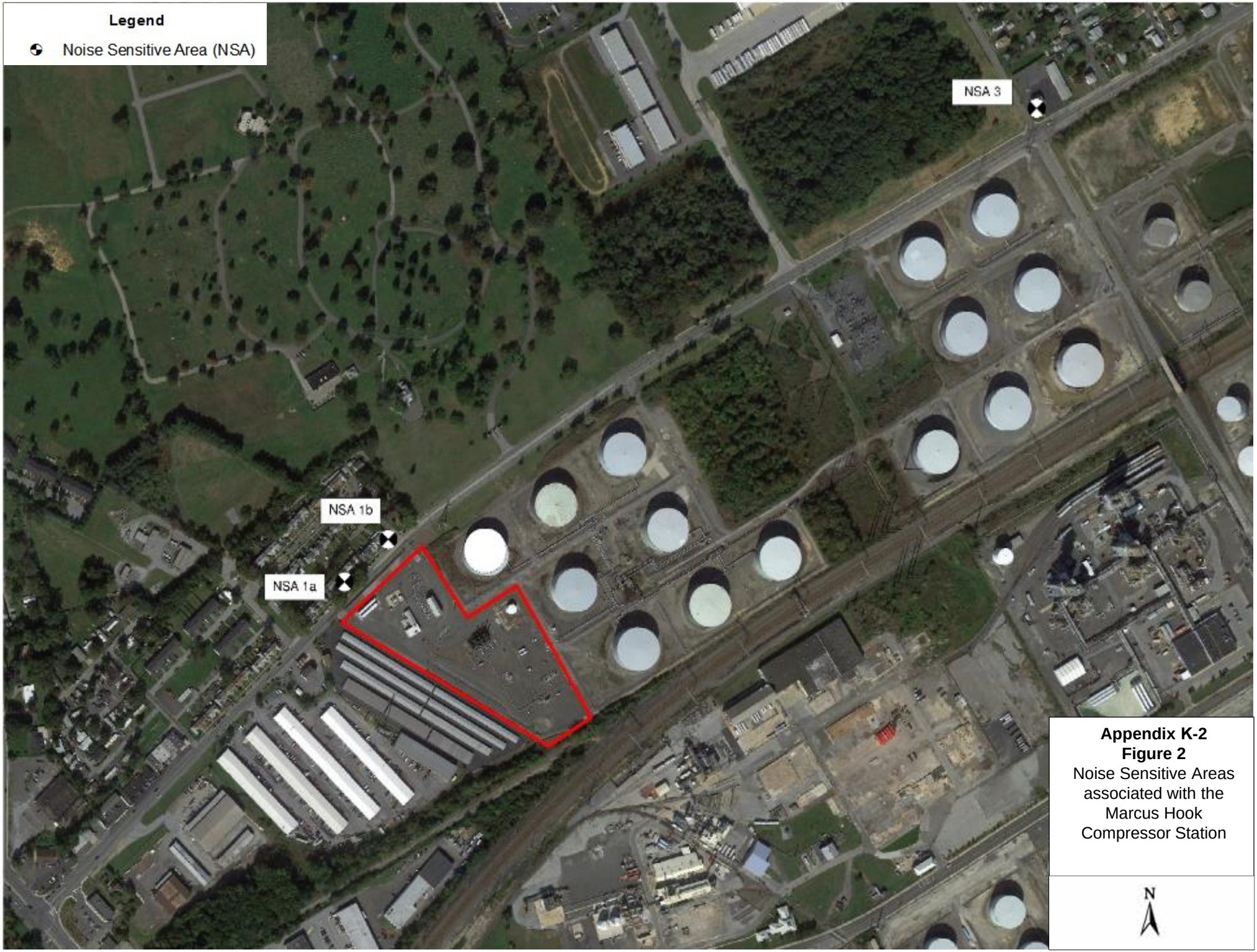
Appendix K-1
Figure 9
Noise Sensitive Areas within 0.5 mile of HDD 9

APPENDIX K-2

Appendix K-2
Figure 1

Noise Sensitive Areas Associated with the Quakertown Compressor and Meter Stations





Appendix K-2
Figure 2
Noise Sensitive Areas associated with the Marcus Hook Compressor Station

Appendix K-2
Figure 3
Noise Sensitive Areas associated with the Delmarva Meter Station

Appendix K-2
Figure 4
Noise Sensitive Areas associated with the Transco Meter Station

Appendix K-2
Figure 5
Noise Sensitive Areas associated with the Monroe Meter Station

Appendix K-2
Figure 6
Noise Sensitive Areas associated with the Tilghman Meter Station