

ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 5

Socioeconomics

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Source(s)^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. For major aboveground facilities and major pipeline projects that require an environmental impact statement, describe existing socioeconomic conditions within the Project area – Title 18 CFR § 380.12 (g)(1)	I, JJ, KK	5.1	N/A
2. For major aboveground facilities, quantify impact on employment, housing, local government services, local tax revenues, transportation, and other relevant factors within the Project area – 18 CFR § 380.12 (g)(2-6)	I, KK, LL	5.1, 5.2	N/A
CFR = Code of Federal Regulations ^a I = County/Municipal Agencies JJ = U.S. Department of Labor KK = U.S. Bureau of the Census LL = U.S. Department of Transportation Source: FERC, 2017			

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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
Delmarva Station	Delmarva-owned meter station (location of Parkway Lateral interconnect facilities).
Tilghman Station	existing interconnect between PECO and TETCO systems at Tilghman Street
Project	Adelphia Gateway Project
RV	recreational vehicle
U.S. Census	United States Department of Commerce, Bureau of the Census

5 SOCIOECONOMICS

This resource report describes the socioeconomic conditions for the proposed Adelphia Gateway Project (Project) and provides an analysis of the potential socioeconomic impacts resulting from construction and operation of the Project. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard.

The socioeconomic data presented in this resource report was obtained from the United States Department of Commerce, Bureau of the Census (U.S. Census) online database (U.S. Census, 2010). The statistics presented within this report represent the most current available data from all censuses. Census information from 2010 and 2016 was used to the extent it was available to account for socioeconomic changes in population. Information provided for community public services, infrastructure, and available hotel lodging and recreation vehicle (RV) parks was obtained from publicly available online sources, as cited.

5.1 EXISTING CONDITIONS

5.1.1 Population

Details regarding population data and trends, including population density, for the states and counties that would be crossed by the Project are provided in table 5.1-1. The population density of each individual county crossed by the Project is greater than the average densities for the states of Pennsylvania and Delaware. Population densities in all counties surrounding the Project are significantly above the national average of 87.4 people per square mile (U.S. Census, 2010).

State/County	2010 Population	2010 Population Density (people/square mile)	2016 Population Estimate	2010 – 2016 Population Change (%)
Pennsylvania	12,702,379	124.4	12,784,227	+0.1
Delaware	558,979	1,212.5	563,402	+0.1
Chester	498,886	657.3	516,312	+3.5
Montgomery	799,874	674.3	821,725	+0.5
Bucks	625,249	407.0	626,399	+<0.1
Northampton County	297,735	805.4	302,294	+1.0
Delaware	897,934	208.3	952,065	+1.0
New Castle	538,477	510.2	556,987	+0.6
Source: U.S. Census, 2010; 2016				

Table 5.1-2 lists the municipalities crossed by the Project along with their populations and population densities. Of the municipalities in proximity to the Project area, East Goshen and Concord Townships had the largest populations according to the 2010 U.S. census. Populations in these two municipalities were at least several magnitudes larger than the other municipalities crossed by the Project area. Claymont CDP and Richlandtown Borough were two of the most densely populated municipalities in the Project area in 2010; Richlandtown, however, had the highest population density in the Project area (but a relatively small population size and area of approximately 0.3 square miles).

County/State	Municipality	Nearby Project Site(s) ^a	2010 Population	2010 Population Density (people/mi ²)
Delaware/PA	Lower Chichester Township	Marcus Hook Compressor Station and wareyard, Parkway Lateral, Tilghman Lateral, Transco Meter Station	3,469	3,242
	Trainer Borough	Tilghman Lateral, Monroe Meter Station,	1,828	1,329
	Chester Township	Tilghman Lateral,	3,940	2,757

County/State	Municipality	Nearby Project Site(s) ^a	2010 Population	2010 Population Density (people/mi ²)
		PECO Meter Station		
New Castle/DE	Claymont CDP	Parkway Lateral, TETCO Meter Station, TCO Meter Station, Delmarva Meter Station	8,253	3,958
Montgomery/PA	Skippack Township	Skippack Meter Station, East Perkiomen Gate Blowdown	13,715	982
Delaware/PA	Concord Township	New MLV Options 1 and 2	17,231	1,263
Delaware/PA	Thornbury Township	Chester Creek Gate Blowdown	8,028	866
Chester/PA	East Goshen Township	Paoli Pike Gate Blowdown	18,026	1,774
Chester/PA	Charlestown Township	Pickering Creek Gate Blowdown	5,671	453
Chester/PA	East Pikeland Township	French Creek Gate Blowdown, Cromby Gate Blowdown, Schuylkill River Gate Blowdown	7,079	796
Montgomery/PA	Perkiomen Township	Perkiomen Creek Gate Blowdown	9,139	1,853
Bucks/PA	Richlandtown Borough	Quakertown Compressor Station, Quakertown Meter Station	1,327	5116
	West Rockhill Township		5,256	320
Northampton/PA	Lower Mount Bethel Township	Martins Creek Station	3,101	126

^a Includes associated meter stations and delivery points.
Source: U.S. Census, 2010; Google Maps, 2017

5.1.2 Economy and Employment

Table 5.1-3 provides income and employment information for the states and counties that would be crossed by the Project. As shown in the table, 2015 state-wide per capita income and median household income for Pennsylvania and Delaware were similar. Montgomery County, Pennsylvania had the highest per capita and median household income of all counties crossed by the Project; these income values were also significantly higher than those for the state of Pennsylvania. Bucks County, Pennsylvania had the lowest per capita income of the counties

crossed by the Project; however, its median household income was the second highest crossed by the Project. Northampton County, Pennsylvania had the lowest 2015 median household income of the counties crossed by the Project (U.S. Census, 2015b).

Table 5.1-3					
2015 Socioeconomic Conditions in the Project Area					
State/County	Per Capita Income (U.S. Dollars [inflation adjusted])	Median Household Income (U.S. Dollars [inflation adjusted])	Civilian Labor Force	Unemployment Rate (%)	Major Industry
Pennsylvania	\$30,251	\$55,355	6,518,882	7.9	Educational services, health care, and social assistance; Manufacturing
Delaware	\$35,181	\$67,258	293,191	8.2	Educational services, health care, and social assistance; Professional, scientific, and management, and administrative and waste management services
Chester	\$43,951	\$109,031	276,983	5.9	Manufacturing, Retail trade, Finance and insurance, Professional, scientific, and management, Arts, entertainment.
Montgomery	\$43,661	\$83,319	447,095	6.4	Educational services, health care, and social assistance; Professional, scientific, and management; Administrative and waste management services
Bucks	\$40,067	\$80,111	345,609	7.0	Educational services, health care, and social assistance; Retail trade

State/County	Per Capita Income (U.S. Dollars [inflation adjusted])	Median Household Income (U.S. Dollars [inflation adjusted])	Civilian Labor Force	Unemployment Rate (%)	Major Industry
Northampton	\$31,165	\$62,970	156,288	7.3	Manufacturing; Retail trade, Educational services, and health care, and social assistance.
Delaware	\$31,556	\$62,492	470,039	7.7	Educational services, health care, and social assistance; Retail trade
New Castle	\$33,972	\$68,655	289,856	7.4	Educational services, and health care, and social assistance; Finance and insurance, Real estate and rental and leasing
<small>Note: Reported 2015 U.S. dollars converted to 2017 U.S. Dollars. Sources: U.S. Census, 2015b; U.S. Inflation Calculator, 2017</small>					

Pennsylvania has a larger civilian labor force than Delaware due to its larger geographical size. However, unemployment rates between the two states are comparable, as are unemployment rates among all counties crossed by the Project. In 2015, differences in unemployment rates between states and counties within the Project area did not exceed 2.3% with Chester County having the greatest difference in unemployment when compared to the state in which it is located. The primary industry in 2015 for all counties and states crossed by the Project was the educational services, health care, and social assistance industry (U.S. Census, 2015b).

5.1.3 Housing

The Project would require temporary housing for construction workers during the construction phase; however, it is expected that very few workers would become permanent residents. Table 5.1-4 summarizes temporary housing availability in and near the Project area.

County/State	Rental Vacancy Rate (2015)	Number of Vacant Rental Units (2010)	Number of Units for Seasonal, Recreational, or Occasional Use (2010)	Number of RV Parks (2017) ^a	Number of Hotels and Motels (2017) ^a
Delaware/PA	7.9%	6,585	621	6	35
New Castle/DE	8.2%	6,744	712	2	72
Chester/PA	5.0%	3,672	1,064	2	32
Bucks/PA	6.4%	4,319	1,536	18	80
Montgomery/PA	7.3%	5,118	3,364	18	61
Northampton/PA	5.0%	2,244	755	0	40
Total		25,010	6,988	44	288
Sources: U.S. Census, 2010; 2015c; Google Maps, 2017					
^a Adelphia evaluated hotels and RV parks in relative proximity to the Project area.					

5.1.4 Public Services and Infrastructure

Public services available within the Project area are adequate to provide for the current needs of the counties, cities, and towns in the Project area. Sufficient medical services are available in all Project counties, in addition to sufficient community hospitals and emergency medical services (Google Maps, 2017). Table 5.1-5 summarizes the availability of public services and facilities in the vicinity of the Project area.

County	Community Hospitals	Emergency Medical Services	Police Services	Fire Services
<i>Pennsylvania</i>				
Delaware	2	5	14	19
Chester	6	7	17	15
Bucks	14	14	19	19
Montgomery	8	12	20	20
Northampton	5	12	12	23
<i>Delaware</i>				

Table 5.1-5				
Existing Public Services and Facilities in the Vicinity of the Project Area				
County	Community Hospitals	Emergency Medical Services	Police Services	Fire Services
New Castle	8	7	13	26
Source: Google Maps, 2017				

Major transportation routes within the Project area and their annual average daily traffic (AADT) counts are listed below in table 5.1-6.

Table 5.1-6	
Major Transportation Routes and Traffic Counts in the Vicinity of the Project Area	
County: Major Transportation Route	AADT Count
<i>Pennsylvania</i>	
Delaware: I-476	458,100
Delaware: I-95	666,000
Delaware: US-1	618,000
Delaware: US-13	216,000
Delaware: Pennsylvania-3	338,000
Delaware: PA-291	5,700
Chester: I-76	204,300
Chester: US-322	255,600
Chester:US-202	567,000
Chester: US-30	401,000
Chester: US-1	273,850
Chester: Pennsylvania-100	387,000
Bucks: I-476	114,000
Bucks: I-95	598,700
Bucks: US-1	556,900
Bucks: Pennsylvania-276	131,000
Bucks: Pennsylvania-309	378,000
Montgomery: I-476	629,000
Montgomery: I-76	742,300
Montgomery: US-422	504,300
Montgomery: Pennsylvania-276	615,000
Montgomery: Pennsylvania-309	878,750

Table 5.1-6	
Major Transportation Routes and Traffic Counts in the Vicinity of the Project Area	
County: Major Transportation Route	AADT Count
Northampton: I-78	191,000
Northampton: US-22	273,000
Northampton: Pennsylvania-33	385,000
Northampton: Pennsylvania-611	45,500
Delaware	
New Castle: I-95	1,715,050
New Castle: I-295	393,045
New Castle: US-1	874,440
New Castle: US-9	205,577
<small>Notes: AADT is the typical daily traffic on a road segment for all the days in a week, over a one-year period. Volumes represent total traffic in both directions. AADT data provided includes AADT totals for the highway segment across the entire county. Sources: PennDOT, 2015; DE DOT, 2016</small>	

5.2 SOCIOECONOMIC IMPACT ANALYSIS AND MITIGATION

5.2.1 Population, Employment, and Housing

The Project is not expected to induce growth, displace permanent residents or businesses, or cause any significant population increase, because the Project facilities would be operated with an estimated seven to nine new long-term employees hired. The construction workforce likely would consist primarily of personnel hired from labor unions local to the Project area and would include multiple craft specialists for compressor station and pipeline construction, supervisory personnel, and inspectors. Any personnel hired from outside the Project area would temporarily relocate to the area. A total of 100-150 workers are expected to be working along the Project during peak construction activities. Therefore, the socioeconomic effects would be temporary and primarily related to the construction phase.

The Project area population impacts are expected to be temporary and proportionally small. Most non-local workers are not expected to be accompanied by their families. Most of the construction workforce for the Project is anticipated to occupy temporary residences in rental units and/or hotels, motels, apartments, and RV parks near the Project. Given the number of these temporary housing units and campsites available in communities within commuting distance of the Project, construction crews should not encounter difficulty in finding temporary housing. No significant impacts on local housing markets are expected due to the large number of available

rental units near the Project area (see table 5.1-4). The use of vacant housing units, hotel/motel rooms, and RV parks would provide a temporary increase in rent and local spending that would benefit local communities. Therefore, there would be no long-term impacts on housing.

5.2.2 Economy and Tax Revenue

Construction would take approximately six to seven months to complete from start to finish. During peak construction periods, a total of up to 150 people are anticipated to be working along the Project. Compressor station and pipeline construction would be conducted by companies specializing in these activities. Adelphia anticipates that the majority of the workforce would be hired from labor unions local to the Project area, although some non-local workers would also be hired.

Project construction would result in short-term, beneficial impacts in terms of increased payroll and local material purchases. The estimated total construction payroll for the Project is approximately 9 to 10 million dollars. In addition, the equipment and materials purchased in these communities is estimated to be in excess of 2 to 3 million dollars. The local economy would experience additional increased revenues because of purchases made by the construction workforce in the form of lodging, fuel, food, entertainment, and other expenses. The bulk of most payroll earnings is expected to be spent locally by the construction workforce, resulting in increased sales tax revenue in Pennsylvania. The sales tax rate in Pennsylvania is 6.0 percent (Pennsylvania Department of Revenue, 2017). There is no sales tax in Delaware (Delaware Department of Revenue, 2017).

5.2.3 Property Tax Revenue

Once Project construction activities are complete, the Marcus Hook Compressor Stations, Quakertown Compressor Station, and Martins Creek Station would be subject to applicable state and local property taxes. Final tax considerations are under review, and the tax would be determined based on the final assessed value and any local and State abatement programs. Calculation of the property tax revenues associated with the Project would be subject to the state and county taxes upon completion of construction. County taxes are used to support school operating costs, public safety, public utilities, and other local government functions. The county would assess the value of Project facilities and would levy the local tax rate against the assessed value.

5.2.4 Landowner Compensation

Adelphia would compensate landowners for the acquisition of new property or property rights (easements) associated with the new facilities.

5.2.5 Displacement of Residence or Businesses

The Project has been sited such that there would be minimal impacts on residences and businesses resulting from the construction of the Project. No businesses would be displaced. In areas where residences would be impacted by the Project, Adelphia would work with the landowners to reach mutually acceptable agreements to mitigate these impacts (see Resource Report 8 – *Land Use, Recreation, and Aesthetics* for more information regarding impacts on residences and businesses as a result of the Project). Additional information regarding land use is presented in Resource Report 8.

5.2.6 Environmental Justice

Construction and operation of the Project would not disproportionately affect Pennsylvania Department of Environmental Protection-designated Environmental Justice areas (PADEP, 2015). An Environmental Justice area is defined as any census tract where 20 percent or more individuals live in poverty, and/or where 30 percent or more of the population within a census tract is a minority. A portion of the Tilghman Lateral (MP TL-1.3 to the Tilghman Station), its proposed new delivery points/meter stations, and Tilghman Station are located within designated Environmental Justice areas. However, the proposed Project would not significantly affect health, social, or economic conditions within these areas because the majority of the Tilghman Lateral would be located within existing right-of-way, roadways, and/or industrial areas, and a majority of it would be constructed via the Horizontal Directional Drill method. No compressor stations associated with the Project would be located within designated Environmental Justice areas.

5.2.7 Public Services and Infrastructure

During construction, public service requirements of the Project are expected to be negligible due to the limited Project scope. In a construction emergency, fire, police, and emergency medical services may be required, but requirements would not be atypical for the available services. Also, such emergency service requirements would be needed only in the unlikely event of an accident and would be temporary. The emergency response needed would not be expected to place an increased burden on the public services in the Project area.

Adelphia anticipates the addition of seven to nine new permanent employees associated with the Project. This permanent addition to the local population and labor force would be negligible. Therefore, impacts on public services and infrastructure are not anticipated because of operation of the Project.

Emergency medical, fire, and police services would be provided by the respective entities available in each county (see table 5.1-5). The construction crew foreman and operation manager would be aware of the public services available near each of the Project areas. They also would maintain contact information for those entities providing services.

5.2.8 Traffic and Transportation

The movement of personnel, equipment, and materials to the construction work areas could temporarily adversely affect the transportation system in the Project area. Once equipment and materials reach the construction workspace, construction traffic would be confined to the designated workspace for the Project. As necessary, parking areas would be established for construction workers. Construction working hours and commuting time to work typically are scheduled to occur on Monday through Saturday from 6AM to 4PM depending on applicable permitting and regulatory requirements. It is anticipated that workers would be carpooling to the site in order to keep traffic to a minimum. Appropriate traffic control measures, such as flagmen and signs, would be used, as necessary, to ensure local traffic safety. Major transportation routes and current traffic count data from the Project area are listed in table 5.1-6.

Before construction commences, Adelphia would initiate discussions with local officials about minimizing the short-term, localized impacts on roadways. These discussions would take into account the most up-to-date traffic use information available for the roadways in the Project area. Adelphia's construction contractors would be directed to ensure compliance with local weight limitations and restrictions on area roadways. Adelphia's construction contractors would also remove any soil that falls from equipment onto roadway surfaces. Adelphia would work with state and local officials to obtain all necessary permits for temporary construction-related impacts on roadways.

Construction of the proposed laterals and associated M&R facilities would require trench excavation and pipe installation within paved public roadways (see Resource Report 1). Adelphia would obtain permits to conduct the in-road installation from applicable federal, state, and local agencies. These permits would dictate the specific requirements for the day-to-day construction activities for the Lateral, as well as post-construction restoration and repair requirements. Traffic

would either be detoured around the open trench during the installation process or a portion of the roads would be temporarily closed and traffic would be detoured around the work area onto an adjacent roadway. In addition, to minimize traffic disruptions, Adelphia proposes to install the majority of the Tilghman Lateral using the Horizontal Directional Drill method, which will minimize impact to traffic as well as the community.

Prior to construction, Adelphia would develop a *Residential Access and Traffic Management Plan* for the construction and restoration for all of the pipeline laterals (see Resource Report 5 – *Socioeconomics*). The Plan would provide detailed information regarding traffic management strategies. The *Residential Access and Traffic Management Plan* would also include proposed mitigation measures for potential transportation-related impacts such as avoidance of peak traffic periods, detours, consultation and coordination with local authorities, signage, and public notification in newspapers.

5.3 REFERENCES

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ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 6

Geological Resources

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
Information	Data Sources^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities – Title 18 CFR § 380.12(h)(1&2)	L, S, DD	6.2	N/A
2. Identify any geologic hazards to the proposed facilities - 18 CFR § 380.12(h)(2)	L, AA, DD, II	6.3	N/A
3. Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities - 18 CFR § 380.12(h)(3)	D, X	6.5.4	N/A
4. For LNG Projects in seismic areas, the materials required by 'Data Requirements for the Seismic Review of LNG Facilities,' NBSIR84-2833. - 18 CFR 380.12(h)(5)	N/A	N/A	N/A
5. For underground storage facilities, how drilling activity by others within or adjacent to the facilities would be monitored, and how old wells would be located and monitored within the facility boundaries - 18 CFR § 380.12(h)(6)	N/A	N/A	N/A
CFR = Code of Federal Regulations N/A = Not Applicable LNG = Liquefied Natural Gas ^a L = Field Surveys S = Mineral Resource Maps, Federal and State DD = State Agencies AA = Resource Report 2 II = Surficial Geologic and Bedrock Geologic Maps D = Applicant X = Natural Resources Conservation Service Soil Surveys or Soil Survey Geographic Database (SSURGO)			
Source: FERC, 2017			

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ACRONYMS AND ABBREVIATIONS

Adelphia	Adelphia Gateway, LLC
Delmarva Station	Delmarva-owned meter station (location of Parkway Lateral interconnect facilities)
Marcus Hook CS	Marcus Hook Compressor Station
MLV	Mainline Valve
Quakertown CS	Quakertown Compressor Station
PASDA	Pennsylvania Spatial Data Access
Project	Adelphia Gateway Project
Tilghman Station	Existing interconnect between PECO and TETCO systems at Tilghman Street.
USGS	United States Geological Survey

6 GEOLOGICAL RESOURCES

This resource report describes geological resources and hazards in the proposed Adelphia Gateway Project (Project) area, the associated characteristics and limitations, and the proposed mitigation for impacts that could occur as result of construction or operation of the Project. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard.

6.1 GEOLOGIC SETTING

6.1.1 Physiography

The Project is located in the Atlantic Coastal Plain, Piedmont, New England, and Valley and Ridge Physiographic Provinces in Pennsylvania and in the Atlantic Coastal Plain in Delaware (PASDA, 1995; USGS, 2017a).

The Lowland and Intermediate Upland Section of the Atlantic Coastal Plain Province is made up of a terrace that has been shaped by the action of many streams. Relief in this province is relatively low, and the surface of the terrace consists of sands and gravels (PADCNR, 2000). Project facilities within this section include the Marcus Hook Compressor Station (Marcus Hook CS) and wareyard, the Parkway Lateral and its associated interconnects/meter stations, and the Tilghman Lateral and its associated interconnects/meter stations.

The Piedmont Upland Section of the Piedmont Province is a relatively flat plateau. MLV Option 1, MLV Option 2, the Chester Creek Gate Blowdown, Paoli Pike Gate Blowdown, and Pickering Creek Gate Blowdown would be located within this physiographic section.

The Gettysburg-Newark Lowland Section of the Piedmont Province is composed mainly of rolling low hills and valleys developed on red sedimentary rock. This section also includes isolated higher elevation hills that consist mainly of diabase and conglomerates. The basic

drainage pattern is dendritic (PADCNR, 2000). Project facilities located within this Section include the Skippack Meter Station and the Quakertown Compressor Station (Quakertown CS) and associated meter station. Additionally, the French Creek Gate Blowdown, the Cromby Gate Blowdown, the Schuylkill River Gate Blowdown, the Perkiomen Gate Blowdown, and the East Perkiomen Gate Blowdown would be located in this physiographic section.

The Great Valley Section of the Valley and Ridge Province consists of very broad lowlands that have undulating hills eroded into shales and siltstones on the north side while the south side consists of a lower elevation flatter landscape developed on limestones and dolomites. The Martins Creek Station would be located within the Great Valley Section (PADCNR, 2000).

6.1.2 Topography

The topography across the Project area varies between gently, moderately, and highly sloped terrain, with elevations ranging from approximately 10 to 800 feet above mean sea level. Topography is illustrated in the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps provided in appendix 1A (USGS, 2017b).

6.1.3 Geologic Formations

Table 6.1-1 below describes the bedrock that would be crossed by the Project. The Project mainly crosses sedimentary rock types including mudstone, siltstone, shale, and limestone. The Project also crosses beds of feldspathic sand such as the Pennsauken and Bridgeton Formations, undifferentiated and igneous rocks like anorthosite and diabase (USGS, 2005). With the exception of access roads (all of which would be existing), construction and operation of the new MLV (regardless of which location is selected) and blowdown assemblies would take place within the previously excavated and maintained existing IEC pipeline right-of-way.

Project Site	Formation/ Rock Type	Begin MP	End MP	Period/ Era	Primary Lithology	Secondary Lithology
Marcus Hook CS and wareyard	Anorthosite	0.0 ^a	0.0 ^a	Lower Paleozoic	Anorthosite	Local alteration minerals
	Trenton Gravel			Tertiary	Gravelly sand	Sand, clay- silt beds
Parkway Lateral ^b	Trenton Gravel	PL 0.0	PL 0.0 ^c	Tertiary	Gravelly sand	Sand, clay- silt beds
	Anorthosite	PL 0.0	PL 0.2	Lower Paleozoic	Anorthosite	Local alteration minerals

Project Site	Formation/ Rock Type	Begin MP	End MP	Period/ Era	Primary Lithology	Secondary Lithology
	Pensauken and Bridgeton Formations, undifferentiated	PL 0.2	PL 0.3	Tertiary	Feldspathic quartz sand	Gravel, clay, silt
Tilghman Lateral ^b	Anorthosite	TL 0.0	TL 0.3	Lower Paleozoic	Anorthosite	Local alteration minerals
	Trenton Gravel	TL 0.3	TL 1.0	Tertiary	Gravelly sand	Sand, clay-silt beds
	Anorthosite	TL 1.0	TL 1.2	Lower Paleozoic	Anorthosite	Local alteration minerals
	Trenton Gravel	TL 1.2	TL 1.9	Tertiary	Gravelly sand	Sand, clay-silt beds
	Wissahickon Formation	TL 1.9	TL 2.0	Lower Paleozoic	Oligoclase-mica schist	Hornblende gneiss, augen gneiss,
	Trenton Gravel	TL 2.0	TL 2.4	Tertiary	Gravelly sand	Sand, clay-silt beds
	Wissahickon Formation	TL 2.4	TL 2.5	Lower Paleozoic	Oligoclase-mica schist	Hornblende gneiss, augen gneiss,
	Trenton Gravel	TL 2.5	TL 4.2	Tertiary	Gravelly sand	Sand, clay-silt beds
Skippack Meter Station	Brunswick Formation	36.0 ^a	36.0 ^a	Jurassic	Reddish-brown mudstone, siltstone, and shale	Interbeds of green, and brown shale, red and dark-gray argillites near base.
Schuylkill River Gate Blowdown		28.0	28.0			
Perkiomen Creek Gate Blowdown		34.0	34.0			
East Perkiomen Gate Blowdown		36.8	36.8			
Quakertown CS and Quakertown M&R	Diabase	49.4 ^a	49.4 ^a	Jurassic	Medium to coarse grained, quartz-normative tholeiite	N/A

Table 6.1-1 Geologic Formations in the Adelphia Project Area						
Project Site	Formation/ Rock Type	Begin MP	End MP	Period/ Era	Primary Lithology	Secondary Lithology
	Brunswick Formation			Triassic	Reddish - brown mudstone, siltstone, shale	Green and brown shale, argillites
Martins Creek Station	Epler Formation	84.4 ^a	84.4 ^a	Ordovician	Very finely crystalline , light-gray limestone interbedd ed with gray dolomite.	Coarsely crystalline limestone lenses present
MLV Option 1	Felsic and intermediat e gneiss	6.7	6.7	Precambria n	Light medium grained felsic and intermedia te gneiss.	Rocks of probable sedimentary origin.
MLV Option 2		7.9	7.9			
Chester Creek Gate Blowdown		9.5	9.5			
Pickering Creek Gate Blowdown		23.0	23.0			
Paoli Pike Gate Blowdown	Felsic Gneiss	14.5	14.5	Precambria n	Light medium grained gneiss	Rocks of probable sedimentary origin
French Creek Gate Blowdown	Stockton Formation	25.7	25.7	Triassic	Light-gray to buff, coarse- grained, arkosic sandstone	Reddish- brown to grayish- purple sandstone, siltstone , and mudstone.
Cromby Gate Blowdown	Lockatong Formation	27.3	27.3	Triassic	Dark-gray to black, thick- bedded argillite containing a few zones of thin- bedded black shale	Thin layers of impure limestone and calcareous shale.
<p>MP = Project milepost</p> <p>^a This is an aboveground facility. The location provided is at the nearest Project MP.</p> <p>^b Pipeline laterals include associated interconnects/meter stations.</p> <p>^c MPs have been rounded to the tenths place. The End MP is greater than 0.0 mile but less than 0.05 mile.</p> <p>Source: USGS, 2005</p>						

6.1.4 Blasting

Shallow depth to bedrock may be encountered at the Tilghman Lateral and associated M&R facilities where Made Land would be encountered, the Skippack Meter Station where the Penn silt loam would be encountered, and the Quakertown CS and associated M&R facilities where the Udorthents, shale and sandstone soils are located. Made Land, Penn silt loam, and Udorthents, shale and sandstone are all identified as having bedrock within 6 feet of the ground's surface (see Resource Report 7 – *Soils*). Prior to construction Adelphia would conduct a geotechnical soil analysis at the Quakertown CS to confirm blasting would not be required. Blasting would not be used to construct the new MLV or blowdown assemblies. The ground in these areas has been previously excavated during construction of the existing 18-inch and 20-inch pipelines.

6.1.5 Horizontal Directional Drill

Adelphia would use the horizontal direction drill (HDD) construction method to minimize impacts to numerous resources located along the proposed Tilghman Lateral. Table 6.1-2 identifies the HDD locations by milepost, the name of the HDD, the distance of the HDD, and geotechnical investigation status. Adelphia is in the process of conducting geotechnical investigations to determine the viability of using the HDD construction method at the proposed locations. Adelphia will provide the FERC with the results of the geotechnical investigations in a supplemental filing.

The HDD method avoids sensitive resources but may potentially cause an inadvertent return of drilling mud. Drilling mud is a non-hazardous fluid that is part of the HDD process and typically consists of water and bentonite. Inadvertent returns occur when the HDD encounters a pathway of lesser resistance to the surface than that of the intended mud flow. Instead of flowing back to the drill rig the mud is released at the ground surface. Adelphia is preparing an *HDD Inadvertent Release Contingency Plan* that will detail the measures that would be used to identify inadvertent releases, stop the inadvertent release, clean up and/or mitigate effects of the release, and report to the appropriate parties. Adelphia will provide its *HDD Inadvertent Release Contingency Plan* in a supplemental filing.

HDD #	Entry MP	Exit MP	Distance (miles)	Geotechnical Investigation Status
1	0.3	0.9	0.6	Pending
2	1.1	1.7	0.6	Pending
3	1.8	2.2	0.5	Pending
4	2.4	2.6*	0.2	Pending
5	2.9	3.4	0.5	Pending
6	3.5	3.7	0.3	Pending
7	3.9	4.2	0.3	Pending
8	4.3	4.4	0.1	Pending

* As described in Resource Report 2, *Water Use and Quality*, Adelphia is analyzing two crossing methods (HDD and open-cut (dry or wet)) for a waterbody at approximately TL 2.7.

6.2 MINERAL RESOURCES

Mineral resources in Pennsylvania consist of fuel sources such as coal, oil, and natural gas as well as non-fuel mineral resources such as stone, sand and gravel. Pennsylvania also contains major production areas for mineral resources such as peat, clay shale, dimension stone, and silica (USGS, 2013). Adelphia obtained data on fuel mineral resources in proximity to the Project in Pennsylvania through the Pennsylvania Spatial Data Access (PASDA) database. Adelphia's search included a review of abandoned mine lands, underground permit boundaries, coal mining operations, and digitized mined areas (PASDA, 2017a; 2017b; 2017c; 2017d). The Applicant used the PASDA *Industrial Mineral Mining Operations Data Layer* (PASDA, 2017e) to review the locations of non-fuel mineral resource extraction locations and the PASDA *Oil and Gas Locations Data Layer* to obtain oil and gas spatial data (PASDA, 2017f).

The state of Delaware is not known to produce coal or oil and gas fuel mineral resources (EIA, 2015a). Delaware does produce some non-fuel mineral resources such as sand and gravel. However, according to USGS Active Mines and Mineral Plants in the U.S. data layers and Delaware Department of Geologic Survey mapping, there are no non-fuel mineral resource producers within 0.25 mile of the Project (DGS, 2004; USGS, 2017c).

None of the proposed Project facilities would be within 0.25 mile of any active, inactive, or proposed coal mine, oil and natural gas wells, or non-fuel mineral resources (PASDA, 2017a; 2017b; 2017c; 2017d).

6.2.1 Coal

Pennsylvania's coal resources are located across the state with bituminous coal fields located in western Pennsylvania and anthracite coal fields located toward the north east of the state. According to available PADEP mapping, there are no active, inactive, or proposed coal mines, or previously mined areas located within 0.25 mile of the Project (PASDA,2017a; 2017b; 2017c; 2017d).

6.2.2 Oil and Natural Gas

Pennsylvania's oil and natural gas fields are concentrated in the western part of the state and consist of both shallow and deep oil and gas fields (PADNR, 2014). According to the Pennsylvania Department of Environmental Protection Oil and Gas Well data layer, there are no oil and gas wells located within 0.25 mile of the proposed Project (PASDA, 2017f). The Marcellus Shale Formation, which is one of the richest gas fields in North America, is located over 10 miles away from the Project facilities and would not be affected by the Project (O&G Journal, 2016; PASDA, 2002).

6.2.3 Non-fuel Mineral Resources

Major non-fuel mineral resources in Pennsylvania consist mainly of aggregates such as sand, gravel, and crushed stone (USGS 2013). According to the PASDA, there are no industrial mineral resource extraction operations within 0.25 mile of the Project (PASDA, 2017e). In Delaware, there are no non-fuel mineral resource producers within 0.25 mile of the Project (DGS, 2004; USGS, 2017c; Google Earth, 2017).

6.3 GEOLOGIC HAZARDS

According to the National Park Service, geologic hazards are "any geological or hydrological process that poses a threat to people and or their property" (NPS, 2017). Geologic hazards that could occur in proximity to and pose a hazard to the Project include seismicity and soil liquefaction, subsidence and karst terrain, landslides, and flash flooding. Volcanism is not known in the Project area and is therefore not discussed further below.

6.3.1 Seismic Hazards and Liquefaction

Seismicity is the occurrence or frequency of earthquakes for a given area. A seismic disturbance or earthquake can be due to natural or manmade causes. Earthquakes result when two blocks of earth overcome the frictional forces holding them in place and suddenly slide past each other (USGS, 2017d). The USGS has created seismic hazard maps used to depict

probabilistic ground motions with a set probability of exceedance in 50 years. The proposed Project would be located in an area where Peak Ground Accelerations of 0.05 the force of gravity has a ten percent probability of being exceeded in 50 years (Peterson et al., 2014). The USGS has also created an Interactive Fault Map that identifies quaternary faults, which are faults that demonstrate geologic evidence of surface deformation within the last 1.6 million years (the Quaternary). No faults from this database were identified within 0.25 mile of the proposed Project (USGS, 2017e).

Seismic disturbances such as earthquakes can also cause other hazards such as soil liquefaction. Soil liquefaction is a phenomenon where normally solid and stiff soils lose strength and temporarily act like a liquid due to the stress applied by seismic shaking. Typically, in order for soil liquefaction to occur three criteria must be met. The soil must be loose and non-cohesive (such as with Holocene deposits), the soil must be saturated with water, and the soil must have the potential to experience strong ground shaking (USGS, 2006). As indicated above, the potential for strong prolonged and significant ground shaking to occur within the Project area is low, and therefore the likelihood for soil liquefaction to occur is also low.

Well maintained and designed carbon steel pipelines that are constructed using modern arc-welding techniques with full penetrating welds have performed generally satisfactorily and have not been ruptured by ground shaking caused by an earthquake. Wave propagation damage to modern steel pipelines is not common, and there are many oil and gas transmission pipelines that have been located in seismic regions and performed satisfactorily through moderate earthquakes (FEMA, 1992).

6.3.2 Subsidence and Karst Terrain

Subsidence is defined as the gradual caving or sinking of an area of land and can occur due to previous mining (mine collapse) or the development of sinkholes through the dissolution of limestone. As stated above, there are no known areas of previous underground mining in proximity to the Project.

According to the USGS, “karst is a terrain with distinctive landforms and hydrology created from the dissolution of soluble rocks, principally limestone and dolomite. Karst terrain is characterized by springs, caves, sinkholes, and unique hydrogeology that results in aquifers that are highly productive but extremely vulnerable to contamination” (USGS, 2017f). The Martins Creek Station would be in proximity to several surface depressions. The remaining Project facilities would not be located within 0.25 mile of any known karst features (PASDA, 2017g).

According to the *Karst in the United States: A Digital Map Compilation and Database*, no potential karst feature forming rocks exist within 0.25 mile of the Project in Delaware (Weary and Doctor, 2014). No karst features were identified in proximity to the two MLV locations being considered, the blowdown assemblies, or the Skippack Meter Station (PASDA, 2017g).

6.3.3 Landslides

Landslides include a wide range of ground movements, such as rock falls, deep failure of slopes, and shallow debris flows. Contributing factors to landslides can include erosion, oversteepening of slopes, slope weakening due to saturation, earthquakes, and extra weight from rain and snow (USGS, 2017g). The topography in the areas of the Project is nearly level to gently undulating and would not be susceptible to debris flows or landslides (USGS, 2017b). The Southwestern Pennsylvania Commission has identified previously active documented landslides, none of which are located within one mile of the Project (PASDA, 2017h). According to the *Landslide Overview Map of the Conterminous United States*, the entirety of the Project is located in an area with low susceptibility and low incidence of landslide occurrence (Radbruch-Hall, et al., 1982).

6.3.4 Flash Flooding

Flash flooding is possible within waterbody floodplains during or after large and/or sudden rain events (NSSL, 2017). Although the proposed Project activities would not cross any major waterbodies, the Tilghman Lateral would cross floodplains between mileposts TL 2.4 and TL 2.5 where the Tilghman Lateral right-of-way and additional temporary workspace would occur within the 100-year floodplain, and between mileposts TL 2.6 and TL 2.8 where the Tilghman right-of-way and ATWS would occur within the 100-year floodplain and a regulatory floodway (see Resource Report 2 – *Water Use and Quality*) (FEMA, 2016). A small portion of the Project's ATWS would be within the 500-year floodplain near MP TL 4.4 where the Tilghman Lateral terminates. The Schuylkill River Gate Blowdown would be located within the 500-year floodplain of the Schuylkill River. The Paoli Pike Gate Blowdown would be located within the 100-year floodplain and in close proximity to a regulatory floodway. The Chester Creek Gate Blowdown would be located within the 100-year floodplain of Chester Creek.

6.4 PALEONTOLOGICAL RESOURCES

None of the rock types crossed by the proposed Project are known to contain significant fossil resources (PADCNR, 1964; USGS, 2005; Bascom et al, 1931). Although fossils have been found in the Brunswick formation, this is considered to be rare (Bascom et al, 1931). Therefore, it

is unlikely that a significant fossil discovery during excavation would occur. Work associated with the proposed new MLV and blowdowns would be done within previously disturbed and maintained right-of-way. Any paleontological resources potentially occurring in the area would have been discovered during the original 18-inch and 20-inch pipeline construction.

6.5 CONSTRUCTION AND OPERATION IMPACTS

6.5.1 Mineral Resources

There are no historical, current, or known planned coal mines, non-fuel mineral resource operations, or oil and gas wells within proximity to the proposed Project. Activities associated with the construction and operation of the proposed Project are therefore not expected to adversely affect or be adversely affected by these resources either in Delaware or Pennsylvania.

6.5.2 Geologic Hazards

As stated above, earthquakes, soil liquefaction, subsidence, and landslides are unlikely to occur within the Project area. Therefore, these geologic hazards are unlikely to affect Project construction or operation. Similarly, karst terrain, which has only been mapped in the area of the Martins Creek Station, is not likely to affect Project construction or operation due to the limited nature of the karst features and because Project activities at the Martins Creek Station would be limited to the installation of a chain-link fence at an existing industrial facility.

Flash flooding could occur in the Project area at the two locations where the Tilghman Lateral crosses the 100-year flood zone. Adelphia has performed preliminary buoyancy calculations and has determined that once installed and backfilled, weighted pipe would not be needed even in the event of flash flooding. During construction, measures would be implemented to handle waterbody flow increases. Weather forecasts would be monitored and necessary steps taken prior to storm events to prevent flooding impacts.

6.5.3 Blasting

Shallow bedrock is not expected in most construction areas as only the Tilghman Lateral, Skippack Meter Station, and Quakertown CS contain soils that have the potential for shallow bedrock. The soil at the Tilghman Lateral is Made Land, and Adelphia does not expect blasting would be required to install the pipeline or associated M&R facilities in these areas. Additionally, a large portion of the Tilghman Lateral would be constructed via HDD. Adelphia would conduct a geotechnical site investigation of the Quakertown CS and associated M&R facilities site prior to construction to determine if blasting would be required. Additionally, geotechnical investigations

would be conducted for the eight HDDs located along the Tilghman Lateral, which would characterize the likely depth of bedrock and geologic conditions in the general Tilghman Lateral area. Adelphia would first attempt to use conventional means (e.g., hydraulic hammers and mechanical rippers) to remove any shallow bedrock encountered during construction. If consolidated bedrock that cannot be removed by chipping or ripping is encountered, blasting may be required. If blasting is required, Adelphia would implement pre- and post-blasting surveys, coordinate with the appropriate local authorities, and develop a Project and Site-specific *Blasting Plan* that would outline the regulations, safety measures, pre- and post-blast inspection, and monitoring involved with blasting activities. Adelphia and its contractors would adhere to local, state, and federal regulations that govern controlled blasting.

6.5.4 Horizontal Directional Drill

Adelphia will conduct geotechnical investigation to verify the viability of conducting HDD at the proposed locations and determine the potential for an inadvertent return to occur. If an inadvertent return were to occur during the HDD process, Adelphia would follow the procedures within its *HDD Inadvertent Release Contingency Plan*. Adelphia is currently preparing this plan and will provide the plan for FERC review and approval in a supplemental filing.

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ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 7

Soils

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Sources^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. Identify, describe, and group by milepost the soils affected by the proposed pipeline and aboveground facilities - Title 18 CFR § 380.12(i)(1)	D, W, X	7.1	N/A
2. For aboveground facilities that would occupy sites over 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation - 18 CFR § 380.12(i)(2)	D, W, X	7.1	N/A
3. Describe by milepost potential impacts on soils - 18 CFR § 380.12(i)(3,4)	D, W, X	7.2	N/A
4. Identify proposed mitigation to minimize impact on soils and compare with the FERC's <i>Upland Erosion Control, Revegetation, and Maintenance Plan</i> - 18 CFR § 380.12(i)(5)	W, Y	7.2	N/A
CFR = Code of Federal Regulations N/A = Not Applicable FERC = Federal Energy Regulatory Commission ^a D = Applicant W = Natural Resources Conservation Service (NRCS) X = NRCS Soil Surveys Y = FERC Plan Source: FERC, 2017			

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ACRONYMS AND ABBREVIATIONS

Adelphia	Adelphia Gateway, LLC
Delmarva Station	Delmarva-owned meter station (location of Parkway Lateral interconnect facilities)
ECD	erosion control device
ESCP	<i>Adelphia's Erosion and Sediment Control Plan</i>
FERC	Federal Energy Regulatory Commission
FERC Plan	<i>FERC's Upland Erosion Control, Revegetation, and Maintenance Plan</i>
FERC Procedures	<i>FERC's Wetland and Waterbody Construction and Mitigation Procedures</i>
N/A	not applicable
NRCS	Natural Resources Conservation Service
NSSH	National Soil Survey Handbook
Project	Adelphia Gateway Project
Marcus Hook CS	Marcus Hook Compressor Station
MLV	Mainline Valve
Quakertown CS	Quakertown Compressor Station
SPCC Plan	<i>Adelphia's Spill Prevention Control and Countermeasures Plan</i>
Tilghman Station	Existing interconnect between PECO and TETCO systems at Tilghman Street.
USDA	U.S. Department of Agriculture
WEG	Wind Erodibility Group
WSS	Web Soil Survey

7 SOILS

This resource report identifies soils within the proposed Adelpia Gateway Project (Project) including their associated characteristics and limitations, and the proposed mitigation for impacts that may occur because of construction or operation of the Project. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard..

7.1 EXISTING SOIL RESOURCES

Soil is a natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the combined effect of climate and living matter acting on earthy parent material, as affected by topographic relief and time (USDA, 2016). Adelpia identified and assessed soils that would be impacted by the Project using the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service's (NRCS) Web Soil Survey (WSS). The WSS is a regularly updated and maintained online database that contains soil maps and data available for more than 95 percent of the counties in the U.S. (USDA, 2016).

The WSS identifies soils by map units. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soils or 'miscellaneous areas'. A map unit is named according to the taxonomic classification of the dominant soils within the unit (USDA, 2016). Some Project components would cross areas mapped as Urban Land, which is considered a 'miscellaneous area' by the WSS. Although Urban Land does not fit the USDA definition of a soil, it is included in the discussion below as well as in applicable acreage estimates.

The WSS also provides soil characterization data that are based on standards outlined in the National Soil Survey Handbook (NSSH) (USDA, 2017). For example, the WSS provides interpretive group data for each soil unit, when available. The NSSH assigns interpretative groups to combinations of soils that have similar behavior for specified land use and management

practices. Most are based on soil properties and other factors that directly influence the specific use of the soil (USDA, 2017). Adelphia used the following interpretive groups to assess soils for this resource report: the Land Capability Classification Group to estimate a soil's revegetation potential; the Farmland Classification Group; and the Hydric Soils Group. Adelphia used other data types provided in the WSS to characterize a soil's susceptibility to erosion, depth to bedrock, and compaction potential. Descriptions of the soils crossed by the proposed Project are provided in section 7.1.1.

7.1.1 Soil Descriptions

Descriptions of each soil crossed by the proposed Project are provided below. Table 7.1-1 lists and further characterizes the soils.

7.1.1.1 Amwell Silt Loam

Amwell silt loam is a deep to very deep soil that was formed by igneous, metamorphic, and sedimentary rock. It is a somewhat poorly drained soil that can be found at the base of hillslopes and extending onto upland flats or depressions. The depth to the water table for this soil ranges from about 12 to 20 inches, and the depth to bedrock is more than 6 feet. It is present on the majority of the Quakertown Compressor Station (Quakertown CS) and associated M&R facilities site, and the Skippack Station site (USDA, 2016).

7.1.1.2 Bowmansville-Knauers Silt Loams

The Bowmansville-Knauers silt loams consist of 40 percent Knauers and 40 percent Bowmansville soils with the remaining consisting of 20 percent Rowland Soil (discussed below). The Knauers and Bowmansville soils have slopes of 0 to 3 percent and is derived from alluvium of sedimentary rock. This soil is not prime farmland, and is not hydric. The depth to water table is shallow but depth to bedrock is greater than 6 feet.

7.1.1.3 Butlertown silt loam

Butlertown silt loam is found on coastal plains and broad uplands. It is derived from thick deposits of silty over sandy fluvial coastal plain sediments. The root restrictive layer is 25 to 40 inches from the surface. This soil is well drained, and water movement within the most restrictive layer is considered to be low. Butlertown silt loam is not subject to ponding or flooding, but a seasonal zone of water typically exists within 36 inches of the ground surface (USDA, 2016). This soil is only present along the Tilghman Lateral, Transco Station, and Skippack Station.

7.1.1.4 Gibraltar silt loam

The Gibraltar silt loam has slopes ranging from 0 to 2 percent and is derived from coal over wash over alluvium derived from shale and silt stone. This soil is well drained, not hydric and depth to water table is greater than 6 feet. Depth to bedrock for this soil is reported less than 6 feet.

7.1.1.5 Gladstone Gravelly Loam

The Gladstone gravelly loam has slopes that range from 8 to 15 percent and is derived from Residuum and colluvium from granitic gneiss. The soil is listed as well drained, is not hydric, and has typical depth to ground water greater than 200 cm. The soil is listed as farmland of statewide importance. The typical depth to bedrock for this soils is less than 6 feet.

7.1.1.6 Glenelg Channery Loams

The Glenelg Channery loam has slopes that range from 0 to 8 percent and is derived from residuum of weathered phyllite. The soil is listed as being well drained, is not hydric, and has a depth to groundwater greater than 6 feet. Depth to bedrock for this soil is also typically greater than 6 feet.

7.1.1.7 Hatboro silt loam

The Hatboro silt loam has slopes ranging from 0 to 3 percent and is derived from metamorphic and sedimentary rock. The soil is listed as poorly drained, depth to the water table is typically shallow, and is considered to be hydric. Depth to bedrock is listed as greater than 6 feet.

7.1.1.8 Klinsville channery silt loam

Klinsville channery silt loam is located on piedmonts and hills and is derived from Triassic residuum that has been weathered from siltstone, shale, mudstone, and sandstone. Depth to a restrictive layer is 20 to 27 inches. This soil is well drained, but water movement through its most restrictive layer is very low. This soil is not considered to be flooded or ponded, and there is no zone of water within 72 inches of the ground surface (USDA, 2016).

7.1.1.9 Made Land, gravelly materials

The majority of this soil (85 percent) consists of Udorthents, shale and sandstone, which is discussed above.

7.1.1.10 Neshaminy Gravelly Silt Loam

The Neshaminy gravelly silt loam has slopes that range from 3 to 8 percent and is derived from the residuum from weathered diabase. This soil is listed as well drained, is not hydric, and has a typical depth to groundwater of 168 cm. The soil is considered to be prime farmland. Depth to bedrock for this soil is typically less than 6 feet.

7.1.1.11 Othello Silt Loam

Othello silt loam is located on depressions, swales, and flats at the base of slopes along the Atlantic Coastal Plain of Delaware, New Jersey, and Maryland. It is a deep soil made from fluviomarine (river- and ocean-driven) and/or silty eolian (wind-driven) deposits. The depth to the water table for this soil is about 10 to 20 inches, and the depth to bedrock is more than 72 inches (6 feet) (USDA, 2016).

7.1.1.12 Penn Silt Loam

This is a moderately deep, fine loamy soil found on hilltops and ridges. Penn silt loams were formed from weathered shale and siltstone, mudstone, and/or sandstone. They are well drained soils with a depth to water table of more than 80 inches and a depth to bedrock of less than 6 feet (USDA, 2016).

7.1.1.13 Readington Silt Loam

The Readington silt loam has slopes that range from 3 to 8 percent and is derived from residuum from noncalcareous shale, siltstone, and fine-grained sandstone. The soil is listed as moderately well drained, is not hydric, and has a typical depth to groundwater of 61 cm. The soil is listed as farmland of statewide importance. This soil has typical depth to bedrock of less than 6 feet.

7.1.1.14 Rowland Silt Loam

The Rowland silt loam has slopes that range from 0 to 3 percent and is derived from alluvium from sandstone and shale sources. The soil is listed as moderately well drained, is not considered hydric, and typically has a depth to water table of 61 cm. Depth to bedrock for this soil map unit is typically greater than 6 feet.

7.1.1.15 Udorthents, Limestone

This well drained soil is a silty clay loam formed by graded limestone that is typically found on hillslopes. Its depth to the water table begins at about 60 inches, and the depth to a restrictive

feature begins at about 40 inches. Bedrock is less than 6 feet below the ground's surface.

7.1.1.16 Udorthents, Shale and Limestone

The Udorthents, shale and limestone is a well-drained, silty loamy soil formed by graded shale and siltstone or graded siltstone and shale. It can be found on ridgetops. Depth to the water table is about 60 inches or deeper, and the depth to bedrock is less than 6 feet.

7.1.1.17 Urban Land

Urban land consists mainly of impervious man-made structures such as streets, parking lots, roads, and buildings. As such, many of the factors used to characterize soils, including depth to bedrock, depth to water table, erosion potential, and compaction potential are not applicable to this soil map unit; the WSS lists these values as 'not applicable' or 'N/A'. Urban land is not classified as a farmland, has a low revegetation potential, and is not hydric (USDA, 2016).

7.1.1.18 Watchung Silt Loam

The Watchung silt loam has slopes that range from 0 to 3 percent and is derived from the residuum of basic rocks. The soil is listed as poorly drained, is considered to be hydric, and has a typical depth to water table of 15 cm. The soil is listed as not prime farmland. Depth to bedrock for this soil is typically greater than 6 feet.

7.1.1.19 Wehadkee silt loam

The Wehadkee silt loam has slopes that range from 0 to 3 percent and derived from loamy alluvium originally from igneous and metamorphic rock. The Wehadkee silt loam is considered to be poorly drained, is not hydric and has a typical depth to water table of 8 cm. Depth to bedrock for this soil is typically greater than 6 feet.

**Table 7.1-1
Soils Crossed by the Adelphia Gateway Project**

Project Site ^a	Soil Map Unit Name	Slope (%)	MP Begin	MP End	Area Crossed (acres)	Erosion Potential		Shallow Depth to Bedrock (Y/N) ^d	Revegetation Potential ^e	Farmland Classification	Hydric (Y/N)	Compaction Potential ^f
						Wind ^b	Water ^c					
Marcus Hook CS and wareyard	Othello silt loam	0-2	0.0 ^g	0.0 ^g	6.31	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High
	Urban land	N/A			0.71	N/A	N/A	N/A	Low	Not Prime Farmland	N	N/A
Parkway Lateral	Othello silt loam	0-2	PL 0.0	PL 0.0	6.32	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High
	Urban land	N/A	PL 0.0	PL 0.2	2.11	N/A	N/A	N/A	Low	Not Prime Farmland	N	N/A
Delmarva Station ^h	Urban land	N/A	PL 0.2	PL 0.2	0.23	N/A	N/A	N/A	Low	Not Prime Farmland	N	N/A
Transco Station	Butlertown silt loam	0-6	TL 0.3	TL 0.3	0.12	Moderate	Moderate	No	Moderate	Prime Farmland	N	Low
Tilghman Lateral	Othello silt loam	0-2	TL 0.0	TL 0.3	1.67	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High
	Butlertown silt loam	0-6	TL 0.3	TL 0.4	0.85	Moderate	Moderate	No	Moderate	Prime Farmland	N	Low
	Made land	0-8	TL 0.9	TL 1.1	1.99	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 1.6	TL 1.8	2.59	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 2.3	TL 2.7	4.56	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Wehadkee silt loam	0-2	TL 2.7	TL 2.8	0.33	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High
	Made land	0-8	TL 2.8	TL 2.9	2.51	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 3.4	TL 3.6	1.2	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 3.7	TL 3.9	2.4	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 4.2	TL 4.3	2.38	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
	Made land	0-8	TL 4.4	TL 4.4	0.96	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
Monroe Station	Made land	0-8	TL 2.7	TL 2.7	0.03	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
Skippack Station	Amwell silt loam	0-8	36.0 ^g	36.0 ^g	0.03	Moderate	Moderate	No	Moderate	Farmland of Statewide Importance	N	Moderate

**Table 7.1-1
Soils Crossed by the Adelphia Gateway Project**

Project Site ^a	Soil Map Unit Name	Slope (%)	MP Begin	MP End	Area Crossed (acres)	Erosion Potential		Shallow Depth to Bedrock (Y/N) ^d	Revegetation Potential ^e	Farmland Classification	Hydric (Y/N)	Compaction Potential ^f
						Wind ^b	Water ^c					
	Penn silt loam	0-15	35.9	36.0	0.57	Moderate	Moderate	Yes	High	Prime Farmland/ Farmland of Statewide Importance	N	Low
PECO Station	Made land	0-8	TL 4.4	TL 4.4	0.06	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
Quakertown CS and Quakertown Meter Station	Amwell silt loam	0-8	49.0 ^g	49.0 ^g	1.8	Moderate	Moderate	No	Moderate	Farmland of Statewide Importance	N	Moderate
	Udorthents, shale and sandstone	0-8			0.01	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
Martins Creek Station	Udorthents, limestone	0-8	84.4 ^g	84.4 ^g	3.5	Moderate	Moderate	Yes	Low	Not Prime Farmland	N	Low
Chester Creek Gate	Wehadkee silt loam	0-2	9.5	9.5	0.23	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High
Paoli Pike Gate	Hatboro silt loam	0-2	14.5	14.5	0.17	Moderate	Moderate	No	Moderate	Not Prime Farmland	Y	High
Pickering Creek Gate	Gladstone gravelly loam	0-15	23.0	23.0	0.23	Moderate	Low	Yes	Moderate	Farmland of Statewide Importance	N	Low
French Creek Gate	Penn silt loam	0-25	25.7	25.7	0.21	Moderate	Moderate	Yes	High	Prime Farmland/ Farmland of Statewide Importance	N	Low
Cromby Gate	Penn silt loam	0-3	27.3	27.3	0.24	Moderate	Moderate	Yes	High	Prime Farmland/ Farmland of Statewide Importance	N	Low
Schuylkill River Gate	Penn silt loam	0-8	28.0	28.0	0.05	Moderate	Moderate	Yes	High	Prime Farmland/ Farmland of Statewide Importance	N	Low
	Gibraltar silt loam	N/A	28.0	28.0	0.02	Moderate	Moderate	Yes	High	Farmland of Statewide Importance	N	Low
Perkiomen Creek Gate	Bowmansville-Knauers silt loams	0-2	34.0	34.0	0.05	Moderate	Moderate	No	Moderate	Not Prime Farmland	N	High

**Table 7.1-1
Soils Crossed by the Adelphia Gateway Project**

Project Site ^a	Soil Map Unit Name	Slope (%)	MP Begin	MP End	Area Crossed (acres)	Erosion Potential		Shallow Depth to Bedrock (Y/N) ^d	Revegetation Potential ^e	Farmland Classification	Hydric (Y/N)	Compaction Potential ^f
						Wind ^b	Water ^c					
	Readington silt loam	0-3	34.0	34.0	0.02	Moderate	Moderate	Yes	High	Farmland of Statewide Importance	N	Low
East Perkiomen Gate	Rowland silt loam	0-2	36.7	36.7	0.0	Moderate	Moderate	No	High	Prime Farmland	N	Low
MLV Option 1	Watchung silt loam	0-3	8.0	8.0	0.03	Moderate	Moderate	No	Moderate	Not Prime Farmland	Y	High
	Neshaminy gravelly silt loam	0-8	8.0	8.0	0.01	Moderate	Low	Yes	High	Prime Farmland	N	Low
	Glenelg channery silt loam	0-8	8.0	8.0	0.02	High	Low	No	High	Prime Farmland	N	Low
MLV Option 2	Glenelg channery silt loam	0-3	6.7	6.7	0.06	High	Low	No	High	Prime Farmland	N	Low

Kw Erosion factor Kw
WEG Wind Erodibility Group
^a Project Sites include access roads, as applicable.
^b The potential for soil loss due to wind erosion was estimated using the soil's WEG value. WEG 1, 2, 3 = Low; WEG 4, 5, 6 = Moderate; and WEG 7, 8 = High.
^c The potential for soil loss due to water erosion was estimated using the soil's Erosion Factor Kw. <0.30 = Low; >0.30, <0.50 = Moderate; and >0.50 = High.
^d Shallow Depth to Bedrock is defined as the presence of lithic or paralithic bedrock ≤ 6 feet (72 inches) below the soil surface.
^e The soils' revegetation potentials were estimated using USDA's Non-irrigated Capability Class. Capability Class 1,2 = High; 3,4,5,6 = Moderate; and 7,8 = Low
^f Compaction potential was inferred from the soils drainage potential (very poorly drained to poorly drained = High, somewhat poorly drained to moderately well drained = Moderate, well drained to excessively well drained = Low).
^g This is an aboveground facility. Its location presented is the nearest Project MP.
^h Includes the TETCO, TCO, and Delmarva interconnect and meter station facilities at the Delmarva Station.
Sources: USDA, 2003; 2005; 2010; 2016

7.1.2 Soil Characteristics and Limitations

7.1.2.1 Erosion Potential

Soil erosion involves the breakdown, detachment, transport, and redistribution of soil particles by forces of water, wind, or gravity (USDA, no date). Factors influencing the rate of water erosion include climate, soil moisture, soil cover, land management, and topography. Wind erosion rates are also influenced by climate, soil cover, and land management and are additionally affected by soil surface roughness, unsheltered distance, and wind velocity and turbulence (PASSEL, 2017). Erosion by gravity is primarily influenced by topography and climate.

The susceptibility of a soil to water erosion can be expressed by the erosion factor K_w . Factor K_w estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (i.e., a saturated soil's ability to transmit water) (Hillel, 1980; USDA, 2016). K_w values range from 0.15 to 0.49; the higher the value, the more susceptible the soil is to water erosion. With the exception of urban land, which the WSS lists a K_w value of 'N/A' and consists mainly of impermeable surfaces (see section 7.1.1), soils in the Project area have a 'low' to 'moderate' susceptibility to water erosion. The Butlertown silt loam has the highest K_w rating within the Project area at 0.49 (a 'moderate' rating) (USDA, 2016).

The susceptibility of a soil to wind erosion can be determined based on the Wind Erodibility Group (WEG) to which the soil is assigned. Soils within the same WEG have similar properties affecting their susceptibility to wind erosion. Soil assigned to WEG 1 are the most susceptible to wind erosion, and those assigned to WEG 8 are the least susceptible. Excluding those soils classified as urban land for which the WSS lists a K_w value of 'N/A', the majority of soils crossed by the Project are moderately susceptible to wind erosion. WEG values at the soils that would be affected by the Project range from 5 to 7 (i.e., moderate to low susceptibility to wind erosion) (USDA, 2016).

7.1.2.2 Shallow Depth to Bedrock

Shallow depth to bedrock occurs when bedrock (either lithic or paralithic) occurs within 6 feet of the ground's surface (MSM, 2015). Blasting or other means of mechanical removal may be needed to construct the Project in areas of shallow bedrock. Shallow bedrock may also cause the introduction of stones or rocks to surface soil layers and may reduce soil moisture-holding capacity, resulting in a reduction of soil productivity. Additionally, some construction equipment could be damaged by contact with large rocks, stones, or shallow bedrock.

Adelphia identified soils in the Project area with shallow depths to bedrock using the WSS 'Depth to a Selected Soil Restrictive Layer' and determined depths to bedrock for each soil. The Project would cross 23.5 acres of shallow depth to bedrock soils (USDA, 2016).

7.1.2.3 Revegetation Potential

Successful revegetation of Project workspaces is important for protecting the underlying soil from potential damage and minimizing erosion during operation of the facilities. Adelphia used Land Capability Classification interpretive group data to estimate a soils' potential to revegetate following disturbance. The Land Capability Classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. The System groups soils into capability classes numbered 1 through 8, with Class 1 soils having the fewest limitations that restrict their use (i.e., high revegetation potential) and Class 8 soils having limitations that preclude commercial plant production and restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes (i.e., low revegetation potential) (USDA, 2016).

The majority of the soils crossed by the Project (about 25 acres out of the 38.5 that would be disturbed by Project construction) have a low revegetation potential (i.e., soils in Classes 7 or 8) and are associated with made land, urban land, and rocky soils. The remaining Project area would cross soils with a moderate revegetation potential. The Glenelg channery loam, Neshaminy gravelly silt loam, Reading silt loam, and Rowland silt loam all have a high revegetation potential and a capability class of 2.

7.1.2.4 Farmland Classification

The Farmland Classification soil interpretive group designates soils as prime farmland, farmland of statewide importance, farmland of local importance, or farmland of unique importance. Prime farmland is, "...land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding" (USDA, 2017).

Soils of unique, statewide, or local importance are not prime farmland. These soils are of statewide importance for the production of food, feed, fiber, forage, and oil seed crops and are

designated by state agency or agencies. These soils generally include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods (USDA, 2000). The Project would cross 3.6 acres of soils that are considered to be prime farmland or farmland of statewide importance (USDA, 2016).

7.1.2.5 Hydric Soils

Hydric soils are defined as “soils that are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (USDA, 2017). Hydric soils in their natural condition are poorly drained. Due to extended periods of saturation, they can be prone to compaction and rutting. The Project would cross 0.2 acre of hydric soils (USDA, 2016).

7.1.2.6 Compaction Potential

Soil compaction is the reduction of soil volume due to external factors. Compaction decreases a soil’s porosity. Low soil porosity restricts root growth and function, reduces water infiltration, increases the soil’s susceptibility to erosion, adversely affects soil fauna, reduces the soil’s drought tolerance, and lowers nutrient uptake levels (Duiker, 2004). Compaction is caused primarily by wheel traffic, but it also can be caused by animal traffic or natural processes. Soil is especially susceptible to compaction when it is saturated (USDA, 2003).

Adelphia evaluated compaction potential by assessing the soils’ drainage potential, as assigned by the WSS. Soils that are very poorly to poorly drained are assigned a high compaction potential rating, soils that are somewhat poorly drained to moderately well drained are assigned a moderate compaction potential rating, and soils that are well-drained or excessively well-drained are assigned a low compaction rating. Othello silt loam, Wehadkee silt loam, Hatboro silt loam, Bowmansville-Knauers silt loam, and Watchung silt loam all have a high potential for compaction. In total 15.1 acres of these soils would be crossed by the Project. All other soils that would be affected by the Project have a moderate or low soil compaction rating.

7.2 SOIL IMPACTS AND MITIGATION

Adelphia would adhere to the FERC’s *Upland Erosion Control, Revegetation, and Maintenance Plan* (FERC Plan) to minimize potential adverse impacts to soils during construction and operations. In addition, Adelphia would develop state-specific *Erosion and Sediment Control Plans* (ESCP), as required, and a Project-specific *Spill Prevention Control and Countermeasures Plan* (SPCC Plan) prior to construction.

7.2.1 Erosion

As stated in section 7.1, there are no soils in the Project area that are considered to be highly susceptible to water or wind erosion. Those with the greatest susceptibility to either type of erosion in the Project area are classified as being 'moderately' susceptible.

Soils that have not been covered with impervious surface generally have increased erosion potential when exposed, excavated, or stockpiled. To minimize or avoid potential effects from soil erosion and sedimentation, Adelphia would use erosion control devices (ECD), as necessary, and implement construction best management practices in accordance with the FERC Plan and ESCP, including, but not necessarily limited to the following:

- Install temporary ECDs (e.g., hay or straw bales and silt fences) prior to or immediately after initial soil disturbance;
- Use environmental inspectors to inspect and ensuring the maintenance of temporary ECDs on a regular basis;
- Test for compaction and decompact if necessary to reduce runoff and aid in percolation of stormwater;
- Reestablish vegetation as soon as possible following final grading;
- Install permanent ECDs (e.g., riprap or rock outlet protection), as necessary; and
- Remove temporary ECDs following the successful restoration of construction areas.

Upon the completion of construction activities, disturbed areas would be seeded with a seed mixture approved by the appropriate agency or landowner. Adelphia would submit its ESCP to the appropriate state agencies and county conservation districts for review and comment as part of the permitting process.

7.2.2 Shallow Depth to bedrock

Soils with shallow depth to bedrock occur at the Tilghman Lateral, Tilghman Station, Monroe Station, Skippack Station, Quakertown CS and associated M&R facilities, Martins Creek Station, MLV 1, and various blowdown assembly sites. However, excavation activities at the Martins Creek Station would be shallow and limited to that required to install a chain-link fence; therefore, impacts associated with a shallow depth to bedrock are not a concern. The Project would require some excavation at the Quakertown CS Site, Tilghman Lateral, Skippack Station,

and MLV 1. If bedrock is encountered during construction, Adelphia would first use conventional removal methods such as ripping or chipping to remove the bedrock. In areas where removal of bedrock by conventional excavation methods fails, blasting could be required, although it is not anticipated. Excavation at the blowdown assembly sites would not require blasting as the area has been previously excavated to install the existing pipeline. Further information on blasting can be found in Resource Report 6 – *Geological Resources*.

7.2.3 Revegetation Potential

Many of the soils classified as having a low revegetation potential within the Project area are classified as urban land (i.e., Marcus Hook CS and wareyard, Parkway Lateral, Delmarva Station) and/or are located in areas that have previously been removed of vegetation and covered with gravel (i.e., along the gravel access road at the Quakertown CS Site and the entire Martins Creek Station). These Sites would be returned to their pre-construction conditions following Project construction; therefore, revegetation potential is not a concern at these Sites.

Adelphia would ensure the successful revegetation as required by the FERC's Plan for all soils disturbed by project-related activities. Adelphia would follow restoration and seeding specifications outlined in the FERC's Plan, as necessary (FERC, 2013). Additional information about vegetation within the Project area, including proposed restoration and seeding measures, can be found in Resource Report 3 – *Fish, Wildlife, and Vegetation*.

Soils at the Quakertown CS and associated M&R facilities would be paved or graveled for Project operations, which would permanently affect the revegetation potential of soils at this Site.

7.2.4 Prime Farmlands

The Adelphia Gateway Project has been sited to avoid prime farmlands to the extent practicable. However, construction and operation of the Project would affect soils classified as prime farmlands and farmland of statewide importance affected by the Project at the Quakertown CS Site, Transco Station, Tilghman Lateral, Skippack Station, and various blowdown assembly sites. Temporarily impacted soils would be restored to pre-construction conditions in accordance with the FERC Plan.

Adelphia would work with landowners in agricultural areas crossed by the Project to ensure that proper restoration of impacted agricultural areas occurs. Restoration measures including topsoil segregation, stone removal, soil de-compaction, and compliance with reseeding specifications would be used to restore affected agricultural lands. Adelphia would also work with the landowners to avoid, minimize, and mitigate impacts to drain tiles and irrigation systems; and

arrange for proper fencing of the work areas, locations for livestock to cross the right-of-way, and alternate grazing areas for livestock, as needed. Agricultural areas are also discussed in Resource Report 8 – *Land Use, Recreation, and Aesthetics*.

7.2.5 Hydric Soils

Hydric soils within the Project area are located within the existing 18-inch and 20-inch pipeline right-of-way, blowdown assembly sites, and MLV 1. Construction of the Project would not adversely affect hydric soils due to their already disturbed nature at these Sites.

7.2.6 Compaction

Soils that are compacted have a lower water carrying capacity, are more prone to runoff and can hinder plant growth. The Othello silt loam located at the Marcus Hook CS and wareyard, Parkway Lateral, and Tilghman Lateral has a high potential for soil compaction; the Wehadkee silt loam at the Tilghman Lateral and Chester Creek Gate also has a high potential for compaction. Lastly the Hatboro silt loam at the Paoli Pike Gate; the Bowmansville-Knauers silt loams at the Perkiomen Creek Gate, and Watchung silt loam at MLV Option 1 also have a high potential for compaction. Construction activities, particularly the operation of heavy equipment when soils are saturated, could cause soil compaction. Adelphia would relieve any compaction in areas not occupied by pavement, gravel, or facilities during Project restoration in accordance with the FERC Plan. Mitigation measures could include topsoil and subsoil compaction testing in agricultural and residential areas disturbed by construction activities. In order to prevent the mixing and compaction of subsoil Adelphia would segregate topsoil in all cultivated or rotated croplands, managed pastures, residential areas, hayfields, and other areas at the landowner's request. In severely compacted areas a deep tillage implement such as a paraplow may be used. In areas where topsoil segregation has taken place subsoil would be plowed prior to replacement of the topsoil.

7.2.7 Topsoil Mixing

Construction activities, such as grading, excavation, and heavy equipment moving along the right-of-way could impact topsoil and subsoil and cause compaction or mixing. Compaction and topsoil mixing could result in a loss of soil fertility. Adelphia would follow measures outlined in the Plan to minimize and avoid adverse effects due to topsoil mixing. Specifically:

- Unless the landowner or applicable land management agency specifically approves otherwise, Adelphia would segregate topsoil from subsoil in cultivated or

rotated croplands, and managed pastures; residential areas; hayfields; and other areas at the landowner's or land managing agency's request;

- Topsoil segregation would either be conducted within the full work area or in the trench and subsoil storage area only;
- Where topsoil segregation is required, Adelphia would segregate at least 12 inches of topsoil in deep soils (more than 12 inches of topsoil), and make every effort to segregate the entire topsoil layer in soils with less than 12 inches of topsoil.; and
- Adelphia would stabilize topsoil piles and minimize loss due to wind and water erosion with the use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary (FERC, 2013).

Implementation of proper topsoil segregation would help ensure post-construction revegetation success, thereby minimizing loss of crop productivity and the potential for long-term erosion problems.

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ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 8

Land Use, Recreation, and Aesthetics

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Sources^a	Found in Section	To be Filed
<p>Minimum Requirements to Avoid Rejection:</p> <p>1. Classify and quantify land use affected by Title 18 CFR § 380.12(j)(1):</p> <ul style="list-style-type: none"> a. Pipeline construction and permanent rights-of-way; b. Extra work/staging areas; c. Access roads; d. Pipe and contractor yards; and e. Aboveground facilities <p>For aboveground facilities provide the acreage affected by construction and operation, acreage leased or purchased, and describe the use of the land not required for operation.</p>	A, L	8.1	N/A
2. Identify by milepost all locations where the pipeline right-of-way would at least partially coincide with existing right-of-way, where it would be adjacent to existing rights-of-way, and where it would be outside of existing right-of-way – 18 CFR § 380.12 (j) (1).	A, D, L, LL	8.2.2	N/A
3. Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent right-of-way and temporary construction right-of-way. (§ 380.12(j)(1))	D	Appendix 1A	N/A
4. Summarize the total acreage of land affected by construction and operation of the Project. (§ 380.12(j)(1))	D	8.1	N/A
5. Identify by milepost all planned residential or commercial/business development and the time frame for construction. (§ 380.12(j)(3))	I	8.2	N/A
6. Identify by milepost special land uses (e.g., maple sugar stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§ 380.12(j)(4))	A, B, L, DD, CC	8.3	N/A
7. Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations. (§ 380.12(j)(4))	B, I, DD, LL	8.3	N/A
8. Identify by milepost all natural, recreational, or scenic areas and all registered natural landmarks crossed by the Project. (§ 380.12(j)(4&6))	A, B, DD, LL	8.3	N/A
9. Identify all facilities that would be within designated coastal zone management areas. (§ 380.12(j)(4))	DD	8.3	N/A

10. Identify by milepost all residences that would be within 50 feet of the construction right-of-way or extra work area. (§ 380.12(j)(5))	A, L	8.3	N/A
11. Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the Project. (§ 380.12(j)(6))	DD	8.5	N/A
12. Describe any measures to visually screen aboveground facilities, such as compressor stations. (§ 380.12(j)(11))	D	8.5	N/A
13. Demonstrate that applications for rights-of-way or other proposed land use have been or soon will be filed with Federal land-managing agencies with jurisdiction overland that would be affected by the Project. (§ 380.12(j)(12))	D	8.3, Appendix 1D	N/A
<p>CFR = Code of Federal Regulations N/A = Not applicable ^a A = Aerial Photography B = Agency Consultation D = Applicant I = County/Municipal Agencies L = Field Surveys O = National Wetlands Inventory Maps CC = Soil Authorities, Other than Natural Resources Conservation Service DD = State Agencies LL = U.S. Department of Transportation</p> <p>Source: FERC, 2017</p>			

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ACRONYMS AND ABBREVIATIONS

Adelphia	Adelphia Gateway, LLC
Congoleum Plant	Congoleum Corporation Plant 3
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
Delmarva Station	Delmarva-owned meter station (location of Parkway Lateral interconnect facilities).
EPA	United States Environmental Protection Agency
FRPP	Farm and Ranch Land Protection Program
GRP	Grasslands Reserve Program
M&R	meter and regulator
Marcus Hook CS	Marcus Hook Compressor Station
MLV	mainline valve
MP	milepost
Quakertown CS	Quakertown Compressor Station
Project	Adelphia Gateway Project
RCRA	Resource Conservation and Recovery Act
Tilghman Station	existing interconnect between PECO and TETCO systems at Tilghman Street
TWS	temporary work space
WRP	Wetland Reserve Program

8 LAND USE, RECREATION, AND AESTHETICS

Resource Report 8 identifies the types or uses of land that would be affected by construction and operation of the Adelpia Gateway Project (Project) and includes associated mapping and descriptions for aboveground facilities. It also describes the potential impacts on recreational and special use areas, scenic rivers, public roads, public lands, and other protected areas that would be crossed or would be within proximity to the Project. Additionally, this report addresses the visual impacts of aboveground facilities. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard.

8.1 LAND USE

This section identifies the current land use in areas that would be affected by the Project and quantifies land use impacts. Adelpia characterized land use types based on interpretation of aerial photography and information collected during field surveys of the Project area. Land uses within the Project area are classified into the following categories:

- Agricultural Land - active cropland, orchards, vineyards, and/or hay fields;
- Forested Land - upland or wetland forest. Forested land that would be affected by the Project is fragmented and of marginal quality (see Resource Report 3 – *Fish, Wildlife, and Vegetation*). Construction on forested land would require some tree removal. However, Adelpia would limit tree removal to only those areas where it is deemed necessary to safely and effectively construct and operate the Project;
- Open Land – non-forested vegetated uplands (except agricultural land), herbaceous and scrub-shrub wetlands, pasture, and maintained utility right-of-way;

- Residential Land - residential lawns/gardens/yards and residential subdivisions; Residential land crossed by the proposed Project consists of privately owned landscaped and maintained lawns/yards;
- Industrial/Commercial Land - electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, railroads, and roads.

Table 8.1-1 identifies the existing land uses types that would be affected by Project facilities. Overview maps and plot plans of the Project facilities are provided in appendices 1A and 1B of Resource Report 1. Impacts to wetlands and waterbodies are identified and discussed in Resource Report 2 – *Water Use and Quality*. In Resource Report 8, wetlands are not given a separate land use category; instead, they are reported as they fit into the land use type definitions provided above (e.g. a forested wetland would be characterized under the forest land use type).

Table 8.1-1

Summary of Land Use Impacts for the Adelphia Gateway Project in Acres

Project Facility	Agricultural Land		Open Land		Industrial/ Commercial		Forested Land		Residential Land		Project Total	
	Const ^a	Op.	Const ^a	Op.	Const ^a	Op.	Const ^a	Op.	Const ^a	Op.	Const ^a	Op.
<i>Pipeline Laterals^{bc}</i>												
Parkway Lateral	0.0	0.0	0.0	0.0	1.6	0.8	0.0	0.0	0.0	0.0	1.6	0.8
Tilghman Lateral	0.0	0.0	0.0	0.0	14.7	2.3	1.5	0.5	6.0	0.0	22.2	2.8
<i>Pipeline Laterals Subtotal</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>16.3</i>	<i>3.1</i>	<i>1.5</i>	<i>0.5</i>	<i>6.0</i>	<i>0.0</i>	<i>23.9</i>	<i>3.6</i>
<i>Aboveground Facilities^{bd}</i>												
Marcus Hook CS	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0
Quakertown CS	0.0	0.0	2.4	0.6	1.2	1.2	0.0	0.0	0.0	0.0	3.6	1.8
Martins Creek Station	0.0	0.0	0.0	0.0	3.5	3.5	0.0	0.0	0.0	0.0	3.5	3.5
Skippack Meter Station	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2
MLV and Blowdown Assembly Sites	0.1	0.0	3.3	0.1	0.2	0.2	0.0	0.0	0.0	0.0	3.6	0.3
<i>Aboveground Facility Subtotal</i>	<i>0.1</i>	<i>0.0</i>	<i>6.3</i>	<i>0.9</i>	<i>11.9</i>	<i>4.9</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>18.3</i>	<i>5.8</i>
Project Total	0.1	0.0	6.3	0.9	28.3	8.0	1.5	0.5	6.0	0.0	42.2	9.4

Notes: Totals may not sum correctly due to rounding

Impacts less than 0.05 are presented as 0.0 due to rounding

Const. = Construction impacts

Op. = Operations impacts

^a Operations impacts are included in construction impacts.

^b Impacts include those associated with meter stations.

^c To avoid double counting of impacts, acreages of affected land for the pipeline laterals do not include the portions of the lateral located within the boundaries of the proposed Marcus Hook CS Site.

^d Impacts include those associated with the wareyard at the Marcus Hook CS and access roads, if applicable.

8.1.1 Pipeline Laterals

Adelphia proposes to construct and operate two new pipeline laterals: the Parkway Lateral; and the Tilghman Lateral. The Parkway Lateral, including associated meter stations, would be constructed and operated entirely on industrial/commercial land. Construction of the Tilghman Lateral, including associated interconnects/meter stations, would primarily affect industrial/commercial land (i.e., roadways and existing gas utility stations), but some impacts would also occur on forested, and residential land. Industrial/commercial land affected by construction of the laterals would be kept as industrial-use land following construction. The majority of forested land affected by construction of the Tilghman Lateral would be allowed to revegetate naturally while the remaining forested land would be maintained in an herbaceous state during operations to allow for access to the pipeline right-of-way and to ensure safe operations.

8.1.2 Aboveground Facilities

Aboveground Project facilities include the Marcus Hook Compressor Station (Marcus Hook CS), wareyard, the Quakertown Compressor Station (Quakertown CS) and associated M&R facilities, the Martins Creek Station, and the Skippack Meter Station.

The Marcus Hook CS, wareyard and modifications to the Martins Creek Station would be installed entirely on existing paved/graveled industrial/commercial land, which would be kept as industrial-use land for operations.

The Quakertown CS and associated M&R facilities would be installed within the boundaries of the existing Quakertown M&R Station, which consists of paved/graveled industrial land and open land (scrub-shrub uplands). The remaining portion of the Quakertown CS would be located on open land (non-agricultural field and maintained pipeline right-of-way) and industrial/commercial land (road) located adjacent to the Quakertown M&R Station property. Industrial/commercial land affected by construction of the Quakertown CS would remain in industrial/commercial use during operations. Open land within the boundaries of the Quakertown M&R Station would be paved and permanently converted to industrial use land. Open land outside of the Quakertown M&R Station boundaries that would be affected by the Project would be returned to pre-construction conditions following construction.

The Skippack Meter Station would be installed on open land (including maintained pipeline right-of-way and pasture). Area used as temporary work space (TWS) would be returned to pre-

existing conditions following construction. A portion of the land affected would be permanently converted to paved/graveled industrial-use land for Project operations.

8.1.3 Mainline Valves and Blowdown Assemblies

Construction of the new MLV and blowdown assemblies at existing MLVs would affect agricultural, open land, and industrial/commercial land. Land used as TWS would be returned to pre-existing conditions following construction completion. Adelphia would use existing access roads to access the sites.

8.2 PLANNED RESIDENTIAL AND COMMERCIAL AREAS

Adelphia consulted with county planning departments and reviewed county planning commission records to identify proposed residential and commercial developments within 0.5 mile of the Project.¹ No proposed new residential developments were identified within 0.5 mile of the Project (New Castle County Land Use Department, 2017; Bucks County Planning Commission, 2017; Lower Chichester Township, 2017; Delaware County Planning Department, 2017). However, several proposed commercial developments were identified in proximity to the Tilghman Lateral and Marcus Hook CS. Table 1.10-1 in Resource Report 1 identifies planned development projects within 0.5 mile of the Project. Due to the proposed commercial developments' distance from the Project and/or the temporary duration of Project construction, the Project would not adversely impact proposed commercial land development in the vicinity of the Project area.

8.2.1 Existing Residences and Buildings

There are no residences or other non-residential buildings located within the Project's construction workspace. A total of 121 residences and 37 non-residential structures would be located within 100 feet of the Project's construction workspace, as identified during field reconnaissance surveys and aerial imagery interpretation. Table 8.2-1 provides the number residences within 100 feet of the Project Area, by Project Site. Table 8.2-2 provides the location by facility, workspace type, and milepost for residences within 50 feet of the Project.

¹ Due to the limited scope and geographical extent of proposed Project activities at the Martins Creek Station and MLV/Blowdown Sites, Adelphia did not evaluate planned residential or commercial areas near these Project Sites.

Table 8.3-2		
Structures within 100 Feet of the Adelphia Gateway Project's Construction Workspace		
Project Site	Number of Structures^a	
	Residences	Non-residential Buildings
Marcus Hook CS ^b	27	4
Parkway Lateral	24	4
Tilghman Lateral	67	22
Quakertown CS ^c	1	0
Martins Creek Station	0	1
Delmarva Meter Station ^d	0	1
Transco Meter Station	0	1
Monroe Meter Station	0	1
Skippack Meter Station	0	1
PECO Meter Station	0	1
Chester Creek Gate Blowdown	0	0
Paoli Pike Gate Blowdown	0	0
Pickering Creek Gate Blowdown	0	0
French Creek Gate Blowdown	1	0
Cromby Gate Blowdown	0	0
Schuylkill River Gate Blowdown	0	0
Perkiomen Creek Gate Blowdown	0	0
East Perkiomen Gate Blowdown	0	0
MLV Option 1	1	1
MLV Option 2	0	0
Total	121	37

^a Counts determined based on Google Earth imagery and includes several multi-unit apartment buildings, which are counted as one residence due to the inability to discern between units on aerial imagery.

^b Includes the proposed wareyard located at the Marcus Hook Pump Station.

^c Includes associated M&R facilities.

^d Includes the TETCO, TCO and Delmarva M&R facilities.

Table 8.2-2		
Residences within 50 Feet of the Adelpia Gateway Project's Construction Workspace^a		
Project Site	Workspace Type	Nearest Project Milepost
Parkway Lateral	ATWS	PL 0.0
	ATWS	PL 0.0
	ATWS	PL 0.1
	ATWS	PL 0.1
	ATWS	PL 0.1
Tilghman Lateral	ATWS	TL 0.9
	HDD ATWS	TL 1.0
	HDD ATWS	TL 1.1
	HDD ATWS	TL 3.4
	HDD ATWS	TL 3.4
	HDD ATWS	TL 3.4
	HDD ATWS	TL 3.4
	HDD ATWS	TL 3.5
	HDD ATWS	TL 3.5
	HDD ATWS	TL 3.5
	HDD ATWS	TL 3.9
HDD ATWS	TL 4.2	
ATWS = additional temporary workspace HDD = horizontal directional drill ^a Counts determined based on Google Earth imagery and includes several multi-unit apartment buildings, which are counted as one residence due to the inability to discern between units on aerial imagery.		

Construction the Project could result in short-term impacts on nearby residences and other buildings by increasing construction-related traffic on local roads, generating dust, and causing noise during construction. Adelpia would minimize these impacts by adhering to its *Residential Access and Traffic Management Plan* (see Resource Report 5 – *Socioeconomics*), the FERC *Upland Erosion Control, Revegetation, and Maintenance Plan*, (see appendix 1C) and through implementation of mitigation measures that include:

- limiting construction activities to daytime hours, wherever feasible;
- ensuring that utilities are not disrupted during construction, to the extent practicable. If the need to disrupt utilities arises, Adelpia would provide notice to affected land owners as early as possible;

- notifying adjacent landowners no later than two weeks prior to the start of construction; and
- inspecting road surfaces near residences and, if necessary, cleaning roads of soil and debris deposited due to construction activities.

8.2.2 Existing Right-of-Way Colocations

The Parkway and Tilghman Laterals would be collocated within existing road and utility right-of-way for the majority of their proposed routes. Table 8.2-3 provides the locations by milepost where the pipelines would be collocated or adjacent to existing right-of-way.

Table 8.2-3					
Proposed Pipeline Collocations for the Tilghman and Parkway Laterals					
Begin MP	End MP	Collocated With^a	Distance within Existing ROW (feet)	Distance Adjacent to Existing ROW (feet)	Distance Outside Existing ROW (feet)
<i>Parkway Lateral</i>					
PL 0.0	PL 0.1	Ridge Road	167	0	0
PL 0.1	PL 0.2	Parkway Avenue	493	0	0
PL 0.2	PL 0.2	N/A	0	0	607
<i>Tilghman Lateral</i>					
TL 0.0	TL 0.3	Ridge Road, power line, Transco pipeline ROW	1,795	0	0
TL 0.3	TL 2.2	Ridge Road, power lines	10,031	0	0
TL 2.2	TL 2.3	N/A	0	0.0	529
TL 2.3	TL 2.9	Transco	0	3,010	0
TL 2.9	TL 3.7	Highway 291, power line	4,382	0	0
TL 3.7	TL 3.8	Townsend Street	348	0	0
TL 3.8	TL 4.3	Transco pipeline ROW, W. Front Road	2,661	0	0
TL 4.3	TL 4.4	Central Avenue	422	0	0
TL 4.4	TL 4.4	Delaware Avenue	0	158	0

Table 8.2-3					
Proposed Pipeline Collocations for the Tilghman and Parkway Laterals					
Begin MP	End MP	Collocated With^a	Distance within Existing ROW (feet)	Distance Adjacent to Existing ROW (feet)	Distance Outside Existing ROW (feet)
<small>ROW = right-of-way ^a Detailed civil surveys have not yet been performed so a full list of collocated utilities is not yet available. Adelpia is continuing to seek access and will complete field evaluations as access is granted.</small>					

8.3 PUBLIC LAND, RECREATION, AND OTHER DESIGNATED AREAS

Public land, recreational land, and other similarly designated areas within the vicinity of the Project were investigated by reviewing publicly available information such as U.S. Geological Service topographic maps, Google Earth aerial imagery, and both state and federal agency services. Construction of the new MLV and blow-down assembly modifications along the existing 18-inch and 20-inch diameter pipeline would take place within existing previously permitted, and maintained pipeline right-of-way and existing access roads and would therefore not affect public or conservation land, natural, recreational, or scenic areas and are not included in the discussion below.

8.3.1 Public or Conservation Land

None of the Project facilities that would require construction are located within 0.25 mile of any National Park System lands (NPS, 2017). The Project does not cross and is not located within 0.25 mile of any Indian reservations, national wildlife refuges, or National Wilderness Areas (U.S. Fish and Wildlife Service, 2015; NPS, 2017).

The U.S. Department of Agriculture Farm Service Agency manages the Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), which are voluntary programs that aid land owners in preventing topsoil erosion and conserving natural resources. None of the Project facilities would be located within 0.25 mile of areas registered as CRP or CREP (NRCS, 2015).

The Agricultural Act of 2014 created the Agricultural Conservation Easement Program (ACEP) which replaces the Wetlands Reserve Program (WRP), Farm and Ranch Land Protection Program (FRPP), and Grasslands Reserve Program (GRP). New enrollments are no longer being accepted for the WRP, GRP, and WRP programs, but contracts under these programs are still

valid. None of the properties in which the Project would be built were found to be within 0.25 mile of any conservation easements (NRCS, 2015).

8.3.2 Natural, Recreational, or Scenic Areas

The National Scenic Byways Program was established under the Intermodal Surface Transportation Efficiency Act of 1991 in order to preserve and protect the nation's scenic roads (FHA, 2017). Roads designated as National Scenic Byways must meet at least one of the six intrinsic qualities specified by the Federal Highway Administration, including: archaeological, cultural, historic, natural, recreational, and/or scenic qualities. If a road or highway meets more than one of these criteria it is deemed an All-American Road and is recognized for its unique features. No All-American Roads, natural areas, recreational areas, historic areas, hiking trails, or scenic areas were identified within 0.25 mile of the Project (FHA, 2017; PADCNr, 2017a; PADCNr, 2017b; PADCNr 2017c; PASDA, 2017a; PASDA, 2017b). The Martins Creek Station is located along the Delaware River Scenic Byway (FHA, 2017); however, because construction at this Site would be limited to the installation of a chain-link fence and would occur entirely within the boundaries of the existing Martins Creek Terminal, Project-related impacts to the Byway are not anticipated.

The Marcus Hook CS, wareyard, the portion of the Parkway Lateral located in Pennsylvania, and all of the Tilghman Lateral (including and associated M&R facilities) would be located within the Delaware Estuary Coastal Zone (PASDA, 2004). In accordance with the Federal Coastal Zone Management Act (CZMA), Adelphia will request a federal consistency review from the Pennsylvania Department of Environmental Protection's Coastal Resources Management Program for the portion of the Project within the Delaware Estuary Coastal Zone and will file its request with the FERC upon its submittal to the Pennsylvania Department of Environmental Protection. Adelphia will file the agency's response to its request, along with all related correspondence, with the FERC upon its receipt. None of the Project facilities would be within the coastal zone in the state of Delaware (DNREC, 2017).

8.4 CONTAMINATED SITES

According to the U.S. Environmental Protection Agency's (EPA) *Cleanups in My Community* website, two Resource Conservation and Recovery Act (RCRA) Corrective Action sites occur in proximity to the Project (EPA, 2017a). The Congoleum Corporation Plant 3 (Congoleum Plant) is a 51.5-acre site located along Ridge Road and adjacent to the Tilghman Lateral at MP TL-1.5. The Congoleum Plant is an active facility that has manufactured floor

products since 1902. Solvent based inks/paints were historically used in the manufacturing process until the early 1980s, and some heavy metal contaminants remain in the soil and groundwater at the facility above levels appropriate for residential uses. Therefore, the EPA implemented institutional controls to restrict land and groundwater use at the site. In 2016, the EPA determined that the Congoleum Plant completed the requirements of the RCRA Corrective Action, and both human exposures to contaminants and migration of contaminated groundwater are 'under control' (EPA, 2016b). Project activities would not violate any of the implemented land and groundwater use restrictions.

The Monroe Energy, LLC site is a former BP Oil Incorporated-owned oil refinery located on a 350-acre site adjacent to State Route 291 in Trainer, Pennsylvania approximately at approximately MP 2.7 on the Tilghman Lateral. In 1989, while under BP Oil ownership, the EPA initiated a RCRA Facility Assessment at the site. The Assessment identified groundwater, soil, and air contamination at the site. Since 1991, the EPA and the PADEP have been involved in cleanup activities at the site. The main contaminants in the facility are typical hazardous petroleum constituents such as benzene, toluene, ethyl benzene, total xylene, semi-volatile organic compounds, arsenic, chromium and lead. As of 2013, human exposure to contamination and migration of contaminated groundwater are listed by the EPA as being 'under control', and the cleanup is ongoing (EPA, 2016a).

There is also one EPA Superfund Site located in the vicinity of the Project. The Metro Container Corporation Superfund Site is a 10.4-acre site located along Route 291 and adjacent to the Tilghman Lateral at MP TL 2.6. The site has been used for various industrial activities since the late 19th century. Soil and groundwater at the Superfund site are contaminated with polychlorinated biphenyls, inorganic elements, polycyclic aromatic hydrocarbons and volatile organic compounds. Buried containment structures and piping systems used by past owner/operators contain sludges and non-aqueous phase liquids and in many areas remain connected to Stoney Creek. The EPA has conducted several removal response actions to remove contaminants from the site, the most recent of which completed in 2016 (EPA, 2017b). The Metro Container Site is on the EPA's National Priorities List and will be subject to future monitoring and remediation activities by or under the direction of the EPA (Towle, 2017). Adelphia proposes to install the pipeline via horizontal directional drill in this area to avoid potential impacts to the contaminated area.

Adelphia conducted Phase One Environmental Site Assessments for all proposed aboveground facilities. These investigations identified several historic recognized environmental

conditions (NV5, 2017a-d), which are presented in table 8.5-1. No contaminated soils, sediments, or groundwater are expected to be encountered at any of the Project facilities. Prior to the start of construction, Adelphia would draft an *Unanticipated Discovery of Contamination Plan* that outlines the steps that would be followed in the unlikely event that contaminated sediments, soils, or groundwater are identified during Project construction.

Project Facility	Date of Occurrence	Identified Condition	Description	Comment/Status
Marcus Hook CS	2/6/1992	Oil Release	An oil release affected storm water drainage and subsurface.	No evidence of staining or discharge via visual inspection. Soil and gravel were excavated and area cleaned/remediated.
Marcus Hook CS	6/30/1992	Oil release	Release of Therminol 55 heat transfer fluid affected storm water drainage system.	No evidence of staining or discharge via visual inspection. Contaminated soil was addressed.
Marcus Hook CS	4/5/1993	Oil release	Release of No. 2 fuel oil from adjacent site that was transferred to Marcus Hook CS via transfer pipe.	No evidence of staining or discharge via visual inspection. Contaminated soil and gravel were removed, area was remediated.
Marcus Hook CS	8/23/1993	Oil spray release	Surface spray of oil from muffler reported. Exact location unknown.	No evidence of staining or discharge via visual inspection.
Marcus Hook CS	5/28/2015	Monitoring well closure	Several groundwater monitoring wells installed at the site.	N/A

Sources: NV5, 2017a-d

8.5 VISUAL RESOURCES

The Project would not be located within any federal, state, or locally designated scenic areas, such as National Wild and Scenic Rivers. However, Martins Creek Station would be located approximately 0.5 mile from a portion of the Delaware River listed as a Pennsylvania scenic river (Wild & Scenic Rivers, 2017). Due to the limited extent of Project activities that would occur at the Martins Creek Station and the distance of this site from the listed portion of the Delaware River, impacts to Pennsylvania listed scenic rivers would not occur.

Project construction would result in impacts on visual and/or aesthetic resources due to vegetation clearing and the presence of construction equipment. Impacts to these resources during operations would be caused by the permanent conversion of vegetated land to

industrial/commercial land and the conversion of forested and scrub/shrub vegetation to maintained herbaceous habitat. The creation of new aboveground facilities (i.e., compressor stations and meter stations) would also result in permanent impacts to visual and/or aesthetic resources; however, these sites would at least partially be sited on existing industrial-use lands, and impacts would therefore be minimized. Visual impacts from construction and operation for the remainder of the Project would be minimal and temporary. The need for additional visual screening to further reduce visual impacts would be determined on a site-specific basis through consultation with adjacent landowners.

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ADELPHIA GATEWAY PROJECT

RESOURCE REPORT 9

Air Quality and Noise

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
Information	Data Sources^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. Describe existing air quality in the vicinity of the project – Title 18 Code of Federal Regulations (CFR) part (§) 380.12 (k) (1).	J, DD	9.1.1	N/A
2. Quantify the existing noise levels (day-night sound level (Ldn) and other applicable noise parameters) at noise sensitive areas and at other areas covered by relevant state and local noise ordinances – 18 CFR § 380.12 (k) (2)	U	9.2.3, Appendix 9-D	X
3. Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NOx) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project – 18 CFR § 380.12 (k) (3)	D, R	Table 9.1-6, Table 9.1.9, Appendix 9-A and Appendix 9-C.	N/A
4. Describe the existing compressor units at each station where new, additional, or modified compression units are proposed, including the manufacturer, model number, and horsepower of the compressor units. For proposed, new, additional, or modified compressor units, include horsepower, type, and energy source – 18 CFR § 380.12 (k) (4)	D	9.1	N/A
5. Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure – 18 CFR § 380.12 (k) (4)	A	9.2.1	N/A
6. Identify any applicable state or local noise regulations – 18 CFR § 380.12 (k) (4)	I	9.2.1	N/A
7. Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment – 18 CFR § 380.12 (k) (4)	D, R, U	9.2.5, 9.2.6 and Appendix 9-D	X
<p>N/A = Not Applicable</p> <p>^a A = Aerial Photographs D = Applicant I = County/Municipal Agencies J = U.S. Environmental Protection Agency R = Manufacturer's Data U = Noise Surveys DD = State Agencies</p> <p>Source: FERC, 2017</p>			

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ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	microgram per cubic meter
25 PA Code	Title 25 of the Pennsylvania Code
40 CFR	Title 40 of the Code of Federal Regulations
Adelphia	Adelphia Gateway, LLC
BAT	Best Available Technology
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
dB	decibel
dBA	decibels on the A-weighted scale
dscfm	dry standard cubic feet per minute
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
g/HP-hr	grams per horsepower hour
GHG	greenhouse gases
gr/dscf	grains per dry standard cubic feet
HAP	hazardous air pollutant
HDD	horizontal directional drill
HP	horsepower
Hz	hertz
kg/MMBtu	kilograms per million British thermal unit
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
MACT	Maximum Available Control Technology
Marcus Hook CS	Marcus Hook Compressor Station
MRR	Greenhouse Gas Mandatory Reporting Rule

N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
nmnehc	non-methane/non-ethane hydrocarbon
NNSR	Nonattainment New Source Review
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
PA Code	Pennsylvania Code
PADEP	Pennsylvania Department of Environmental Protection
Plan Approval	Pennsylvania Air Quality Construction Permit
PM ₁₀	particulate matter less than 10 micrometers in diameter
PM _{2.5}	particulate matter less than 2.5 micrometers in diameter
ppb	part per billion
ppm	part per million
ppmvd	parts per million, by volume, dry basis
Project	Adelphia Gateway Project
PSD	Prevention of Significant Deterioration
psia	pounds per square inch, atmospheric pressure
psig	pounds per square inch, gauge pressure
Quakertown CS	Quakertown Compressor Station
RACT	Reasonably Available Control Technology
RICE	reciprocating internal combustion engines
SAAQS	State Ambient Air Quality Standards
scfh	standard cubic feet per hour
SCR	selective catalytic reduction
SIP	State Implementation Plan
SO ₂	sulfur dioxide
tpy	tons per year

VOC	volatile organic compound
VOL	volatile organic liquid

9 AIR QUALITY AND NOISE

Resource Report 9 includes a discussion of potential Adelphia Gateway Project (Project) impacts on air quality and noise in the Project area. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook Compressor Station [Marcus Hook CS] and the Quakertown Compressor Station [Quakertown CS]); two laterals, including an approximately 0.2-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves (MLV); one new MLV; and use of an existing disturbed site as a wareyard. Potential impacts on air quality resources from the Project are discussed in section 9.1, and section 9.2 addresses Project impacts on noise quality.

9.1 AIR QUALITY

The Quakertown CS would be located in Quakertown, Bucks County, Pennsylvania. The Marcus Hook CS, would be located in Lower Chichester, Delaware County, Pennsylvania. The Project would include three meter facilities co-located on one site located in Claymont, New Castle County, Delaware associated with the Parkway Lateral (the Delmarva Meter Station); and three meter stations in Lower Chichester, Trainer, and Chester, Delaware County, Pennsylvania associated with the Tilghman Lateral (the Transco Meter Station, the Monroe Meter Station, and the PECO Meter Station, respectively). An additional two new meter stations, the Skippack Meter Station and the Quakertown Meter Station, would also be located in Skippack, Montgomery County, Pennsylvania and Quakertown, respectively.

The proposed equipment at the Quakertown CS includes:

- three Caterpillar G3606 natural gas compressor engines (rated at 1,875 horsepower [HP]) equipped with oxidation catalysts;
- one Caterpillar G3412C natural gas emergency generator engine (rated at 670 HP) for power generation;
- one 1,000-gallon produced fluid tank;
- one 500-gallon engine oil tank;

- one 500-gallon glycol tank; and
- associated piping and components.

The proposed equipment at the Marcus Hook CS includes:

- three Caterpillar G3606 natural gas compressor engines (rated at 1,875 HP) equipped with oxidation catalysts;
- one Caterpillar G3412C natural gas emergency generator engine (rated at 670 HP) for power generation;
- one 1,000-gallon produced fluid tank;
- one 500-gallon engine oil tank;
- one 500-gallon glycol tank; and
- associated piping and components.

The Project scope also includes the construction and operation of a new mainline valve and eight blowdown assemblies. Apart from emissions generated during the construction period of these assets, which would be brief, air emissions and noise during operation would be limited to maintenance and emergency use, (which are expected to occur less than one time per year on average). Therefore, these emissions and noise are not part of the normal operation of the Project. The existing 18-inch- and 20-inch-diameter pipelines and other ancillary facilities (see Resource Report 1 – *General Project Description*) are not part of the scope of Resource Report 9 and are therefore not discussed further.

Adelphia Gateway, LLC (Adelphia) would implement measures to avoid, minimize, and/or mitigate any potential adverse impacts on air quality resulting from Project-related air emissions. The impacts on air quality resulting from the construction and operation of the Project are summarized in the following sections.

In addition to meeting requirements of the Federal Energy Regulatory Commission (FERC), Adelphia would comply with other applicable permitting requirements, such as obtaining Pennsylvania Air Quality Construction Permits (Plan Approvals) from the Pennsylvania Department of Environmental Protection (PADEP) for the Quakertown CS and the Marcus Hook CS. The PADEP would review air permit applications for these operations and upon its approval of the applications, would issue the necessary permits in accordance with its rules and regulations. Construction would not commence on the Quakertown CS or Marcus Hook CS until its respective Plan Approval has been issued.

Table 9.1-1

Selected Climate Parameters at Adelpia Gateway Project Sites

Project Sites	Site Location (County, State)	Weather Monitoring Station Location	Weather Monitoring Station ID	Site Distance and Direction from Station (miles/ direction)	Average Daily Minimum Temperature – January (°F)	Average Daily Maximum Temperature – July (°F)	Average Annual Precipitation (inches)
Parkway Lateral	Delaware, PA	Marcus Hook, PA	GHCND:US C00365390	<1.0/NE	27.1	87.2	39.3
Marcus Hook CS							
Tilghman Lateral							
Transco Meter Station							
Monroe Meter Station							
PECO Meter Station							
Parkway Lateral	New Castle, DE	Marcus Hook, PA	GHCND:US C00365390	~1.0/NE	27.1	87.2	39.3
Delmarva Meter Station ^a							
TETCO Meter Station ^a							
TCO Meter Station ^a							
Skippack Meter Station	Montgomery, PA	Graterford, PA	GHCND: USC003634 37	~1.0/SE	21.3	83.5	46.3
Quakertown CS and Quakertown Meter Station	Bucks, PA	Sellersville, PA	GHCND:US C00367938	5.1/SSE	18.5	84.5	48.9

^a The TETCO, TCO and Delmarva Meter Stations would be located within the existing Delmarva Station Site (see Resource Report 1).

Source: NOAA, 2017

9.1.1 Existing Conditions

Climate

The proposed Quakertown CS and associated M&R Station, Marcus Hook CS, and the remaining seven meter stations are all located in a continental temperate climate. This climate type is characterized by warm summers and cold winters that are lacking extremes in temperature and precipitation (ISC Audubon, 2017). Table 9.1-1 summarizes a selection of climate parameters for Project Sites.

National Ambient Air Quality Standards

The Clean Air Act (CAA), requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA identifies two types of national ambient air quality standards: primary standards, which provide public health protection; and secondary standards, which provide public welfare protection (EPA, 2016). Table 9.1-2 summarizes the NAAQS that are currently in effect.

Pollutant	Primary Standards	Averaging Times for both Primary and Secondary Standards	Secondary Standards
Carbon Monoxide (CO)	9 ppm (10,000 µg/m ³)	8-hour	None
	35 ppm (40,000 µg/m ³)	1-hour	None
Lead	0.15 µg/m ³	Rolling 3-month Average	Same as Primary
Nitrogen Dioxide (NO ₂)	53 ppb (100 µg/m ³)	Annual (arithmetic mean)	Same as Primary
	100 ppb (188 µg/m ³)	1-hour	None
Particulate Matter Less Than 10 Micrometers In Diameter (PM ₁₀)	150 µg/m ³	24-hour	Same as Primary
Particulate Matter Less Than 2.5 Micrometers In Diameter (PM _{2.5})	12 µg/m ³	Annual (arithmetic mean)	15 µg/m ³
	35 µg/m ³	24-hour	Same as Primary
Ozone	70 ppb (137 µg/m ³)	8-hour	Same as Primary
Sulfur Dioxide (SO ₂) ^a	0.03 ppm (80 µg/m ³)	Annual (arithmetic mean)	None
	0.14 ppm (365 µg/m ³)	24-hour	None
	None	3-hour	0.5 ppm (1,300 µg/m ³)
	75 ppb (196 µg/m ³)	1-hour	None

ppm = parts per million

Table 9.1-2			
National Ambient Air Quality Standards for Criteria Pollutants			
Pollutant	Primary Standards	Averaging Times for both Primary and Secondary Standards	Secondary Standards
µg/m ³ = micrograms per cubic meter ppb = parts per billion ^a The existing annual and 24-hour SO ₂ standards will be revoked one year after the effective dates in areas with designated status for the revised SO ₂ NAAQS. Source: EPA, 2016			

Pennsylvania also has State Ambient Air Quality Standards (SAAQS) for beryllium, fluoride, and hydrogen sulfide as codified in Title 25, Chapter 131, Section 3 of the Pennsylvania Code (25 PA Code §131.03). The Quakertown CS, Marcus Hook CS and proposed meter stations are not expected to be a source of these state-specified pollutants. Delaware SAAQS are outlined in Title 7, *Natural Resources and Environmental Control*, Delaware Administrative Code, Regulation 1103. The Delaware standards mimic the NAAQS; however, there are additional specified standards for suspended particulates, 1-hour ozone, hydrocarbons (exclusive of methane), and hydrogen sulfide. The proposed meter stations are not expected to be a source of these state-specified pollutants.

Any area that does not meet the NAAQS for the corresponding pollutant is known as a nonattainment area. If an area was previously designated nonattainment, but now attains the standard and has an EPA-approved plan to maintain the standard, then the area is designated a maintenance area (EPA, 2017a). Attainment status is defined in Title 40 of the Code of Federal Regulations (CFR) Part 81 Section 339 (40 CFR 81.339) for Pennsylvania and Section 308 (40 CFR 81.308) for Delaware. The attainment statuses for the Project area are listed in table 9.1-3. Pennsylvania and Delaware are in the Ozone Transport Region, which is a group of states in the northeastern U.S. that are required by the CAA to install a certain level of controls for the pollutants that form ozone, even if they meet the ozone standards. Therefore, the entire states are classified as moderate nonattainment for ozone (EPA, 2017c).

Table 9.1-3		
Attainment Status Summary for Counties Crossed by the Adelfia Gateway Project		
County, State	Nonattainment Area	Maintenance Area
Bucks, PA	2008 ozone (part of Metropolitan Philadelphia Interstate Air Quality Control Region)	1997 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
		2006 PM _{2.5}

Table 9.1-3 Attainment Status Summary for Counties Crossed by the Adelphia Gateway Project		
County, State	Nonattainment Area	Maintenance Area
Delaware, PA	2008 ozone (part of Metropolitan Philadelphia Interstate Air Quality Control Region)	1997 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
	2012 PM _{2.5}	2006 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
New Castle, DE	2008 ozone (part of Metropolitan Philadelphia Interstate Air Quality Control Region)	1997 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
		2006 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
Montgomery, PA	2008 ozone (part of Metropolitan Philadelphia Interstate Air Quality Control Region)	1997 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
		2006 PM _{2.5} (part of Metropolitan Philadelphia Interstate Air Quality Control Region)
Source: EPA, 2017d		

Monitoring Data

Ambient air quality monitoring data is collected by state and federal agencies to determine ambient air quality for a region. These data are then used by the regulatory agencies to compare a region's air quality to the NAAQS. Table 9.1-4 presents recent existing ambient air quality data from representative monitoring stations surrounding the Quakertown CS and Marcus Hook CS Sites and the eight meter stations. These monitoring stations were chosen either as the nearest station to the Project Site or due to similarities in land use and topography between the monitoring stations and the Site. Data quality and quantity were also considered.

Class 1 Areas

Federal Class I areas are certain areas established by Congress that are afforded special protection under the CAA. Once designated as a Class I area, that area cannot be redesignated to another (less restrictive) classification. Class II areas are all other areas outside of those initially designated as Class I. Class I areas are allowed the smallest degree of air quality deterioration (compared to other areas with different class designations) through New Source Review (NSR) permitting, and special considerations must be made in the NSR permitting process when a Class I area is located close to a proposed project site. NSR regulations are discussed in section 9.1.5. NSR applicability would be evaluated once all aspects of the Project are finalized, and Class I

modeling requirements would be reviewed if the Project requires Prevention of Significant Deterioration (PSD) review. However, preliminary potential emission estimates indicate the Quakertown CS and Marcus Hook CS would be minor sources and therefore not subject to NSR/PSD permitting or Class I modeling (see section 9.1.5). The Class I areas nearest to the proposed location of the Quakertown CS and Marcus Hook CS have been identified in table 9.1-5. No Class I areas are located within 50 miles of the proposed meter stations.

**Table 9.1-4
Ambient Air Quality for the Quakertown Compressor Station, Marcus Hook Compressor Station, and Meter Stations for the Adelpia Gateway Project**

Pollutant	Averaging Period	Monitoring Station	Air Quality System Site ID	Location of Nearest Project Site (County, State)	Distance and Direction from Nearest Project Site (miles/ direction)	Background Concentration ($\mu\text{g}/\text{m}^3$)^c	Primary /Secondary NAAQS ($\mu\text{g}/\text{m}^3$)
NO ₂	1-hour	Front Street and Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	83.4	188 / NA
NO ₂	1-hour	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	82.2	188 / NA
NO ₂	1-hour	Front Street and Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	83.4	188 / NA
NO ₂	1-hour	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Montgomery, PA	27.2/N	82.2	188 / NA
NO ₂	Annual	Front Street and Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	17.5	100 / 100
NO ₂	Annual	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	18.3	100 / 100
NO ₂	Annual	Front Street and Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	17.5	100 / 100
NO ₂	Annual	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Montgomery, PA	27.2/N	18.3	100 / 100
PM _{2.5} ^b	24-hour	Marcus Hook Elementary, Marcus Hook, PA	42-045-0109	Delaware, PA	1.1/E	25.0	35 / 35
PM _{2.5}	24-hour	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	27.3	35 / 35
PM _{2.5} ^b	24-hour	Marcus Hook Elementary, Marcus Hook, PA	42-045-0109	New Castle, DE	1.5/E	25.0	35 / 35
PM _{2.5} ^b	24-hour	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	25.3	35 / 35
PM _{2.5} ^b	Annual	Marcus Hook Elementary, Marcus Hook, PA	42-045-0109	Delaware, PA	1.1/E	10.0	12 / 15

**Table 9.1-4
Ambient Air Quality for the Quakertown Compressor Station, Marcus Hook Compressor Station, and Meter Stations for the Adelpia Gateway Project**

Pollutant	Averaging Period	Monitoring Station	Air Quality System Site ID	Location of Nearest Project Site (County, State)	Distance and Direction from Nearest Project Site (miles/ direction)	Background Concentration ($\mu\text{g}/\text{m}^3$)^c	Primary /Secondary NAAQS ($\mu\text{g}/\text{m}^3$)
PM _{2.5}	Annual	Washington and Cambria Streets. Freemansburg	42-095-0025	Bucks, PA	15.5/N	10.5	12 / 15
PM _{2.5} ^b	Annual	Marcus Hook Elementary, Marcus Hook, PA	42-045-0109	New Castle, DE	1.5/E	10.0	12 / 15
PM _{2.5} ^b	Annual	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	8.8	12 / 15
CO	1-hour	MLK Blvd and Justison Street, Wilmington, DE	10-0003-2004	Delaware, PA	8.5/SW	1,718.4	40,000 / NA
CO ^a	1-hour	Washington and Cambria Streets. Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	1,833.0	40,000 / NA
CO	1-hour	MLK Blvd and Justison Street, Wilmington, DE	10-0003-2004	New Castle, DE	8.1/SW	1,718.4	40000 / NA
CO	1-hour	MLK Blvd and Justison Street, Wilmington, DE	10-0003-2004	Montgomery, PA	35.2/S	1,718.4	40000 / NA
CO	8-hour	MLK Blvd and Justison Street, Wilmington, DE	42-125-0005	Delaware, PA	8.5/SW	1,374.7	10,000 / NA
CO ^a	8-hour	Washington and Cambria Streets. Freemansburg, PA	42-125-0005	Bucks, PA	15.5/N	1,260.2	10,000 / NA
CO	8-hour	MLK Blvd and Justison Street, Wilmington, DE	42-125-0005	New Castle, DE	8.1/SW	1,374.7	10,000 / NA
CO	8-hour	MLK Blvd and Justison Street, Wilmington, DE	42-125-0005	Montgomery, PA	35.2/S	1,374.7	10,000 / NA
PM ₁₀	24-hr	Morgan Boulevard and I-676 Entrance, Camden, NJ	34-007-0009	Delaware, PA	18.1/NE	113.0	150 / 150
PM ₁₀	24-hr	State Hospital Rear 1600 Hanover Ave, Allentown, PA	42-077-0004	Bucks, PA	15.0/NNW	42.0	150 / 150

**Table 9.1-4
Ambient Air Quality for the Quakertown Compressor Station, Marcus Hook Compressor Station, and Meter Stations for the Adelpia Gateway Project**

Pollutant	Averaging Period	Monitoring Station	Air Quality System Site ID	Location of Nearest Project Site (County, State)	Distance and Direction from Nearest Project Site (miles/ direction)	Background Concentration ($\mu\text{g}/\text{m}^3$)^c	Primary /Secondary NAAQS ($\mu\text{g}/\text{m}^3$)
PM ₁₀	24-hr	Morgan Boulevard and I-676 Entrance, Camden, NJ	34-007-0009	New Castle, DE	18.5/NE	113.0	150 / 150
PM ₁₀	24-hr	State Hospital Rear 1600 Hanover Ave, Allentown, PA	42-077-0004	Montgomery, PA	25.5/N	42.0	150 / 150
SO ₂	1-hour	Front Street & Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	23.6	196 / NA
SO ₂	1-hour	17 and Spring Garden Streets, Wilson, PA	42-095-8000	Bucks, PA	20.7/NNE	55.9	196 / NA
SO ₂	1-hour	Front Street & Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	23.6	196 / NA
SO ₂	1-hour	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	15.7	196 / NA
SO ₂	24-hour	Front Street and Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	13.4	365 / NA
SO ₂	24-hour	17 and Spring Garden Streets, Wilson, PA	42-095-8000	Bucks, PA	20.7/NNE	18.6	365 / NA
SO ₂	24-hour	Front Street and Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	13.4	365 / NA
SO ₂	24-hour	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	9.2	365 / NA
SO ₂	Annual	Front Street & Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	2.1	80 / NA
SO ₂	Annual	17 and Spring Garden Streets, Wilson PA	42-095-8000	Bucks, PA	20.7/NNE	3.3	80 / NA
SO ₂	Annual	Front Street & Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	2.1	80 / NA

**Table 9.1-4
Ambient Air Quality for the Quakertown Compressor Station, Marcus Hook Compressor Station, and Meter Stations for the Adelpia Gateway Project**

Pollutant	Averaging Period	Monitoring Station	Air Quality System Site ID	Location of Nearest Project Site (County, State)	Distance and Direction from Nearest Project Site (miles/ direction)	Background Concentration ($\mu\text{g}/\text{m}^3$)^c	Primary /Secondary NAAQS ($\mu\text{g}/\text{m}^3$)
SO ₂	Annual	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	2.5	80 / NA
Ozone	1-hour	Front Street and Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	188.5	236 / NA
Ozone	1-hour	Washington and Cambria Streets – Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	190.4	236 / NA
Ozone	1-hour	Front Street and Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	188.5	236 / NA
Ozone	1-hour	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	174.7	236 / NA
Ozone	8-hour	Front Street and Norris Street, Chester, PA	42-045-0002	Delaware, PA	3.5/ENE	142.7	137 / 137
Ozone	8-hour	Washington and Cambria Streets – Freemansburg, PA	42-095-0025	Bucks, PA	15.5/N	138.7	137 / 137
Ozone	8-hour	Front Street and Norris Street, Chester, PA	42-045-0002	New Castle, DE	3.9/ENE	142.7	137 / 137
Ozone	8-hour	State Armory - 1046 Belvoir Rd, Norristown, PA	42-091-0013	Montgomery, PA	11.6/SE	142.7	137 / 137
Lead	3-month	MLK Blvd and Justison Street, Wilmington, DE	10-003-2004	Delaware, PA	8.5/SW	<0.1	0.15 / 015
Lead ^d	3-month	Roxborough Water Pump Station, Philadelphia, PA	42-101-0014	Bucks, PA	25.1/S	<0.1	0.15 / 0.15

**Table 9.1-4
Ambient Air Quality for the Quakertown Compressor Station, Marcus Hook Compressor Station, and Meter Stations for the Adelpia Gateway Project**

Pollutant	Averaging Period	Monitoring Station	Air Quality System Site ID	Location of Nearest Project Site (County, State)	Distance and Direction from Nearest Project Site (miles/ direction)	Background Concentration ($\mu\text{g}/\text{m}^3$)^c	Primary /Secondary NAAQS ($\mu\text{g}/\text{m}^3$)
Lead	3-month	MLK Blvd and Justison Street, Wilmington, DE	10-003-2004	New Castle, DE	8.1/SW	<0.1	0.15 / 0.15
Lead	3-month	Roxborough Water Pump Station, Philadelphia, PA	42-101-0014	Montgomery, PA	17.2/SE	<0.1	0.15 / 0.15

^a Concentrations of carbon monoxide from Freemansburg, PA are based on 2013 and 2014 data (only data available). This was deemed appropriate given the proximity of the data station compared to other options.

^b Concentrations of PM_{2.5} from Marcus Hook Elementary School are based on 2015 and 2016 data (only data available). This was deemed appropriate given the proximity of the data station.

^c Three-hour average concentrations of sulfur dioxide were not readily available from EPA resources. However, given the concentrations for other averaging periods, it is clear that ambient three-hour average concentrations of sulfur dioxide are far below the NAAQS.

^d Concentrations of lead from the Roxborough Water Pump Station are based on 2013-2015 data (most recent years).

Source: EPA, 2017e

Table 9.1-5				
Federal Class I Areas Closest to the Project Sites				
Class I Area	Managing Agency	Direction from Site	Distance to Site	
			Kilometers	Miles
<i>Class I Areas near Quakertown CS</i>				
Brigantine, NJ	National Fish and Wildlife Service	SE of Quakertown CS	~123	~76
Shenandoah, VA	National Park Service	SW of Quakertown CS	~295	~180
<i>Class I Areas near Marcus Hook CS</i>				
Brigantine, NJ	National Fish and Wildlife Service	SE of Marcus Hook CS	~91	~56
Shenandoah, VA	National Park Service	WSW of Marcus Hook CS	~260	~162
Source: National Park Service, 2017				

9.1.2 Air Quality Impacts and Mitigation

Both the short-term and long-term air quality impacts associated with the Project are analyzed below. Short-term air quality impacts would be temporary and would result from construction activities necessary to install the pipeline, engines, and other equipment at the Quakertown CS and Marcus Hook CS and the meter stations. Additional short-term air quality impacts would potentially result from construction activities necessary for the mainline valve and blowdown assemblies. However, such construction activities would last for only a couple of days (e.g., two days or less of heavy equipment) and would involve significantly less equipment than construction of other Project sites such as the compressor stations. Operational air impacts from these operations are minimal and/or not foreseeable as emissions are only expected to occur one time per year, on average, in the event of pre-planned maintenance or emergency situations. As such, these activities are not considered part of the normal operation of the Project. Long-term impacts would result from the operation of the engines and other equipment at the Quakertown CS and Marcus Hook CS.

From a regulatory standpoint, the emissions and associated air quality impacts are addressed in two separate ways:

- Pre-construction Permitting – Pre-construction permitting addresses the emissions and associated impacts that would occur from the operational equipment at the facilities. Depending on the major/minor source status of the proposed equipment, the project location, and the federal and state permits required, pre-construction permitting would

ensure that the installation of new air emissions sources (i.e., operational equipment) would meet required emission levels through the installation of appropriate control technologies, as well as other regulatory requirements, where appropriate. A pollutant that triggers a PSD and/or Non-attainment NSR (NNSR) major source threshold would be subject to additional review and requirements. Air emissions from the Project would comply with applicable federal and state air quality regulations, including the establishment of best available technology (BAT). As a result, the air emissions associated with the Project's stationary sources would be far below PSD permitting thresholds such that PSD requirements including air dispersion modeling are not triggered. Even though these requirements are not triggered, air dispersion modeling was performed to evaluate impacts on air quality resulting from the Project. This modeling is included as appendix 9-B. NSR and PSD permitting regulations are discussed in section 9.1.5.

- General Conformity Analysis – the General Conformity rule addresses the sources of emissions in non-attainment or maintenance areas that are not covered by permitting actions and ensures that they conform to the applicable tribal or state implementation plan(s) (SIP) (EPA, 2017b). Generally, these include the short-term emissions from construction activities and new emissions increases from non-permitted emission sources, such as mobile sources (e.g., trucks, bulldozers). Section 9.1.6 discusses the General Conformity analysis.

9.1.3 Air Permitting Requirements

25 PA Code §127.11 requires certain stationary sources of air pollutant emissions to receive a permit (referred to as a Plan Approval) before construction, modification, reactivation or installation of such a source. Emissions from construction of the pipeline are temporary and do not require a Plan Approval. Similarly, emissions from ancillary operations such as the meter stations are minimal and do not require a Plan Approval. However, the air pollutant emission sources to be installed at the Quakertown CS and Marcus Hook CS would require a Plan Approval issued by the PADEP to authorize construction. The Plan Approval requires demonstration that best available technology (BAT) would be employed for the proposed new source of air pollution and includes a detailed regulatory applicability study. The Plan Approval applications for the Quakertown CS and Marcus Hook CS are being prepared and will be provided as part of an addendum to this filing.

9.1.3.1 Federal Air Quality Regulations

The following text discusses federal air quality regulations that may be applicable to the Project based on current design.

Major New Source Review and Title V Operating Permit

The Federal NSR program applies to major stationary sources, such as compressor stations. Based on their small magnitude of emissions, meter stations, such as the eight proposed for this Project, are not considered to be major stationary sources. The NSR permitting regulations are comprised of two programs: PSD for projects located in areas where specified pollutant levels have met NAAQS; and NNSR (called NSR in Pennsylvania) for projects located in areas where pollutant levels have not attained the corresponding NAAQS. The PSD and NSR programs regulate the installation of new major sources or major modifications to existing major sources. The proposed Quakertown CS is located in Bucks County, Pennsylvania, which is classified as attainment with all NAAQS except for ozone. The Marcus Hook CS is located in Delaware County, Pennsylvania, which is classified as attainment with all NAAQS except for ozone and PM_{2.5}. Pennsylvania's regulations for NSR are found in 25 PA Code, Chapter 127, Subchapter E and PSD permitting under 25 PA Code, Chapter 127, Subchapter D.

The estimated emissions from the Quakertown CS and the Marcus Hook CS would be the same. The emissions from each compressor station, as shown in table 9.1-6, are below major source thresholds found in Subchapters D and E. Therefore, the Quakertown CS and Marcus Hook CS would be classified as new minor sources of all regulated pollutants and neither PSD nor NSR would be triggered by this Project.

Pollutant	Marcus Hook CS Potential to Emit (TPY) ^a	Quakertown CS Potential to Emit (TPY) ^a	Major Source Threshold (TPY)	Major Source Program	Subject to Major Source Permitting?
PM ₁₀	1.91	1.91	250	PSD	No
PM _{2.5}	1.91	1.91	250 100	PSD (Bucks, PA) NSR (Delaware, PA)	No

Pollutant	Marcus Hook CS Potential to Emit (TPY) ^a	Quakertown CS Potential to Emit (TPY) ^a	Major Source Threshold (TPY)	Major Source Program	Subject to Major Source Permitting?
SO ₂	0.11	0.11	250 100	PSD (Bucks, PA) NSR (Delaware, PA) ^b	No
CO	10.51	10.51	250	PSD	No
NO _x	17.03	17.03	25	NSR ^c	No
VOC	22.75	22.75	25	NSR	No
Formaldehyde	2.90	2.90	10	N/A (Title V)	N/A
HAP	6.60	6.60	25	N/A (Title V)	N/A
CO _{2e}	31,348	31,348	NA ^d	PSD	No
CO ₂	24,869	24,869	N/A	PSD	N/A
CH ₄	259	259	N/A	PSD	N/A
N ₂ O	0.04	0.04	N/A	PSD	N/A
TPY = tons per year NO _x = nitrogen oxide VOC = volatile organic compounds N/A = not applicable HAP = hazardous air pollutants CO _{2e} = carbon dioxide equivalent CO ₂ = carbon dioxide CH ₄ = methane N ₂ O = nitrous oxide ^a Potential to Emit includes site-wide emissions from all sources, including storage tanks, fugitive leaks, and blowdowns. Emissions represents ton per year (tpy) values. ^b SO ₂ is also a regulated PSD pollutant with a major source threshold of 250 tpy. ^c NO ₂ is also a regulated PSD pollutant with a major source threshold of 250 tpy. ^d Only applicable if another pollutant exceeds major source threshold for PSD					

The Title V Operating Permit program applies to stationary sources with the potential to emit over 100 tons per year (tpy) (or a lower major source threshold defined by nonattainment status) of any individual criteria air pollutant, 10 tpy of any individual Hazardous Air Pollutant (HAP), or 25 tpy of combined HAPs. Maximum potential emissions for criteria pollutants and HAP from the Quakertown CS would not exceed the major source thresholds for the Title V permit program. Similarly, maximum potential emissions from the Marcus Hook CS would not exceed the major source threshold for the Title V permit program. Therefore, the Quakertown CS and the Marcus Hook CS would be minor sources with respect to the Title V Program after the construction of the proposed Project. Continued operation of the Quakertown CS and Marcus Hook CS would be authorized under the operating permit requirements in 25 PA Code Chapter 127 Subchapter F.

Due to the low level of emissions, interconnects, blowdown stations and meter stations are anticipated to be exempt from air permit requirements.

National Emission Standards for Hazardous Air Pollutants

Regulatory requirements for facilities subject to National Emission Standards for Hazardous Air Pollutants (NESHAP) standards, otherwise known Maximum Available Control Technology (MACT) Standards for source categories, are contained in 40 CFR Parts 61 and 63. 40 CFR Part 61 NESHAP standards are defined for specific pollutants, and Part 63 NESHAP standards are defined for source categories. A major source of HAPs is defined as having potential emissions in excess of 25 tpy for total HAPs and/or potential emissions in excess of 10 tpy for any individual HAP. Part 63 NESHAP standards apply to sources in specifically regulated industrial source categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

Historically, NESHAPs have only been applicable to major sources of HAPs. However, the EPA has finished promulgating area source NESHAP standards to address area (or minor) source categories that represent ninety percent of the emissions of a specific list of urban air toxics under Section 112(c) of the CAA. Potential HAP emissions from the proposed Quakertown CS, Marcus Hook CS, pipeline/meter station interconnects, and meter stations would be below the HAP major source thresholds and would be classified as area sources of HAPs. The potential applicability of specific MACT standards to the Quakertown CS and Marcus Hook CS is discussed in the following sections.

NESHAP Subpart HH – Oil and Natural Gas Production Facilities

Glycol dehydration units are potentially subject to Subpart HH. This standard applies to such units at natural gas production facilities that are major or area sources of HAP emissions. The proposed Quakertown CS, Marcus Hook CS, interconnects, and meter stations are located in the transmission sector. Therefore, Subpart HH is not applicable.

NESHAP Subpart HHH – Natural Gas Transmission and Storage Facilities

This standard applies to glycol dehydration units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. The proposed Quakertown CS, Marcus Hook CS, interconnects, and meter stations are located in the transmission sector and are area sources of HAP emissions. Therefore, the proposed facilities would not be subject to Subpart HHH.

NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

Stationary reciprocating internal combustion engines (RICE) at both area and major sources of HAP emissions are potentially subject to Subpart ZZZZ – *NESHAP for Stationary Reciprocating Internal Combustion Engines*. Stationary RICE at facilities that are area sources of HAPs are considered new if they commenced construction after June 12, 2006. According to 40 CFR §63.6590(c), new area source stationary RICE are required to meet the requirements of this MACT standard by meeting the applicable requirements of the applicable New Source Performance Standard (NSPS) in 40 CFR 60 (Subpart IIII for compression ignition engines and Subpart JJJJ for spark ignition engines). No further requirements apply to such engines under NESHAP Subpart ZZZZ. The proposed compressor engines and the generator engines at the proposed compressor stations would be new, area source stationary RICEs and would comply with Subpart ZZZZ by complying with 40 CFR 60, Subpart JJJJ as described in the following section.

New Source Performance Standards

Regulatory requirements for facilities subject to NSPS are contained in 40 CFR Part 60. NSPS are technology-based standards for criteria pollutants that are applicable to specific categories of sources and equipment. NSPS that are potentially applicable to the proposed operations at the Quakertown CS and Marcus Hook CS are:

- 40 CFR Part 60 Subpart K/Ka/Kb – *Storage Vessels for Petroleum Liquids/Volatile Organic Liquids*;
- 40 CFR Part 60 Subpart JJJJ – *Stationary Spark Ignition Internal Combustion Engine*;
- 40 CFR Part 60 Subpart OOOO – *Crude Oil and Natural Gas Production, Transmission, and Distribution*; and
- 40 CFR Part 60 Subpart OOOOa – *Crude Oil and Natural Gas Facilities*.

NSPS Subparts K, Ka, and Kb - Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka to those constructed, reconstructed, or modified prior to 1984. All storage tanks located at the Quakertown CS and Marcus Hook CS were constructed after these dates; therefore, the requirements of Subparts K and Ka do not apply. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 cubic

meters (~19,813 gallons). All storage tanks at the Quakertown CS and Marcus Hook CS were constructed after this date, but do not have a capacity greater than 75 cubic meters. Therefore, Subpart Kb does not apply to the storage tanks at the Quakertown CS or the Marcus Hook CS.

NSPS Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ applies to manufacturers, owners, and operators of stationary spark ignition engines. The requirements for stationary spark ignition engines with a maximum power rating greater than or equal to 500 HP (except lean burn engines 500 HP ≤ HP < 1,350 HP) apply to owner/operators of such engines manufactured on or after July 1, 2007. Because the order dates are after the date specified in the rule, the proposed compressor engines and generator engines at the Quakertown CS and Marcus Hook would be subject to this Subpart.

The proposed Caterpillar G3412C emergency generator engines are new, four-stroke, rich burn spark ignition RICE rated at 670 HP. The engines would be equipped with a non-selective catalytic reduction, or three-way, catalyst for control of NO_x, CO, VOC, and HAPs. The engines would be operated only for electric generation during emergency situations and would be subject to the emergency engine emission standards in table 1 to NSPS Subpart JJJJ, which are compared to the manufacturer's specifications in table 9.1-7. As shown in table 9.1-7, emergency generator engines used for the Project would not exceed applicable emissions standards.

Table 9.1-7		
NSPS Subpart JJJJ Emission Standards for Emergency Natural Gas Engines ≥ 130 HP Manufactured on or After 1/1/2009		
Pollutant	Emission Standards (g/HP-hr)	Caterpillar G3412C Specifications - with Oxidation Catalyst (g/HP-hr)
NO _x	2.0	2.0
CO	4.0	1.8
VOC ^a	1.0	0.8

g/HP-hr = grams per horsepower hour
^a VOC as defined in NSPS JJJJ does not include formaldehyde.

In addition to the emission limitations, the generator engines are limited to 100 hours of non-emergency use (e.g., maintenance checks, readiness testing). Emergency use is not limited. Records of engine operation as recorded by a non-resettable hour meter must be maintained, and the records must document the hours of operation of the generators and the reason for operation (e.g., emergency, testing, non-emergency operation).

The proposed Caterpillar G3606 compressor engines are new four-stroke, lean burn spark ignition RICE rated at 1,875 HP each. The compressor engines would be equipped with oxidation catalysts and would be subject to the following emissions standards in table 1 to NSPS Subpart JJJJ, which are compared to manufacturer's specifications in table 9.1-8. As shown in table 9.1-8, non-emergency generator engines used for the Project would not exceed applicable emissions standards.

Table 9.1-8 NSPS Subpart JJJJ Emission Standards for Non-Emergency Natural Gas Engines \geq 500 HP Manufactured On or After 7/1/2010		
Pollutant	Emission Standards (g/HP-hr)	Caterpillar G3616 Specifications - with Oxidation Catalyst (g/HP-hr)
NOX	1.0	0.3
CO	2.0	0.18
VOC ^a	0.7	0.25
^a VOC as defined in NSPS JJJJ does not include formaldehyde.		

Compliance with the emission limitations would be demonstrated through an initial performance test. Subsequent performance tests are to be conducted within 8,760 hours of operation or 3 years, whichever comes first. In addition, the owner or operator is required to keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions.

Adelphia would maintain records of all notifications submitted to comply with this Subpart, maintenance conducted on the engines, and performance testing conducted in accordance with Subpart JJJJ.

NSPS Subpart OOOO – Oil and Natural Gas Sector

Subpart OOOO, *Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution*, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 and before September 18, 2015. The Project does not include any source categories with equipment that falls within the applicability dates of this Subpart. Therefore, Subpart OOOO would not apply.

NSPS Subpart OOOOa – Oil & Natural Gas Sector

Subpart OOOOa, *Standards of Standards of Performance for Crude Oil and Natural Gas Facilities*, applies to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. The final regulation was published in the Federal Register on June 3, 2016. The rule includes provisions for the following affected facilities and equipment:

- Wellheads;
- Centrifugal compressors with wet seals located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of greater than 6 standard cubic feet per hour (scfh) located in the production, gathering, processing, or transmission and storage segments (excluding natural gas processing plants);
- Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- Pneumatic pumps located in the production and processing segments;
- Storage vessels with potential VOC emissions greater than 6 tpy;
- Equipment located at natural gas processing plants;
- The collection of fugitive emissions components at a well site;
- The collection of fugitive emissions components at a compressor station; and
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

The Quakertown CS, Marcus Hook CS, interconnects, and meter stations are not well sites, nor are they natural gas processing plants. Therefore, the potential affected facilities are limited to storage vessels, reciprocating and centrifugal compressors, fugitive emission sources, and pneumatic controllers, where construction commenced after September 18, 2015.

The produced water storage vessels at the Quakertown CS and Marcus Hook CS would commence construction after the applicability date. Subpart OOOOa applies to storage vessels

with VOC emissions equal to or greater than 6 tpy. The storage vessels at the facilities would have potential VOC emissions less than 6 tpy, and therefore would not be subject to Subpart OOOOa.

The reciprocating compressors at the Quakertown CS and Marcus Hook CS are subject to the requirements of NSPS OOOOa, which requires owners and operators of affected reciprocating compressors to change the rod packing prior to operating 26,000 hours or prior to 36 months of startup or the last packing replacement.

Pneumatic controllers included as part of the proposed Project would potentially be subject to NSPS OOOOa. A pneumatic controller affected facility is a single continuous bleed natural gas driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh. Pneumatic controllers proposed as part of the Project would either be low bleed (i.e., < 6 scfh) or intermittent. Therefore, these units would not be subject to the requirements of Subpart OOOOa.

The collection of fugitive emission sources at the Quakertown CS and Marcus Hook CS would be an affected facility under Subpart OOOOa. According to 40 CFR §60.5397a, Adelphia would be required to monitor all fugitive emission components (e.g., connectors, flanges, etc.) with an optical gas imaging device and repair all sources of fugitive emissions in accordance with Subpart OOOOa. Adelphia must also develop a corporate-wide monitoring plan and a site specific monitoring plan (or one plan that incorporates all required elements), and conduct surveys on a quarterly basis. Adelphia would also be subject to the applicable recordkeeping and reporting requirements of the rule.

Greenhouse Gas Reporting Rule

As set forth in 40 CFR §98.2(a)(2), facilities that contain a source category listed in table A-4 of the regulation and emit 25,000 metric tons per year of CO₂e in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories in tables A-3 and A-4, are subject to reporting under the Greenhouse Gas Mandatory Reporting Rule (MRR). Table A-4 of 40 CFR 98 Subpart A includes Petroleum and Natural Gas Systems. Annual Greenhouse Gas (GHG) emissions from the facilities included as part of the Project would be calculated and compared with the 25,000 metric tons per year of CO₂e to address the applicability of the rule and would report GHG emissions as required under 40 CFR 98 Subpart W (*Petroleum and Natural Gas Systems*).

State Air Quality Regulations

Pennsylvania Air Quality Regulations

The PA Code contains air quality regulations that fall under two main categories: those regulations that are generally applicable (e.g., permitting requirements) and those that have specific applicability (e.g., sulfur compound emissions from combustion units). Both categories of regulations with potential applicability to the Project are discussed below.

25 PA Code §§123.1 and 123.2: Prohibition of Certain Fugitive Emissions and Fugitive Particulate Matter

25 PA Code §§123.1 and 123.2 state exceptions to fugitive emissions sources and methods for controlling fugitive emissions. Due to the nature of the activities at the facilities included as part of the Project, it is unlikely that fugitive particulate matter emissions would be emitted under normal operating conditions. However, Adelphia would take measures to ensure any fugitive particulate matter emissions would not cross the property boundary should any such emissions occur. Particulate emissions from the pipeline would result from its construction, but they would be temporary in nature. Adelphia would take all measures necessary to ensure compliance with this requirement and would follow its *Fugitive Dust Control Plan*, which would be developed prior to Project construction.

25 Pa Code §§123.11 and 123.13: Particulate Emissions

25 PA Code §123.11, *Particulate Emissions: Combustion Units*, defines particulate matter emissions for combustion units. Combustion units are defined in 25 PA Code §121.1 as stationary equipment used to burn fuel primarily for the purpose of producing power or heat by indirect heat transfer, such as boilers. This definition does not apply to the proposed engines at the Quakertown CS and Marcus Hook CS. As such, the particulate matter emissions limitations for processes in 25 PA Code §123.13, *Particulate Emissions: Processes*, would apply to these units instead.

25 PA Code §123.13 defines particulate matter emissions limitations for processes. For processes excluded from table 1 of 25 PA Code §123.13(b), particulate emissions are limited to 0.04 grains per dry standard cubic feet (gr/dscf) and 0.02 gr/dscf, for exhaust flowrates less than 150,000 dry standard cubic feet per minute (dscfm) and greater than 300,000 dscfm, respectively. Particulates from equipment with exhaust flowrates between 150,000 dscfm and 300,000 dscfm are limited to the allowable emission rate calculated using the formula in 25 PA Code §123.13(c)(1)(ii). As all proposed combustion sources at the facility would be fueled exclusively

with pipeline quality natural gas, potential particulate emissions from all sources would be expected to comply with these requirements.

25 PA Code §123.21: Sulfur Compound Emissions: General

25 PA Code §123.21 states that the concentration of sulfur oxides in the effluent gas may not exceed 500 ppm, by volume, dry basis (ppmvd). The proposed equipment at Quakertown CS and Marcus Hook CS would combust pipeline quality natural gas and the sulfur oxide emissions are expected to be well below this concentration level in the combustion exhaust.

25 PA Code §123.31: Odor Emissions

25 PA Code §123.31 prohibits the emission of malodorous air contaminants from any source that are detectable outside the facility fence line. This regulation applies to the facility in general. Adelphia would take measures to minimize odor from the proposed operations by combusting pipeline quality natural gas fuel only, using pressure/vacuum reliefs on the produced fluid storage tank to minimize atmospheric venting under normal operations, and limiting fugitive emissions from process equipment in accordance with 40 CFR 60 Subpart OOOOa.

25 Pa Code §123.41: Visible Emissions: Limitations

25 PA Code §123.41 states that a facility may not emit visible emissions equal to or greater than 20 percent for a period or periods aggregating more than 3 minutes in any 1 hour, or equal to or greater than 60 percent at any time. This standard applies to the proposed equipment at the Quakertown CS and the Marcus Hook CS. The use of pipeline quality natural gas as fuel would ensure compliance with this requirement.

25 PA Code §127.1: Construction, Modification, Reactivation and Operation of Sources: General Purpose

25 PA Code §127.1 outlines requirements for new sources to comply with applicable standards and includes provisions to ensure that new sources do not result in impacts in excess of ambient air quality standards. Additionally, new sources are required to control emissions of air pollutants to the maximum extent, consistent with BAT, as determined by the PADEP. The proposed equipment at the Quakertown CS and the Marcus Hook CS would comply with the BAT requirement for the applicable sources.

25 PA Code §127.11: Plan Approval Requirements

25 PA Code §127.11 outlines requirements for Plan Approvals required to authorize construction or modification of air contamination sources. Construction, installation, modification,

or reactivation of air contaminant sources or air pollution control devices is prohibited unless otherwise approved by the PADEP. The construction of new equipment at the proposed Quakertown CS and the Marcus Hook CS would be subject to Plan Approval permitting requirements under this requirement. Based on the level of emissions anticipated from the interconnects, blowdown stations and meter station sites, they would be exempt from the Plan Approval permitting requirements.

25 PA Code §129.57: Sources of VOC: Storage Tanks Less Than or Equal to 40,000 Gallons Capacity Containing VOCs

25 PA Code §129.57 contains requirements for storage vessels less than 40,000 gallons in capacity that contain VOCs. Under this section, above-ground storage tanks with a capacity greater than or equal to 2,000 gallons that contain VOCs with a vapor pressure greater than 1.5 pounds per square inch, atmospheric pressure (psia) must be equipped with pressure relief valves that are maintained in good operating condition and that are set to release at no less than 0.7 pounds per square inch, gauge pressure (psig) of pressure or 0.3 psig of vacuum (or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association guidelines). The proposed produced fluid and oil storage tanks for the Quakertown CS and the Marcus Hook CS would either be less than 2,000 gallons or have a vapor pressure less than the applicability threshold of the rule.

25 PA Code §129.96: Additional Reasonably Available Control Technology Requirements for Major Sources of NO_x and VOCs

25 PA Code §129.96 establishes control standards for major stationary sources of NO_x and VOC under the Reasonably Available Control Technology (RACT) program. The standards apply to sources in existence on or before July 20, 2012. Major stationary sources of NO_x and VOC are defined in 25 PA Code §121.1. The proposed Quakertown CS, Marcus Hook CS, interconnects, and meter stations would each have potential NO_x and VOC emissions below the applicable major source thresholds. In addition, the sources would not be in existence prior to or on July 20, 2012. Therefore, this regulation would not apply to facilities included as part of the Project.

25 PA Code §129.203 and 129.204: Additional NO_x Requirements: Stationary Internal Combustion Engines

25 PA Code §129.203 establishes NO_x RACT emission limits for stationary internal combustion engines rated for more than 1,000 HP, which are located in Bucks, Chester,

Delaware, Montgomery, or Philadelphia County. The proposed Quakertown CS would be located in Bucks County and the proposed Marcus Hook CS would be located in Delaware County. As such, the proposed compressor engines at both stations would be subject to these requirements. The allowable emissions for spark-ignited engines are 3.0 grams of NO_x per brake horsepower-hour. Also, per 25 PA Code §129.204, the owner or operator of the stationary internal combustion engine shall calculate the difference between the allowable and actual emissions from the unit during the period from May 1 through September 30. Adelpia would comply with the requirements of this rule by installing natural gas fired spark ignition compressor engines that do not exceed the allowable emissions rate. Adelpia would also keep records of actual emissions from each engine for the specified reporting period. Actual emissions of NO_x from the proposed engines would be determined using the one-year average emission rate calculated from the most recent permit emission limit compliance demonstration test data for NO_x.

25 PA Code §131: Ambient Air Quality Standards

25 PA Code §131 references NAAQS for criteria pollutants and establishes SAAQS for settled particulate, beryllium, fluorides, and hydrogen sulfide. The Project would not trigger PSD for any of the permanent facilities. Therefore, the associated emissions of criteria pollutants would not reasonably be anticipated to exceed the corresponding NAAQS. The proposed Project would not emit any quantifiable amount of beryllium, fluorides, or hydrogen sulfide. Therefore, no comparison against the SAAQS would be required.

25 PA Code §135: Reporting of Sources

25 PA Code §135 includes requirements for submittal of emissions data to the PADEP for the purposes of evaluating the effectiveness of regulations, identifying available or potential emission offsets, and maintaining an accurate inventory of air contaminant emissions for air quality assessment and planning activities. The proposed Quakertown CS and Marcus Hook CS are considered part of an oil and natural gas system. Therefore, emissions from the sources at these Sites would be subject to reporting and recordkeeping requirements under this section, and Adelpia would submit annual emissions inventory data by March 1 of each year.

25 PA Code §137: Air Pollution Episodes

25 PA Code §137 contains requirements intended to prevent the excessive buildup of air pollutants during air pollution episodes, thereby preventing the occurrence of an emergency due to the effects of the pollutants on the health of persons. This chapter specifically addresses air pollution episodes and the PADEP's response to such episodes. This section of the PA Code

specifies certain industrial sources that must have standby plans, which includes coal- and oil-fired electric and steam generating facilities and other specific manufacturing industries (e.g., metals, refining, paper, etc.). The proposed facilities would be natural gas transmission facilities, which are not an industry specified by these regulations.

25 PA Code §139: Sampling and Testing

25 PA Code §139 establishes requirements for source operators to provide adequate sampling ports, safe sampling platforms and adequate utilities, and establishes testing procedures to be followed, for performance testing when required by the PADEP. The proposed Quakertown CS and Marcus Hook CS would be designed and constructed to accommodate performance testing as required by applicable federal regulations (e.g., NSPS Subpart JJJJ) and any permit conditions set forth by the PADEP in the Plan Approval.

Delaware Air Quality Regulations

According to Regulation 1102 Section 2, the Delaware Department of Natural Resources and Environmental Control requires any source with emissions that exceed 10 pounds per day of any air contaminant or contaminants, in the aggregate to obtain a Regulation 1102 construction permit. Sources with emissions that are equal to or greater than 0.2 pound per day and less than 10 pounds per day are required to obtain a source registration in accordance with Regulation 1102, Section 2.1.1. Facilities also may not cause, allow, or permit the disposal of more than 11 pounds of any VOC, or of any materials containing more than 11 pounds of any VOCs, in any one day in a manner that would permit the evaporation of VOC into the ambient air per Regulation 1124, Section 8.4.1. Adelphia would comply with these requirements, as applicable.

General Conformity

General Conformity regulations implement Section 176(c) of the CAA, which prohibits federal agencies from taking actions that may cause or contribute to violations of the NAAQS in an area working to attain or maintain the standards. In order to meet this CAA requirement, a federal agency must demonstrate that every action that it undertakes, approves, permits or supports conforms to the appropriate state, tribal or Federal implementation plan.

Because the FERC is a federal agency and is the authority from which Adelphia must obtain a certificate authorizing the construction and operation of the pipeline and compressor stations, it is necessary to undertake a General Conformity evaluation for the various aspects of the Project.

The first step of the General Conformity evaluation is an analysis of applicability of the General Conformity rule to the Project. The applicability analysis starts with the determination of whether or not each of the areas in which the Project would be conducted in is currently designated as nonattainment or maintenance for one or more pollutants for which a NAAQS exists. This review can be found in section 9.1.2 of this report. Because portions of the Project occur in nonattainment and/or maintenance areas, the applicability of the General Conformity rule must be analyzed for Project emissions occurring in New Castle County, Delaware and Bucks, Montgomery and Delaware Counties, Pennsylvania.

The assessment of General Conformity must include emissions of air pollutants associated with the Project that would be released during construction and operation. Emissions that would occur during operation of the compressor stations and pipeline would be subject to the air permitting programs and air quality rules and standards administered by Pennsylvania and Delaware. Adelphia would obtain valid air quality construction permits for the Quakertown CS and the Marcus Hook CS, and would operate the stations pursuant to an air quality operating permit issued by the PADEP. Because the air quality programs under which the Quakertown CS and the Marcus Hook CS would be constructed and operated would have been administered in accordance with Pennsylvania's approved SIP, the emissions from operation of the stations may be presumed to conform to Pennsylvania's SIP and are therefore exempted from the General Conformity rule. All other operational emissions from ancillary operations such as meter stations would also conform to state, federal, or tribal implementation plan requirements and are also exempt from the General Conformity rule.

Emissions from construction of the pipeline laterals in Pennsylvania, construction of the Quakertown CS, construction of the Marcus Hook CS, and construction of the meter stations and interconnects are not subject to state air quality permitting; they must therefore be assessed against the applicability criteria in the General Conformity rule to determine what, if any, requirements of the rule may be applicable. Additional short-term emissions would potentially result from construction activities necessary for the mainline valve and blowdown assemblies. However, such construction activities would last for only a couple of days (e.g., two days or less of heavy equipment) and would involve significantly less equipment than construction of other Project sites such as the compressor stations. As such, these minimal, temporary emission are not addressed further in this report. An exception to the applicability of the General Conformity rule is for actions that result in emissions below *de minimis* thresholds prescribed in the General Conformity rule. The *de minimis* thresholds for pollutants for which New Castle County, Delaware

and Bucks, Montgomery and Delaware Counties, Pennsylvania are currently classified as nonattainment or maintenance are listed in table 9.1-9. Listed below the *de minimis* thresholds for each pollutant are the estimated total annual emissions of that pollutant from construction of the Project occurring in each county. Detailed calculations of emissions are provided in appendix 9-C. The total annual emissions are listed in table 9.1-9 according to the calendar year in which they are expected to occur. Estimated emissions are under the *de minimis* thresholds for each of the years in which the Project would be constructed. Therefore, the Project would be exempt from the requirements of the General Conformity rule.

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 <i>Quakertown Compressor Station</i> Estimated 2018 emissions (tpy)	6.52	6.52	6.52	1.09	6.52	1.09	1.28	1.28	1.28	2.76	0.46	0.46	11.46
<i>Quakertown Meter Station</i> Estimated 2018 emissions (tpy)	2.93	2.93	2.93	0.56	2.93	0.56	0.52	0.52	0.52	1.34	0.23	0.23	6.79
Attainment Status¹ Conformity De Minimis (tpy) Max. Annual County-Wide Emissions (tpy) Exceeds De Minimis? (Yes/No)	Attain/Uncl	Attain/Uncl	Marginal		Moderate		Attainment	Maintenance	Maintenance	Attain/Uncl	Attain/Uncl	Attain/Uncl	Attain/Uncl
	N/A	N/A	25	25	25	25	N/A	100	100	N/A	N/A	N/A	N/A
	9.44	9.44	9.44	1.65	9.44	1.65	1.80	1.80	1.80	4.10	0.69	0.69	18.24
	No	No	No	No	No	No	No	No	No	No	No	No	No
Montgomery County, PA <i>Quakertown Meter Station</i> Estimated 2018 emissions (tpy)	2.93	2.93	2.93	0.56	2.93	0.56	0.52	0.52	0.52	1.34	0.23	0.23	6.79
Attainment Status¹ Conformity De Minimis (tpy) Max. Annual County-Wide Emissions (tpy) Exceeds De Minimis? (Yes/No)	Attain/Uncl	Attain/Uncl	Marginal		Moderate		Attainment	Maintenance	Maintenance	Attain/Uncl	Attain/Uncl	Attain/Uncl	Attain/Uncl
	N/A	N/A	25	25	25	25	N/A	100	100	N/A	N/A	N/A	N/A
	2.93	2.93	2.93	0.56	2.93	0.56	0.52	0.52	0.52	1.34	0.23	0.23	6.79
	No	No	No	No	No	No	No	No	No	No	No	No	No
Delaware County, PA <i>Ridge Lateral Meter Station Construction</i> Estimated 2018 emissions (tpy)	2.91	2.91	2.91	0.56	2.91	0.56	0.52	0.52	0.52	1.34	0.23	0.23	6.73
<i>Marcus Hook Compressor Station</i> Estimated 2018 emissions (tpy)	6.49	6.49	6.49	1.08	6.49	1.08	1.28	1.28	1.28	2.74	0.46	0.46	11.23
<i>Tilghman Meter Station</i> Estimated 2018 emissions (tpy)	2.91	2.91	2.91	0.56	2.91	0.56	0.52	0.52	0.52	1.34	0.23	0.23	6.73
<i>Tilghman Lateral Pipeline Construction</i> Estimated 2018 emissions (tpy)	3.70	3.70	3.70	0.69	3.70	0.69	0.63	0.63	0.63	1.42	0.28	0.28	8.00
<i>Ridge Lateral Pipeline Construction</i> Estimated 2018 emissions (tpy)	2.14	2.14	2.14	0.42	2.14	0.42	0.33	0.33	0.33	0.81	0.15	0.15	5.10
Attainment Status¹ Conformity De Minimis (tpy) Max. Annual County-Wide Emissions (tpy) Exceeds De Minimis? (Yes/No)	Attain/Uncl	Attain/Uncl	Marginal		Moderate		Nonattainment	Maintenance	Maintenance	Attain/Uncl	Attain/Uncl	Attain/Uncl	Attain/Uncl
	N/A	N/A	25	25	25	25	100	100	100	N/A	N/A	N/A	N/A
	18.14	18.14	18.14	3.31	18.14	3.31	3.29	3.29	3.29	7.65	1.35	1.35	37.78
	No	No	No	No	No	No	No	No	No	No	No	No	No
Newcastle County, DE <i>Parkway Lateral Meter Stations Construction</i> Estimated 2018 emissions (tpy)	5.47	5.47	5.47	1.01	5.47	1.01	0.52	0.52	0.52	1.57	0.82	0.82	9.55
<i>Parkway Lateral Pipeline Construction</i> Estimated 2018 emissions (tpy)	2.74	2.74	2.74	0.51	2.74	0.51	0.30	0.30	0.30	1.15	0.41	0.41	4.96
Attainment Status¹ Conformity De Minimis (tpy) Max. Annual County-Wide Emissions (tpy) Exceeds De Minimis? (Yes/No)	Attain/Uncl	Attain/Uncl	Marginal		Moderate		Attainment	Maintenance	Maintenance	Attain/Uncl	Attain/Uncl	Attain/Uncl	Attain/Uncl
	N/A	N/A	25	25	25	25	N/A	100	100	N/A	N/A	N/A	N/A
	8.21	8.21	8.21	1.52	8.21	1.52	0.82	0.82	0.82	2.72	1.24	1.24	14.51
	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.

9.1.4 Mitigation Measures

Under PADEP air permitting regulations in 25 PA Code §127.1, new sources of air emissions must implement BAT. The Quakertown CS and Marcus Hook CS would involve installing new equipment, thus this section addresses the proposed BAT for the various emission sources proposed as part of this Project. This information will also be outlined in detail in the Plan Approval application; excerpts are included in the following subsections.

Best Available Technology for Natural Gas-Fired Engines

The proposed natural gas-fired compressor engines are 1,875 HP four stroke-lean burn Caterpillar G3606 engines. The engines are equipped with air/fuel ratio control to reduce NOX emissions. Caterpillar's specifications for this engine indicate an emission rate of 0.3 g/HP-hr, which is much lower than the current applicable limit of 1.0 g/HP-hr required by NSPS Subpart JJJJ for engines of this size, type, and use. Furthermore, this emission rate is compliant with PADEP's BAT limit for compressor engines in the production/gathering segment of the industry authorized under PADEP General Permit-5, as finalized in February 2013 (PA Bulletin, 43 PA.B. 740, February 2, 2013). As such, Adelphia believes that the potential NOX emissions rate of 0.3 g/HP-hr would comply with the BAT requirement in 25 PA Code § 127.1, and as such, Adelphia is proposing a limit of 0.3 g/HP-hr.

A potential option to further reduce NO_x emissions is through the use of Selective Catalytic Reduction (SCR) control technology. The SCR process chemically reduces the NO_x molecule into molecular nitrogen and water vapor. A nitrogen-based reagent such as ammonia or urea is injected into the engine exhaust upstream of a catalyst bed. The exhaust gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst. The reagent reacts selectively with the NO_x within a specific temperature range and in the presence of the catalyst and oxygen. The rate of reaction depends on the type of catalyst, reagent, and the temperature. The reaction requires an optimum temperature range of 480 to 800 °F and fairly constant exhaust temperatures for best performance.

SCR is not a widely used technology for natural gas-fired combustion engines like those proposed for this Project. Although potentially technically feasible, SCR is very costly. Capital costs are significantly higher than other types of NO_x controls due to the volume of catalyst that is required. The operating and maintenance costs of using SCR are driven by the reagent usage, catalyst replacement, and increased electrical power usage. The following shows budgetary cost estimates for installation of SCR for each of the compressor engines proposed for this Project:

Capital Costs = approximately \$990,000;

Operations and Maintenance Costs = approximately \$200,000;

Annual Costs = approximately \$300,000.

The compressor engines proposed for the Quakertown CS and Marcus Hook CS are estimated to have potential emissions of approximately 5.43 tpy each. At an estimated NO_x control efficiency of 90 percent, the cost-effectiveness of SCR on the engines at the proposed Quakertown CS and Marcus Hook CS is estimated to be greater than \$60,000 per ton removed. Therefore, SCR is determined to be economically infeasible for this application.

Adelphia is proposing the use of an oxidation catalyst as BAT for controlling emissions of CO and VOCs from the compressor engines. The rate of formation of CO during natural gas combustion depends primarily on the efficiency of combustion. The formation of CO occurs in small, localized areas inside the combustion chamber (engine cylinder) where oxygen levels cannot support the complete oxidation of carbon to CO₂. CO emissions resulting from natural gas combustion can be decreased via catalytic oxidation.

This reaction is promoted by several noble metal-enriched catalysts at high temperatures. The oxidation catalyst vendor has guaranteed a CO removal efficiency of 93 percent at this temperature, resulting in an emission rate of 0.18 g/HP-hr. This emission rate is well below the current limit of 2.0 g/HP-hr required by NSPS Subpart JJJJ for non-emergency lean burn natural gas engines \geq 1,350 HP manufactured after July 1, 2010, and is equivalent to PADEP's BAT level for compressor engines under General Permit-5.

Catalytic oxidation also promotes the conversion of non-methane/non-ethane hydrocarbon (NMNEHC) and formaldehyde to carbon dioxide and water, over the face of the catalyst, thereby reducing emissions of these pollutants. The efficiency of the oxidation catalyst proposed for the Quakertown CS and Marcus Hook CS compressor engines is guaranteed by the vendor to be at least 50 percent for NMNEHC emissions resulting in an emission rate of 0.25 g/HP-hr, and at least 75 percent for formaldehyde emissions resulting in an emission rate of 0.05 g/HP-hr. The engines' NMNEHC emission rate is well below the current limit of 0.7 g/HP-hr required by NSPS Subpart JJJJ for non-emergency lean burn natural gas engines \geq 1,350 HP manufactured after July 1, 2010, and the proposed NMNEHC and formaldehyde emission limits are compliant with PADEP's BAT limits in the recently finalized General Permit-5.

Potential BAT options for both PM_{2.5}/PM₁₀ and SO₂ emissions, based on a search in the EPA's RACT /Best Available Control Technology /Lowest Achievable Emission Rate

Clearinghouse database, indicate that the only technologies used to reduce these pollutants from natural gas burning engines are good combustion practices and low-sulfur fuels. The sulfur content of the pipeline quality natural gas, which would be used in the engines, is very low. Adelphia would also operate the engines in accordance with the manufacturer's recommended practice to minimize emissions of particulate matter and SO₂.

Best Available Technologies for Emergency Generator Engines

The Caterpillar G3412C emergency generator engines are expected to operate less than 500 hours per year. In addition, the engine would be subject to emissions standards contained within NSPS Subpart JJJJ. These two considerations adequately reduce emissions potential from the source.

9.1.5 Construction and Operational Emissions

The construction emissions associated with the Quakertown CS, Marcus Hook CS and construction of the 0.2-mile and 4.4-mile lateral pipelines are expected to have minimal impact on the air quality in the surrounding area. These emissions, which were calculated using publicly available emissions factors such as those contained within EPA's NONROAD2008a (EPA, 2017f) and EPA's AP-42, compilation of air emissions factors (EPA, 2017g), are detailed in appendix 9-C and summarized, in part, in table 9.1-9. Emissions from the construction of the MLV and blowdown assemblies would also occur, however, such construction activities would last for only a couple of days (e.g., two days or less of heavy equipment) and would involve significantly less equipment than construction of other Project sites such as the compressor stations. Adelphia would implement various mitigation measures to minimize construction emissions. These include:

- avoiding unnecessary construction activities leading to increased emissions, where possible;
- following manufacturer's operating recommendations regarding good combustion practices to ensure that fuel efficiency is maximized and engines are operated such that emissions are minimized;
- requiring contractors to follow all local, state, and federal emission standards and air quality regulations applicable to their fleet and equipment; and
- creating and implementing a fugitive dust control plan and using certain dust control measures such as water suppression, enclosures, or other techniques.

Emissions from operating the equipment at the new Quakertown CS and Marcus Hook CS result from combustion of natural gas in the compressors and generator engine, fugitive emissions from the operation of ancillary equipment at the stations (e.g., leaks and blowdowns), and flashing, breathing, and working losses from the produced fluids tank. These emissions are detailed on an equipment-level basis in appendix 9-A as summarized in table 9.1-6. Adelphia will perform a BAT analysis in the Plan Approval application and would install units compatible with the BAT emission limits approved by PADEP. Adelphia would mitigate these emissions through the development and implementation of an operation and maintenance plan that is in line with the manufacturer's recommendations for good combustion practices. Proper operation and preventative maintenance activities would ensure that emissions from the compressor engines and other equipment would be minimized and continue to meet the emission standards. Refer to the operational emissions calculations provided in appendix 9-A.

In addition, an air dispersion modeling analysis of these operational emissions from each of the new compressor stations was performed as outlined in appendix 9-B. EPA's AERMOD model was applied and showed that the air emissions from the compressor stations do not cause or contribute to an exceedance of the NAAQS. Further information regarding model inputs and detailed model results are provided in appendix 9-B. As discussed previously, the mainline valve and blowdown assemblies would not be considered part of normal operation and therefore they were not included in the operational emissions calculations or air dispersion modeling analysis.

Fugitive GHG (and to a lesser extent, VOC) leaks would be minimized by adhering to good operating and maintenance practices. Despite the lack of federal or state guidance on conducting control technology reviews for GHGs, Adelphia believes the Project is designed to reduce GHG emissions where technically and economically feasible. The Project GHG emissions are summarized in table 9.1-6 and appendix 9-A. The PSD major source threshold status for CO₂e is 100,000 tons per year. The potential to emit CO₂e from each of the compressor stations are less than a third of this threshold providing an indication of the low emissions intensity of this Project. Additional discussion regarding GHG impacts are included in Resource Report 1. Additionally, because the Project involves the conversion of the Southern Segment of the existing pipeline to natural gas from fuel oil, there would also be an expected decrease in associated end-use GHG emissions. This is illustrated in the EPA fuel combustion emissions factors contained in the MRR Subpart C tables C-1 and C-2, which are summarized below in table 9.1-10.

Table 9.1-10		
Comparison of GHG Emissions Factors for Natural Gas and Fuel Oil Combustion		
Pollutant	#2 Oil (kg/MMBtu)	Natural Gas (kg/MMBtu)
CO ₂ ^a	73.96	53.06
CH ₄ ^b	0.003	0.001
N ₂ O ^b	0.0006	0.0001
kg/MMBtu = kilograms per million British thermal unit		
^a 40 CFR 98 Subpart C, Table C-1		
^b 40 CFR 98 Subpart C, Table C-2		

9.2 NOISE QUALITY

Sound is caused by vibrations that generate waves of minute pressure fluctuations in the surrounding air. Sound levels are typically measured using a logarithmic decibel (dB) scale. Sound that causes disturbance or annoyance, or unwanted sound, is often called noise. The terms sound and noise are used interchangeably in this analysis.

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 Hertz (Hz) and is least sensitive to sound frequencies below 400 Hz or above 12,500 Hz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose. A list of typical sound levels for example sound sources is presented in figure 9.2-1.

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
Jet flyover at 300 meters	120 dBA	Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	Night club with live music
	90 dBA	
Large truck pass by at 15 meters	80 dBA	Noisy restaurant
	70 dBA	Garbage disposal at 1 meter
Gas lawn mower at 30 meters	60 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime	50 dBA	Normal speech at 1 meter
Suburban expressway at 90 meters	40 dBA	Active office environment
Suburban daytime	30 dBA	Quiet office environment
Urban area nighttime	20 dBA	Library
	10 dBA	Quiet bedroom at night
Suburban nighttime	0 dBA	
Quiet rural areas		Quiet recording studio
Wilderness area		Threshold of human hearing
Most quiet remote areas		
Threshold of human hearing		

Figure 9.2-1 Sound Levels of Typical Noise Sources

Source: Caltrans, 2016

Varying sound levels often are described in terms of an equivalent constant decibel level. Equivalent sound levels (Leq) are not a simple averaging of decibel values but are based on the cumulative acoustical energy associated with the variable sound levels. Leq values sometimes are referred to as energy-averaged sound levels. As a consequence of the calculation procedure, high dB events contribute more to the Leq value than do low dB events. Leq values are used to develop single-value descriptions of average sound exposure over various periods of time. Such average sound exposure ratings often include additional weighting factors for potential annoyance due to time of day or other considerations. The Leq data used for average sound exposure descriptors are generally based on A-weighted sound level measurements (expressed as dBA), which include adjustments to the unweighted values to account for the variation in human hearing sensitivity across the audible frequencies.

Average sound exposure over a 24-hour period is often presented as a day-night average, or time-weighted, sound level (Ldn). Ldn values are calculated in the units of dBA from hourly Leq values, with the Leq values for the nighttime period (10 p.m. to 7 a.m.) increased by 10 dBA to reflect the greater disturbance potential from nighttime sounds.

Ldn is calculated from the daytime and nighttime Leq values according to the following formula:

$$L_{dn} = 10 \times \text{Log}_{10} \left(\frac{15}{24} \times 10^{(L_{eq(day)}/10)} + \frac{9}{24} \times 10^{((L_{eq(night)}+10)/10)} \right)$$

Certain statistical noise values are sometimes used to describe the allowable sound levels, or limits, at noise sensitive areas (NSAs). The L1, L10, and L50 statistical noise level descriptors are the noise levels that equaled or exceeded a stated percentage of the time during a given hour. For example, an L10 = 60 dBA implies that in any hour of the day, a noise level of 60 dBA is equaled or exceeded 10 percent of the time, or for 6 minutes. The L50, the noise level exceeded 50 percent of the time, is commonly known as the median noise level.

Sound intensity attenuates with distance as it propagates over a larger area, generally in a spherical spreading pattern, away from a point source where the sound waves were generated. Generally speaking, the sound pressure level emitted from a point source decreases by approximately 6 dBA for each doubling of distance. Sound emitted from a line of point sources attenuates in a cylindrical spreading pattern and decreases approximately 3 dBA for each doubling of distance.

9.2.1 Applicable Noise Regulations

The FERC's noise analysis guidelines require that any applicable federal, state or local noise regulations or standards be identified and compared with the anticipated noise levels from the Project. It is further required to specify how the addition of the Quakertown CS and Marcus Hook CS would meet the applicable regulations. The FERC's standard for noise quality can be found at 18 CFR 380.12 (k)(4)(v)(A):

The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day- night sound level (Ldn) of 55 dBA at any preexisting noise-sensitive area (such as schools, hospitals, or residences).

Because the Project includes the construction and operation of a new compressor station, the applicable FERC noise standard is that the noise level at any preexisting NSA attributable only to the Quakertown CS or Marcus Hook CS does not exceed 55 dBA Ldn. The Ldn 55 dBA limit is equivalent to a continuous noise level of 48.6 dBA Leq for facilities that operate at a constant level of noise. The Quakertown CS would be located on the border of Richland Township and West Rockhill Township. Because NSAs would be located within each township, local

continuous sound limits established by Richland Township (Richland Township, 2017) and West Rockhill Township (West Rockhill Township, 2017) in addition to federal standards, would be applicable as follows:

- Richland Township
 - for residential, public space, open space, agricultural or institutional land use:
 - 55 dBA for 7 AM through 10 PM;
 - 50 dBA for 10 PM through 7 AM, plus Sundays and legal holidays;
 - for office, commercial, or business land use:
 - 65 dBA for 7 AM through 10 PM;
 - 60 dBA for 10 PM through 7 AM, plus Sundays and legal holidays; and
 - for industrial land use:
 - 70 dBA at all times.

- West Rockhill Township
 - for residential, recreational or agricultural land use:
 - 60 dBA for 7 AM through 10 PM (weekdays) and 9 AM to 10 PM (weekends and legal holidays);
 - 55 dBA for nighttime (opposite of times listed above);
 - for commercial, institutional or mixed use districts:
 - 65 dBA for 7 AM through 10 PM (weekdays) and 9 AM to 10 PM (weekends and legal holidays);
 - 60 dBA for nighttime (opposite of times listed above);
 - for industrial land use:
 - 79 dBA for 7 AM through 10 PM (weekdays) and 9 AM to 10 PM (weekends and legal holidays); and
 - 72 dBA for nighttime (opposite of times listed above).

The Marcus Hook CS would be located within Lower Chichester Township, Pennsylvania. Because the NSAs around Marcus Hook CS are located in Lower Chichester Township, a review of the township's ordinances was performed to identify any sound limits. There are no separate and specific sound limits for Lower Chichester Township.

Excursions of sound pressure levels for any source emitting an impact sound is limited to 20 dBA over the maximum limits listed above, assuming that they do not exceed 80 dBA. While Adelphia has identified the NSAs surrounding the Quakertown CS and Marcus Hook CS, it does not have landowner approval to access the NSAs surrounding the Quakertown CS at the time of this filing. As such, alternative monitoring points (i.e., the closest representative point to the identified NSA to which Adelphia had access) were used to establish the existing noise levels or

perform additional calculations related to the impacts to noise quality resulting from the Project. This information is provided appendix 9-D. Table 9.2-1 summarizes the location of NSAs with regards to the Quakertown CS and Marcus Hook CS, respectively. The table also includes details regarding the alternative NSAs for the Quakertown CS. Figures 9.2-2 and 9.2-3 show the locations of the NSAs (and alternative NSAs) with respect to the compressor stations.

Table 9.2-1			
Location of NSAs for Adelphia Gateway Project Compressor Stations			
Identification	Township Name	NSA Land Use Type	NSA Distance (ft) and Direction from Compressor Station Building
<i>Quakertown CS</i>			
NSA1	Richland	Residential	~530 W
<i>Alt NSA1</i>	<i>Richland</i>	<i>Residential</i>	<i>~460 W</i>
NSA2	West Rockhill	Residential	~630 SE
<i>Alt NSA2</i>	<i>West Rockhill</i>	<i>Residential</i>	<i>~630 SE</i>
NSA3	Richland	Residential	~640 S
<i>Alt NSA3</i>	<i>Richland</i>	<i>Residential</i>	<i>~690 S</i>
<i>Marcus Hook CS</i>			
NSA1a	Lower Chichester	Residential / Industrial (nearby)	~630 NW
NSA1b	Lower Chichester	Residential / Industrial (nearby)	~530 NW
NSA2	Lower Chichester	Residential / Industrial (nearby)	~2,780 NE

Figure 9.2-2 Location of NSAs for Marcus Hook CS



Figure 9.2-3 Location of NSAs for Quakertown CS



9.2.2 Existing Noise Sensitive Areas

Surveys consisting of review of aerial and satellite imagery of the area surrounding the proposed compressor station properties were conducted to identify residences, schools, churches, hospitals and other potential NSAs. The noise survey was conducted on December 12, 2017 at the two identified NSAs that were closest to the Marcus Hook CS, and on December 13, 2017 at the three identified NSAs that were closest to the Quakertown CS. Detailed information on the existing NSAs and baseline noise levels are presented in the noise monitoring survey report which is included in Attachment 9-D of this report.

Adelphia is in the process of conducting HDD Noise Surveys to identify potential NSAs and estimate potential associated noise impacts. Adelphia will file the results of its study with the FERC upon completion.

9.2.3 Existing Sound Environment

FERC rules at 18 CFR 380.12(k)(2)(ii) state that environmental reports for Natural Gas Act applications require the applicant to quantitatively describe existing noise levels at existing NSAs. The existing noise levels at NSAs near the two compressor stations were quantified by collecting field noise measurements during the noise survey.

Marcus Hook Compressor Station

With respect to the Marcus Hook CS, the ambient sound levels at two existing NSAs (NSA-1b and NSA-2) were determined during the sound monitoring survey performed on December 12, 2017. The results of the ambient sound measurements are described in the sound monitoring survey included as Appendix 9-D of this report. A summary of the measurements is included in Table 9.2-2 below. Figure 9.2-2 shows the locations of the NSAs in comparison with the proposed Marcus Hook CS.

Location	Direction and Distance from Proposed Compressor Station Building	Background (December 2017)	
		Daytime/Nighttime Measurements (L_{eq} , dBA)	L_{dn} (dBA)
NSA-1b (residence)	NW – 530 ft	66.2	69.2
		61.8	
NSA-2 (residence)	NE – 2,780 ft	61.5	68.5
		62.2	

The ambient noise measurements collected at NSA-1b are expected to be the typical ambient noise levels for the houses fronting Ridge Road, across from the property proposed for the Marcus Hook CS. For the modeling impact assessment, two NSAs were placed at these houses. Due to the proximity of NSA-1a to NSA-1b, the ambient sound levels that were measured at NSA-1b were considered to be representative of the ambient sound levels at NSA-1a.

Quakertown Compressor Station

With respect to the Quakertown CS, the ambient sound levels at three existing NSAs were determined during the sound monitoring survey performed on December 13, 2017. The results of the ambient sound measurements are described in the sound monitoring survey included as appendix 9-D of this report. A summary of the measurements is included in table 9.2-3 below. Figure 9.2-3 shows the locations of the NSAs in comparison with the proposed Quakertown CS.

Location	Direction and Distance from Proposed Compressor Station Building	Background (December 2017)	
		Daytime/Nighttime Measurements (L_{eq} , dBA)	L_{dn} (dBA)
Alt NSA-1 (residence)	W – 460 ft	50.1	49.6
		38.5	
Alt NSA-2 (residence)	SE – 630 ft	59.1	58.5
		47.4	
Alt NSA-3 (residence)	S – 690 ft	65.3	63.5
		44.2	

9.2.4 Noise Sources

Noise will be generated at the site of the Marcus Hook CS and Quakertown CS during its construction and operation. The anticipated primary sources of noise at those locations during construction and operation are discussed below.

Additional noise will be generated during construction of the 0.2 and 4.4 mile pipeline laterals, however, given these lengths noise impacts are considered insignificant. Furthermore, noise impacts from the new mainline valve and blowdown assemblies are also expected to be insignificant due to the limited duration of their construction (e.g., two days or less of heavy equipment, each) or intermittent nature of operations (i.e., they are not considered part of normal operation).

The expected noise resulting from pipeline maintenance blowdown events (i.e., those occurring away from the compressor stations) would depend on the valve or venting location, the proximity of NSAs, the blowdown event duration, the reference noise levels and the time of day that the blowdown occurs. Such details regarding the blowdowns are not known at this time; however, the following equations offer a prediction method depending on the time of day that the blowdowns would occur. These equations are used to calculate the reference Leq values.

$$\text{Daytime Blowdown: } L_{dn} = 10 \times \text{Log}_{10} \left(\frac{t}{24} \times 10^{(L_{eq(day)}/10)} \right)$$

$$\text{Nighttime Blowdown: } L_{dn} = 10 \times \text{Log}_{10} \left(\frac{t}{24} \times 10^{((L_{eq(night)}+10)/10)} \right)$$

Where:

t = duration of blowdown event (hours)

$L_{eq} = L_{eq, ref} - 20 \cdot \text{LOG} (d_{NSA}/50)$

$L_{eq, ref}$ = dBA of blowdown at a reference distance of 50 feet

d_{NSA} = distance (in feet) between blowdown vent and the NSA

The estimated blowdown event Ldn calculated in the manner outlined above would be compared to the FERC's 55 dBA criteria. Potential mitigation, including blowdown silencing, would be addressed as well. NSAs and neighboring communities would be notified of any blowdown events in advance by Adelphia, when possible.

9.2.4.1 Construction Noise Sources

Construction activities associated with the both compressor stations can be categorized into the following five phases based on schedule of operations and the type of construction equipment used:

- Site Preparation which includes removal of existing residential dwellings and vegetation
- Earthmoving which includes excavation, grading and filling
- Concrete Pouring
- Structural Erection, which involves steel erection, construction of building framework, and welding
- Equipment Installation and Building Finishing, which involves installation of mechanical and electrical equipment, and completion of buildings

Table 9.2-4 identifies the type, quantity and operating hours of construction equipment that can be expected over the course of the construction of the compressor station. Based on a review of the quantity and sound power level of the equipment that is likely to be used at the site, it was determined that the earthmoving phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the earthmoving activities are the internal combustion engines of the construction equipment.

Description	Typical Hours of Operation	Quantity
Air Compressor	12	2
Backhoe	12	2
Bobcat	12	2
Dozer	12	2
Dump Truck	12	3
Excavator	12	3
Front-end Loader	12	2
Generator	12	3

Construction of the compressor stations will consist of earth work (e.g., site grading), construction of the buildings, and installation of the equipment. The noise impact at the NSAs from construction activities will be dependent on the type of equipment used, the duration of use for each piece of equipment, and the quantity of construction equipment operating simultaneously. Construction equipment will be conventional in type (e.g., front end loaders, backhoes, dump trucks) and will be primarily operated during daytime hours on an as-needed basis. The

construction activities will be of limited duration (i.e., that necessary to complete the Project components).

9.2.4.2 Operational Noise Sources

The primary sources of noise during operation of the Project will consist of three RICE and ancillary equipment. Tables 9.2-5 and 9.2-6 list the primary sources of noise expected during the operation of the Marcus Hook CS and Quakertown CS, respectively. The engines at each compressor station will be housed in a sound attenuated building. The site will also consist of a valve/metering station yard, and other ancillary equipment such as a generator and blowdown vents.

Table 9.2-5				
Primary Sources of Noise at the Marcus Hook Compressor Station				
Source ID	Description	Quantity	Manufacturer	Model
1	Reciprocating Engine – Unenclosed	3	Caterpillar	G3606
2	Reciprocating Engine Combustion Air Intake	6	--	--
3	Reciprocating Engine Combustion Exhaust	3	--	--
4	Reciprocating Engine Utility Coolers	3	Not available	Not available
5	Compressor Building Air Intake (Side wall)	4	--	--
6	Compressor Building Air Exhaust	4	--	--
7	Above-Ground Piping and Valves	Multiple	--	--
8	Generator	1	Caterpillar	G3412C
9	Blowdown Vents	4	--	--

Table 9.2-6				
Primary Sources of Noise at the Quakertown Compressor Station				
Source ID	Description	Quantity	Manufacturer	Model
1	Reciprocating Engine – Unenclosed	3	Caterpillar	G3606
2	Reciprocating Engine Combustion Air Intake	6	--	--
3	Reciprocating Engine Combustion Exhaust	3	--	--
4	Reciprocating Engine Utility Coolers	3	Not available	Not available
5	Compressor Building Air Intake (Side wall)	4	--	--
6	Compressor Building Air Exhaust	4	--	--

7	Above-Ground Piping and Valves	Multiple	--	--
8	Generator	1	Caterpillar	G3412C
9	Fuel gas regulation skid	1	--	--
10	Blowdown Vents	4	--	--

9.2.5 Noise Impact Analysis for Construction Activities

9.2.5.1 Methodology

Noise impacts at the NSAs were determined using computer model Cadna-A (Computer Aided Noise Abatement, Version 4.4.145), a noise modeling software developed by DataKustik GmbH. The model is based on International Standards Organization (ISO) Standard 9613-2 “Acoustics – Attenuation of Sound During Propagation Outdoors”. The model evaluates the A-weighted sound pressure levels of each noise source at each identified receptor. The ISO-based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures, topography and brush. The model is considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver.

The absorption of sound by the ground as the sound propagates from the emitting source is influenced by vegetation type, ground cover and the density and height of foliage. Attenuation by ground absorption is inputted into the model based on a numerical value between 0 and 1, where “0” indicates acoustically hard, reflective surfaces, and “1” indicates soft, absorptive ground. A ground absorption coefficient of 0.0 was used in the model for the Marcus Hook CS and the intervening land between the Marcus Hook CS and the NSAs; these intervening areas primarily consist of developed lands. A ground absorption coefficient of 0.5 was used in the model for the Quakertown CS and the intervening land between the Quakertown CS and the NSAs; these intervening areas primarily consist of undeveloped lands.

9.2.5.2 Construction Noise

As previously indicated, it was considered that the earthmoving phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the construction activities would be the internal combustion engines of the construction equipment.

The noise from construction equipment was modeled in Cadna-A as an area source covering the impacted area within which all of the construction equipment identified in Table 9.2-7 would potentially operate simultaneously. The movement of on-site vehicles were modeled as a moving point source around the footprint of the compressor stations.

Table 9.2-7					
Estimated Sound Pressure Levels of Construction Activities Potentially Used During the Earthmoving Phase					
Equipment	Quantity	Typical Daily Operating Hours (Hours per Day)	Sound Pressure Level (dBA)	Distance of Sound Pressure Level (ft)	Sound Power Level (dBA)
<i>Construction Equipment</i>					
Air Compressor	2	12	78	50	109.5
Backhoe	2	12	78	50	109.5
Bobcat [2]	2	12	70.7	23	95.4
Dozer	2	12	82	50	113.5
Excavator	3	12	81	50	112.5
Front-end Loader	2	12	79	50	110.5
Generator	3	12	81	50	112.5
TOTAL	-	-	-	-	123.1
<i>On-site Vehicles</i>					
Dump Truck	3	12	76	50	107.5
SPL = sound pressure level PWL = sound power level					

9.2.5.3 Construction Noise Impacts from Marcus Hook Compressor Station

Based on the acoustic modeling, two of the three NSAs were found to be impacted with an Ldn higher than the FERC criteria of 55 dBA, as summarized in table 9.2-8. The maximum predicted impacts from construction activities is expected to be at NSA 1b, with an Ldn of 69.2 dBA, approximately 3.9 dBA over the existing ambient sound levels.

Although the maximum Ldn at the NSAs are predicted to be higher than the FERC Ldn criteria of 55 dBA, construction noise will be temporary and intermittent. The increase in ambient day-night sound levels due to the construction activity will be barely perceptible at one NSA and perceptible at two NSAs (NSA-1a and NSA-1b). Further, the earthmoving activity is not anticipated to occur during the night-time periods. Therefore, construction noise is not considered to have an adverse impact at the NSAs.

NSA	Distance to NSA from Compressor Building (ft)	Direction	Existing Ambient Background L _{dn} (dBA)	Estimated Maximum L _{dn} From Construction Activities (dBA)	Estimated Total L _{dn} (dBA)	Predicted Change from Existing Ambient L _{dn} (dBA)
NSA-1a	630	NW	69.2	73.1	74.6	+5.4
NSA-1b	530	NW	69.2	71.1	73.3	+4.1
NSA-2	2,780	NE	68.5	55.4	68.7	+0.2

9.2.5.4 Construction Noise Impacts from Quakertown Compressor Station

Based on the acoustic modeling, all three NSAs were found to be impacted with an L_{dn} higher than the FERC criteria of 55 dBA, as summarized in table 9.2-9. The maximum predicted impacts from construction activities is expected to be at NSA 1, with an L_{dn} of 63.5 dBA, approximately 13.9 dBA over the existing day-night ambient sound levels. Although the maximum L_{dn} at the NSAs are predicted to be higher than the FERC L_{dn} criteria of 55 dBA, construction noise will be temporary and intermittent. Further, the earthmoving activity is not anticipated to occur during the night-time periods. Therefore, construction noise is not considered to have an adverse impact at the NSAs.

NSA	Distance to NSA from Compressor Building (ft)	Direction	Existing Ambient Background L _{dn} (dBA)	Estimated Maximum L _{dn} From Construction Activities (dBA)	Estimated Total L _{dn} (dBA)	Predicted Change from Existing Ambient L _{dn} (dBA)
NSA-1	530	W	49.6	63.3	63.5	+13.9
NSA-2	630	SE	58.5	59.7	62.2	+3.7
NSA-3	640	S	63.5	60.4	65.2	+1.7

9.2.6 Noise Impact Analysis for Compressor Station Operation

9.2.6.1 Methodology

A three-dimensional noise model was constructed in Cadna-A based on the latest available site plans for the compressor stations. The noise sources were assigned in the model as follows:

- stacks as point sources
- sidewall intakes as point sources with the applicable directivity
- roof as area sources
- walls as vertical area sources
- noise radiating from pipelines as line sources

The sound power levels of each significant noise source associated with the compressor station, summarized in tables 9.2-10 and 9.2-11 for the Marcus Hook CS and Quakertown CS, respectively, were inputted in the model to determine the cumulative noise impacts at the NSAs and any other compliance points. The sound levels were inputted into the model either as a Z-weighted sound power levels in the 1/1 octave band, or an A-weighted overall sound power levels. Sound level data for the significant noise sources in tables 9.2-10 or 9.2-11 were not provided to Trinity directly by Adelphia or by the respective equipment manufacturer. Therefore, the sound levels identified in tables 9.2-10 and 9.2-11 for the noise sources were estimated from Trinity's database and from publicly available sources.

The modeling results were used to identify the sources requiring mitigation, as well as the extent of mitigation required. Similar to the sound level data, the insertion losses for sources that required mitigation were obtained from Trinity's database or from publicly available sources. As more accurate sound level data becomes available, the assessment can be updated to reassess the required mitigation and insertion losses.

Tables 9.2-10 and 9.2-11 summarize the sound power level for each of the significant noise sources included as part of the noise impact assessment, and also summarize the attenuated sound power levels for sources that require mitigation in order to meet the applicable sound level criteria.

**Table 9.2-10
Sound Pressure Level and Sound Power Level of Significant Noise Sources at Marcus Hook CS**

Description	Sound Pressure Levels (dBA)										SPL Distance (ft)	Sound Power Levels (dBA)									
	31.5	63	125	250	500	1000	2000	4000	8000	Overall		31.5	63	125	250	500	1000	2000	4000	8000	Overall
Engine – Unenclosed ^{ab}	-	-	-	-	-	-	-	-	-	-	-	117.0	120.0	118.0	119.0	118.0	117.0	115.0	113.0	111.0	122.3
Engine Combustion Air Intake – Unattenuated ^c	-	-	-	-	-	-	-	-	-	-	-	104.0	114.0	116.0	115.0	113.0	112.0	117.0	123.0	123.0	127.0
Engine Combustion Air Intake – Attenuated ^b	-	-	-	-	-	-	-	-	-	-	-	99.0	102.0	94.0	82.0	67.0	53.0	57.0	63.0	67.0	81.2
Engine Combustion Exhaust – Unattenuated ^c	-	-	-	-	-	-	-	-	-	-	-	119.0	130.0	127.0	122.0	120.0	123.0	129.0	133.0	131.0	136.8
Engine Combustion Exhaust – Attenuated ^b	-	-	-	-	-	-	-	-	-	-	-	102.0	100.0	80.0	72.0	75.0	77.0	82.0	86.0	84.0	90.0
Engine Utility Coolers ^b	-	55.7	54.7	51.7	46.7	44.7	38.7	32.7	26.7	54.7	50.0		92.2	91.2	88.2	83.2	81.2	75.2	69.2	63.2	86.1
Compressor Building Sidewall Air Intakes ^d	-	-	-	-	-	-	-	-	-	60.0	15.0										81.0
Compressor Building Rooftop Exhaust ^d	-	-	-	-	-	-	-	-	-	60.0	15.0										81.0
Above-Ground Piping and Valves ^d	-	-	-	-	-	-	-	-	-	61.0	5.0										66.0
Generator ^d	-	-	-	-	-	-	-	-	-	50.0	23.0										92.0
Blowdown Vents ^d	-	-	-	-	-	-	-	-	-	60.0	50.0										81.5

SPL = sound pressure level

^a Unenclosed engine packages will be located in an acoustically insulated engine building.

^b In absence of sound level data from the manufacturer, sound level data was obtained from publicly-available source.

^c Insertion losses for silencer was not available from manufacturer. Insertion loss was estimated based on previous, similar assessments.

^d In absence of specific sound data for equipment, the minimum sound levels for the equipment were used that would demonstrate compliance with noise criteria

**Table 9.2-11
Sound Pressure Level and Sound Power Level of Significant Noise Sources at Quakertown Compressor Station**

Description	Sound Pressure Levels (dBA)										SPL Distance (ft)	Sound Power Levels (dBA)									
	31.5	63	125	250	500	1000	2000	4000	8000	Overall		31.5	63	125	250	500	1000	2000	4000	8000	Overall
Engine – Unenclosed ^{ab}	-	-	-	-	-	-	-	-	-	-	-	117.0	120.0	118.0	119.0	118.0	117.0	115.0	113.0	111.0	122.3
Engine Combustion Air Intake – Unattenuated ^c	-	-	-	-	-	-	-	-	-	-	-	104.0	114.0	116.0	115.0	113.0	112.0	117.0	123.0	123.0	127.0
Engine Combustion Air Intake – Attenuated ^b	-	-	-	-	-	-	-	-	-	-	-	99.0	102.0	94.0	82.0	67.0	53.0	57.0	63.0	67.0	81.2
Engine Combustion Exhaust – Unattenuated ^c	-	-	-	-	-	-	-	-	-	-	-	119.0	130.0	127.0	122.0	120.0	123.0	129.0	133.0	131.0	136.8
Engine Combustion Exhaust – Attenuated ^b	-	-	-	-	-	-	-	-	-	-	-	99.0	95.0	80.0	72.0	67.0	70.0	76.0	80.0	81.0	84.8
Engine Utility Coolers ^b	-	55.7	54.7	51.7	46.7	44.7	38.7	32.7	26.7	49.7	50.0	-	87.2	86.2	83.2	78.2	76.2	70.2	64.2	58.2	81.1
Compressor Building Sidewall Air Intakes ^d	-	-	-	-	-	-	-	-	-	60.0	15.0	-	-	-	-	-	-	-	-	-	81.0
Compressor Building Rooftop Exhaust ^d	-	-	-	-	-	-	-	-	-	60.0	15.0	-	-	-	-	-	-	-	-	-	81.0
Above-Ground Piping and Valves ^d	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
Fuel Gas Regulation Skid ^d	-	-	-	-	-	-	-	-	-	60.0	50.0	-	-	-	-	-	-	-	-	-	91.5
Generator ^d	-	-	-	-	-	-	-	-	-	50.0	23.0	-	-	-	-	-	-	-	-	-	74.7
Blowdown Vents ^d	-	-	-	-	-	-	-	-	-	60.0	50.0	-	-	-	-	-	-	-	-	-	91.5

^a Unenclosed engine packages will be located in an acoustically insulated engine building.

^b In absence of sound level data from the manufacturer, sound level data was obtained from publicly-available source.

^c Insertion losses for silencer was not available from manufacturer. Insertion loss was estimated based on previous, similar assessments.

^d In absence of specific sound data for equipment, the minimum sound levels for the equipment were used that would demonstrate compliance with noise criteria

9.2.6.2 Noise Impacts from Marcus Hook Compressor Station Operations

Based on the sound power levels identified in table 9.2-10 and the implementation of the noise mitigation measures described below in section 9.2.7.2, the modeled noise impact at the NSAs from the Marcus Hook CS are predicted to be below the FERC Ldn of 55 dBA, as summarized in Table 9.2-12. Table 9.2-12 also identifies the predicted change in ambient Ldn due to the Marcus Hook CS over the existing ambient Ldn to be imperceptible at all three NSAs (less than 0.5 dBA).

Table 9.2-12						
Estimated Impact at Noise Sensitive Areas Due to Marcus Hook Compressor Station Operational Noise						
NSA	Distance to NSA from Compress or Building	Direction	Existing Ambient Background L_{dn}	Estimated Maximum L_{dn} From Operational Activities	Estimated Total L_{dn}	Predicted Change from Existing Ambient L_{dn}
	(ft)		(dBA)	(dBA)	(dBA)	(dBA)
1a	630	NW	69.2	51.5	69.3	+0.1
1b	530	NW	69.2	53.3	69.3	+0.1
2	2,780	NE	68.5	37.1	68.5	+0.0

9.2.6.3 Noise Impacts from Quakertown Compressor Station Operations

Based on the sound power levels identified in table 9.2.11 and the implementation of the noise mitigation measures described below in Section 9.2.7.3, the modeled noise impact at the NSAs from the Quakertown CS are predicted to be well below the FERC Ldn of 55 dBA, as summarized in table 9.2-13. Table 9.2-13 also identifies the predicted change in ambient Ldn due to the Quakertown CS over the existing ambient Ldn to be imperceptible at all three NSAs (less than 2 dBA).

The Quakertown CS is required to be compliant with the Richland and West Rockhill Townships noise criteria. Richland Township require their noise limits to be met at or within the property boundary of the property impacted by noise. The West Rockhill Township's noise criteria is required to be met at the property boundary of the property generating the noise. The sound level impacts along the property line of the Quakertown CS are summarized in table 9.2-14, and are demonstrated to meet or be below the applicable noise criteria from the Townships.

Table 9.2-13						
Estimated Impact at Noise Sensitive Areas Due to Quakertown Compressor Station Operational Noise						
NSA	Distance to NSA from Compressor Building	Direction	Existing Ambient Background Ldn (dBA)	Estimated Maximum Ldn From Operational Activities (dBA)	Estimated Total Ldn (dBA)	Predicted Change from Existing Ambient Ldn (dBA)
NSA-1	530	W	49.6	45.5	51.0	+1.4
NSA-2	630	SE	58.5	38.9	58.5	+0.0
NSA-3	640	S	63.5	38.4	63.5	+0.0

Table 9.2-14			
Estimated Impact at Noise Sensitive Areas Due to Marcus Hook Compressor Station Operational Noise			
Quakertown CS Property Line	Type of Adjoining Land Use (and Township)	Maximum Noise Impact at Property Line (dBA)	Sound Level Criteria (dBA)
North property boundary, east half of site,	Residential/Recreational (West Rockhill Township)	54.6	55.0
North property boundary, west half of site	Residential/Open Space (Richland Township)	48.7	50.0
South property boundary, east half of site,	Industrial (West Rockhill Township)	48.9	72.0
South property boundary, west half of site	Open Space (Richland Township)	48.3	50.0
East property boundary	Agricultural (West Rockhill Township)	54.2	54.0
West property boundary	Agricultural (Richland Township)	50.0	50.0

9.2.7 Noise Mitigation Measures

Apart from the HDD installations along the Tilghman Lateral and operation of the Quakertown CS and Marcus Hook CS, Project impacts on noise quality would be temporary (e.g., impacts due to non-HDD construction-related sources or abnormal operations such as mainline valves) or would be expected to be minor (e.g., impacts due to operation of valves at interconnects).

9.2.7.1 Horizontal Directional Drill Installation

Adelphia would install a total of eight segments of the Tilghman Lateral via HDD (see table 1.3-3 of Resource Report 1). HDD installation would be conducted during normal daylight hours with construction occurring approximately 12 hours a day, 6 days a week until the pipe pull back activity begins. Once the carrier pipe is being pulled into place, construction work would continue 24 hours a day until it is complete. Installation of each segment is expected to take approximately two to three weeks to complete. Adelphia is in the process of conducting HDD Noise Surveys to estimate potential associated noise impacts. Adelphia will file the results of its study with the FERC upon completion. The study will include identification of noise mitigation, where necessary.

9.2.7.2 Marcus Hook Compressor Station Operations

As shown in appendix 9-D, Adelphia would comply with all federal, state and local rules and ordinances for noise standards potentially applicable to the Project. To the extent necessary, Adelphia would implement mitigation measures to lessen Project impacts on noise quality below the requisite standards. The noise impact analysis predicts that the Marcus Hook CS and Quakertown CS will remain under the FERC's Ldn criteria of 55 dBA at the NSAs through the implementation of the noise mitigation measures outlined in this section.

Compressor Building Structure

One building is proposed for the site to enclose the three reciprocating engines. The roof and walls of the compressor building should have a minimum Sound Transmission Class (STC) of 50, with the interior surface of the building having a minimum Noise Reduction Coefficient (NRC) of 0.9. The walls and roof shall have the minimum sound transmission loss (TL) values listed in table 9.2-15 below. All personnel doors should be a minimum of STC-40 with tight perimeter seals.

Minimum Transmission Loss Values (dB) for Compressor Building Walls and Roof									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	--	--	22	43	56	65	63	53	46

Compressor Building Ventilation

It was considered that that ventilation of the compressor building would consist of four powered intake fans in the walls of the building and four roof-top discharge hoods or fans. All intakes were considered to be located along the north wall of the compressor building.

The intakes and exhausts shall be equipped with inlet and discharge mufflers to minimize the indoor sound propagating outdoors. The intakes and exhausts shall each have a maximum total sound pressure level of 60 dBA at 15 feet (i.e. includes both the noise associated with the intakes and exhausts as well as any escaping indoor noise).

Engine Combustion Air Intake

The attenuated engine air intake shall have a maximum sound pressure level of 50 dBA at 50 feet. For each engine air intake, the silencer and air inlet cleaner shall have the combined insertion losses provided in table 9.2-16.

Table 9.2-16									
Estimated Intensity Level Values (dB) for Engine Combustion Air Intake System									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	5	12	22	33	46	59	60	60	56

It should be noted that the insertion losses specified above are based on modeling using sound data for the unattenuated engine air intake that was obtained from a publicly available document and not from the manufacturer. The sound performance and insertion losses specified above shall be verified once the sound data is provided by the manufacturer of the equipment.

Engine Combustion Air Exhaust

The attenuated engine air exhaust shall have a maximum sound pressure level of 58 dBA at 50 feet. The silencer for each engine air exhaust shall have the insertion losses listed in table 9.2-17.

Table 9.2-17									
Estimated Intensity Level Values (dB) for Engine Combustion Air Exhaust System									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	17	30	47	50	45	46	47	47	47

It should be noted that the insertion losses specified above are based on modeling using sound data for the unattenuated engine air exhaust obtained from a publicly available document and not from the manufacturer. The sound performance and insertion losses specified above shall be verified once the sound data is provided by the manufacturer of the equipment.

Engine Utility Cooler

The utility cooler associated with each engine shall have a maximum overall sound pressure level of 55 dBA at 50 feet.

Aboveground Pipes and Valves

As a result of the aboveground piping located as close as 150 feet from the nearest NSA, sound pressure levels from the aboveground pipes and valves shall not exceed 61 dBA measured at a distance of 5 feet. One or more of the following noise mitigations shall be implemented in order to meet the sound level criteria of 61 dBA at 5 feet:

- Acoustical lagging installed on the aboveground pipes;
- Acoustical blankets over the valves
- Selection of low-noise trims or noise-attenuating diffusers
- Located the pipe below ground as much as possible, particularly the suction and discharge header lines.

Generator

The Caterpillar G3412C engine was noted to be located outside of the compressor building. This engine shall be equipped with an acoustical enclosure. The acoustical enclosure, and any other external component (such as exhaust stack, air inlets and coolers), shall have a combined maximum sound pressure level of 50 dBA at 50 feet.

Blowdown Vents

The blowdown vents shall be equipped with silencers such that each attenuated blowdown vent has a maximum sound pressure level of 60 dBA at 50 feet.

9.2.7.3 Quakertown Compressor Station Operations

The Quakertown CS is expected meet the FERC Ldn criteria of 55 dBA at the NSAs, as well as the Township sound level criteria at the property lines, through the implementation of the noise controls outlined in this section.

Compressor Building Structure

One building is proposed for the site to enclose the three reciprocating engines. The roof and walls of the compressor building should have a minimum Sound Transmission Class (STC) of 50, with the interior surface of the building having a minimum Noise Reduction Coefficient (NRC) of 0.9. The walls and roof shall have the minimum sound transmission loss (TL) values listed in table 9.2-18. All personnel doors should be a minimum of STC-40 with tight perimeter seals.

Table 9.2-18									
Minimum Transmission Loss Values (dB) for Compressor Building Walls and Roof									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	--	--	22	43	56	65	63	53	46

Compressor Building Ventilation

It was considered that that ventilation of the compressor building would consist of four powered intake fans in the walls of the building and four roof-top discharge hoods or fans. All intakes were considered to be located along the north wall of the compressor building.

The intakes and exhausts shall be equipped with inlet and discharge mufflers to minimize the indoor sound propagating outdoors. The intakes and exhausts shall each have a maximum total sound pressure level of 60 dBA at 15 feet (i.e. includes both the noise associated with the intakes and exhausts as well as any escaping indoor noise).

Engine Combustion Air Intake

The attenuated engine air intake shall have a maximum sound pressure level of 45 dBA at 200 feet. For each engine air intake, the silencer and air inlet cleaner shall have the combined insertion losses listed in table 9.2-19.

Table 9.2-19									
Estimated Intensity Level Values (dB) for Engine Combustion Air Intake System									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	5.0	12.0	22.0	33.0	46.0	59.0	60.0	60.0	56.0

It should be noted that the insertion losses specified above are based on modeling using sound data for the unattenuated engine air intake that was obtained from a publicly available document and not from the manufacturer. The sound performance and insertion losses specified above shall be verified once the sound data is provided by the manufacturer of the equipment.

Engine Combustion Air Exhaust

The attenuated engine air exhaust shall have a maximum sound pressure level of 53 dBA at 50 feet. The silencer for each engine air exhaust shall have the insertion losses listed in table 9.2-20.

Table 9.2-20									
Estimated Intensity Level Values (dB) for Engine Combustion Air Exhaust System									
Hz	31.5	63	125	250	500	1000	2000	4000	8000
dB	20.0	35.0	47.0	50.0	53.0	53.0	53.0	53.0	50.0

It should be noted that the insertion losses specified above are based on modeling using sound data for the unattenuated engine air exhaust obtained from a publicly available document and not from the manufacturer. The sound performance and insertion losses specified above shall be verified once the sound data is provided by the manufacturer of the equipment.

Engine Utility Cooler

The utility cooler associated with each engine shall have a maximum overall sound pressure level of 50 dBA at 50 feet.

Aboveground Pipes and Valves

As a result of the aboveground piping located as close as 6 feet from the boundary in some areas, sound pressure levels from the aboveground pipes and valves shall not exceed 54 dBA measured at a distance of 5 feet. One or more of the following noise mitigations shall be implemented in order to meet the noise limits of West Rockhill Township (which are defined at the property boundary of the noise source) and the noise limits of Richland Township (which are defined at the receiving site's property boundary):

- Acoustical lagging installed on the aboveground pipes;
- Acoustical blankets over the valves

- Selection of low-noise trims or noise-attenuating diffusers
- Located the pipe below ground as much as possible, particularly the suction and discharge header lines.

Fuel Gas Regulator Skid

The fuel gas regulator skid, including the exhaust, shall have a maximum overall sound pressure level of 50 dBA at 23 feet.

Generator

The Caterpillar G3412C engine was noted to be located outside of the compressor building. This engine shall be equipped with an acoustical enclosure. The acoustical enclosure, and any other external component (such as exhaust stack, air inlets and coolers), shall have a combined maximum sound pressure level of 50 dBA at 23 feet in order to meet the Richland Township's night-time criteria of 55 dBA at the property line since the adjoining property north of the Quakertown CS that is receiving the noise impacts is zoned for residential agricultural uses.

Blowdown Vents

The blowdown vents shall be equipped with silencers such that each attenuated blowdown vent has a maximum sound pressure level of 60 dBA at 50 feet.

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ADELPHIA GATEWAY PROJECT

RESOURCE REPORT NO. 10

Alternatives

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Sources^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. Address the “no action” alternative - 18 CFR § 380.12(l)(1)	D	10.1	N/A
2. For large projects, address the effect of energy conservation or energy alternatives to the Project - 18 CFR § 380.12(l)(1)	D	10.2	N/A
3. Identify system alternatives considered during the identification of the Project and provide the rationale for rejecting each alternative - 18 CFR § 380.12(l)(1)	D	10.3	N/A
4. Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (e.g., wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route - 18 CFR § 380.12(l)(2)(ii)	A, D	10.3	N/A
5. Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site - 18 CFR § 380.12(l)(2)(ii)	A, D	10.3.3	N/A
Notes:	CFR	Code of Federal Regulations	
	N/A	Not applicable	
^a	A	Aerial photographs	
	D	Applicant	
Source:	FERC, 2017		

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ACRONYMS AND ABBREVIATIONS

18-inch Mainline	existing 18-inch-diameter pipeline
Adelphia	Adelphia Gateway, LLC
dthd	dekatherms per day
FERC	Federal Energy Regulatory Commission
M&R	meter and regulator
MAOP	maximum allowable operating pressure
mscfd	million standard cubic feet per day
MP	milepost
NWI	National Wetland Inventory
Preferred Alternative Project	Adelphia Gateway Project
Quakertown CS	Quakertown Compressor Station
RR	Resource Report
Southern Segment	existing pipeline segment from the Quakertown Compressor Station to the Marcus Hook Compressor Station
USGS	U.S. Geological Survey

10 ALTERNATIVES

Resource Report 10 discusses the environmental, economic, technological, and procedural viability of alternatives to the proposed project including the No-Action Alternative, energy conservation alternatives, system alternatives, and project-specific alternatives. In addition, several facility iterations and flow modelling scenarios were evaluated to develop the best cost effective solution with the least environmental impact that accomplish Project objectives. This resource report describes how the proposed Adelpia Gateway Project (Project) would be designed, constructed, operated, and maintained in order to provide reliable service and maintain public safety. The alternatives presented are evaluated and considered relative to the proposed Project, in accordance with 18 Code of Federal Regulation Section 380.12(l). Adelpia Gateway LLC (Adelpia) used the results of the alternatives evaluation process to develop and refine the scope of the Project.

10.1 INTRODUCTION

As stated in Resource Report 1 (*General Project Description*), the Project includes assets currently owned by Interstate Energy Company (IEC). Of the existing 84 miles of 18-inch-diameter pipeline extending from Marcus Hook to its termination at the Martins Creek Power Plant (Existing System), the southern 50 miles (Southern Segment) is an idled fuel oil pipeline subject to the jurisdiction of the Pennsylvania Public Utility Commission. The Project (also known as the Preferred Alternative for the purposes of Resource Report 10), would, among other acquisitions and proposed services, repurpose the Southern Segment of the pipeline to flow natural gas and provide customers in the greater Philadelphia region with a needed, new source of clean, safe, low-cost natural gas supply. Upon purchase of the IEC assets, Adelpia would repurpose the entire pipeline to provide interstate natural gas transportation services. Current gas supplies are available on the 18-inch Mainline from TETCO at approximately milepost (MP) 50 and Columbia Gas Transmission, LLC, at approximately MP 66.

The Project would include the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any alternatives for review in this resource report;

eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard. Adelphia sited the proposed Project along existing, previously developed infrastructure to the greatest extent practicable to avoid and minimize impacts to the human and natural environment. Several alternatives have been evaluated for modifying the Existing System to extend transportation services along the entire existing 84-mile pipeline.

10.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, Adelphia would not construct the proposed Project or acquire the asset being discussed. If the proposed facilities were not constructed, both the potential beneficial and adverse impacts identified in resource reports included in Adelphia's application for a Federal Energy Regulatory Commission (FERC) Certificate of Public Convenience and Necessity would not occur. In addition, under the No-Action Alternative, the Project's purpose and need, as set forth in Resource Report 1 (*General Project Description*) would not be met.

In its current state (i.e., without the proposed Project facilities), the existing IEC pipeline system (Existing System, encompassing both the Northern and Southern Segments) does not include the horsepower or the bidirectional flow capabilities required to provide the proposed 250,000 dekatherms per day (dthd) of transportation capacity into the greater Philadelphia area that would be provided by the Project. Alternate project(s) would be necessary to meet the Project's purpose and need under the No-Action Alternative as the incremental gas supplies available for customers in the area would not be available through existing infrastructure. In order to provide the same benefit as the proposed Project, other transporters would need to replace or upsize their system and facilities to provide comparable service as evidenced by Texas Eastern Transmission, LP's (TETCO's) proposed Greater Philadelphia Expansion, which called for replacing existing pipeline with a larger diameter and adding new pipeline looping. These activities would likely result in greater environmental impacts than the proposed Project. For these reasons, the No-Action Alternative was rejected from further consideration.

10.3 ENERGY CONSERVATION AND ALTERNATIVE ENERGY SOURCES

Energy conservation reduces the need for natural gas and other energy sources. It is possible that the development and implementation of additional conservation measures would have an effect on energy demand. However, with the growing demand for clean, low-cost natural

gas in the greater Philadelphia market, the Project's purpose is to increase access to natural gas transportation capacity, not to decrease the demand for natural gas or other energy sources. Therefore, energy conservation would not meet the purpose and need of the Project and thus was removed from further consideration.

Similarly, alternative forms of energy could be used to meet increased energy demand. However, meeting increased demand for energy through use of coal, oil, electric, and nuclear energy as well as renewable sources such as solar, wind, and geothermal energy does not result in the construction of the transportation infrastructure that is necessary to transport natural gas supplies. Thus, alternative forms of energy would not meet the purpose of the Project in providing transportation service to bring 250,000 dthd into the greater Philadelphia area, or the need of the Project's customers in accessing additional natural gas supplies.

10.4 SYSTEM ALTERNATIVES

System alternatives are those that would meet the objectives of the Project, but would use a different (and often existing) natural gas facility/pipeline system or a different configuration of facilities that would eliminate the need to construct all or part of the project (FERC, 2017). A system alternative could be preferable if it reduces adverse effects associated with the Project. To be a viable system alternative to the Project as proposed, the alternative must meet the following criteria:

- Capable of transporting incremental quantities up to 250,000 dthd of natural gas to the greater Philadelphia market;
- Capable of being constructed and placed in-service within the same schedule as the Project; and
- Reduce environmental impacts when compared to the Project.

Adelphia evaluated two systems alternatives to the proposed modifications to the Existing System (not including the new proposed delivery laterals): the Pipeline Replacement Alternative; and the Looping Alternative, which are discussed in the subsections below and compared in table 10.4-1.

10.4.1 PIPELINE REPLACEMENT ALTERNATIVE

The existing 84-mile pipeline currently has a maximum operating pressure of 1,083 psig. Using this maximum operating pressure, pipeline capacities were calculated from the existing receipt points to proposed delivery points. In order to increase the volumes and move them

southward, additional pressure (delivery pressure) or additional pipe (looping) would be required.

The Pipeline Replacement Alternative involves replacing the Existing System in-place with a new pipeline with either a larger diameter pipeline or a pipeline designed to operate at higher pressures, or both. While this Alternative can increase throughput capability and make use of the existing pipeline right-of-way, additional temporary workspace would be required during construction. The Pipeline Replacement Alternative was eliminated from consideration because it would require new workspace resulting in greater environmental impacts than the Preferred Alternative, as shown in table 10.4-1.

Evaluation Criteria	Units	Alternative		
		Preferred	Pipeline Replacement ^b	Looping ^b
New Pipeline Length	mi	0	49.4	49.4
Total Compressor Stations	no.	2	0	0
Upgraded	no.	N/A	N/A	N/A
New	no.	1	N/A	N/A
Total Compression	HP	11,250	N/A	N/A
Upgraded	HP	N/A	N/A	N/A
New	HP	11,250	N/A	N/A
Environmental Factors				
New Construction ROW ^c	ac	5.8	185.5	455.1
New Permanent ROW ^d	ac	2.6	2.6	302.0
Length adjacent to existing ROW or corridor	%	100.0	100.0	100.0
Total wetlands affected ^e	ac	0.0	15.5	17.4
PFO	ac	0.0	6.7	11.5
PEM and/or PSS	ac	0.0	8.8	5.9
Total waterbodies crossed ^f	no.	0	80	82
Major waterbody crossings (>100 feet)	no.	0	3	3
Natural and scenic rivers	no.	0	1	1
Known cultural resources ^g	no.	0	0	0
Federal land crossed	mi	0.0	0.0	0.0
State land crossed	mi	0.0	0.0	0.0
Other recreation/designated land use areas crossed	mi	0.0	0.0	0.0

Table 10.4-1				
Comparison of System Alternatives and the Preferred Alternative for the Proposed Adelphia Gateway Project^a				
Evaluation Criteria	Units	Alternative		
		Preferred	Pipeline Replacement^b	Looping^b
Existing residences within \leq 50 feet of construction work area ^h	no.	0	517	560
<p>HP = horsepower ROW = right(s)-of-way</p> <p>^a This table only considers alternatives along the Existing System and does not address proposed customer delivery laterals.</p> <p>^b Compression would not be installed for the Pipeline Looping or Replacement Alternatives.</p> <p>^c Assumes no new construction ROW would be required for pipeline installation for the proposed Project. For the Pipeline Replacement Alternative, any new ROW required for these alternatives would be for aboveground facilities. Assumes a new 75-foot-wide construction ROW located adjacent to the eastern edge of the Existing System's pipeline ROW (with an additional 15 feet that would be located within the Existing System's construction ROW) would be required for pipeline installation for the Looping Alternative. Totals also include permanent ROWs associated with aboveground facilities. A new 30-foot-wide construction ROW would be required for the pipeline installation for the Pipeline Replacement Alternative.</p> <p>^d Assumes no new permanent pipeline ROW for the proposed Project or the Pipeline Replacement Alternatives. Assumes 15 feet of new permanent ROW for the Looping Alternative, which would be located adjacent to the eastern edge of the Existing System's pipeline ROW. Totals also include permanent ROWs associated with aboveground facilities.</p> <p>^e All wetland information is based on National Wetlands Inventory mapping. Includes wetlands within the construction ROW. To be conservative, mixed-type wetlands that were partially classified as PFO wetlands (e.g., PFO/PSS) were included in PFO acreages only.</p> <p>^f All non-wetland waterbody information is based on Google Earth aerial imagery and the Pennsylvania Department of Environmental Protection eMap database. Includes waterbodies within the construction ROW.</p> <p>^g All cultural information is based on National Register of Historic Places mapping. Includes sites within the construction ROW.</p> <p>^h Counts determined based on Google Earth imagery. Includes several multi-unit apartment buildings, which are counted as one residence due to the inability to discern between units on aerial imagery.</p> <p>Sources: PADEP 2017; NPS, 2014; Google Earth, 2017; USFWS, 2017</p>				

10.4.2 PIPELINE LOOPING ALTERNATIVE

The Pipeline Looping Alternative consists of the installation of a new pipeline, adjacent to and often in the same right-of-way easement parallel to the Existing System. The new pipeline would typically be of the same diameter and length as the existing pipeline that it would parallel - in this case, the Southern Segment's 50 miles of 18-inch-diameter pipeline. No looping would be necessary for the Northern Segment. Based on the current right-of-way easement width and the development around the pipeline in the area of the Southern Segment over the years, some new right-of-way and additional temporary workspace would be required during construction. The Looping Alternative was eliminated from consideration, because it would require at least some new pipeline right-of-way and workspace, resulting in greater environmental impacts than the Preferred Alternative, as shown in table 10.4-1.

10.5 COMPRESSOR STATION ALTERNATIVES

Adelphia considered alternative sites for the two proposed compressor stations. Adelphia evaluated installing compression at supply receipt points, as well as at market delivery points. In order to take full advantage of Adelphia's potential capacity, pressure provided by suppliers needs to be at or near the pipeline maximum allowable operating pressure (MAOP) of 1083 psig. Based on available data current deliveries from existing interconnects are well below the MAOP of the 18-inch mainline. Based on preliminary design discussions potential customer(s) of the pipeline have requested a delivery pressure of 800 psig in the Marcus Hook area.

Free flowing volumes at current receipt pressures to Marcus Hook while maintaining a delivery pressure of 800 psig provides insufficient capacity to meet the Project objectives. The addition of receipt compression at the current Quakertown interconnect designed for a discharge pressure of the MAOP of the line could facilitate the transportation of approximately 250 mmcf/d at a delivery pressure of up to 700 psig. To meet the desired delivery pressure of 800 psig, delivery compression is required at the terminus of the mainline designed for a discharge pressure of approximately 840 psig.

10.5.1 RECEIPT POINT COMPRESSION ALTERNATIVES

The Quakertown CS Site Alternative (Preferred Alternative) is located along the Existing System near MP 49.4 on land within an existing M&R station with TETCO (Quakertown M&R Station) located in Quakertown, Bucks County, Pennsylvania (see Resource Report 1).

As part of the Preferred Alternative, Adelphia proposes a second interconnect with TETCO, which is projected to be a major source of supply for Adelphia, as its strategic location along the pipeline allows volumes to flow north and/or south independently. Installing new compression facilities allows incremental receipts of up to 250 mmcf/d deliveries from TETCO and takes advantage of the optimal (maximum) discharge pressure (MAOP -1083 psig) required to achieve the necessary delivery pressure at the Marcus Hook CS (700 psig). Adding compression at Quakertown CS allows for 250 mmcf/d of incremental gas supplies to be delivered to the market at Marcus Hook CS without additional mainline pipeline facilities.

Adelphia reviewed several alternative receipt compressor sites in order to optimize the flow characteristic objectives and minimize environmental impacts including:

- installing compression at an existing Adelphia disturbed site used for oil re-heating, known as Salford;

- reviewing various new, previously un-disturbed areas for greenfield compression; and
- acquiring additional land adjacent to the existing Quakertown meter station site (north, east, and west).

Alternate locations for the receipt compression did not have any additional environmental impacts due to construction, but because some sites would require more horsepower to meet the same goals, those sites would therefore have an increased impact to the environment during operation. Alternate sites for compression were also considered based on the hydraulically optimum location of compression to maximize capacity. Development of the undisturbed parcels would require additional horsepower and result in disturbance within previously undisturbed areas, making these sites the most environmentally impactful alternatives. Consequently, these sites were not chosen and were not evaluated further. The Preferred Alternative has been selected and contemplates expanding the existing Quakertown CS location to accommodate new facilities.

Upon selection of the Quakertown location for the receipt compression, several layout alternatives were evaluated to again minimize impacts. Adelphia chose not to advance an alternative for development immediately north of the existing facility to avoid wetland impacts. Adelphia similarly rejected developing to the east of the existing facility, which would have disturbed an agricultural field and caused the greatest overall disturbance when including access roads and new security measures. Adelphia analyzed an isolated piece of property to the west currently bound by the existing access road, the existing right of way and an existing TETCO right of way. However, this parcel was not advanced for additional consideration because it is wooded, would require extensive clearing of forest, and is in close proximity to a residential dwelling.

A quantitative comparison of the proposed site layout and each of the alternative site layouts is presented in table 10.5-1 and supports the selection of the Preferred Alternative. Location maps of considered alternatives are provided in appendix 10A.

Table 10.5-1				
Comparison of Receipt Point Compressor Station Layout Alternatives for the Proposed Adelpia Gateway Project				
Category	Quakertown Site (Preferred)	Quakertown East	Quakertown North	Quakertown West
Total Land Disturbance (acres)	1.8 ^a	2.7	4.1	2.6
Residences within 100 feet	1 ^b	1 ^b	1 ^b	1 ^b
Federal Lands Crossed (acres)	0.0	0.0	0.0	0.0
Federal Lands within 0.25 mile (acres)	0.0	0.0	0.0	0.0
Land Use Acreage (Percent)				
Agriculture	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	(0.0)
Forest ^c	0.0 (0.0)	0.9 (33.3)	2.3 (56.3)	0.8 (31.6)
Open Land ^d	1.8 (100.0)	1.8 (66.6)	1.8 (43.7)	1.8 (68.4)
Residential	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Industrial	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Water	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
<p>^a This is an existing industrial site. No new land disturbance would occur other than temporary workspace</p> <p>^b All alternatives are located within 100 feet of a residence near the Quakertown Meter Station, but the Quakertown West Alternative would exacerbate existing effects to the residence. Temporary workspace for the Preferred Alternative would occur within 100 feet of the residence.</p> <p>^c Forest includes forested wetlands.</p> <p>^d Open land in includes vegetated uplands that are not dominated by trees (except agricultural lands), herbaceous and scrub-shrub wetlands, and maintained utility right-of-way.</p>				

10.5.2 DELIVERY POINT COMPRESSION ALTERNATIVES

The Marcus Hook Site Alternative (Preferred Alternative) is located within the property boundary of the existing Adelpia-owned Marcus Hook Pump Station in Marcus Hook, Delaware County, Pennsylvania. Adelpia proposes to install 5,625 horsepower at Marcus Hook in order to receive mainline volumes and increase the pressure accordingly to provide requested delivery pressure by customers in the area. Because the Marcus Hook site is currently an industrial site, environmental impact from construction, operation, and maintenance would be minimal. No modifications to the footprint or layout are necessary to address or ameliorate any potential environmental impacts.

Alternate locations for delivery compression were evaluated at Project MP 7.0, Delmarva Station, and at two of the proposed meter stations that would be sited along the Tilghman Lateral (see Resource Report 1). Potential alternative locations were not selected because each was previously undisturbed, and each would require substantially more greenfield disturbance than the Preferred Alternative, increasing the overall environmental impact. Table 10.5-2 provides a comparison of the Preferred Alternative with the other evaluated delivery compression alternatives.

Table 10.5-2 Comparison of Delivery Point Compression Siting Alternatives for the Adelpia Gateway Project			
Category	Marcus Hook Site (Preferred)	Compression @ MP 7^d	Compression @ Delivery Sites^e
Total Land Disturbance (acres)	0.0 ^a	2.8	1.2
Residences within 100 feet	0	0	0
Federal Lands Crossed (acres)	0.0	0.0	0.0
Federal Lands within 0.25 mile (acres)	0.0	0.0	0.0
Land Use			
Acreage (Percent)			
Agriculture	0.0 (100.0)	0.0 (100.0)	0.0 (100.0)
Forest^b	0.0 (100.0)	1.5 (52.5)	0.
Open Land^c	0.0 (100.0)	1.3 (47.5)	0.4 (30.3)
Residential	0.0 (100.0)	0.0 (100.0)	0.0 (100.0)
Industrial	0.0 (100.0)	0.0 (100.0)	0.8 (69.7)
Water	0.0 (100.0)	0.0 (100.0)	0.0 (100.0)
^a This is an existing industrial site. No new land disturbance would occur. ^b Forest includes forested wetlands. ^c Open land includes vegetated uplands that are not dominated by trees (except agricultural lands), herbaceous and scrub-shrub wetlands, and maintained utility right-of-way. ^d This alternative includes the installation of compressors near MP 7 to increase delivery pressures at Marcus Hook. ^e This alternative includes the installation of smaller compressors at each of the three delivery sites along the Tilghman Lateral.			

10.6 CUSTOMER DELIVERY LATERAL ALTERNATIVES

The Project includes the installation of two delivery laterals, which both originate at the Marcus Hook CS and terminate at existing M&R stations (see Resource Report 1).

One route alternative was evaluated for the Parkway Lateral. The alternate route extended up Parkway Road and followed the eastern boundary (outside the fence) of the Delmarva Station

site. This route was eliminated due to a cultural resource located along the fence and the additional impact from clearing trees and vegetation.

The Tilghman Lateral had four additional alternatives evaluated before finalizing the proposed route.

- Variation 1 – evaluated route along the northern edge of railroad right-of-way and an existing powerline corridor. However, this route would require a crossing of Marcus Hook Creek, which is avoided in the Preferred Alternative by implementing an HDD crossing method and having the route maintain a direction along Ridge Road.
- Variation 2 – evaluated an alternate route that turned south on Blueball Street to Highway 13 where it turned east to connect to the proposed route. While this route avoids Ridge Road, it is ultimately approximately 850 linear feet longer.
- Variation 3 – evaluated use of an HDD from approximate M.P. 2.3 southward across the existing railroad corridor. The exit point is located near an EPA superfund site. The HDD in the Preferred Alternative is westward of this area to avoid this obstacle.
- Variation 4 – evaluated a variation minimizing the route along Highway 291 (W 2nd St.) while minimizing impact to W 2nd St. and following a southerly route to and along Seaport Drive. While this route would parallel a railroad spur for approximately 2,500 feet a it is approximately 1150 feet longer than the Preferred Alternative.

All the pipeline routes are constrained to following the existing streets and roads, avoiding as many obstacles (underground utilities, buildings, bridges, and structures) as possible. Several potential routes have been reviewed and the final selection of the Preferred Alternative was based in part upon constructability issues such as utility congestion, traffic control, and stovepipe construction. In addition, in order to make use of existing infrastructure (i.e., the Marcus Hook CS and existing meter stations) and thereby avoid additional environmental impacts, the lateral routes are limited due to their necessary start and end points. Therefore, the only feasible alternatives to the selected routes would be minor route adjustments made between the Marcus Hook CS and the applicable M&R station. For each proposed pipeline lateral, Adelphia considered multiple route variations and selected the Preferred Alternative because it required the least disturbance to the human and natural environment.

10.7 ABOVEGROUND FACILITIES – ALTERNATIVES SITES

The Project would require a number of additional facilities in addition to the compressor stations discussed above. These additional facilities include the meter stations, the new Mainline Valve and various ancillary facilities (e.g. pig launchers and receivers, filter separators, liquid disposal tanks, and chromatography and communication equipment). Each of these additional facilities would be sited within the pipeline right-of-way. The Project currently proposes two (2) alternatives for the new Mainline Valve. Both sites are equally suited for the installation and meet all regulatory requirements for spacing. Final site selection for the new Mainline Valve will be dependent on final environmental findings and negotiations with landowners.

10.8 CONCLUSION

If the Project is not constructed, Adelphia would not have the ability to meet its obligations to its customers to increase the capacity of its existing pipeline system to provide natural gas transportation and compression services. Adelphia conducted an alternatives analysis for the purpose of identifying the most environmentally sound, technically feasible, and cost-effective route. Alternatives were evaluated using information obtained from engineering and design criteria and a desktop analysis of the surrounding environment, which employed aerial photography, NWI maps, and USGS 7.5-minute topographic quadrangle maps. For the previously discussed reasons, the Preferred Alternative is considered to be the most appropriate to accomplish the Project's objectives.

10.9 REFERENCES

Federal Energy Regulatory Commission (FERC). 2017. Guidance Manual for Environmental Report Preparation for Applications Filed Under the Natural Gas Act. Volume 1. February 2017.

National Park Service (NPS). 2014. National Register of Historic Places. Download Center. Available at: <https://npgallery.nps.gov/NRHP/Download/#spatial>. Accessed October 3, 2017.

Pennsylvania Department of Environmental Protection (PADEP). 2017. eMapPA. Available at: <http://www.depgis.state.pa.us/emappa/>. Accessed October 2017.

United States Fish and Wildlife Service (USFWS). 2017. National Wetlands Inventory. Available at: <https://www.fws.gov/wetlands/data/google-earth.html>. Accessed October 3, 2017.

ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 11

Reliability and Safety

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
Information	Data Sources^a	Found in Section	To Be Filed
Minimum Requirements to Avoid Rejection: 1. Describe how the Project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of Project components as a result of accidents or natural catastrophes - Title 18 CFR § 380.12(m)	D	11.0	N/A
CFR = Code of Federal Regulations N/A = Not applicable ^a D = Applicant LL = U.S. Department of Transportation Source: FERC, 2017			

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ACRONYMS AND ABBREVIATIONS

Adelphia	Adelphia Gateway, LLC
DOT	U.S. Department of Transportation
ERP	Emergency Response Plan
HCA	High Consequence Area
IMP	<i>Integrity Management Plan</i>
Part 192	Title 49 Code of Federal Regulations Part 192
Procedural Manual	<i>Procedural Manual for Operations, Maintenance, and Emergencies</i>
Project	Adelphia Gateway Project

11 RELIABILITY AND SAFETY

This resource report describes how the proposed Adelphia Gateway Project (Project) would be designed, constructed, operated, and maintained in order to provide reliable service and maintain public safety. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard. There are no FERC-jurisdictional activities proposed for the existing 18-inch diameter line north of milepost 49.4 or for the 4.4 miles of 20-inch-diameter pipeline (see Resource Report 1 – *General Project Description*); therefore, these facilities are not discussed further in this report.

11.1 FEDERAL SAFETY STANDARDS

The Project would be designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) Minimum Federal Safety Standards provided in Title 49 Code of Federal Regulations Part 192 (Part 192), Transportation of Natural and Other Gas by Pipeline. The regulations in Part 192 are intended to protect the public from natural gas pipeline failures and provide the minimum basis for facility planning, construction, and operation. Subparts B through P of Part 192 provide regulations regarding pipeline materials and design, welding, corrosion control requirements, test requirements, operations and maintenance, qualifications of pipeline personnel, and pipeline integrity management (USGPO, 2017). Adelphia Gateway, LLC (Adelphia) would adhere to all applicable standards defined in Part 192, including, but not limited to those detailed in the subsections below.

11.1.1 Procedural Manual

Part 192, Subpart L (*Operations*), Section 192.605 requires transmission pipeline operators to prepare and follow a manual of written procedures for conducting operations and maintenance activities, emergency response, and handling abnormal operations (USGPO, 2017).

Adelphia would prepare a Project-specific *Procedural Manual for Operations, Maintenance, and Emergencies* (Procedural Manual) in accordance with the DOT guidelines provided in Subpart L prior to the commencement of Project operations. Copies of the appropriate parts of the Procedural Manual would be kept at locations where operations and maintenance activities are conducted. Adelphia would review and update (as necessary) its Procedural Manual at least once each calendar year.

11.1.2 Damage Prevention Program

Section 192.614 of Subpart L states that each operator of a buried pipeline must carry out a program to prevent damage to that pipeline from excavation activities, including excavation, blasting, boring, tunneling, backfilling, the removal of aboveground structures by either explosive or mechanical means, and other earthmoving operations (USGPO, 2017). Adelphia would comply with the requirements of Section 192.614 through its participation in Delaware and Pennsylvania's One-Call System programs. Through participation in these programs, Adelphia would be informed of all planned third-party excavations that may occur in proximity to the Project. Advanced notice of excavations would allow Adelphia to plan and monitor activities that may have the potential to affect the Project.

11.1.3 Emergency Response Plan

Section 192.615 of Subpart L states that pipeline operators must establish an emergency response plan (ERP) that includes written procedures for the prevention or minimization of hazards that may arise during a natural gas pipeline emergency (USGPO, 2017). Prior to the commencement of Project construction, Adelphia would develop a Project-specific ERP that would include, but not necessarily be limited to, the following key elements:

- Recognizing, identifying, and classifying emergency events such as gas leakage, fires, explosions, and natural disasters;
- Establishing continuing communications with local fire, police, and public officials, and coordinating emergency response;
- Procuring personnel, equipment, tools, and materials and making them available at the scene of an emergency;
- Protecting people first, then property, and making them safe from actual or potential hazards; and
- Performing emergency shutdown of the system and the safe restoration of service

following an emergency event.

Adelphia would provide all Project supervisors responsible for emergency action with a copy of its ERP and ensure that all appropriate operating personnel have been trained and are knowledgeable of the emergency procedures detailed in the document.

11.1.4 Continuing Public Education Program

Section 192.616 of Subpart L states that pipeline operators must develop and implement a written continuing public education program to enable customers, the public, government officials, and those engaged in excavation activities on how to recognize and report a gas pipeline emergency (USGPO, 2017). Adelphia would develop and implement a Project-specific Continuing Public Education Program in accordance with DOT guidelines listed in Subpart L. Adelphia would develop and commence implementation of its Continuing Public Education Program prior to placing the Project into operation.

11.1.5 Qualification Program

Prior to the start of Project construction, Adelphia would develop a Written Qualification Program that identifies the minimum requirements for the qualification of individuals performing covered tasks on a pipeline facility. DOT regulations specify the requirements for the qualification program in Part 192, Subpart N (*Qualifications of Pipeline Personnel*) (USGPO, 2017).

11.2 PIPELINE SAFETY

The transmission of natural gas by pipeline could pose risk to the public in the event of an incident and potential subsequent release of gas. The greatest hazard posed to the public by a natural gas pipeline is the damage that could be caused by a major pipeline rupture. However, these incidents are relatively rare considering the total mileage of pipelines in the U.S. and the volume of product transported. Carrying natural gas and other fuel via pipeline has been proven a safer alternative to other transport options. Based on fatality statistics from 2005 through 2009, oil pipelines are roughly 70 times as safe as trucks (Groeger, 2012). Causes of pipeline ruptures include corrosion; excavation damage; incorrect operation; material, weld, or equipment failure; natural force damage (heavy rains/floods, lightning, extreme temperatures); and other outside force damage (vehicle strike [not related to excavation activities]) (PHMSA, 2017b).

11.2.1 Pipeline Design Specifications

New Project facilities would use high-strength micro-alloyed steel pipe, which increases resistance to pipe deformation and penetration by excavating equipment, optimizes leak-before-

break characteristics in the event of penetration, and mitigates the initiation and propagation of pipeline ruptures by providing self-arrest of the rupture.

Part 192, Subpart A (*General*) discusses pipeline class locations. Pipeline class locations are used to minimize the risks associated with potential pipeline ruptures by determining pipe design factors, shutoff valve spacing, and depth of cover requirements based on population density along the pipeline corridor (number of residences and occupied structures in proximity of pipeline facilities). The class location unit is an area that extends 220 yards (660 feet) on either side of the centerline of any continuous 1-mile length of pipeline. The four class locations are generally defined as:

- **Class 1** – Location is with 10 or fewer buildings intended for human occupancy;
- **Class 2** – Location is with more than 10 but less than 46 buildings intended for human occupancy;
- **Class 3** – Location is with 46 or more buildings intended for human occupancy, is within 100 yards of any building, or has a small, well-defined outside area occupied by 20 or more people during normal use, such as a playground; and
- **Class 4** – Location with prevalence of buildings with four or more stories (USGPO, 2017).

Higher class locations require higher safety factors when it comes to pipeline design, testing, and operation. In accordance with Part 192, Subpart G (*General Construction Requirements for Transmission Lines and Mains*), pipelines constructed in Class 1 areas must be installed with a minimum depth of cover of 30 inches in normal soil (18 inches in consolidated rock). Pipelines in Class 2, 3, and 4 locations, as well as where the pipeline would be located under drainage ditches for public roads and railroad crossings, must be installed with a minimum depth of cover of 36 inches in normal soil (24 inches in consolidated rock). Part 192, Subpart D (*Design of Pipeline Components*) identifies the maximum pipeline distance allowed to the nearest sectionalizing block valve, which varies based on class location (i.e., within 10.0 miles in Class 1 locations, within 7.5 miles in Class 2 locations, within 4.0 miles in Class 3 locations, and within 2.5 miles in Class 4 locations). Pipeline design pressures, pressure test levels, non-destructive examination of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more densely populated areas. In addition, according to Part 192, Subpart L, all gas received into the pipeline in Class 3 and 4 areas must be odorized to provide additional safety to the public by acting as a warning system for any potential leaks that

may occur (USGPO, 2017). The Parkway and Tilghman laterals would be sited entirely in Class 3 locations, and the pipelines have been designed accordingly.

Integrity Solutions analyzed the existing Southern Segment in accordance with the requirements of DOT Part 192.5 and provided an updated Population Classification Analysis Report dated June 16, 2017. The results of the analysis are shown in table 11.2-1. As part of Adelphia's ongoing routine operation and maintenance activities, the existing population density along the pipeline would be monitored to ensure compliance with Part 192. In the event population density increases along the pipeline, Adelphia would make required adjustments to maintain compliance with Part 192.

Begin Project MP	End Project MP	Segment Length (ft)	Class	Identified Site? (Yes/No)
0.0	8.5	44,914	3	Yes
8.5	8.8	1,765	2	No
8.8	20.8	63,280	3	Yes
20.8	22.9	11,072	2	No
22.9	27.1	22,111	3	Yes
27.1	28.4	6,652	1	No
28.4	28.5	856	2	No
28.5	37.5	47,254	3	Yes
37.5	38.6	5,817	2	No
38.6	41.7	16,600	3	Yes
41.7	42.2	2,357	2	No
42.2	45.4	16,838	3	Yes
45.4	47.6	11,847	2	No
47.6	48.3	3,553	1	No
48.3	49.4	6,026	2	No

11.2.2 High Consequence Areas

The regulations in Part 192, Subpart O (*Gas Transmission Pipeline Integrity Management*) establishes the requirements for an Integrity Management Plan (IMP), which is required for high consequence areas (HCAs) to minimize the potential for an accident. The DOT defines HCAs as locations where a gas pipeline accident could result in considerable harm to people and property. Part 192 defines HCAs in one of two ways. In the first method, an HCA is an area that meets any of the following definitions:

- Areas in current Class 3 or 4 locations;

- Areas 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 (a circle of radius equal to the potential impact radius); or
- Areas in Class 1 or 2 locations where the potential impact circle includes an identified site.¹

In the second method, an HCA includes any area within a potential impact circle that contains either 20 or more buildings intended for human occupancy or an identified site (USGPO, 2017). Integrity Solutions performed an HCA and Population Classification Analysis and provided a report dated June 16, 2017 that identified the HCA areas along the existing 18-inch-diameter pipeline. Based on the results of the analysis, Adelphia is considering all Class 3 areas in which Project activities would occur to be HCAs. The Parkway and Tilghman laterals would be located in Class 3 areas and therefore would be considered HCAs. As such, Adelphia would incorporate the Class 3 areas of the 18-inch-diameter pipeline and both laterals into an IMP for the proposed Project.

11.2.3 Construction and Operations

Adelphia would use high-strength carbon steel pipe, as described by American Petroleum Institute Specification 5L, to construct the new pipeline laterals. Adelphia would employ qualified pipeline contractors that would construct the Project in accordance with Adelphia's specifications, plans, and procedures. Adelphia would hire inspectors to inspect the Project work areas and all onsite contractor activities to ensure compliance with company specifications, plans, and procedures. Adelphia would conduct non-destructive examination for each weld to ensure it meets or exceeds the minimum requirements prescribed in Part 192, Subpart E (*Welding of Steel in Pipelines*) and in accordance with the latest DOT referenced edition of the American Petroleum Institute's Standard 1104.

Prior to placing the Project into service, Adelphia would conduct hydrostatic pressure testing of new piping to verify the integrity of the pipe and welds (see Resource Report 2 – *Water*

¹ An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

Use and Quality). Any pipe segment that does not pass the pressure test would be repaired and retested.

Adelphia is designing the pipelines to allow for the use of electronic in-line inspection tools to detect potential anomalies such as corrosion or pipe deformation. Adelphia would address external corrosion protection by using externally fusion bonded epoxy coated pipe and cathodic protection, which uses rectifiers and anodes as required by Part 192, Subpart I (*Requirements for Corrosion Control*). Cathodic protection systems pass a low-voltage current through the pipeline to offset natural soil and groundwater corrosion (USGPO, 2017). Where pipe would be located aboveground such as at meter and compressor stations, Adelphia would use an epoxy paint to prevent atmospheric corrosion. Adelphia would install aboveground markers and signs within the Project right-of-way to indicate the pipelines' location. The markers would be placed in areas where the pipelines cross both private and public property and at each road crossing. The markers would enhance public safety by alerting any potential excavators of the pipelines' presence. The markers would also display Adelphia's name and contact number for assistance.

Once the Project is operational, Adelphia would electronically monitor the entire Project via the Adelphia Gas Control Center located in Wall, New Jersey. The control center would be staffed 24 hours a day, 365 days a year and use a Supervisory Control and Data Acquisition system to read pressures along the pipeline on a continuous basis. Adelphia would also rely on area offices along the Project, which would allow Adelphia personnel to provide quick response to emergency situations. In order to detect and ensure against the development of leaks, Adelphia would perform regularly scheduled visual inspection of the pipeline right-of-way in order to determine any potential problems. Inspections may occur by foot, vehicle, or aerial survey, depending on the area being inspected. Adelphia would also follow the procedures of its IMP, which would involve internal inspection of all Project pipelines.

Adelphia would implement its IMP and leak detection procedures that would meet or exceed the minimum safety standards prescribed in Part 192. Pipeline inspections would take place within the intervals identified in Part 192, typically every seven years. Any anomalies identified by internal or visual inspections would be investigated and repaired if necessary in accordance with DOT regulations and Adelphia's IMP (USGPO, 2017).

11.2.4 Compressor Station Safety

Part 192, Subpart D identifies the minimum safety standards required for compressor stations and addresses design, construction, liquid removal, emergency shutdown, pressure

limiting devices, additional safety equipment, and ventilation of compressor stations (USGPO, 2017). The Quakertown CS and Marcus Hook CS would be designed and constructed to meet these safety standards. These regulations are intended to ensure adequate protection for employees and the public at and around compressor stations. Both compressor stations would be equipped with automatic detection and emergency shutdown systems, including the following:

- Flame detection that uses ultraviolet sensors;
- Gas detection for detecting flammable concentrations of natural gas;
- Emergency shutdown systems 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.

The compressor stations would be designed with pressure transmitters, switches, and venting systems to allow for the safe blowdown of gas to protect the compressor stations and associated piping from over-pressurization. Firefighting equipment would be kept and maintained at the compressor stations and would include hand-held or wheeled dry chemical fire extinguishers in accordance with National Fire Prevention Association 17 Dry Chemical Extinguishing Systems (NFPA, 2017).

11.3 REFERENCES

- Federal Energy Regulatory Commission (FERC). 2017. Guidance Manual for Environmental Report Preparation for Applications Filed Under the Natural Gas Act. Volume 1. February 2017.
- Groeger, L. 2012. Pipelines Explained: How Safe are America's 2.5 Million Miles of Pipelines? Available online at: <https://www.propublica.org/article/pipelines-explained-how-safe-are-americas-2.5-million-miles-of-pipelines>. Accessed November 2017.
- National Fire Protection Association. 2017 (NFPA). NFPA 17, Standard for Dry Chemical Extinguishing Systems. Available at: <http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=17>. Accessed September 2017.
- National Institute for Occupational Safety and Health (NIOSH). 2014 International Chemical Safety Cards. Methane. Available at: <https://www.cdc.gov/niosh/ipcsneng/neng0291.html>. Accessed September 2017.
- Pipeline and Hazardous Materials Safety Association (PHMSA). 2017a. Pipeline Incidents by System Type: Significant. Available at: https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages&NQUser=PDM_WEB_USER&NQPassword=Public_Web_User1&PortalPath=%2Fshared%2FPDM%20Public%20Website%2F_portal%2FSC%20Incident%20Trend&Page=Significant&Action=Navigate&col1=%22PHP%20-%20Geo%20Location%22.%22State%20Name%22&val1=%22%22. Accessed September 2017.
- Pipeline and Hazardous Materials Safety Association (PHMSA). 2017b. Significant Pipeline Incidents by Cause. Significant Incident Cause Breakdown. Available at: https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages&NQUser=PDM_WEB_USER&NQPassword=Public_Web_User1&PortalPath=%2Fshared%2FPDM%20Public%20Website%2F_portal%2FSC%20Incident%20Trend&Page=Significant&Action=Navigate&col1=%22PHP%20-%20Geo%20Location%22.%22State%20Name%22&val1=%22%22. Accessed September 2017.
- U.S. Government Publishing Office (USGPO). 2017. Electronic Code of Federal Regulations. Available at: <https://www.ecfr.gov/cgi-bin/ECFR?page=browse>. Accessed September 2017.

ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 12

PCB Contamination

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Sources	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection: 1. For projects involving the replacement or abandonment of facilities determined to have PCBs, provide a statement that activities would comply with an approved EPA disposal permit or with the requirements of the TSCA. (40 CFR § 380.12(n)(1))	N/A	N/A	N/A
2. For compressor station modification on sites that have been determined to have soils contaminated with PCBs, describe the status of remediation efforts completed to date. (40 CFR § 380.12(n)(2))	N/A	N/A	N/A
CFR = Code of Federal Regulations EPA = U.S. Environmental Protection Agency N/A = Not applicable PCB = Polychlorinated biphenyls TSCA = Toxic Substances Control Act of 1976 Source: FERC, 2017			

TABLE OF CONTENTS

12	PCB CONTAMINATION	1
12.1	Summary	1
12.2	References	2

ACRONYMS AND ABBREVIATIONS

Adelphia	Adelphia Gateway, LLC
ESA	environmental site assessment
PCB	polychlorinated biphenyls
ppm	parts per million

12 PCB CONTAMINATION

12.1 SUMMARY

The Adelpia Gateway Project (Project) consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook CS and the Quakertown CS); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve; and use of an existing disturbed site as a wareyard..

This resource report is required for applications involving the replacement, abandonment by removal, or abandonment in place of pipeline facilities determined to have polychlorinated biphenyls (PCB) in excess of 50 parts per million (ppm) in pipeline liquids. Adelpia Gateway, LLC (Adelpia) performed environmental site assessments (ESA) at the sites of the proposed Marcus Hook CS and wareyard (which is located within the boundary of the Marcus Hook Pump Station), Quakertown CS and associated M&R facilities, and Martins Creek Station. The ESAs, which are summarized in greater detail in Resource Report 8 (*Land Use, Recreation and Aesthetics*), included reviewing the PCB Activity Database System and PCB Transformer Registration Database to determine if PCBs were potentially used at the sites. The results of the ESAs found no evidence of previous use of PCBs at any of the reviewed sites.

The Project does not include any modifications to any compressor stations where soils are known to have been contaminated with PCBs. In addition, the Project does not involve pipelines known or expected to have PCBs in excess of 50 (ppm), and Adelpia does not anticipate the replacement or abandonment of any such existing pipeline. Therefore, according to the Federal Energy Regulatory Commission guidelines, this resource report is not required.

12.2 REFERENCES

Federal Energy Regulatory Commission (FERC). 2017. Guidance Manual for Environmental Report Preparation for Applications Filed Under the Natural Gas Act. Volume 1. February 2017. Accessed July 2017.

Adelphia Gateway, LLC

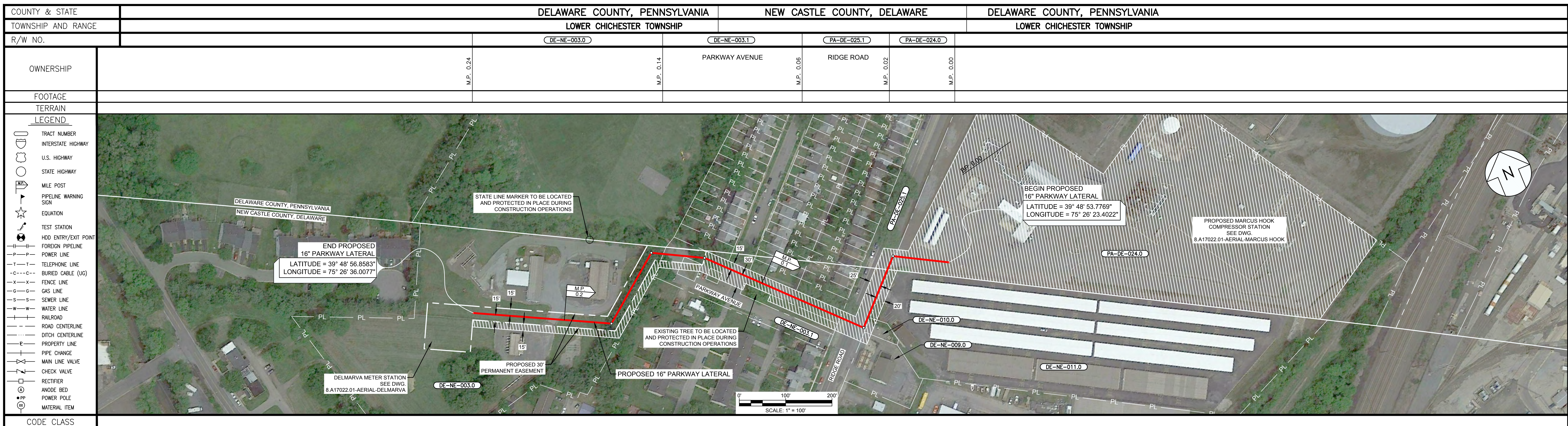
Adelphia Project

DOCKET NO. CP18-__-000

Appendix 1A

Project Mapping

PART 1 OF 7



STATIONING	<p>M.P. 0.24 END PROPOSED 16" PARKWAY LATERAL</p> <p>M.P. 0.20</p> <p>M.P. 0.14 END PARKWAY AVENUE</p> <p>M.P. 0.10</p> <p>M.P. 0.06 BEGIN PARKWAY AVENUE</p> <p>M.P. 0.06 & RIDGE ROAD</p> <p>M.P. 0.00 BEGIN PROPOSED 16" PARKWAY LATERAL</p>
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WORKSPACE	<p>20180112-5115 FERC PDF (Official) 1/11/2018 7:20:49 PM</p>
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MATERIAL	
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PROFILE	
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- GENERAL NOTES**
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 0.64 AC. (27,689.21 SQ. FT.)
 - TEMPORARY WORK SPACE = 7.27 AC. (316,770.41 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 0.52 AC. (22,503.91 SQ. FT.)
 - THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

BILL OF MATERIALS		REFERENCE DRAWINGS	
NO.	DESCRIPTION	QUANTITY	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
0	12/28/2017	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	

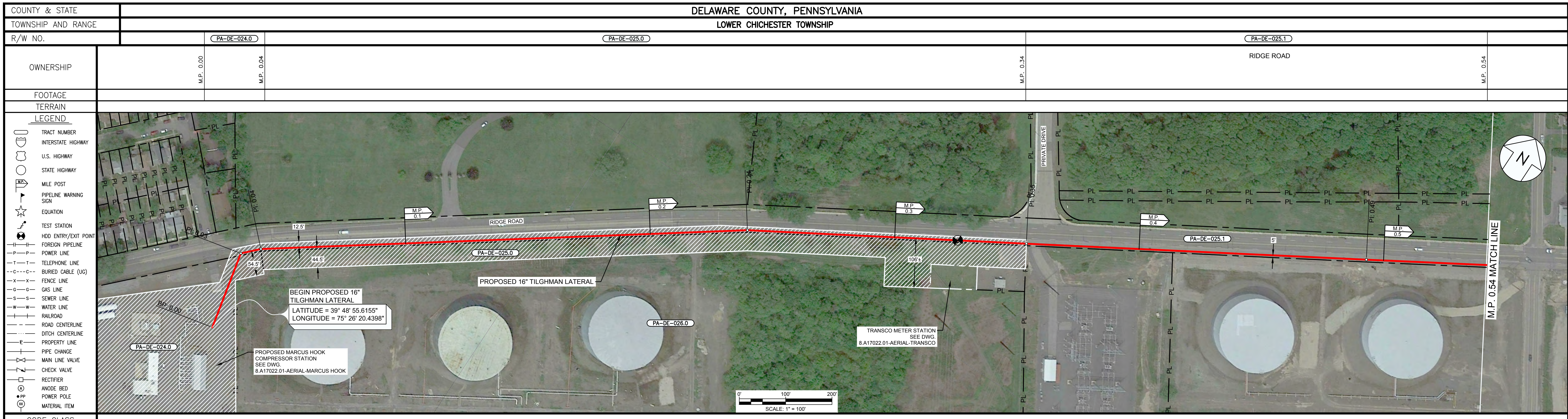
PUBLIC

ISSUED FOR FERC SUBMITTAL 12/29/2017

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4777
FIRM # PA 4004148 DE 4361

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	8.A17022-FERC-00-01	0



STATIONING
M.P. 0.00 BEGIN PROPOSED 16" TILGHMAN LATERAL
M.P. 0.10
M.P. 0.20
M.P. 0.30
M.P. 0.32 HDD ENTRY/EXIT POINT
M.P. 0.40
M.P. 0.50
M.P. 0.54 MATCH LINE

20180112-5115 FERC PDF (Unofficial) 1/11/2018 7:20:49 PM

WORKSPACE

MATERIAL

PROFILE

PUBLIC

ISSUED FOR FERC SUBMITTAL 12/29/2017

HGA HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4377
 FAX: # PA 4054143

- GENERAL NOTES
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 0.12 AC. (5066.35 SQ. FT.)
 - TEMPORARY WORK SPACE = 8.82 AC. (384,280.45 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 0.60 AC. (26,249.31 SQ. FT.)
 - THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

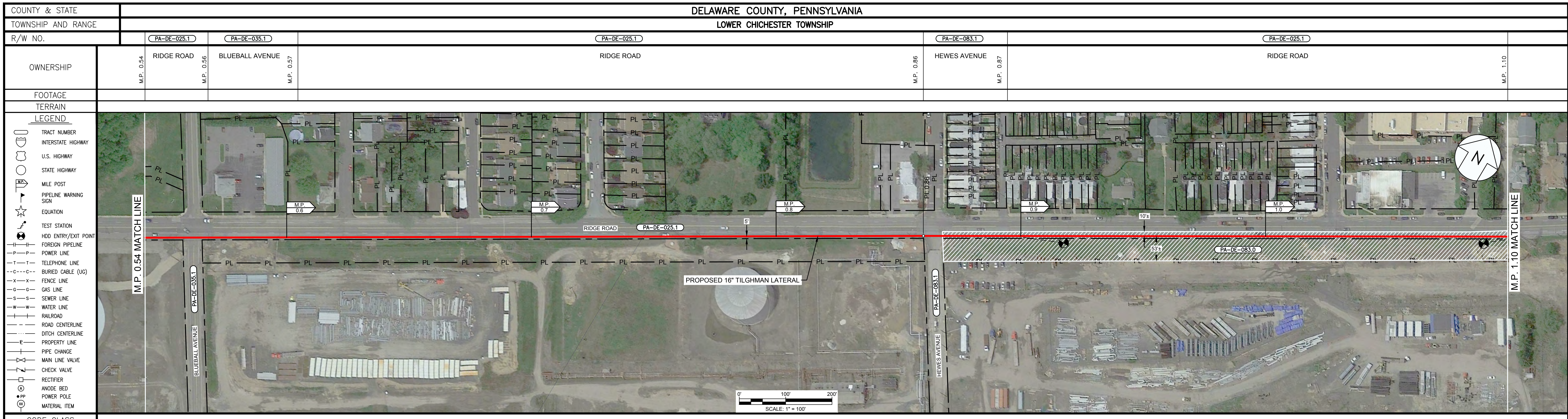
BILL OF MATERIALS		REFERENCE DRAWINGS	
NO.	DESCRIPTION	QUANTITY	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
0	12/28/2017	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: AS SHOWN DRAWING NUMBER: 8.A17022-FERC-01-01 REV: 0



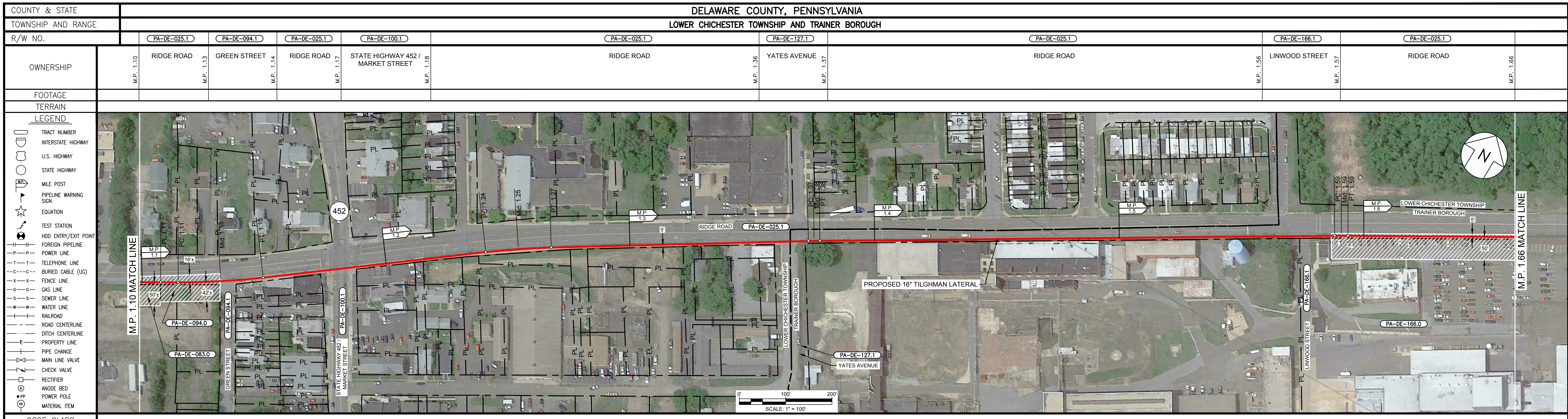
STATIONING	M.P. 0.54 MATCH LINE	M.P. 0.56 & BLUEBALL AVENUE	M.P. 0.60	M.P. 0.70	M.P. 0.80	M.P. 0.86 & HEWES AVENUE	M.P. 0.90	M.P. 0.92 HDD ENTRY / EXIT POINT	M.P. 1.00	M.P. 1.09 HDD ENTRY / EXIT POINT	M.P. 1.10 MATCH LINE
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WORKSPACE	20180112-5115 PERC PDF (Unofficial) 1/11/2018 7:20:49 PM										
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MATERIAL											
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PROFILE	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> PUBLIC ISSUED FOR FERC SUBMITTAL 12/29/2017 </div>										
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GENERAL NOTES 1. [Hatched Area] = TEMPORARY WORK SPACE 2. [Dashed Line] = PERMANENT EASEMENT 3. PERMANENT EASEMENT = 0.00 AC. (0.00 SQ. FT.) 4. TEMPORARY WORK SPACE = 1.34 AC. (58,183.49 SQ. FT.) 5. TEMPORARY WORK SPACE BY PERMIT = 0.42 AC. (18,285.04 SQ. FT.) 6. THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.	BILL OF MATERIALS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>QUANTITY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DESCRIPTION	QUANTITY																REFERENCE DRAWINGS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DWG. NO.</th> <th>DRAWING TITLE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	DWG. NO.	DRAWING TITLE											<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>REV.</td> <td>DATE</td> <td>BY</td> <td>DESCRIPTION</td> <td>CHK.</td> <td>ENGR.</td> <td>APPR.</td> <td>CLIENT</td> </tr> <tr> <td>0</td> <td>12/28/2017</td> <td>PLH</td> <td>ISSUED FOR FERC</td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT	0	12/28/2017	PLH	ISSUED FOR FERC					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DRAWN BY</td> <td>PLH</td> <td>11/14/17</td> </tr> <tr> <td>DESIGNED BY</td> <td>PLH</td> <td>11/14/17</td> </tr> <tr> <td>CHECKED BY</td> <td>RJB</td> <td>12/21/17</td> </tr> <tr> <td>APPROVED BY</td> <td>MEH</td> <td>12/21/17</td> </tr> <tr> <td>HGA JOB NO.</td> <td colspan="2">8.A17022</td> </tr> <tr> <td>PLOT SCALE</td> <td colspan="2">1:1</td> </tr> <tr> <td>MODEL ID</td> <td colspan="2">8.A17022</td> </tr> </table>	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		HGA <small>MINT, GUILLOT & ASSOCIATES, LLC ONE METROPLEX DRIVE, SUITE 100 BIRMINGHAM, AL 35209 PHONE: 205-970-4277 FAX: 205-970-4277</small>	ADELPHIA GATEWAY, LLC FERC ALIGNMENT SHEET PROPOSED 16" TILGHMAN LATERAL FROM M.P. 0.54 TO M.P. 1.10 DELAWARE COUNTY, PENNSYLVANIA	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE</td> <td>DRAWING NUMBER</td> <td>REV</td> </tr> <tr> <td>AS SHOWN</td> <td>8.A17022-FERC-01-02</td> <td>0</td> </tr> </table>	SCALE	DRAWING NUMBER	REV	AS SHOWN	8.A17022-FERC-01-02	0
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STATIONING	M.P. 1.10 MATCHLINE	M.P. 1.13 & GREEN STREET	M.P. 1.18 & STATE HIGHWAY 452 / MARKET STREET	M.P. 1.20	M.P. 1.30	M.P. 1.36 & YATES AVENUE	M.P. 1.40	M.P. 1.50	M.P. 1.57 & LINWOOD STREET	M.P. 1.60	M.P. 1.66 MATCHLINE
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20180112-5115 PERC PDF (Unofficial) 1/11/2018 7:20:49 PM

WORKSPACE

MATERIAL

PROFILE

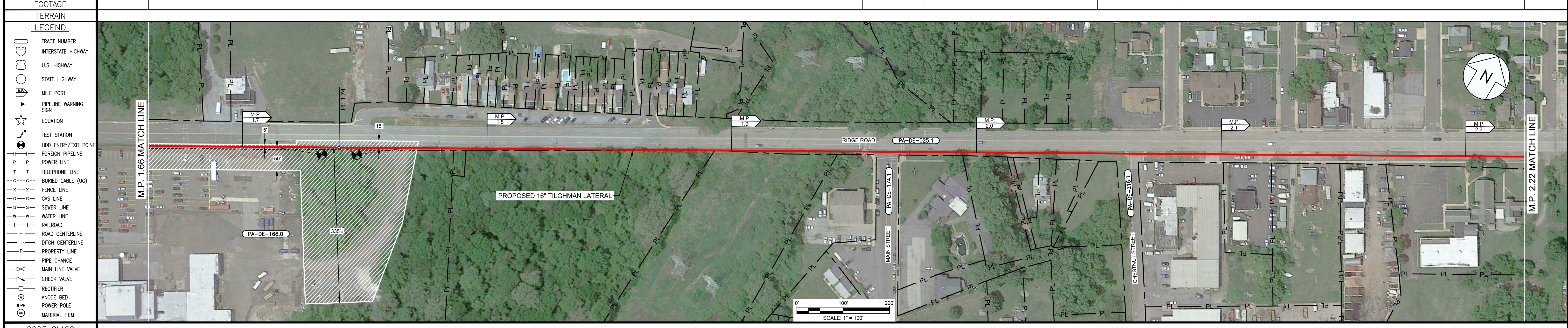
PUBLIC

ISSUED FOR FERC SUBMITTAL
12/29/2017

HGA
 HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4277
 FAX: 205-970-4277

<p>GENERAL NOTES</p> <ol style="list-style-type: none"> 1. [Hatched Box] = TEMPORARY WORK SPACE 2. [Dashed Box] = PERMANENT EASEMENT 3. PERMANENT EASEMENT = 0.00 AC. (0.00 SQ. FT.) 4. TEMPORARY WORK SPACE = 0.56 AC. (24,506.60 SQ. FT.) 5. TEMPORARY WORK SPACE BY PERMIT = 0.17 AC. (7,507.21 SQ. FT.) 6. THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE. 	<p>BILL OF MATERIALS</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>QUANTITY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DESCRIPTION	QUANTITY																															<p>REFERENCE DRAWINGS</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>NO.</th> <th>DRAWING TITLE</th> <th>DWG. NO.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DRAWING TITLE	DWG. NO.																															<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td>DRWN BY</td> <td>PLH</td> <td>11/14/17</td> </tr> <tr> <td>DESIGNED BY</td> <td>PLH</td> <td>11/14/17</td> </tr> <tr> <td>CHECKED BY</td> <td>RJB</td> <td>12/21/17</td> </tr> <tr> <td>APPROVED BY</td> <td>MEH</td> <td>12/21/17</td> </tr> <tr> <td>HGA JOB NO.</td> <td colspan="2">8.A17022</td> </tr> <tr> <td>PLOT SCALE</td> <td colspan="2">1:1</td> </tr> <tr> <td>MODEL ID</td> <td colspan="2">8.A17022</td> </tr> </table>	DRWN 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	
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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	M.P. 2.22 RIDGE ROAD



STATIONING	M.P. 1.66 MATCH LINE	M.P. 1.70	M.P. 1.73 HDD ENTRY/EXIT POINT	M.P. 1.75 HDD ENTRY/EXIT POINT	M.P. 1.80	M.P. 1.90	M.P. 1.97 & MAIN STREET	M.P. 2.00	M.P. 2.06 & CHESTNUT STREET	M.P. 2.10	M.P. 2.20	M.P. 2.22 MATCH LINE
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WORKSPACE	20180112-5115 FERC PDF (Official) 1/11/2018 7:20:49 PM											
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MATERIAL												
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PROFILE	<p style="text-align: right;">PUBLIC</p> <p style="text-align: center;">ISSUED FOR FERC SUBMITTAL 12/29/2017</p> <p style="text-align: right;"><small>HGA MINT, GUILLOT & ASSOCIATES, LLC ONE METROPLEX DRIVE, SUITE 100 BIRMINGHAM, AL 35209 PHONE: 205-970-4277 FAX: # PA 4054143</small></p>											
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- GENERAL NOTES**
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 0.53 AC. (23,047.98 SQ. FT.)
 - TEMPORARY WORK SPACE = 1.90 AC. (82,628.95 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 0.19 AC. (8,418.18 SQ. FT.)
 - THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

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NO.	DESCRIPTION	QUANTITY	DWG. NO.

REV.	DATE	BY	DESCRIPTION	CHK.	ENGR.	APPR.	CLIENT
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DRAWN BY	PLH	11/14/17
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PLOT SCALE	1:1	
MODEL ID	8.A17022	

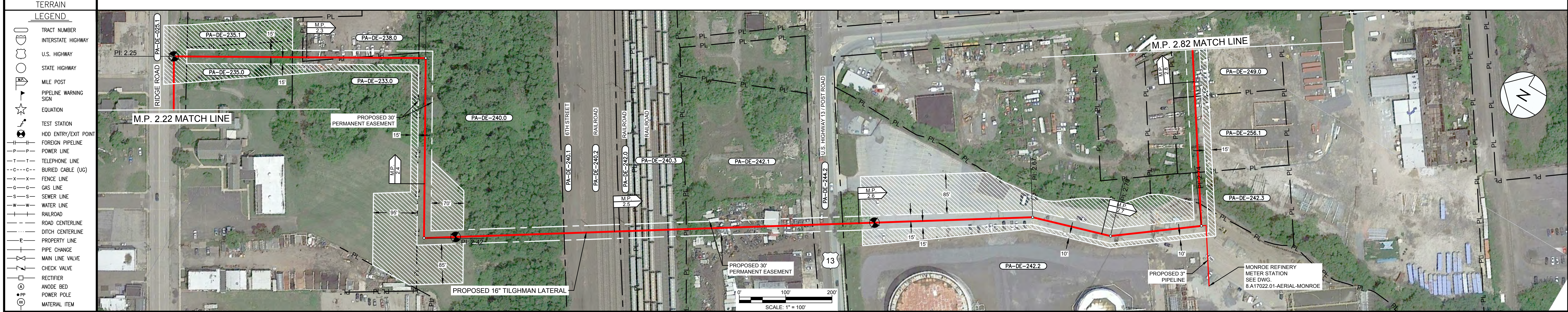


ADELPHIA GATEWAY, LLC FERC ALIGNMENT SHEET PROPOSED 16" TILGHMAN LATERAL FROM M.P. 1.66 TO M.P. 2.22 DELAWARE COUNTY, PENNSYLVANIA		
SCALE	DRAWING NUMBER	REV
AS SHOWN	8.A17022-FERC-01-04	0

DELAWARE COUNTY, PENNSYLVANIA

TRAINER BOROUGH

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-256.1	PA-DE-249.0	
OWNERSHIP	M.P. 2.22 RIDGE ROAD	M.P. 2.25	M.P. 2.28	M.P. 2.29	M.P. 2.31	M.P. 2.35	M.P. 2.48 6TH STREET	RAILROAD	RAILROAD	RAILROAD	M.P. 2.53	M.P. 2.58 U.S. HIGHWAY 13 / POST ROAD	M.P. 2.59	M.P. 2.76	M.P. 2.80	M.P. 2.82
FOOTAGE																



CODE CLASS

STATIONING	M.P. 2.22 MATCH LINE M.P. 2.24 HDD ENTRY / EXIT POINT	M.P. 2.30	M.P. 2.40 M.P. 2.43 HDD ENTRY / EXIT POINT	M.P. 2.48 & 6TH STREET M.P. 2.49 & RAILROAD M.P. 2.50 M.P. 2.50 & RAILROAD M.P. 2.52 & RAILROAD	M.P. 2.56 & U.S. HIGHWAY 13 / POST ROAD M.P. 2.60 M.P. 2.61 HDD ENTRY / EXIT POINT	M.P. 2.70 M.P. 2.80 M.P. 2.82 MATCH LINE
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WORKSPACE	
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MATERIAL	
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PROFILE	
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PUBLIC
ISSUED FOR FERC SUBMITTAL 12/29/2017

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4377
FIRM # PA 4054143

- GENERAL NOTES**
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 2.04 AC. (89,023.85 SQ. FT.)
 - TEMPORARY WORK SPACE = 2.94 AC. (128,159.80 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 0.14 AC. (6,307.55 SQ. FT.)
 - THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

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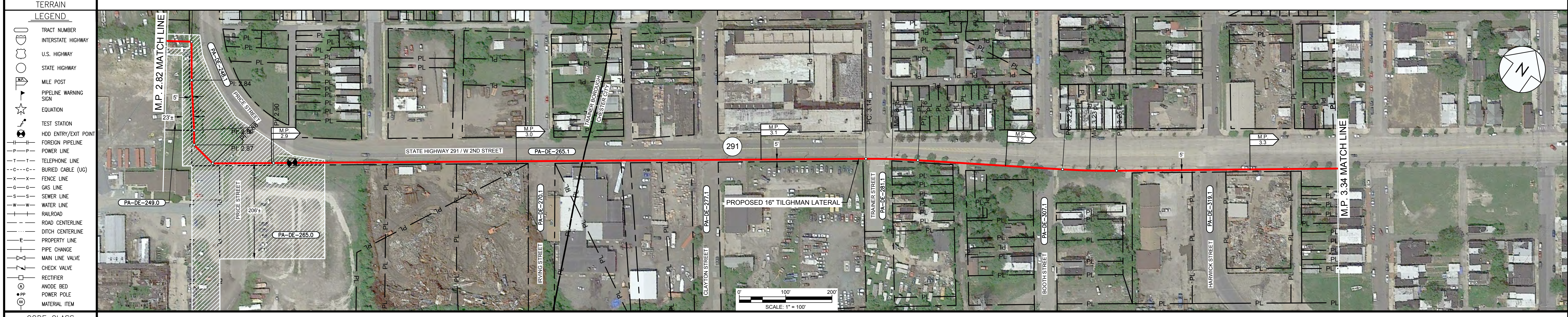
ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 2.22 TO M.P. 2.82
DELAWARE COUNTY, PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
AS SHOWN	8.A17022-FERC-01-05	0

COUNTY & STATE DELAWARE COUNTY, PENNSYLVANIA

TOWNSHIP AND RANGE TRAINER BOROUGH AND CHESTER CITY

R/W NO.	PA-DE-249.0	PA-DE-248.1	PA-DE-265.1	PA-DE-270.1	PA-DE-265.1	PA-DE-277.1	PA-DE-265.1	PA-DE-281.1	PA-DE-265.1	PA-DE-307.1	PA-DE-265.1	PA-DE-319.1	PA-DE-265.1													
OWNERSHIP	M.P. 2.82	M.P. 2.83	PRICE STREET	M.P. 2.91	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.01	IRVING STREET	M.P. 3.02	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.07	CLAYTON STREET	M.P. 3.08	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.14	TRAINER STREET	M.P. 3.15	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.21	BOOTH STREET	M.P. 3.22	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.28	HARWICK STREET	M.P. 3.29	STATE HIGHWAY 291 / W 2ND STREET	M.P. 3.34
FOOTAGE																										



STATIONING	M.P. 2.82 MATCH LINE	M.P. 2.88 & PRICE STREET	M.P. 2.90	M.P. 2.91 HDD ENTRY / EXIT POINT	M.P. 3.00	M.P. 3.01 & IRVING STREET	M.P. 3.08 & CLAYTON STREET	M.P. 3.10	M.P. 3.15 & TRAINER STREET	M.P. 3.20	M.P. 3.22 & BOOTH STREET	M.P. 3.28 & HARWICK STREET	M.P. 3.30	M.P. 3.34 MATCH LINE
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- GENERAL NOTES**
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 0.03 AC. (1,419.62 SQ. FT.)
 - TEMPORARY WORK SPACE = 1.11 AC. (48,233.68 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 1.15 AC. (50,147.00 SQ. FT.)
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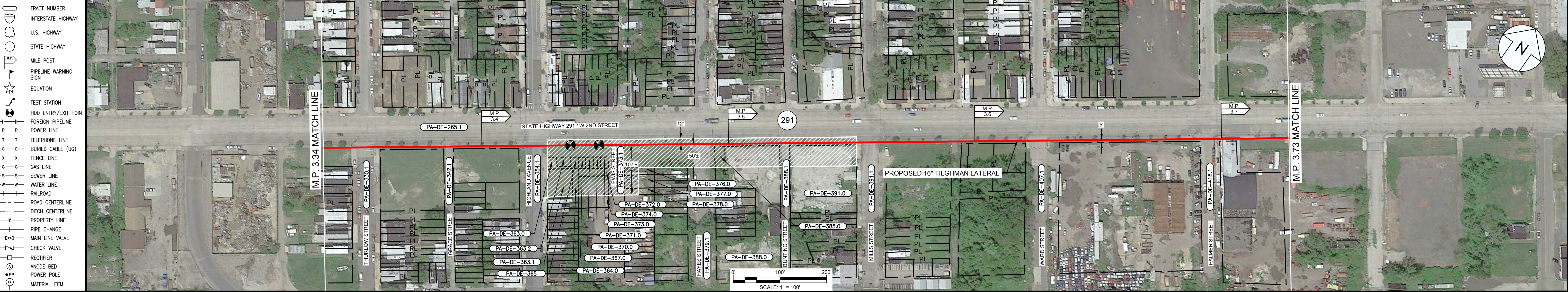
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FROM M.P. 2.82 TO M.P. 3.34
DELAWARE COUNTY, PENNSYLVANIA

SCALE AS SHOWN	DRAWING NUMBER 8.A17022-FERC-01-06	REV 0
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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-265.1	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
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OWNERSHIP	STATE HIGHWAY 291 / W 2ND STREET	THURLOW STREET	STATE HIGHWAY 291 / W 2ND STREET	GRACE STREET	STATE HIGHWAY 291 / W 2ND STREET	HIGHLAND AVENUE	STATE HIGHWAY 291 / W 2ND STREET	LEWIS STREET	STATE HIGHWAY 291 / W 2ND STREET	HAYES STREET	STATE HIGHWAY 291 / W 2ND STREET	BUNTING STREET	STATE HIGHWAY 291 / W 2ND STREET	MILLS STREET	STATE HIGHWAY 291 / W 2ND STREET	WARD STREET	STATE HIGHWAY 291 / W 2ND STREET	PALMER STREET	STATE HIGHWAY 291 / W 2ND STREET
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FOOTAGE	M.P. 3.34	M.P. 3.35	M.P. 3.36	M.P. 3.38	M.P. 3.39	M.P. 3.42	M.P. 3.43	M.P. 3.46	M.P. 3.47	M.P. 3.49	M.P. 3.50	M.P. 3.52	M.P. 3.53	M.P. 3.55	M.P. 3.57	M.P. 3.62	M.P. 3.64	M.P. 3.69	M.P. 3.70	M.P. 3.73
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CODE CLASS	
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STATIONING	M.P. 3.34 MATCH LINE M.P. 3.36 & THURLOW STREET M.P. 3.38 & GRACE STREET M.P. 3.40 M.P. 3.42 & HIGHLAND AVENUE M.P. 3.44 HDD ENTRY / EXIT POINT M.P. 3.45 HDD ENTRY / EXIT POINT M.P. 3.46 & LEWIS STREET M.P. 3.49 & HAYES STREET M.P. 3.50 M.P. 3.53 & BUNTING STREET M.P. 3.56 & MILLS STREET M.P. 3.60 M.P. 3.63 & WARD STREET M.P. 3.70 & PALMER STREET M.P. 3.70 M.P. 3.73 MATCH LINE
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WORKSPACE	
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MATERIAL	
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PROFILE	
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- GENERAL NOTES**
- TEMPORARY WORK SPACE
 - PERMANENT EASEMENT
 - PERMANENT EASEMENT = 0.00 AC. (0.00 SQ. FT.)
 - TEMPORARY WORK SPACE = 0.58 AC. (25,383.27 SQ. FT.)
 - TEMPORARY WORK SPACE BY PERMIT = 0.62 AC. (27,067.33 SQ. FT.)
 - THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

BILL OF MATERIALS		REFERENCE DRAWINGS	
NO.	DESCRIPTION	QUANTITY	DWG. NO.

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. 3.34 TO M.P. 3.73
DELAWARE COUNTY, PENNSYLVANIA

SCALE AS SHOWN DRAWING NUMBER 8.A17022-FERC-01-07 REV 0

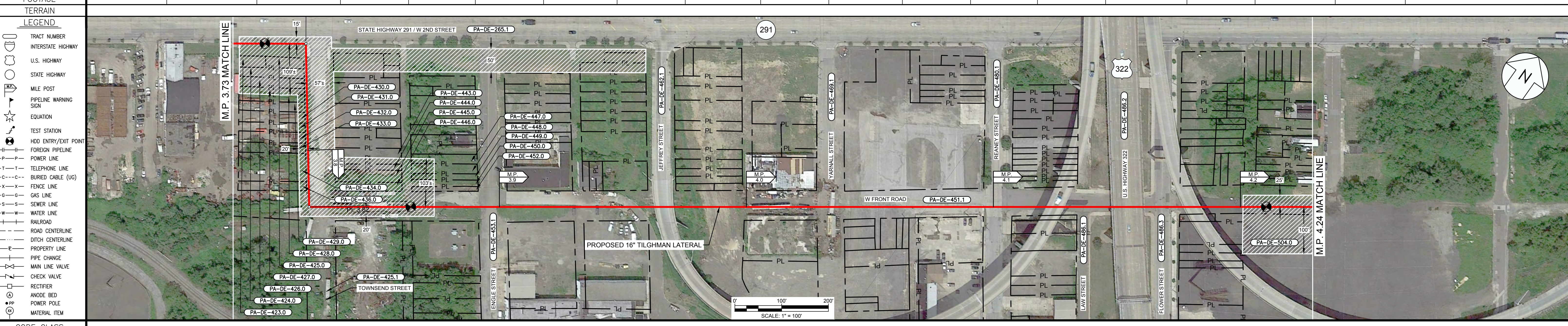
PUBLIC
ISSUED FOR FERC SUBMITTAL
12/29/2017

HGA
 HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
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 PHONE: 205-970-4277
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DELAWARE COUNTY, PENNSYLVANIA

CHESTER CITY

R/W NO.		(PA-DE-265.1)	(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	ENGLI 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



STATIONING	M.P. 3.73 MATCH LINE	M.P. 3.74 HDD ENTRY / EXIT POINT	M.P. 3.80	M.P. 3.83 & TOWNSEND STREET	M.P. 3.87 HDD ENTRY / EXIT POINT	M.P. 3.90 & ENGLI STREET	M.P. 3.90	M.P. 3.97 & JEFFREY STREET	M.P. 4.00	M.P. 4.04 & YARNALL STREET	M.P. 4.10	M.P. 4.10 & REANEY STREET	M.P. 4.14 & LAW STREET	M.P. 4.16 & U.S. HIGHWAY 322	M.P. 4.17 & FLOWER STREET	M.P. 4.20	M.P. 4.21 HDD ENTRY / EXIT POINT	M.P. 4.24 MATCH LINE
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WORKSPACE	
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MATERIAL	
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PROFILE	
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GENERAL NOTES

- TEMPORARY WORK SPACE
- PERMANENT EASEMENT
- PERMANENT EASEMENT = 0.00 AC. (0.00 SQ. FT.)
- TEMPORARY WORK SPACE = 1.17 AC. (50,887.03 SQ. FT.)
- TEMPORARY WORK SPACE BY PERMIT = 1.63 AC. (70,845.91 SQ. FT.)
- THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO ANY EXCAVATION BY NOTIFYING THE PENNSYLVANIA ONE CALL SYSTEM AT LEAST (2) DAYS IN ADVANCE BY CALLING 811 OR 1-800-242-1776 IF OUT OF STATE.

BILL OF MATERIALS

NO.	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	DRAWING TITLE

REVISIONS

REV.	DATE	BY	DESCRIPTION
0	12/28/2017	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

SCALE AS SHOWN
DRAWING NUMBER 8.A17022-FERC-01-08
REV 0

PUBLIC
ISSUED FOR FERC SUBMITTAL
12/29/2017

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ADELPHIA GATEWAY, LLC
FERC ALIGNMENT SHEET
PROPOSED 16" TILGHMAN LATERAL
FROM M.P. 3.73 TO M.P. 4.24
DELAWARE COUNTY, PENNSYLVANIA

ADELPHIA GATEWAY, LLC

RESOURCE REPORT NO. 1

General Project Description

ADELPHIA GATEWAY PROJECT

January 2018

SUMMARY OF FILING INFORMATION			
INFORMATION	Data Sources^a	Found in Section	To be Filed
Minimum Requirements to Avoid Rejection:			
1. Provide a detailed description and location map of the Project facilities – Title 18 CFR § 380.12(c)(1)	D	1.2, 1.3, 1.4, Appendix 1A	N/A
2. Describe any non-jurisdictional facilities that would be built in association with the Project – 18 CFR § 380.12(c)(2)	D	1.10	N/A
3. Provide current original USGS 7.5-minute-series topographic maps with mileposts showing the Project facilities - 18 CFR § 380.12(c)(3)	D	Appendix 1A	N/A
4. Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the Project facilities. - 18 CFR § 380.12(c)(3)	D	Appendix 1A	N/A
5. Provide plot/site plans of compressor stations showing the location of the nearest NSA within 1 mile - 18 CFR § 380.12(c)(3,4)	D	Appendix 1B	N/A
6. Describe construction and restoration methods - 18 CFR § 380.12(c)(6)	D	1.5	N/A
7. Identify the permits required for construction across surface waters - 18 CFR § 380.12(c)(9)	N/A	N/A	N/A
8. Provide the names and address of all affected landowners and certify that all affected landowners would be notified as required in § 157.6(d) - 18 CFR § 380.12(c)(10).	D	Appendix 1E	N/A
CFR = Code of Federal Regulations N/A = Not applicable NSA = noise sensitive area USGS = United States Geological Survey ^a D = Applicant Source: FERC, 2017			

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Appendix 1D-2	Agency Correspondence - (CONTAINS PRIVILEGED INFORMATION – Provided Under Separate Cover in Volume II)
Appendix 1E	List of Affected Landowners (CONTAINS PRIVILEGED INFORMATION – Provided Under Separate Cover in Volume II)

ACRONYMS AND ABBREVIATIONS

18-inch Mainline	existing 84-mile, 18-inch-diameter, natural gas and petroleum pipeline
20-inch Mainline	existing 4.5-mile, 20-inch-diameter, natural gas pipeline
Adelphia	Adelphia Gateway, LLC
Application	Application for a FERC Certificate of Public Convenience and Necessity
AST	aboveground storage tank
ATWS	additional temporary workspace
CEII	Critical Energy Infrastructure Information
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
Delmarva Station	Delmarva-owned meter station (location of Parkway Lateral interconnect facilities)
Existing System	existing Interstate Energy Company, LLC pipeline system
FERC	Federal Energy Regulatory Commission
FERC Plan	FERC's <i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
FERC Procedures	FERC's <i>Wetland and Waterbody Construction and Mitigation Procedures</i>
HDD	horizontal directional drill
HP	horsepower
IEC	Interstate Energy Company, LLC
ILI	in-line inspection
ISO	International Standards Organization
M&R	meter and regulator
MAOP	maximum allowable pressure
Marcus Hook CS	Marcus Hook Compressor Station
mmscfd	million standard cubic feet per day
MLV	mainline valve
MP	milepost
NJR	New Jersey Resources Corporation

Northern Segment	existing pipeline segment from the Quakertown Compressor Station to the Martins Creek Terminal
NSA	noise sensitive area
PECO	Philadelphia Electric Company
PennEast Project	PennEast Pipeline Project
Project	Adelphia Gateway Project
psig	pounds per square inch gauge
Quakertown CS	Quakertown Compressor Station
SCADA	Supervisory Control and Data Acquisition
Southern Segment	existing pipeline segment from the Quakertown Compressor Station to the Marcus Hook Compressor Station
TCO	Columbia Gas Transmission, LLC
TETCO	Texas Eastern Transmission Company, LP
Tilghman Station	existing interconnect between PECO and TETCO systems at Tilghman Street
Transco	Transcontinental Gas Pipe Line Company, LLC
TWS	temporary work space
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey

1 GENERAL PROJECT DESCRIPTION

Pursuant to Section 7(c) of the Natural Gas Act, Adelphia Gateway, LLC (Adelphia), an indirect wholly-owned subsidiary of New Jersey Resources Corporation (NJR), is filing an application for a Certificate of Public Convenience and Necessity (Certificate) with the Federal Energy Regulatory Commission (FERC) for the construction and operation of its proposed Adelphia Gateway Project (Project), which would be located in Pennsylvania and Delaware. In support of this Application, Adelphia has prepared this environmental report according to Title 18 Code of Federal Regulations (CFR) §§ 157.14(a)(6-a), 380.3, and 380.12. This Certificate Application (Application) is organized into four volumes in compliance with the FERC's document control requirements. Volume I contains Application text and related public exhibits. Volumes II-IV contain the environmental report along with the Critical Energy Infrastructure Information (CEII) and confidential Application exhibits.

1.1 PURPOSE AND NEED

Adelphia, an indirect wholly owned subsidiary of NJR, proposes to construct and operate the Project facilities. The Project is designed to increase available 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 system, the Lower Mount Bethel Power Plant and the Martins Creek Power Plant. The Project would achieve this objective by using and enhancing IEC's existing natural gas and oil pipeline system located in eastern Pennsylvania (Existing System). The Existing System originates in Lower Chichester, Delaware County, Pennsylvania and travels north to its terminus in Lower Mount Bethel Township, Northampton County, Pennsylvania. The Project would provide customers in the greater Philadelphia region with a needed, new source of clean, safe, low-cost supply.

1.2 PROJECT DESCRIPTION

The Project would use existing infrastructure to the greatest extent practicable and would also require the construction and operation of some new facilities. The Project consists of the following primary components, which are discussed in greater detail in sections 1.2.1 and 1.2.2:

- Two existing pipeline segments;
 - 20-inch Mainline—an approximately 4.4-mile 20-inch natural gas pipeline beginning in Northampton County that transports natural gas to the Martins Creek Terminal in Lower Mount Bethel Township, Northampton County;

- 18-inch Mainline—an approximately 84-mile 18-inch pipeline, which originates in Lower Chichester, Delaware County, Pennsylvania, and travels north to its terminus in Lower Mount Bethel Township, Northampton County, Pennsylvania (the northern approximately 34-mile segment of the pipeline which has been used to transport dual products (oil and natural gas), and the southern approximately 50-mile segment which has been used to transport fuel oil) converted to transport solely natural gas;
- Two new compressor stations:
 - Marcus Hook Compressor Station (Marcus Hook CS) in Delaware County, and
 - Quakertown Compressor Station (Quakertown CS) in Bucks County, Pennsylvania;
- Two new pipeline laterals:
 - Parkway Lateral, an approximately 0.25-mile 16-inch pipeline lateral that terminates at a new interconnect at an existing Delmarva-owned meter station (Delmarva Station) in Claymont, New Castle County, Delaware, and
 - Tilghman Lateral, an approximately 4.5-mile 16-inch pipeline lateral that terminates at an existing interconnect between the Philadelphia Electric Company (PECO) and Texas Eastern Transmission Company, LP (TETCO) systems in Chester, Delaware County, Pennsylvania;
- Twelve meter and regulator (M&R) facilities :
 - Existing Meter Stations—four existing meter stations will be used to provide natural gas transportation services in interstate commerce in the same manner they are currently used to provide natural gas transportation services in intrastate commerce:
 - the Existing Quakertown M&R Station located at approximately MP 50 on the 18-inch Mainline connecting to the TETCO system;
 - the Existing Columbia Gas Transmission, LLC (TCO) Meter Station located at approximately MP 66 on the 18-inch Mainline;
 - the Existing Transcontinental Gas Pipe Line Company, LLC (Transco) M&R station located on the 20-inch Mainline, described in detail below; and
 - the Existing Martins Creek Station, described in more detail below, located at the terminus of both the 18-inch Mainline and the 20-inch Mainline and connected to two power generation stations served by the Project;
 - Skippack Meter Station—a new delivery interconnect in Skippack, Montgomery County, Pennsylvania;
 - Quakertown M&R—a new receipt interconnect within the existing Quakertown M&R Station, which is described in detail below, in Bucks County, Pennsylvania;

- Parkway Lateral Interconnects—three new delivery interconnects—the TETCO Meter Station, the Columbia Gas Transmission, LLC (TCO) Meter Station, and the Delmarva Meter Station—on the property of the existing Delmarva Station in Delaware County, Pennsylvania; and
- Tilghman Lateral Interconnects—three new delivery interconnects—the Transco Meter Station, the Monroe Meter Station, and the PECO Meter Station—located in Delaware County, Pennsylvania;
- Eight new blowdown assemblies—one in Delaware County, two in Montgomery County, and five in Chester County, Pennsylvania;
- One new mainline valve located at one of two optional locations in Delaware County, Pennsylvania; and
- One wareyard located entirely within an existing industrial facility in Lower Chichester Township, Delaware County, Pennsylvania.

1.2.1 Existing Facilities

On October 27, 2017, Adelphia entered into an agreement with Talen Generation, LLC (a subsidiary of Talen Energy Corporation) to purchase all of Talen Generation, LLC's membership interests in Interstate Energy Company, LLC (IEC), which owns and operates the Existing System. The transaction is expected to close following receipt of all necessary permits and regulatory actions, including those from the FERC.

The Existing System, which was built in the 1970s, is composed of the 18-inch Mainline and the 20-inch Mainline that cross five counties in eastern Pennsylvania: Delaware; Chester; Montgomery; Bucks; and Northampton Counties.

The 18-inch Mainline is an approximately 84-mile-long, 18-inch-diameter, and 1,083 pounds per square inch gauge (psig) maximum allowable pressure (MAOP), poly-coated seamless steel line (18-inch Mainline) that IEC used to transport oil from Marcus Hook to the Martins Creek Terminal in Lower Mount Bethel Township. The Martins Creek Terminal is part of the larger Martins Creek Power Plant Complex, which houses the Martins Creek Power Plant and the Lower Mount Bethel Power Plant. The southern approximately 50 miles of the 18-inch Mainline (Southern Segment) is a fuel oil pipeline that has been idle since December 2014, and the northern approximately 34 miles of the 18-inch Mainline (Northern Segment) is a dual use (natural gas / oil) pipeline with existing receipt interconnects with the TETCO and TCO pipelines that have been transporting natural gas exclusively since 2014. The Project would convert the Southern Segment of the Existing System to natural gas service and reverse the flow from south-to-north to north-to-south. The Project would also add compression at the existing Marcus Hook

Pump Station in Lower Chichester and at the existing TETCO Interconnect in Bucks County, Pennsylvania to provide 250 million standard cubic feet per day (mmscfd) of capacity on the Southern Segment.

The 20-inch Mainline is an approximately 4.4-mile-long, 20-inch-diameter, 1,200 psig MAOP pipeline (20-inch Mainline) poly-coated steel line that begins in Northampton County and is currently used by IEC to transport natural gas to the Martins Creek Terminal.

The entirety of the Existing System is protected by a previously installed cathodic protection system. Appendix 1A provides an overview map of the Existing System.

As part of its purchase, Adelphia would acquire ancillary properties currently owned by IEC, and four (4) existing meter stations in addition to the Existing System and use each as described herein or below in section 1.2.2 (New Facilities):

- The Quakertown M&R Station - The Quakertown M&R Station is an approximately 1.5-acre site located at approximate latitude 40° 24' 15.98" N, longitude 75° 20' 53.95" W in Quakertown, Bucks County, Pennsylvania. Approximately half of the site is graveled, industrial-use land, and the other half is covered by scrub/shrub vegetation. Facilities onsite include an existing TETCO pipeline interconnect, heaters, meters, regulators, and instrumentation and control buildings. This existing station will be used to provide natural gas services in interstate commerce in the same manner as this station currently provides natural gas services in intrastate commerce. There are no proposed modifications to these facilities and accordingly, there are no impacts to evaluate in this Environmental Report related to the M&R facilities; however, as described in detail herein, a new receipt interconnection and the new compressor station will be sited on the land within the Quakertown M&R Station and those impacts are evaluated in this Environmental Report;
- The Existing Transco M&R Station – The Transco M&R station is an approximately 1.6-acre paved and graveled site at approximate latitude 40° 45' 45.79" N, longitude 75° 11' 51.60" W in Easton Township, Northampton County. Facilities onsite include an existing Transco pipeline interconnect, heaters, meters, regulators and instrumentation and control buildings. There are no proposed modifications to these facilities and this site, and accordingly, there are no impacts

to evaluate in this Environmental Report related to the Existing Transco M&R Station;

- The Existing Martins Creek Station – The Martins Creek Station is a 134.6-acre site located at approximate latitude 40° 47' 37.62" N, longitude 75° 7' 52.36" W in Lower Mount Bethel Township, Northampton County which will be subdivided from the Martins Creek Terminal as part of the transaction. Martins Creek Terminal is currently used as an oil storage and gas M&R station. As described below, the Existing Martins Creek Terminal will be subdivided and Adelpia will own the portion currently used as a gas M&R Station. Existing onsite facilities include heaters, regulator runs, meters, control and maintenance buildings, a radio tower, and onsite septic. There are no proposed modifications to these facilities and accordingly, there are no impacts to evaluate in this Environmental Report related to the M&R facilities; however, as described in detail herein, the construction activities related to subdividing the existing station are evaluated in this Environmental Report;
- The Existing TCO Meter Station – This existing station will be used to provide natural gas services in interstate commerce in the same manner as this station currently provides natural gas services in intrastate commerce. There are no proposed modifications or disturbances to these facilities or at this site and accordingly, there are no impacts to evaluate in this Environmental Report for the Existing TCO Meter Station.

1.2.2 New Facilities

Adelpia proposes to install the following facilities along the Existing System infrastructure:

- two new compressor stations
 - the Marcus Hook CS, located at approximate latitude 39° 48' 53.25" N, longitude 75° 26' 18.57" W in Lower Chichester. The Marcus Hook CS would be located entirely within an existing paved/graveled industrial site;
 - the Quakertown CS, located on land within existing Quakertown M&R Station. Adelpia would also install a new receipt point/meter station within the boundaries of the existing Quakertown M&R Station;

- a wareyard used as a laydown and materials storage yard located entirely within the same existing paved/graveled industrial site as the Marcus Hook CS;
- two new pipeline laterals, both originating at the Marcus Hook CS and terminating at new interconnect sites located within existing meter stations:
 - The Parkway Lateral would be approximately 1,253 feet (0.2 mile), 16-inch-diameter pipeline that terminates at new interconnects at the Delmarva Station in Claymont, New Castle County, Delaware; Adelpia would also install three new delivery meter facilities at the Delmarva Station to connect with TETCO, TCO and Delmarva Gas;
 - The Tilghman Lateral would be approximately 23,300 feet (4.4 miles), 16-inch-diameter pipeline that terminates at an existing interconnect with the PECO and TETCO systems in Chester, Delaware County, Pennsylvania (Tilghman Station). Adelpia would also install three new delivery meter facilities along the Tilghman Lateral with Transco, the Monroe Refinery, and PECO;
- a new meter station, called the Skippack Meter Station in Skippack, Montgomery County, Pennsylvania, that would serve as a new delivery interconnect to an existing PECO-owned pipeline;
- a new receipt interconnection within the Quakertown M&R Station;
- one new mainline valve (MLV)—Adelpia is currently considering two locations for the siting of its new MLV (MLV Option 1 and MLV Option 2);
- eight blowdown assemblies at existing MLV sites along the Southern Segment;
- a new chain-link fence constructed within the boundaries of the Martins Creek Terminal property that would delineate Adelpia's new Martins Creek Station. The Martins Creek Station would be created by a subdivision of the Martins Creek Terminal as part of Adelpia's IEC acquisition and would be located on 140 acres of land (see section 1.10). Approximately 3.5 acres are paved and graveled and contain the M&R equipment, heaters, control building, and a radio tower. The remaining acreage is agricultural land; and
- various ancillary facilities including pig launchers and receivers, filter separators, liquid disposal tanks, chromatography and communication equipment necessary

to monitor the operation of the pipeline, cathodic protection systems on the new facilities which may consist of rectifiers and/or anode beds. All aforementioned ancillary facilities would be installed and operated entirely within permanent right-of-way.

1.3 LOCATION AND DESCRIPTION OF PROJECT FACILITIES

Adelphia is proposing to modify or construct the facilities as summarized in table 1.3-1 and depicted in appendix 1A. A summary of proposed locations for the MLV and blowdown assemblies is provided in table 1.3-2. Detailed descriptions of each facility and the associated proposed Project actions are provided below.

Facility	Nearest Project Milepost	County(s)/State	Description
18-inch Mainline	0.0 – 84.4	Delaware, Chester, Montgomery, Bucks, and Northampton/PA	Adelphia would convert the Southern Segment (approximately 49.4 miles) of the existing 18-inch oil and natural gas pipeline to a pipeline that exclusively carries natural gas, and Adelphia would retain the Northern Segment (approximately 35 miles) in natural gas service.
Marcus Hook CS	0.0	Delaware/PA	Adelphia would construct and operate a new 5,625-horsepower (HP) compressor station on land within the existing Marcus Hook Pump Station. Adelphia would use existing paved roads to access the site; no road improvements would be required.
Parkway Lateral	PL 0.0 – PL 0.2	Delaware/PA; New Castle/DE	Adelphia would construct one new 16-inch-diameter, 0.2-mile pipeline lateral beginning at the Marcus Hook CS and ending at an existing Delmarva-owned meter station in Claymont, DE.
TETCO Meter Station	PL 0.2	New Castle/DE	New delivery M&R facilities and interconnect with TETCO to be built at the terminus of the Parkway Lateral on the property of the existing Delmarva Station.
TCO Meter Station	PL 0.2	New Castle/DE	New delivery M&R facilities and interconnect with Columbia to be built at the terminus of the Parkway Lateral on the property of the existing Delmarva Station.
Delmarva Meter Station	PL 0.2	New Castle/DE	New delivery M&R facilities and interconnect with TETCO to be built at the terminus of the Parkway Lateral on the property of the existing Delmarva Station.
Tilghman Lateral	TL 0.0 – TL 4.5	Delaware/PA	Adelphia would construct one new 16-inch-diameter, 4.4-mile pipeline lateral beginning at the Marcus Hook CS and ending at an existing interconnect between PECO and TETCO gas pipeline systems.
Transco Meter Station	TL 0.3	Delaware/PA	New delivery M&R station and interconnect with Transco adjacent to an existing Transco owned meter station along the Tilghman Lateral.
Monroe Meter Station	TL 2.7	Delaware/PA	New delivery M&R facilities and interconnect with Monroe Refinery to be built on section of previously disturbed property within the Monroe Refinery along the Tilghman Lateral

PECO Meter Station	TL 4.4	Delaware/PA	New delivery M&R facilities and interconnect with PECO to be built at the terminus of the Tilghman Lateral on the property of the existing Tilghman Station.
Skippack Meter Station	36.0	Montgomery/PA	Adelphia would construct and operate a new meter station immediately adjacent to the intersection of the existing IEC line and an existing PECO-owned natural gas pipeline in Montgomery County. The meter station would include a fenced in area containing an M&R station and appurtenant facilities and equipment.
Quakertown CS	49.4	Bucks/PA	Adelphia would construct and operate a new 5,625-HP compressor station and new meter station on land within the existing Quakertown M&R Station Site.
Quakertown Meter Station	49.4	Bucks/PA	New receipt M&R facilities and interconnection between the 18-inch Mainline and TETCO to be built within the existing Quakertown M&R station.
20-inch Mainline	80.0 - 84.4	Northampton/PA	Jurisdiction over this Project component would change from the Pennsylvania Public Utilities Commission to the FERC. No other modifications to this pipeline would occur, and it would remain in-service.
Martins Creek Station	84.4	Northampton/PA	Work at this Site would be limited to the installation of an approximately 800-foot-long, 6-foot-tall chain-link fence. Adelphia would use existing paved roads to access the site; no road improvements would be required.
Wareyard	0.0	Delaware/PA	Adelphia would use the existing Marcus Hook Pump Station site for laydown and pipe storage; no improvements would be required.
MP = milepost ^a Proposed MLV and blowdown assemblies are not included in this table and are instead provided in table 1.3-2.			

Table 1.3-2			
Summary of Proposed Mainline Valves and Blowdown Assemblies			
Facility	County/State	Project MP	Latitude/Longitude
<i>Mainline Valves</i>			
MLV Option 1	Delaware/PA	6.7	39°53'52"N/ 75°29'19"W
MLV Option 2	Delaware/PA	7.9	39°54'44"N/ 75°29'55"W

Table 1.3-2			
Summary of Proposed Mainline Valves and Blowdown Assemblies			
Facility	County/State	Project MP	Latitude/Longitude
<i>Blowdown Assemblies</i>			
Chester Creek Gate Blowdown	Delaware/PA	9.5	39°55'54"N/ 75°30'41"W
Paoli Pike Gate Blowdown	Chester/PA	14.5	39°59'27"N/ 75°32'59"W
Pickering Creek Gate Blowdown	Chester/PA	23.0	40°05'56"N/ 75°34'15"W
French Creek Gate Blowdown	Chester/PA	25.7	40°00'00"N/ 75°32'57" W
Cromby Gate Blowdown	Chester/PA	27.3	40°09'07"N/ 75°31'59"W
Schuylkill River Gate Blowdown	Chester/PA	28.0	40°09'39"N/ 75°31'42"W
Perkiomen Creek Gate Blowdown	Montgomery/PA	34.0	40°12'59"N/ 75°27'14"W
East Perkiomen Gate Blowdown	Montgomery/PA	36.8	40°12'03"N/ 75°26'30"W

1.3.1 Pipeline Laterals and Meter Stations

1.3.1.1 Parkway Lateral

The Parkway Lateral would be a 0.2-mile-long, 16-inch-diameter pipeline lateral used to transport natural gas to new meter stations located within the existing Delmarva Station located at approximate latitude 39° 48' 56.00" N, longitude 75° 26' 33.92" W in Claymont, New Castle County, Delaware. Within the Delmarva Station, Adelphia would construct and install three additional interconnect facilities to tie the proposed lateral in with other gas pipelines already located at the Station. The Parkway Lateral would be installed entirely below ground, except for meter and tie-in facilities located at the Marcus Hook CS and Delmarva Station. It would begin within the Marcus Hook CS, be installed southwest along West Ridge Road within the paved road right-of-way, continue northwest along Parkway Avenue (also within the paved road right-of-way), continue along the south and western side of the Delmarva Station, and end within the Delmarva Station. Adelphia would construct three new delivery point/meter stations at the terminus of the Parkway Lateral within the boundaries of the existing Delmarva Station at approximate latitude 39° 48' 56.00" N, longitude 75° 26' 33.92" W.

1.3.1.2 Tilghman Lateral

The Tilghman Lateral would be an approximately 4.4-mile-long, 16-inch-diameter pipeline that would transport natural gas from the Marcus Hook CS to the Tilghman Station. Adelphia would construct three new delivery point/meter stations along the Tilghman Lateral:

- The Transco Meter Station would be located adjacent to an existing Transco meter station at approximate Project milepost (MP) TL 0.3 along Ridge Road in Lower Chichester at approximate latitude 39 ° 49' 5.5" N, longitude 75 ° 26' 3.1" W;
- The Monroe Meter Station would be located at the Monroe Refinery at or near MP TL 2.7 along Ridge Road in Lower Chichester at approximate latitude 39 ° 49' 34.14" N, longitude 75 ° 24' 2.88" W; and
- The PECO Meter Station would be located at the existing Tilghman Station near MP TL 4.4 at approximate latitude 39 ° 50' 7.22" N, longitude 75 ° 22' 32.5" W.

The Monroe and PECO Meter Stations would be installed within existing industrial sites. All new meter station facilities would include measurement, regulation, flow control, and Supervisory Control and Data Acquisition (SCADA) monitoring equipment required to deliver volumes to each customer/pipeline in accordance with the interconnection agreements negotiated with each company and in accordance with Adelphia's FERC-approved tariff.

Outside of the receipt and delivery points, the majority of the Tilghman Lateral would be installed below ground using horizontal directional drill (HDD) technology to minimize potential impacts to the human and natural environments. Portions of the Tilghman Lateral would also be installed below ground within paved road right-of-way. Table 1.3-3 provides details on proposed installation methods for the Tilghman Lateral.

Table 1.3-3			
Proposed Pipeline Installation Methods for the Tilghman Lateral			
Approximate Begin MP	Approximate End MP	Installation Method	Distance Crossed (feet)
TL 0.0	TL 0.3	Conventional	1,690
TL 0.3	TL 0.9	HDD	3,168
TL 0.9	TL 1.1	Conventional	898
TL 1.1	TL 1.7	HDD	3,379

Approximate Begin MP	Approximate End MP	Installation Method	Distance Crossed (feet)
TL 1.7	TL 1.8	Conventional	106
TL 1.8	TL 2.2	HDD	2,587
TL 2.2	TL 2.4	Conventional	1,003
TL 2.4	TL 2.6	HDD	950
TL 2.6	TL 2.9	Conventional*	1,584
TL 2.9	TL 3.4	HDD	2,798
TL 3.4	TL 3.5	Conventional	53
TL 3.5	TL 3.7	HDD	1,531
TL 3.7	TL 3.9	Conventional	686
TL 3.9	TL 4.2	HDD	1,795
TL 4.2	TL 4.3	Conventional	528
TL 4.3	TL 4.4	HDD	422
TL 4.4	TL 4.4	Conventional	158

* As described in Resource Report 2, *Water Use and Quality*, Adelphia is analyzing two crossing methods (HDD and open-cut (dry or wet)) for a waterbody at approximately TL 2.7.

1.3.1.3 Skippack Meter Station

Adelphia would construct and operate a new approximately 0.2-acre meter station along the Existing System near MP 36.0 at approximate latitude 40°14'32.48"N, longitude 75°26'47.88". Adelphia would install a new interconnect to an existing PECO-owned natural gas pipeline within the Meter Station. The interconnect will include a fenced in area containing an M&R station and appurtenant facilities and equipment.

1.3.2 Compressor Stations

1.3.2.1 Marcus Hook Compressor Station

Adelphia proposes to construct a 5,625-horsepower (HP) International Standards Organization- (ISO) rated compressor station facility that would be sited entirely within the boundaries of the existing Marcus Hook Pump Station. Adelphia would install three 1,875-HP ISO-rated Caterpillar 3606 A4 reciprocating compressor units at the Compressor Station. The units would be housed in a new sound attenuating compressor building. The compressor building would be acoustically insulated to reduce the sound transmission. Additional major auxiliary equipment to be installed include fuel gas system, standby generator, liquid disposal tank, engine lubricant tank, an auxiliary building, control building, filter separators, yard lighting,

and associated equipment piping. The station piping would be designed for an MAOP of 1,440 PSIG.

The Marcus Hook CS would be surrounded by an existing security fence that encloses the Marcus Hook Pump Station and would be accessed from the north via West Ridge Road. No modifications to the access road would be required. Necessary automation and controls would be installed to allow for remote station monitoring and operation from various gas control facilities. The Marcus Hook CS could also require upgrades to the existing security system, office/control building, yard lighting, phone, SCADA system, purchase power feed, and transformer.

1.3.2.2 Quakertown Compressor Station

Adelphia would construct a 5,625-HP ISO-rated compressor facility that would be sited within the boundaries of the existing Quakertown M&R Station

Adelphia proposes to install three 1,875-HP ISO rated Caterpillar 3606 A4 reciprocating compressor units at the Quakertown CS. The units would be housed in a new sound attenuating compressor building. The compressor building would be acoustically insulated to reduce the sound transmission. Additional buildings and major auxiliary equipment to be installed could include electrical power, a control building, fuel gas system, standby generator, liquid disposal tank, engine lubrication tank, filter separators, and associated equipment piping. The station piping would be designed for an MAOP of 1,440 PSIG.

The Quakertown CS would be surrounded by a 7.5-foot security fence and accessed from the south via Rich Hill Road. Adelphia would maintain the paved/gravel access road in order to provide adequate, safe access to the site for construction vehicles and personnel, as needed. Improvements would be limited to the placement of additional gravel on the graveled portion of the road and/or the placement of additional pavement on the paved portion of the road. All improvements would occur within the existing boundaries of the roadway. Necessary automation and controls would be installed to allow for remote station operation from Adelphia's monitoring sites located in various gas control facilities. The Quakertown CS could also require installation or upgrades of the security system, control building, yard lighting, phone system, SCADA system, commercial electric power feed, and a transformer.

1.3.3 Mainline Valve and Blowdown Assemblies

The new MLV location would be determined in accordance with Title 49 CFR Part 192 requirements and based on the outcome of environmental surveys and negotiations of easement modifications with the current landowners. Two alternatives have been identified for the new MLV.

Blowdown assemblies would be installed upstream and downstream of each of eight existing MLVs on the Southern Segment of the 18-inch Mainline. The two potential locations of the MLV and the locations of the blowdown assemblies are provided in table 1.3-2.

1.3.4 Martins Creek Station

Adelphia would install an approximately 800-foot-long, 6-foot-tall chain-link fence at the Martins Creek Station. The fence would be installed entirely within previously disturbed, graveled land. No clearing or grading would be required. Excavation would be limited to that necessary to install several 4-inch-diameter fence posts approximately 24 to 36 inches deep.

1.3.5 Wareyard

Adelphia would utilize the existing Marcus Hook Pump Station to store materials and equipment during the Project. No improvements are required.

1.4 LAND REQUIREMENTS

A summary of the land requirements for the Project is presented in the following section and in table 1.4-1. A detailed description of the land use associated with construction and operation of the Project facilities is provided in Resource Report 8 – *Land Use, Recreation, and Aesthetics*.

Site	Land Affected During Construction (acres) ^{ab}	Land Affected During Operations (acres) ^c
Marcus Hook CS (and wareyard) ^d	0.7	0.0
Parkway Lateral (and Delmarva, TETCO, and TCO Meter Stations) ^d	1.6	0.8
Tilghman Lateral (and Transco, Monroe, and PECO Meter Stations) ^{de}	22.2	3.0
MLV Option 1	0.4	0.2
MLV Option 2	0.4	0.2
Chester Creek Gate Blowdown	0.7	0.5
Paoli Pike Gate Blowdown	0.2	0.0
Pickering Creek Gate Blowdown	0.6	0.4
French Creek Gate Blowdown	0.5	0.3
Cromby Gate Blowdown	1.2	1.0
Schuykill River Gate Blowdown	2.7	2.5

Site	Land Affected During Construction (acres)^{ab}	Land Affected During Operations (acres)^c
Perkiomen Creek Gate Blowdown	0.3	0.1
East Perkiomen Gate Blowdown	0.3	0.1
Quakertown CS (and Quakertown Meter Station) ^d	3.0	1.2
Martins Creek Station	3.5	0.0
Skippack Meter Station MS	0.6	0.2
<p>^a Land affected during construction includes operations (i.e., permanent) impacts.</p> <p>^b Estimated impacts include those associated with interconnects, meter stations, delivery points, and ancillary facilities, as applicable.</p> <p>^c Land affected during operation consists only of new permanent impacts. Operations impacts that would occur on land that was previously disturbed, paved/graveled land prior to construction are not included in acreages.</p> <p>^d Construction and operation would take place at least partially within an existing facility's fence line, which includes previously disturbed, industrial-use land.</p> <p>^e HDD temporary workspace is included in acreages.</p>		

1.4.1 Mainline Valves and Blowdown Assemblies

With the exception of some new temporary access roads required to access the proposed new MLV and blowdown assemblies, these Project components would be constructed entirely within the Existing System's permanent, maintained right-of-way. Adelpia would use existing roads to access the MLV and blowdown sites as depicted in figures provided in appendix 1A. All temporary access roads used for the installation of the MLV and blowdown assemblies would be restored to their pre-construction conditions following construction. All land affected within the Existing System's right-of-way not occupied by new aboveground facilities would also be returned to pre-construction conditions.

1.4.2 Pipeline Laterals and Meter Stations

Land required for construction and operation of the pipeline laterals is provided in table 1.4-1. Adelpia would use a combination of standard, upland, open-cut installation methods and HDD technology to install the pipeline laterals. Adelpia would install a majority of the Parkway Lateral and the Tilghman Lateral (with the exception of associated meter stations, interconnects, and other aboveground ancillary facilities) within existing paved road right-of-way.

About 20,300 feet of the Tilghman Lateral would be collocated with existing utility right-of-way, of which approximately 15,600 feet would be installed in via HDD. Of the portions of the Tilghman Lateral that would not be collocated with existing right-of-way, approximately 950 feet of pipeline would be installed via HDD; the remainder would be installed using open-cut trenching

and conventional techniques and would require surface easements. All temporary work space (TWS) required to support various pipeline installation would be returned to preconstruction conditions following completion of construction.

Adelphia anticipates that an approximate 40- to 45-foot-wide temporary construction workspace corridor would be used within the road right-of-way easement for the Parkway Lateral (see alignment drawings). Typical construction workspace for pipe installation would not extend beyond the existing road rights-of-way, however select areas would require additional temporary workspace (ATWS). All ATWS required to support various pipeline installation would be returned to preconstruction conditions following completion of construction.

Resource Report 8 provides more detail on areas in which the Project would be collocated with other existing rights-of-ways. Once the pipeline is installed, Adelphia would backfill the trench with materials satisfactory to the governing entity of the road, and all affected roads would be returned to their pre-construction conditions. Additional information about open-cut installation methods is provided in section 1.5.

As additional field and civil surveys, landowner negotiations, agency consultations, and engineering studies are performed, Adelphia will evaluate whether additional workspace to construct the Laterals would be necessary to safely construct the pipeline in specific locations. During the final design phase of the Project, any additional staging areas and work spaces not identified at the time of the filing of this Application would be included as part of the Project study area and incorporated into agency consultations, environmental permitting, and resource surveys and filed accordingly on the FERC docket.

All temporarily impacted land used for construction of the pipeline laterals and meter stations, including the Skippack Meter Station, would be returned to its pre-construction state (i.e., repaved, re-graveled, or re-graded and re-seeded). Operational areas for the meter stations would be permanently converted to paved/graveled industrial-use land. Depictions of the pipeline laterals and associated facilities and ATWS are included on drawings provided in appendix 1A, and plot plans are provided in appendix 1B.

1.4.3 Aboveground Facilities

Land required for construction and operation of the proposed aboveground facilities is summarized in table 1.4-1. Depictions of aboveground facilities are provided in appendix 1A. Plot plans for compressor stations are provided in appendix 1B. Construction and operation of the Marcus Hook CS and Martins Creek Station would occur entirely within previously disturbed,

paved/graveled, industrial-use land.

Construction of the Quakertown CS would require 1.2 acres of land, all of which is located on previously disturbed, paved/graveled, industrial-use land within the boundaries of the existing Quakertown M&R Station. Adelphia would lease an additional 1.8 acres of land also adjacent to the Quakertown M&R Station for ATWS during construction. The ATWS would be returned to its pre-construction conditions following construction. All other areas (1.2 acres) used for Quakertown CS construction would be permanently covered with gravel for use during operations.

1.5 CONSTRUCTION PROCEDURES

1.5.1 Marking Workspace

Adelphia would notify affected landowners, including those associated with properties adjacent to all areas where construction would take place in advance of construction activities. Following these notifications, a survey crew would mark the limits of the proposed construction workspace and access roads, property boundaries, underground utilities, and identified foreign pipelines, as applicable. Adelphia would contact the applicable One-Call centers for Pennsylvania and Delaware to accurately and safely identify and flag buried utility lines by their respective owners. Previously identified sensitive resources, such as wetland boundaries, would also be located and marked to minimize or avoid adverse impacts during construction. Temporary erosion and sediment control devices would be installed at this time, as needed, in accordance with the FERC *Upland Erosion Control, Revegetation, and Maintenance Plan* (FERC Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures).

1.5.2 Clearing and Grading

Following the establishment of workspace boundaries, the construction workspace would be cleared and graded, where necessary, to create a level workspace to allow safe passage of equipment. Clearing includes the removal of brush, trees, roots, and other obstructions. Non-woody vegetation may be mowed to ground level. No cleared material would be placed within wetland areas. Grading would include removing rock outcrops, tree stumps, ridges, and topographic irregularities.

With the exception of in stream buffers and wetlands, tree stumps would be removed from the permanent right-of-way. Stump grinding may be used as an alternative to removal to leave below grade root systems intact to aid in soil stabilization. Cleared vegetation and debris within the construction workspace would be disposed of in accordance with federal and state regulations either by chipping and spreading, transportation to a commercial disposal facility, storing along

the right-of-way with landowner approval, or other approved methods. If material is chipped, the chipped material not removed from the site may be spread across the upland areas of the construction work space in a manner that would not inhibit revegetation or broadcast into areas off right-of-way. Wood chips would not be left within agricultural lands, wetlands, or within 50 feet of wetlands. Wood chips would not be stockpiled in a manner that they may be transported into a wetland. Trees, if suitable, would be taken off-site by the clearing contractor and used for timber unless the landowner has made alternative arrangements for the salvageable timber.

Temporary security fencing would be installed around the construction workspace, as required, either during or immediately following clearing and grading activities to limit public access. Adelphia would implement applicable soil mitigation procedures as outlined in the FERC Plan and Procedures, such as segregating topsoil from subsoil and installing silt fence during and immediately following clearing and grading activities, as needed.

1.5.2.1 Clean-up and Restoration

Following completion of construction of each proposed facility, temporary workspace not covered with gravel or asphalt would be graded, restored, and reseeded. Previously paved/graveled areas would be recovered with gravel or asphalt. Construction debris and organic refuse unsuitable for distribution over the construction workspace would be disposed of at appropriate facilities in accordance with applicable regulations. Permanent erosion control devices would be installed as appropriate, and revegetation measures would be applied in accordance with FERC Plan and Procedures and specific landowner requests.

1.5.3 Facility-specific Construction Procedures

1.5.3.1 Mainline Valve and Blowdown Assemblies

To install the new MLV and blowdown assemblies, Adelphia would clear, grade, and excavate, as necessary, to access the existing pipeline. For the MLV, Adelphia would then cut out an approximately 20-foot-long section of the pipe and replace that section with the new valve assembly. For the blowdown assemblies, Adelphia would remove small sections of existing pipe on either side of the existing MLV and install the blowdown assemblies in their place. Adelphia would then backfill the excavated areas with the same material that was removed from the trench and restore the areas to pre-construction conditions. Areas used for temporary access roads would also be restored to pre-construction conditions following construction.

1.5.3.2 Pipeline Installations

Trenching

Once all construction workspace is marked off, cleared, and graded, Adelphia would begin excavating the pipeline trench in the center of the construction right-of-way. Spoil from the ditch would be placed within the Project right-of-way or collected in vehicles for temporary storage until backfill activities begin.

The trench generally would be approximately 12 inches wider than the diameter of the pipe and of sufficient depth to allow for the minimum cover requirements to the top of the pipe in accordance with U.S. Department of Transportation (USDOT) regulations pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended. Crossing of foreign pipelines would generally require the pipeline to be buried at greater depths depending upon the depth of the foreign pipeline. Pipeline burial depths would comply with all applicable requirements.

Stringing

The stringing operation involves moving the pipe into position in proximity to the prepared right-of-way. Pipe for laterals would be delivered to the Marcus Hook CS typically by truck and would then be moved by truck to the construction zone, where it would be placed in proximity to the right-of-way in preparation for subsequent lineup and welding operations. Individual joints of pipe would be strung in proximity to the right-of-way parallel to the centerline and arranged so they are easily accessible to construction personnel. Stringing activities would be coordinated with the advance of the trenching or HDD activities to minimize potential impacts to resources. Steel pipe sections or joints in standard 20- or 40-foot lengths would be used on the Project.

Integrity Inspection

Once the pipe is strung along the centerline, the ends would be carefully aligned and welded together using multiple passes for a full penetration weld. Only welders qualified according to applicable American Petroleum Institute Standard 1104 would be permitted to perform the welding.

To ensure weld quality and integrity, the welds would be inspected both visually and non-destructively using radiographic (x-ray) or another approved test method, in accordance with American Petroleum Institute Standard 1104. Welds displaying defects would be repaired or removed re-welded and re-inspected.

Bending

The pipe would be delivered to the Project site in straight sections. However, field bending of the pipe may be required to allow the pipeline to follow grade changes and direction changes of the right-of-way. For turns involving larger deflections and/or small radii, often related to spatial limitations due to easement constraints, Adelphia would use prefabricated elbow fittings.

Welding and Coating

All welders and welding procedures would be qualified in accordance with USDOT requirements (Title 49 CFR Part 192). All piping system welds would be verified by a non-destructive testing method to ensure compliance with code requirements.

Once a weld has been inspected and approved, the welded area would be coated with appropriate field joint system prior to burial.

Lowering-in and Backfill

The pipe lengths are lowered into the trench by specialty “side boom” tractors. Extreme care is taken to protect the coating during the lowering-in process. Lowered pipe is positioned within the trench on sandbag benches (or approved equivalent structures), or padding the trench with screened subsoil; topsoil would not be used for padding. Connecting ends of the pipe would be welded together in the ditch followed by the above inspection and coating process. Following lowering-in, the trench and pipeline would be backfilled. A bedding layer of rock-free pad dirt would be placed first to protect the pipe and coatings. Final backfill makes use of material excavated from the trench; topsoil would not be used for backfill.

Horizontal Directional Drilling

The HDD construction method is a process by which a pipeline is installed beneath a given feature. Typically, minimal surface disturbance occurs between the entry and exit points of the HDD. The feasibility of using HDD and the length of pipeline that can be installed using this method depends on factors such as access to the entry and exit points, subsurface conditions (geology), entry and exit elevations, terrain, availability of workspace, and pipe diameter. Adelphia anticipates that HDD technology would be used for a majority (approximately 80 percent) of the Tilghman Lateral installation to minimize impacts to sensitive resources.

Open Cut Waterbody Crossings

Adelphia could use the open-cut method to cross Stoney Creek. Should this method be selected, the full width of the construction right-of-way would be used on either side of the waterbody

for construction staging and pipeline fabrication. During clearing and grading activities, a temporary bridge would be constructed across the waterbody to permit construction equipment to cross. Construction equipment would be required to use the bridge, except the clearing crew who would be allowed one pass through the waterbodies before the bridges are installed. Bridges and supports would be removed after restoration is complete.

Clearing would involve the removal of trees and brush from the construction right-of-way and temporary construction workspace. Woody vegetation would be cleared to the edge of the waterbodies, but a 10-foot-long herbaceous strip would be left on the approaches until immediately before construction to provide a natural sediment filter and minimize the potential for erosion immediately adjacent to the waterbody. Initial grading of the herbaceous strip would be limited to the extent needed to install a bridge and in areas that are needed to construct the pipeline safely where large grade cuts are necessary.

During clearing where possible and during grading, sediment barriers would be installed and maintained adjacent to the waterbody and within temporary construction workspaces, where needed, to minimize the potential for sediment runoff. Drivable berms may be installed and maintained across the right-of-way in lieu of silt fence or straw bales.

Flume Crossing Method

Adelphia may choose to cross Stoney Creek by using the flume crossing method (a dry open cut crossing method). The flume crossing method involves diverting the flow of the stream across the construction site through one or more flume pipes placed in the stream. The first step in the flume crossing method involves placing a sufficient number of adequately sized flume pipes in the stream to accommodate the highest anticipated flow during construction. After placing the pipes in the stream, sand or pea gravel bags would be placed in the stream upstream and downstream of the proposed trench. The bags serve to dam the stream and divert the stream flow through the flume pipes, thereby isolating the stream flow from the construction area.

Backhoes located on both banks of the stream would excavate a trench under the flume pipe in the isolated streambed. Spoil excavated from the stream trench would be placed or stored a minimum of 10 feet from the edge of the waterbody or in ATWS as necessary. Once the trench is excavated, a pre-fabricated segment of pipe would be installed beneath the flume pipes. The trench would then be backfilled with native spoil from the streambed. If trench dewatering is necessary near waterbodies, the trench water will be discharged into an energy dissipation/sediment filtration device, such as geotextile filter bag or straw bale structure, away

from the water's edge, preferably in a well-vegetated upland area to prevent heavily silt-laden water from flowing into the waterbody.

Dam and Pump Crossing Method

Adelphia may choose to cross Stoney Creek by using the dam and pump crossing method (a dry open cut crossing method). The dam and pump crossing method involves constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site while using a high capacity pump to divert water from the upstream side around the construction area to the downstream side. Energy dissipation devices, such as steel plates would be placed on the downstream side at the discharge point to prevent streambed scour.

After installing the dams and commencing pumping, a portable pump (separate from that pumping the stream flow around the construction area) may be used to pump standing water from between the dams into a dewatering structure consisting of straw bales/silt fence or into a filter bag located away from the stream banks, thereby creating a dry construction area.

Once the area between the dams is stable, backhoes located on both banks would excavate a trench across the stream. Spoil excavated from the trench may be stored in the dry streambed adjacent to the trench if the stream crossing is major or in a straw bale/silt fence containment area located a minimum of 10 feet from the edge of the stream banks. Leakage from the dam, or subsurface flow from below the streambed, may cause water to accumulate in the trench. As water accumulates in the trench, it may be periodically pumped out and discharged into a dewatering structure located away from the stream banks.

After trenching across the streambed is completed, a prefabricated segment of pipe would be installed in the trench. The streambed portion of the trench is immediately backfilled with streambed spoil. Once restoration of the streambed is complete, the dams are removed and normal flow is re-established in the stream.

Completed stream crossings using the flume or dam and pump methods would be stabilized before returning flow to the channel. Original streambed and bank contours would be re-established, and mulch, jute thatching, or bonded fiber blankets will be installed on the stream banks. Where the flume technique is used, stream banks would be stabilized before removing the flume pipes and returning flow to the waterbody channel.

Seeding of disturbed stream approaches would be completed in accordance with the FERC Plan and Procedures after final grading, weather and soil conditions permitting. Where necessary, slope breakers would be installed adjacent to the stream's banks to minimize the potential for

erosion. Sediment barriers, such as silt fence and/or straw bales would be maintained across the right-of-way until permanent vegetation is established. Temporary equipment bridges would be removed following construction.

Wet Open Cut Crossing Method

Adelphia could cross Stoney Creek by using the wet open cut crossing method. The wet open cut construction method involves the excavation of the pipeline trench across the waterbody, installation of a prefabricated pipeline segment, and backfilling of the trench with excavated material. Depending upon the width of the crossing and the reach of the excavating equipment, excavation and backfilling of the trench will generally be accomplished using backhoes or other excavation equipment operating from one or both banks of the waterbody. Excavated material from the trench would be placed on the bank above the ordinary high water mark for use as backfill. The pipe segment can be weighted, as necessary to provide negative buoyancy and placed below scour depth. Typical backfill cover requirements would be met, contours would be restored within the waterbody, and the banks would be stabilized via seeding and/or the installation of erosion control matting or riprap, per applicable agency approvals. One of the goals of open cut crossings is to complete all in-stream construction (trenching, pipe installation, backfill, and streambed restoration) within 24 hours.

Road Crossings

Construction of the Project across paved roads would be accomplished by boring under the roadbed. Construction of the Project across unpaved roads would be accomplished by boring under the roadbed or by open-cut methods. The boring method involves excavation of a bore pit on one side of the crossing and a receiving pit on the other side. A boring machine then cuts a shaft under the crossing using a cutting head mounted on an auger. The pipeline is then pushed or pulled through the shaft.

The open-cut method of road crossing involves trenching across the road and then restoring the road to pre-construction or better conditions following construction. If an open-cut road requires an extensive construction duration, provisions would be made for detours or other measures to permit traffic flow during construction. If necessary, traffic control measures would be coordinated with the appropriate state or local agency with jurisdiction over the affected road.

The pipeline laterals would be installed at a minimum depth as required in Title 49 CFR Part 192, USDOT requirements, or permit. All crossings would be designed to withstand anticipated external loadings and installed at the calculated depth. Temporary work space areas

would be required at road crossings to accommodate extra spoil generated from the entrance and exit pits at bored crossings or from the increased excavation depths at open-cut road crossings as well as for staging of pipe and vehicle parking.

Hydrostatic Testing

Completed sections of pipeline would be further tested using water pressure. Pipes would be filled with water and then pressurized to levels required to qualify the facilities for the desired MAOP designated for the pipeline. Hydrostatic pressure testing would comply with USDOT regulations specified in Title 49 CFR Part 192, ASME B31.8, and applicable state and local regulations to verify mechanical integrity and to ensure that it can safely operate at the designated MAOP. Additional information about hydrostatic testing and measures to protect water resources are discussed in Resource Report 2 – *Water Use and Quality*.

1.5.3.3 Aboveground Facility Installations

For the proposed Marcus Hook CS and Quakertown CS, Adelphia would first clear, grade, and excavate land, as necessary, to accommodate the reinforced concrete foundation that is required for the new compressor unit and buildings. Forms would be set, rebar would be installed, and concrete would be poured into the foundation setting. Concrete pours would be randomly sampled to verify compliance with minimum strength requirements. Backfill would be compacted in place, and excess soil would be used elsewhere or distributed around the site.

Once the concrete foundations have been completed and determined to meet the design requirements, Adelphia would begin installing machinery and buildings for the compressor stations. Various piping and electrical conduit systems would be connected once the machinery is in place. Electrical wiring would be installed for power and instrumentation. Compression equipment is typically shipped to the site by truck after construction commences. The compressors would be offloaded, positioned on the foundation, leveled, grouted, and secured. Compressor station utilities supporting the operation of the gas compressor and cooling equipment would be housed in modularized, skid mounted buildings. Prior to placing the new compressor units into service, Adelphia would develop and implement measures outlined in Project-specific station commissioning plans to ensure the proper function of controls and safety features.

New meter stations would be installed using generally accepted industry design and construction standards. Minimal concrete foundations are required for electronic measurement buildings and other ancillary facilities. Inlet/outlet meter and regulator headers would be installed

below ground with meters, flow control, regulators, and instrumentation installed above ground for ease in operation, maintenance, testing and calibration. Aboveground and below-ground piping would be installed using the same welding and construction practices as pipeline laterals and compressor stations, and be hydrostatically tested in accordance with all applicable regulations. Adelphia and its contractors would park vehicles and equipment in designated areas at or near the Project Sites that meet guidelines provided in its *Spill Pollution, Prevention, and Countermeasures Plan* and the FERC Plan and Procedures to avoid potential impacts to sensitive resources.

1.5.3.4 Ancillary Facility Installations

Pipe connections associated with the new compressors, and laterals would be flanged, screwed, or welded. Pig launching and receiving facilities, with the appropriate valves and equipment will be installed at each end of the pipeline laterals to allow pipeline to be pigged and periodically inspected using inline electronic pigging devices. Additional ancillary equipment to be installed as part of the project includes: filter separator vessels, liquid disposal tanks, valve actuators, electronic monitoring instruments, electronic measurement equipment (RTUs), BTU determination equipment, SCADA communications equipment and safety monitoring and shut down systems.

1.5.3.5 Environmental Compliance, Training, and Inspection

To ensure that the construction of the proposed facilities would comply with FERC Certificate conditions, the mitigation measures identified in the resource reports in this Application, and the requirements of other federal and state permitting agencies designed to avoid and/or minimize potential environmental impacts, Adelphia would include, whenever possible, implementation details in its construction drawings and specifications. Adelphia's selected contractors would receive copies of design specifications, the FERC Plan and Procedures, and applicable other environmental documents.

For mitigation measures that address pre-construction surveys and clearances, Adelphia would provide pertinent correspondence and documentation to the construction contractor(s). For those mitigation measures that address permit conditions from federal and state agencies, Adelphia would provide copies of permits and related drawings. For those mitigation measures that, in part, address post-construction requirements, Adelphia engineers would provide instructions and documentation to Adelphia's operating personnel following the completion of the construction. Adelphia would require selected contractors to install facilities according to

Adelphia and USDOT specifications, specific permit conditions, and the terms of the negotiated contract.

1.6 OPERATION AND MAINTENANCE

It is anticipated that the Project would result in the need for a total of seven to ten additional operations employees for the two compressor stations. All Project facilities would be patrolled on a routine basis and personnel well-qualified to perform both routine and extraordinary maintenance on pipeline facilities would handle all maintenance. If necessary, permanent structural controls would be installed and maintained to accomplish maximum stabilization, prevent erosion and control sedimentation.

In accordance with USDOT requirements, Adelphia would follow routine operations and maintenance procedures to ensure safe and reliable operation of Project facilities as further described in Resource Report 11 – *Reliability and Safety*. Standard compressor and meter station operation procedures include activities such as:

- calibration, maintenance, and inspection of equipment;
- pressure, temperature, and vibration data monitoring;
- landscape maintenance; and
- periodic checks of safety and emergency equipment and cathodic protection systems.

1.7 FUTURE PLANS AND ABANDONMENT

Because Adelphia would be a provider of natural gas transportation, it must remain responsive to its customers' needs for capacity. Hence, Adelphia would constantly evaluate its customers' needs and whether or not such needs can be met by existing infrastructure or whether additional facilities are needed. Demand for transportation is dynamic and making long-term predictions is speculative at best. Adelphia would continue to work with market participants to develop expansions across its natural gas transmission systems to meet the demands of the market. If additional demand for natural gas requires future expansion, Adelphia would seek the appropriate authorizations from the FERC. When and if an Application is filed, the environmental impact of the new proposed facilities would be examined. Adelphia does not anticipate a scenario in which the Project, once constructed, would no longer be needed. However, in the event that this would occur, Adelphia would follow all applicable regulatory requirements to decommission the Project.

1.8 STAKEHOLDER OUTREACH

Adelphia has been, and will continue to, work with Project stakeholders throughout the course of its Project in order to facilitate stakeholder communications, assist with early identification and resolution of issues, and disseminate information regarding the Project. Adelphia will continue to keep landowners, concerned citizens, government officials and regulatory agencies informed about the Project developments, construction, and restoration through various means such as: notification letters, local land agents, as well as website and local contact.

Adelphia initiated public outreach in October 2017. Significant efforts have been made to inform the public, particularly landowners and local, state, and federal officials, about the proposed Project, including the creation of a Project website (www.Adelphiagateway.com), personal visits, phone calls, emails, and written correspondence. The objective in implementing a comprehensive stakeholder outreach strategy is to identify and potentially resolve issues raised by stakeholders in a timely fashion.

Adelphia would notify all affected landowners pursuant to 18 CFR § 157.6(d) and provide information regarding procedures to follow in the event that a landowner has any concerns or problems during construction. Appendix 1E includes a list of landowners affected by the Project; Adelphia requests that the information within this appendix remains privileged and confidential.

Throughout the course of the Project, landowners and other concerned citizens will be kept informed about Project permitting developments, construction, and restoration through written and verbal communications. Adelphia began talking to landowners about the scope and construction schedule as early as the survey phase. Adelphia's representatives provided the landowner with a business card that has the agent's email and cell phone number as well as the local project office's phone number and address. The representative would maintain contact with the landowner into the construction phase and be available in the field to address landowner concerns as they arise. Adelphia would notify affected landowners (i.e., those owning property on which Adelphia obtained lease agreements for the pipeline laterals and those adjacent to the facilities and those landowners crossed or impacted by access to the sites) prior to the start of construction by written notification.

1.9 PERMITS AND APPROVALS

Adelphia will obtain applicable permits and approvals relating to its aboveground facilities across or under roads, drainage facilities, waterbodies, wetlands, and through any other sites

where a governmental permit or approval is required. Table 1.9-1 provides a list of permits, approvals, and consultations, and their applicable federal, state, and local agencies.

Table 1.9-1		
Permits and Approvals Required for the Adelphia Gateway Project		
Agency	Permit/Approval/Consultation	Status
<i>Federal</i>		
FERC	Certificate of Public Convenience and Necessity	Application filed January 2018. Application in review.
U.S. Fish and Wildlife Service, Pennsylvania Field Office	Consultation under Section 7 of the Endangered Species Act	Original consultation letter submitted July 2017. USFWS response received August 2017. Revised consultation letter submitted January 2018. Consultation ongoing.
	Consultations under The Migratory Bird Treaty Act and The Bald and Golden Eagle Protection Act	Consultation letter submitted January 2018.
U.S. Army Corps of Engineers, Philadelphia District	Clean Water Act Section 404 authorization	General permit application, if necessary, to be submitted upon completion of surveys.
<i>State</i>		
Pennsylvania Department of Environmental Protection	Water Obstruction and Encroachment Permit (in conjunction with the Section 404 authorization application under PA State Programmatic General Permit 5 (PASPGP-5))	General permit application, if necessary, to be submitted upon completion of surveys
	Clean Water Act Section 401 Water Quality Certification	Application, if necessary, to be submitted in conjunction with the PASPGP-5 application)
	Coastal Zone Management Area Consistency Determination	Consistency Determination review form submitted January 2018.
	Erosion and Sediment Control General Permit-2 for Earth Disturbance Associated with Oil and Gas Activities (ESCGP-2)	To be submitted prior to Project construction.
	National Pollutant Discharge Elimination System General Permit for Discharges for Hydrostatic Testing of Tanks and Pipelines (PAG-10)	To be submitted prior to Project construction.
	Air Quality Permit	Permit application to be submitted prior to Project construction.
Pennsylvania Department of Transportation	Highway Occupancy Permit	Permit application to be submitted prior to Project construction.
Pennsylvania Fish and Boat Commission	State Species Consultation	Original consultation letter submitted July 2017. PFBC response received September 2017. Revised

Table 1.9-1		
Permits and Approvals Required for the Adelphia Gateway Project		
Agency	Permit/Approval/Consultation	Status
		consultation letter submitted January 2018. Consultation ongoing.
Pennsylvania Game Commission		Original consultation letter submitted July 2017. PGC response received August 2017. Revised consultation letter submitted January 2018. Consultation ongoing.
Pennsylvania Department of Conservation and Natural Resources		Original consultation letter submitted July 2017. PA DCNR response received August 2017. Revised consultation letter submitted January 2018. Consultation ongoing.
Pennsylvania Historical and Museum Commission	Consultation under Section 106 of the National Historic Preservation Act	Original consultation package submitted August 2017. PA SHPO response received September 2017. Revised consultation package and survey reports submitted December 2017. Consultation ongoing.
<i>Delaware</i>		
Delaware Department of Natural Resources and Environmental Control	State Species Consultation	Consultation letter submitted August 2017. DNREC response received September 2017. Consultation complete.
	Air Contaminant Equipment Registration	Permit application to be submitted prior to Project construction.
Delaware Division of Historical and Cultural Affairs	Consultation under Section 106 of the National Historic Preservation Act	Consultation letter submitted August 2017. DHCA response received September 2017. Consultation complete.

1.10 NON-JURISDICTIONAL FACILITIES

Non-jurisdictional facilities are those facilities related to the Project that are not subject to the FERC's jurisdiction because they are not used for transportation of natural gas in interstate commerce. No such additional facilities are being constructed related to this Project.

1.11 CUMULATIVE IMPACTS

Cumulative impacts may result when impacts from the construction and operation of the Project are combined with the impacts from other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes those actions. In order to review potential cumulative impacts, Adelphia considered recently completed (up to one year prior to construction of the Project), current, and reasonably foreseeable future projects and other human-related activities that may also affect areas that would be affected by the Project. Cumulative impacts are discussed by proximity in section 1.11.1 and on a resource-by-resource basis in section 1.11.2.

1.11.1 Projects and Activities Considered

For the purposes of the cumulative impacts analysis and in order to identify small land developments in proximity to the Project, Adelphia contacted county planning commissions and reviewed local and state online sources to identify projects with ongoing impacts or projects that have reasonably foreseeable past, present, or future actions that may have impacts on same affected environments as the Project (New Castle County Land Use Department, 2017; Bucks County Planning Commission, 2017; Lower Chichester Township, 2017; Delaware County Planning Department, 2017). Records of correspondence are provided in appendix 1D. Adelphia reviewed Delaware County Planning Commission (Delaware County planning Commission, 2017) agenda records to determine all projects that have been proposed in proximity to the Marcus Hook CS, wareyard, and the Parkway and Tilghman Laterals and associated M&R facilities, and corresponded with the Bucks County Planning Commission (Bucks County Planning Commission, 2017) to determine any potential projects in proximity to the Quakertown CS and associated M&R facilities.

Adelphia is in the process of identifying whether there are any projects or activities associated with the Martins Creek Station, the Skippack Station, the new MLV locations, and the eight blowdown assembly locations that have the potential to result in cumulative impacts. Activities at the Martins Creek Station would be limited to fence installation, which would occur within existing industrial facilities. Ground disturbance would be short-term and limited to that required to install fence posts and would not have the potential to significantly affect storm-water within the facility. No habitat would be affected by fence installation and no archaeological surveys or aboveground investigations for cultural resources were required by the Pennsylvania State Historic Preservation Office (see Resource Report 4). The addition of the fence would not significantly affect the view shed in the area as the proposed fence at Martins Creek Station would

be located within the existing Martins Creek Terminal. The fence installation would not generate a significant amount of noise, and work would be short term.

Additionally, Adelphia proposes to construct one new MLV and conduct modifications to add blowdown assemblies at eight existing MLV sites. As discussed above, the work associated with the new MLV construction and existing MLV modifications would be minor and would occur within the maintained, previously disturbed right-of-way. Work would be short-term and through application of the measures provided in the plans and procedures would not significantly affect nearby resources or add to cumulative impacts on resources in the area. Although Adelphia anticipates that the work at these Project facilities would not contribute to cumulative impacts, Adelphia will supplement this cumulative impacts analysis for these Project facilities once records are received from the respective planning commissions and other third-party sources.

Adelphia also conducted a search for larger projects, such as road, railway, electrical transmission, FERC jurisdictional and non-jurisdictional linear pipeline projects, commercial or residential developments, and other major industrial facilities that would be located within the environment that would be affected by the Project (or have the potential to affect the same resources as the Project). The various projects identified during Adelphia's various searches are discussed below.

1.11.1.1 Other Projects

Adelphia reviewed the PADEP's Pennsylvania Pipeline Portal to determine other proposed pipeline projects that may be in proximity to the Project (PADEP, 2017). Sunoco, LP's Mariner East II Project is located to the north of the Project and would terminate in Upper Chichester, Pennsylvania. The Mariner East II Project would be located within the same HUC 10 watershed as the Project. Its nearest point to the Project would be more than one mile from the Tilghman Lateral, where it joins the existing Mariner East I Project. The remaining portions of the Mariner East I Project are located in areas also more than one mile away from the proposed Adelphia Gateway Project. Construction of the Mariner East II Project has started, and it is expected to be complete and in-service by the second quarter of 2018 (Sunoco, 2018). Therefore, construction of the Adelphia Gateway Project and the Mariner East II Project would not occur at the same time.

The PennEast Pipeline has been proposed by the PennEast Pipeline Company, LLC and is a FERC jurisdictional project proposed to transport natural gas from Luzerne County, PA to Mercer County, NJ. The proposed project would cross the existing 18-inch and 20-inch pipelines

and would be located within the HUC 10 watersheds that would also be occupied by the Project facilities. The PennEast Pipeline filed with the FERC in 2015 and the final FERC EIS was issued in April 2017. Construction of the PennEast Pipeline Project and the Adelphia Gateway Project are not expected to occur at the same time.

The Adelphia Gateway Project may be in proximity to the potential Enbridge Greater Philadelphia Expansion Project and might result in cumulative impacts to occur if both of the Projects are constructed. The Greater Philadelphia Expansion Project held an open season from March 25, 2015 to May 8, 2015, but as of December 2017, the project is still in development, and no construction has taken place. The Greater Philadelphia Expansion Project is estimated to be completed in 2019, but because the project has not commenced pre-filing or any other filing with FERC, Adelphia has determined that it is not reasonably foreseeable and has not considered any impact of such project as cumulative with the Project.

The Marcellus to Market Project would be located within Chester County and involves modification at an existing compressor station and two meter stations. The majority of this project is located outside of the HUC 10 watersheds crossed by the proposed Adelphia Gateway Project. However, some of the blowdown assemblies would be located in the same HUC 10 watershed as would a portion (i.e., one of the meter stations) of the Marcellus to Market Project. The target in-service date for this project was cited as November 2017, but the Chester County Planning Commission indicates that the environmental report for the Project is still being prepared. Because the Marcellus to Market Project is limited to modification at existing facilities it is unlikely to add to cumulative impacts in the Project area.

Adelphia reviewed the Pennsylvania Department of Transportation's Road and Bridge Project Construction Mapper to determine any major road construction Projects in proximity to the Project. Adelphia identified one project, the Market St. Over AMTRAK® Bridge Replacement Project, which would occur approximately 0.2 mile away and is planned to be completed by September 2019. The Bridge Replacement Project would replace an existing bridge over existing railroad tracks (PennDOT, 2017). Cumulative impacts would be limited to potential noise and traffic impacts during construction of the Projects.

Adelphia corresponded with county planning commissions and reviewed county planning commission publications and records in order to determine potential land development within proximity to the Project. Adelphia's review identified several proposed land developments within 0.5 mile of the Project, including the Parkway and Tilghman Laterals (and associated meter stations), the Marcus Hook CS and wareyard, and the Quakertown CS and Meter Station. These

were commercial and industrial projects that consisted mainly of the construction and operation of warehouses, office complexes, storage facilities, and manufacturing facilities. Table 1.11-1 provides locational information and project descriptions for the identified proposed land developments. Adelpia is continuing to consult with county and municipal planning commissions regarding the status of proposed developments. All of the proposed land developments along the pipeline laterals are located in areas where the majority of land is already developed as commercial, industrial, or residential.

Table 1.11-1 Proposed Land Development within 0.5 Mile of the Adelpia Gateway Project.				
Development	Location	Nearest Project Site	Distance from Nearest Project Site (miles)	Description
Linde Project	Claymont, DE	Marcus Hook CS	0.3	Replacement of compressor station
KISH Lot 2	Lower Chichester, PA	Tilghman Lateral	0.0	Office and storage area development
Chichester Business Park	Lower Chichester, PA	Tilghman Lateral	0.2	Construct commercial warehouse and office space
PennDOT Amtrak Bridge Project	Marcus Hook, PA	Tilghman Lateral	0.2	Bridge replacement project
ESKE Developers	Trainer, PA	Tilghman Lateral	0.2	Construct warehousing and storage space
Monroe Energy	Trainer, PA	Tilghman Lateral	0.2	Construct cooling tower
Delcora PS-6 Phase II	Chester, PA	Tilghman	0.1	Access drive and equalizer tank.
P&P Property Enterprises LLC	Chester, PA	Tilghman Lateral	0.1	Develop 0.6 acre with home improvement business
Construction Storage	Chester, PA	Tilghman Lateral	0.2	Develop 0.8 acre for construction equipment storage
Evonik Industries	Chester, PA	Tilghman Lateral	0.1	Develop 1.4 acres with 1,800 sq. ft. addition
Health Mats Lot Consolidation	Chester, PA	Tilghman Lateral	0.3	Construct 5-bay garage
<small>Source: New Castle County Land Use Department, 2017; Bucks County Planning Commission, 2017; Lower Chichester Township, 2017; Delaware County Planning Department, 2017</small>				

1.11.2 Potential Cumulative Impacts by Resource

This section addresses the potential cumulative impacts that could result from the

proposed Project and those projects identified in section 1.11.1 that are located within the cumulative impact area defined for each resource.

1.11.2.1 Water Use and Quality

Cumulative impacts in regards to groundwater resources would not be significant, because Adelphia would not withdraw groundwater for use in construction or operation of the Project. Impacts on groundwater would be limited to the potential temporary and minor lowering of groundwater levels due to trench dewatering (if necessary) and minor temporary increases in turbidity following trench excavation (if the groundwater table is intercepted).

The evaluation of potential cumulative impacts on surface waters that would be affected by the Project included consideration of large development projects such as other pipeline or road projects within the HUC 10 watersheds and also smaller projects in proximity to the waterbodies that would be crossed by the Project. The Project would be located within Raccoon Creek-Delaware River, Tohickon Creek – Delaware River, and Upper Delaware River HUC 10 watersheds. The Mariner East II Project, Marcellus to Market Project, and the PennEast Pipeline are the only major projects within a HUC-10 watershed that would also be occupied by the Project. While these projects would be within the same watersheds, they would not cross any waterbodies that would be affected by the Adelphia Gateway Project. The Marcellus to Market Project would be limited to modifications at existing facilities.

Recent or ongoing construction and land development within proximity to the Project could cause a period of time where soils may be exposed for an extended duration as a result of incomplete revegetation. Exposed soils are more likely to erode and could result in increased sedimentation in surface waterbodies. Adelphia would comply with the provisions provided in the FERC Plan and Procedures regarding restoration and revegetation of disturbed areas. Additionally, because one and potentially both Project waterbody crossings would be accomplished by HDD, cumulative impacts to surface waters are not expected to occur.

1.11.2.2 Fish, Wildlife, and Vegetation

Adelphia used the same HUC-10 watershed evaluation area that was used to consider potential cumulative impacts on surface water resources to evaluate cumulative impacts on fisheries (see section 1.11.2.1). As such, cumulative impacts on fisheries would be similar to the surface water resources impacts above; no cumulative impacts on fisheries are expected to occur as a result of the Project.

Projects located within the HUC 10 watersheds that Project would be located in were evaluated for potential cumulative impacts on wildlife and vegetation. As stated above, the only major projects in relative proximity to the Project would be the Mariner East II Project, PennEast Pipeline, and Marcellus to Market Project. The PennEast Pipeline and Mariner East II Projects would require vegetation removal, land grading, and excavation, all of which directly impact vegetation and wildlife resources. However, the impact associated with the construction of the Project would be temporary, and land would be returned to pre-construction conditions following construction. Further, the areas in which these activities would be occurring are well developed industrial and residential areas that contain little to no prime wildlife habitat or vegetative resources. Large portions of the Project would be constructed via HDD and Adelphia would not maintain a permanent right-of-way in these areas limiting impacts on vegetation and habitat. The Project is subject to Section 7 of the Endangered Species Act, and as such, Adelphia has conducted and is continuing to conduct consultations with the U.S. Fish and Wildlife Service (USFWS) regarding any potential impacts on threatened and endangered species. Any potential impacts to listed species would be avoided, minimized, and or mitigated. For these reasons combined cumulative impacts on vegetation and wildlife would be negligible and would not significantly add to cumulative impacts on fish, wildlife, and vegetation within the Project area.

1.11.2.3 Cultural Resources

Adelphia reviewed the potential for cumulative impacts on cultural resources within 0.25 mile of the Project. The PennEast Pipeline would be located within 0.25 mile of the existing 18-inch and 20-inch pipeline. Adelphia is continuing to consult with both State Historic Preservation Offices (SHPO) regarding the Project. Adelphia has followed the SHPOs recommendations regarding surveys and avoidance of cultural resources and would continue to follow the SHPOs recommendations regarding surveys and protection of cultural resources. Since Adelphia would adhere to the SHPO recommendations regarding required investigation and avoidance of cultural resources the Project would not significantly add to cumulative impacts on cultural resources in the area.

1.11.2.4 Socioeconomics

Cumulative impacts on socioeconomics were considered on a county-by-county basis including Delaware, Montgomery, and Bucks counties in Pennsylvania and New Castle County in Delaware. No more than ten long-term employees would be hired to operate the Project, and up to 150 temporary workers who would be employed to construct the Project. Construction of the Mariner East II Project is not expected to overlap with construction of the Project. The PennEast

Pipeline is currently obtaining state permits and awaiting approval from the FERC and is also not expected to overlap with construction of the Project. The other land developments identified are small in nature and are not likely to have significant impact on employment within the Project area. Therefore, the Adelphia Gateway Project would not cause significant cumulative impacts on workforce, local spending and tax income, or available temporary living quarters.

The addition of traffic on local roadways associated with construction personnel commuting to and from the Adelphia Gateway Project construction work areas could also contribute to cumulative regional traffic congestion. However, any contribution by the Project to cumulative traffic impacts are expected to be temporary and short term. If construction on other projects occurs concurrently, the cumulative impact on traffic patterns could lead to congestion in localized areas.

1.11.2.5 Geological and Soil Resources

Adelphia reviewed potential cumulative impacts on geologic resource within a 0.25-mile area of the Project workspaces. As discussed in Resource Report 6 (*Geological Resources*), the majority of impacts would be temporary due to construction of the Project. Adelphia would restore areas disturbed during construction to pre-construction contours to the extent practicable except at aboveground facility locations which would be permanently maintained as industrial facilities. Permanent impacts on topography would occur as result of the permanent aboveground facilities that are part of the Project.

Adelphia reviewed the potential for cumulative soil impacts on soils within 0.25 mile of the Project workspaces. Project impacts to soils could include increased susceptibility to erosion, revegetation issues, disturbance of prime farmlands, and soil compaction due to the movement of heavy equipment (see Resource Report 7 – *Soil Resources*). Adelphia would adhere to the FERC Plan to minimize potential adverse effects on soils due to construction of its Project. Adelphia would also develop and submit for approval to the PADEP site-specific Erosion and Sediment Control Plans prior to the start of construction in order to prevent erosion and sedimentation of soils during construction, conduct topsoil segregation in residential and agricultural areas, and conduct compaction testing and where necessary soil compaction. A large portion of the Project would be constructed via HDD and therefore further minimizing any potential impacts on soils.

The Project's effect on geology and soils would be highly localized and primarily limited to the construction period. Cumulative impacts would only occur if other projects are constructed

during the Adelphia Gateway Project's construction period in a shared location. Given this constraint and when also considering the minimal impacts on soils and geology that would occur as a result of the Adelphia Gateway Project, cumulative impacts on soil and geology resources are expected to be minimal.

1.11.2.6 Land Use, Recreation, and Aesthetics

The area evaluated for land use cumulative impacts included projects and land development located within the HUC 10 watershed where the Project would be located. The Marcellus to Market Project would consist of modifications to existing facilities and would not significantly affect land use within the watershed. However, the PennEast Pipeline and the Mariner East II Projects would have an effect on land use. The remaining land that would be affected by construction of the Project would be restored to preconstruction conditions. When compared to other development within the Project area and the industrial and urban nature of the surrounding area impacts on land use due to the Project would be minimal. The Project has utilized existing industrial facilities to the extent possible to reduce conversion of open land and forest land to industrial use. Additionally, large portion of the Project would be constructed via HDD and therefore further minimizing effects on land use. The Project would not significantly contribute to the cumulative impacts on land use as the majority of the area that would be affected is already developed industrial and residential land located along an existing pipeline corridor, and land development projects in proximity to the Project are all relatively minor and within industrialized areas.

1.11.2.7 Air Quality

Construction-Related Air Emissions

Air emissions would result from the construction of the various Project components (e.g., compressor stations, meters stations, and pipeline laterals). Specifically, the use of heavy equipment that are reliant on diesel-fired engines, increased on-road and off-road vehicle traffic, earthmoving and stockpiling, would all result in air emissions. However, as outlined in section 9.1.5, Adelphia would implement various mitigation measures to minimize construction-related air emissions. Furthermore, any such emissions, as quantified in appendix 9-C, would be short-term and spread among the counties in which the Project would occur. Construction emissions resulting from two of the more significant projects in the area, Mariner East II and PennEast Pipeline, would not be foreseen to overlap with the Adelphia Project construction emissions since 1) Penn East is expected to be operational prior to commencement of Project construction, and

2) the Mariner East II was expected to be operational, however a revised schedule for that project is not known due to ongoing litigation and compliance considerations. As such no cumulative impact from construction emissions resulting the projects would be expected. Furthermore, given the lack of other significant projects in the area with likely impacts on construction-related air emissions, any cumulative air impact in the area would be minimal.

Long-Term (Operational) Air Emissions

Adelphia considered projects located within the counties in which the proposed Marcus Hook CS and Quakertown CS would be located (Delaware and Bucks Counties, Pennsylvania; both of which are part of the Metropolitan Philadelphia Interstate Air Quality Control Region) or within 1.5 miles of the proposed compressor stations for air quality cumulative impact analysis. Adelphia is in the process of expanding this analysis to encompass major sources of air emissions within a 50 kilometer radius around the compressor stations and will provide a supplement once the information has been made available from agency and other records. Any emissions associated with the Project's meter stations would be insignificant and are therefore not expected to affect impacts to air quality. Additionally, operational impacts from the operation of the mainline valve and blowdown assemblies are only expected to occur one time per year, on average, in the event of pre-planned maintenance or emergency situations. As such, these activities are not considered part of the normal operation of the Project and would not be expected to contribute to a cumulative impact to air quality. Table 1.11-2 presents projects identified near the Marcus Hook CS and addresses the potential for cumulative air quality impacts.

Table 1.11-2			
Projects in the Vicinity of the Adelpia Gateway Project with the Potential to Contribute to Cumulative Impacts on Air Quality			
Project	Location	Description	Potential for Cumulative Impacts
Mariner East II Project	Delaware County, PA	Activities in County are limited to a new meter station and pipeline	The Project is located approximately 2 miles from new Mariner East II meter station. At this distance, and given negligible emissions associated with the new meter station, no cumulative impact is expected.
Enbridge Greater Philadelphia Expansion (GPE) Project	Delaware County, PA	Activities in County are limited to pipeline laterals with no new compressor stations	The Project is situated close to the proposed GPE Project's pipeline laterals. However, given that the GPE Project in Delaware County is limited to pipeline laterals (i.e., no compressor stations) there will be negligible, to no cumulative impact.
Linde Project	Claymont, New Castle County, DE	Replacement of existing air separation unit with a new, more efficient air separation unit. Electricity is provided from the Pennsylvania-New Jersey-Maryland Interconnection, now known as the PJM Interconnection LLC, and there are no new emissions or changes to existing air emissions indicated.	The Project is located 0.4 mile from the Linde, LLC Project. However, because there are no changes in air emissions associated with the Linde, LLC Project, no cumulative impact is anticipated. Any impact to air quality resulting from existing air emissions from the Linde Project would be accounted for in observed ambient background concentrations.

Sunoco, multiple projects	Marcus Hook, Delaware County, PA	Multiple projects have been authorized via PADEP Plan Approvals over the past three years. Most recently this includes installation of cryogenic propane and ethane storage and offloading facilities.	Emissions increases from these and other recent projects at Sunoco have primarily been limited to VOCs, which are treated as a precursor to ozone. Ozone is a regional scale pollutant and tends to form downwind of the sources of precursor emissions. All recent Sunoco Partners projects have required minor source permitting without triggering a New Source Review. Given the magnitude of emissions from the Sunoco projects and the proposed Marcus Hook CS, cumulative air impacts are expected to be minimal.
Agilyx Corporation Project	Marcus Hook, Delaware County, PA	Installation of a new plastic-to-oil manufacturing facility	The Project would be located 1.3 miles from the Agilyx Corporation Project. The Agilyx Site is a natural minor facility with respect to air permitting authorization for construction and operation. Given this classification, cumulative air impacts are not anticipated.
Sources: Sunoco Pipeline, L.P., 2017; Spectra Energy, 2017; Linde, LLC, 2017; Energy Transfer, 2017; PA Bulletin, 47 Pa.B. 223, 2017; PA Bulletin, 46 Pa.B. 1909, 2016; PA Bulletin, 45 Pa.B. 7299, 2015; PA Bulletin, 45 Pa.B. 7178, 2015			

No new projects were identified within 1.5 miles of the proposed Quakertown CS, and there are no existing industrial sources of air emissions in proximity of the Compressor Station. The closest projects identified are Cleveland Steel's application for a new printing press via an Air Quality General Permit, which would be 2.8 miles away; (PA Bulletin, 46 Pa. B 763, Feb. 13, 2016); Naceville Materials' proposed installation of diesel fired engines and a portable non-metallic mineral processing plant via Air Quality General Permits, which would be 3.7 miles away (PA Bulletin, 46 Pa. B 467, June. 17, 2017); and a new animal crematorium, Abby Glen Pet Memorial, authorized via an Air Quality General Permit, which would be 3.7 miles away (PA Bulletin, 47 Pa. B 3375, June. 17, 2017). Model-estimated maximum ground level concentrations resulting from operation of the Quakertown CS (see Resource Report 9) are predicted to occur at the source boundary line. Given the distances from these projects to the Quakertown CS (and its boundary line) and considering that all projects, including the Quakertown CS, are minor, no air quality cumulative impact is anticipated.

1.11.2.8 Climate Change

Climate change is the adjustment of climate over time, whether due to natural variability or as a result of human activity. Climate change cannot be represented by single annual events or individual anomalies. The Intergovernmental Panel on Climate Change is the leading international, multi-governmental scientific body for the assessment of climate change. The United States is a member of the Intergovernmental Panel on Climate Change and participates in working groups to develop reports. The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (“USGCRP”). The Intergovernmental Panel on Climate Change and USGCRP have recognized the following:

- globally, greenhouse gases (GHG) have been accumulating in the atmosphere since the beginning of the industrial era (circa 1750);
- combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture and clearing of forests, is primarily responsible for the accumulation of GHG;
- anthropogenic GHG emissions are the primary contributing factor to climate change; and
- impacts extend beyond atmospheric climate change alone and include changes to water resources, transportation, agriculture, ecosystems, and human health.

In May 2014, the USGCRP issued a report, *Climate Change Impacts in the United States*, summarizing the impacts that climate change has already had on the United States and what projected impacts climate change may have in the future (USGCRP 2014). The report includes a breakdown of overall impacts by resource and impacts described for various geographic regions of the country. The USGCRP and other international bodies have recognized that climate change is currently happening. The United States and the world are warming, global sea level is rising, and some types of extreme weather events are becoming more frequent and more severe. These changes have already resulted in a wide range of impacts across every region of the country. Impacts extend beyond atmospheric changes alone and affect water resources, transportation, agriculture, ecosystems, and human health. These changes are thought to be driven primarily by the accumulation of GHG in the atmosphere from the combustion of fossil fuels.

The USGCRP’s report notes the following observations of environmental impacts that may be attributed to climate change in the Northeast region:

- average temperatures have risen about 2°F between 1895 and 2011 and are projected to increase another 1 to 8°F over the next several decades with more frequent days above 90°F;

- areas that currently experience ozone pollution problems are projected to experience an increase in the number of days that fail to meet the federal air quality standards;
- an increase in health risks and costs for vulnerable populations due to projected additional heat stress and poor air quality;
- precipitation has increased by about 5 inches and winter precipitation is projected to increase 5 to 20 percent by the end of the century;
- extreme/heavy precipitation events have increased more than 70 percent between 1958 and 2010 and are projected to continue to increase;
- sea levels have risen about 1 foot since 1900 and are projected to continue increasing 1 to 4 feet by 2100 stressing infrastructure (e.g. communications, energy, transportation, water and wastewater);
- severe flooding due to sea-level rise and heavy downpours is likely to occur more frequently;
- crop damage from intense precipitation events, delays in crop plantings and harvest, and heat stress negatively affect crop yields;
- invasive weeds are projected to become more aggressive due to their benefit of higher CO2 levels;
- a change in range, elevation, and intra-annual life cycle events of vegetation and wildlife species; and
- an increase in carrier habitat and human exposure to vector-borne diseases (e.g. Lyme disease or West Nile).

As discussed in Resource Report 9, construction of the Project is expected to contribute about 13,000 tons of GHG to the atmosphere over the one-year construction period. Operation of the Project is estimated to contribute about 63,000 tons per year of GHG to the atmosphere. The emissions are small in comparison; for example, in 2016, United States GHG emissions were estimated to be 3,285 million tons per year. Note that these comparisons provide a frame of reference for the general magnitude of GHG emissions, and are not an indicator of significance.

The Project purpose is to provide customers in the greater Philadelphia region with a needed, new source of clean, safe, low-cost supply of natural gas. The Project would involve the installation of two new compressor stations along an existing pipeline. Each new compressor station would consist of 5,625 HP of compression. The resulting new compression would allow for transport of an additional 250,000 dekatherms per day of natural gas along the pipeline system. The Southern Segment of the pipeline, which is being converted to natural gas service, would be where additional end use occurs as no additional natural gas would be projected for the Northern Segment. The new natural gas would be transported to the downstream interstate

natural gas pipeline grid; however, there are no specifically identified end users or customers. Due to this unknown, it is not reasonable to foresee how or where the natural gas will be used. Nonetheless, for this analysis, Adelphia has assumed that all of the incremental increase in volumes of natural gas transported by the Project would be combusted for use as a fuel source. This presents a worst-case potential impact of this Project from a GHG emissions quantity perspective, which is conservative because the approach does not account for any emissions offsetting where end-users would be burning natural gas in lieu of some other higher emissions intensity fuel, such as fuel oil or coal. The results of this analysis are shown in the following table.

Greenhouse Emissions Source	CO₂e Emissions (metric tons/yr)^a	Indirect Impact of Project (%)
Project Downstream Use	4,861,766	--
PA Total in 2016 ^b	120,000,000	4.0
U.S. Total in 2016	2,990,000,000	0.2
PA = Pennsylvania ^a Emissions calculated in accordance with procedures and emission factors in 40 CFR 98 Subpart C, Tables C-1 and C-2. CO ₂ e is the carbon dioxide equivalent based on a summation of CO ₂ , CH ₄ , and N ₂ O emissions, using the Global Warming Potential (GWP) factors from 40 CFR 98. ^b Emissions were compared to reported values in Pennsylvania (assumed all additional natural gas was combusted in Pennsylvania). However it is possible that certain portions of the additional natural gas could be combusted in other nearby states (e.g., Delaware).		

Emissions of GHGs from the construction and operation of the Project would not have any direct impacts on the environment in the Project area. Currently, there is no standard methodology to correlate specific amounts of GHG emissions to discrete changes in average temperature rise, annual precipitation changes, surface water temperature changes, or other physical effects on the environment in the Project area or on the global environment. The GHG emissions from the construction and operation of the Project would be negligible compared to the global GHG emission inventory.

The Interagency Working Group on Social Cost of Greenhouse Gases developed a tool to estimate the social cost of carbon. This tool attempts to quantify the comprehensive costs associated with a project's carbon dioxide emissions and provides monetized values for addressing climate change impacts on a global level. However, FERC has previously evaluated this tool and determined that it is not appropriate for use in any project-level NEPA review for the following reasons: (1) the U.S. EPA states that "no consensus exists on the appropriate [discount]

rate to use for analyses spanning multiple generations” and consequently, significant variation in output can result; (2) the tool does not measure the actual incremental impacts of a project on the environment; and (3) there are no established criteria identifying the monetized values that are to be considered significant for NEPA reviews. While the social cost of carbon tool may be useful for rulemakings or comparing regulatory alternatives using cost-benefit analyses where the same discount rate is consistently applied; it is not appropriate for estimating a specific project’s impacts under NEPA. Given this inappropriateness, no further consideration of the tool was given to the Adelpia Gateway Project.

1.11.2.9 Noise Quality

The cumulative impact area for noise is 0.5 mile from facilities that are the primary sources of operation noise associated with the proposed Project. The Project’s operational noise would be driven primarily by the installation of compressor engines at the Quakertown CS and Marcus Hook CS. As discussed in Resource Report 9, the noise attributable to the Quakertown CS and Marcus Hook CS is lower than the FERC and local sound level requirements. There are no known future projects within 0.5 mile of the Quakertown CS, and existing sound levels are primarily driven by natural sources (e.g., wildlife and wind gusts) or intermittent local sources (roadway traffic), which can be excluded as they are likely to be distinct, clearly measurable events. Intermittent local sources, such as the passage of a diesel tractor trailer, could be excluded from existing sound level measurements. Based on this reasoning and as outlined in Resource Report 9, cumulative impacts on noise quality are anticipated to be negligible in the vicinity of Quakertown CS.

Multiple existing, industrial noise sources were identified within 0.5 mile of the Marcus Hook CS, including the Braskem America and Sunoco’s Marcus Hook Refinery Project (commissioning of its new cryogenic propane and ethane storage and off-loading facility), and the Linde Project (see table 1.11-2). In addition to these sources, it is anticipated that existing roadway traffic would also contribute to existing sound levels. The Linde Project involves the replacement of an existing air separation unit with a new and more efficient air separation unit; therefore, any increase in noise resulting from the Linde Project should be minimized. Due to the number of industrial noise sources located in proximity to the proposed Marcus Hook CS there is potential for cumulative impacts to occur on noise quality. However, Adelpia has provided a noise quality analysis in Resource Report 9 that demonstrates compliance with the applicable sound level standards and/or demonstrates the Project’s insignificant contribution to noise quality.

1.12 POST FILING REVIEW

To facilitate public review and input, Adelphia will place a copy of this Application in the following libraries:

- J Lewis Crozer Library
620 Engle St.
Chester, PA

- Paoli Library
18 Darby Rd.
Paoli, PA

- Hellertown Area Library
Central Library
409 Constitution Ave.
Hellertown, PA

1.13 REFERENCES

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January 11, 2018

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

Re: Adelphia Gateway, LLC
Docket No. CP18-___-000

Abbreviated Application of Adelphia Gateway, LLC for Certificates of Public Convenience and Necessity Authorizing Acquisition, Construction, and Operation of Certain Pipeline Facilities and for Related Authorizations

Dear Ms. Bose:

Pursuant to Section 7(c) of the Natural Gas Act, as amended (“NGA”), 15 U.S.C. § 717f(c), and Parts 157 and 284 of the Federal Energy Regulatory Commission’s (“Commission” or “FERC”) regulations, 18 C.F.R. Parts 157 and 284, Adelphia Gateway, LLC (“Adelphia”) hereby files this application for the following certificates and related authorizations and waivers (“Application”):

- 1) a certificate of public convenience and necessity pursuant to Part 157, Subpart A of the Commission’s regulations, authorizing Adelphia (i) to acquire, own, and operate an existing pipeline system and related facilities in Pennsylvania that are currently owned and operated in non-FERC-jurisdictional service by Interstate Energy Company LLC (“IEC”), with a portion of the pipeline system previously used solely for oil transportation and the remaining portion of the system used for oil transportation service or natural gas transportation service; (ii) to operate such acquired pipeline facilities in interstate service as a natural gas company as defined in Section 717a of the NGA; (iii) to construct, own, and operate certain proposed compression facilities and pipeline facilities in Pennsylvania and Delaware; and (iv) to construct, install, own, and operate certain other appurtenant facilities;
- 2) a blanket certificate pursuant to Part 157, Subpart F of the Commission’s regulations, authorizing Adelphia to construct, operate, acquire and abandon certain facilities as described in Part 157, Subpart F;
- 3) a blanket certificate pursuant to Part 284, Subpart G of the Commission’s regulations authorizing Adelphia to provide open-access firm and interruptible interstate natural

Ms. Kimberly D. Bose, Secretary
 January 11, 2018
 Page 2

gas transportation services on a self-implementing basis with pre-granted abandonment for such services;

- 4) approval of Adelphia's *pro forma* FERC Gas Tariff;
- 5) approval of non-conforming provisions in firm transportation service agreements with Lower Mount Bethel Energy, LLC and Martins Creek, LLC, as existing firm shippers with long-term legacy capacity commitments on IEC's existing facilities; and
- 6) such other authorizations and waivers as may be necessary from the Commission to allow Adelphia to undertake the activities described in this Application.

Adelphia requests that the Commission issue an order granting the authorizations and waivers requested herein by August 1, 2018.

Included herewith are four volumes. Volume I contains public information and is comprised of the Application and its public exhibits, except the public version of Exhibit F-I (Environmental Report). Volume II-A contains the public version of Exhibit F-I. Volume II-B contains the public maps and drawings of Exhibit F-I. Volume III contains privileged and confidential information and is comprised of Exhibit F-I, Appendix 1E (Project Landowner List), and Appendix 1D-2 (certain portions of Agency Correspondence), Appendix 04A (Cultural Resource Survey Report), and Appendix 1A (only Existing System alignment sheets); Exhibit I (confidential market information); and Exhibit R (Acquisition Contract). Volume IV contains Critical Energy Infrastructure Information ("CEII") and is comprised of Exhibits G through G-II (Flow Diagrams and Flow Diagram Data).

The privileged information included in Volume III is marked "**CONTAINS PRIVILEGED INFORMATION—DO NOT RELEASE**" and "**CUI//PRIV.**"¹ Privileged information should be treated as confidential and is for use by Commission Staff only and not to be released to the public. The CEII information is included in Volume IV and marked "**CONTAINS CRITICAL ENERGY INFRASTRUCTURE INFORMATION—DO NOT RELEASE**" and "**CUI//CEII.**"² Adelphia requests the CEII information filed herewith be designated as CEII for five (5) years, subject to further re-designation by the CEII Coordinator. Information that is CEII should be treated as confidential pursuant to Order No. 630, *et seq.* and is for use by the Commission Staff only and not to be released to the public.³ Questions pertaining to confidential information may be submitted to:

¹ 18 C.F.R. §§ 380.12, 388.112 (2017); *Filing of Privileged Materials and Answers to Motions*, 141 FERC ¶ 61,049 (Oct. 18, 2012).

² 18 C.F.R. § 388.113 (2017); Federal Energy Regulatory Commission Guidelines for Filing Critical Energy/Electric Infrastructure Information (CEII) (Feb. 21, 2017).

³ *Critical Energy Infrastructure Information*, Order No. 630, FERC Stats. & Regs. Regulations Preambles ¶ 31,140 (2003), 68 Fed. Reg. 9857 (Mar. 3, 2003), *order on reh'g*, Order No. 630-A, 104 FERC ¶ 61,106 (2003), 68 Fed. Reg. 46456 (Aug. 6, 2003).

Ms. Kimberly D. Bose, Secretary
January 11, 2018
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William P. Scharfenberg
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Adelphia Gateway, LLC
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Phone: (732) 938-1134
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Pursuant to the Commission's guidelines for eFiling,⁴ Adelphia is hereby eFiling the Application and will provide two complete copies of the Application to OEP Room 62-46 and one complete copy to OGC-EP Room 101-66.

In accordance with Rule 2011(c)(5) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.2011(c)(5), I hereby state that I have read the paper copy version of the filing and am familiar with the contents thereof; that the paper copies contain the same information as the electronic documents; and that all of the statements contained therein are true and correct, to the best of my knowledge, information and belief.

Should you have any questions concerning this request, please contact me at (732) 938-1169.

Sincerely,

/s/ Mark F. Valori
Mark F. Valori
Vice President
Adelphia Gateway, LLC

Attachments

cc: Terry Turpin (FERC) (Application Text only)
John Wood (FERC) (Application Text only)
Rich McGuire (FERC) (Application Text only)
Pamela Boudreau (FERC) (Application Text only)
Shannon Jones (FERC) (Application Text only)
Rich Foley (FERC) (Application Text only)
Jim Martin (FERC) (Application Text only)

⁴ Federal Energy Regulatory Commission Filing Guide/Qualified Documents List (Feb. 14, 2017).

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Adelphia Gateway, LLC

)
)
)

Docket No. CP18-____-000

**ABBREVIATED APPLICATION OF ADELPHIA GATEWAY, LLC
FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY
AUTHORIZING ACQUISITION, CONSTRUCTION, AND OPERATION OF CERTAIN
PIPELINE FACILITIES AND FOR RELATED AUTHORIZATIONS**

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Adelphia Gateway, LLC)
) Docket No. CP18-____-000
)

**ABBREVIATED APPLICATION OF ADELPHIA GATEWAY, LLC
FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY
AUTHORIZING ACQUISITION, CONSTRUCTION, AND OPERATION OF
CERTAIN PIPELINE FACILITIES AND FOR RELATED AUTHORIZATIONS**

Pursuant to Section 7(c) of the Natural Gas Act, as amended (“NGA”), 15 U.S.C. § 717f(c), and Parts 157 and 284 of the Federal Energy Regulatory Commission’s (“Commission” or “FERC”) regulations,¹ Adelphia Gateway, LLC (“Adelphia”) hereby files this application for the following certificates and related authorizations and waivers (“Application”):

- 1) a certificate of public convenience and necessity pursuant to Part 157, Subpart A of the Commission’s regulations, authorizing Adelphia (i) to acquire, own, and operate an existing pipeline system and related facilities in Pennsylvania that are currently owned and operated in non-NGA-jurisdictional service by Interstate Energy Company LLC (“IEC”), with a portion of the pipeline system previously used solely for oil transportation and the remaining portion of the system used for oil transportation service or natural gas transportation service; (ii) to operate such acquired pipeline facilities in interstate service as a natural gas company as defined in Section

¹ 18 C.F.R. Parts 157 and 284 (2017).

- 717a of the NGA; (iii) to construct, own, and operate certain proposed compression facilities and additional pipeline facilities in Pennsylvania and Delaware; and (iv) to construct, install, own, and operate certain other appurtenant facilities (“Adelphia Gateway Pipeline” or “Project”);
- 2) a blanket certificate pursuant to Part 157, Subpart F of the Commission’s regulations, authorizing Adelphia to construct, operate, acquire and abandon certain facilities as described in Part 157, Subpart F;
 - 3) a blanket certificate pursuant to Part 284, Subpart G of the Commission’s regulations authorizing Adelphia to provide open-access firm and interruptible interstate natural gas transportation services on a self-implementing basis with pre-granted abandonment authority for such services;
 - 4) approval of the *pro forma* FERC Gas Tariff (“Tariff”) attached to this Application as part of Exhibit P;
 - 5) approval of non-conforming provisions in firm service agreements with existing shippers on the IEC system in light of their long-term legacy capacity commitments on IEC’s existing facilities; and
 - 6) such other authorizations and waivers as may be necessary from the Commission to allow Adelphia to undertake the activities described in this Application.

Adelphia respectfully requests that the Commission issue these authorizations and waivers by August 1, 2018, so that Adelphia will be able to close the acquisition of IEC’s facilities at that time and immediately thereafter commence operating the Zone North

capacity in FERC jurisdictional interstate commerce and to commence construction of the compression facilities and pipeline facilities proposed herein to enable service to commence on the Zone South capacity as further described herein by April 1, 2019.

In support hereof, and pursuant to the Commission's regulations, Adelphia respectfully submits the following:

I. EXECUTIVE SUMMARY

Adelphia is a new company created for the purpose of providing open-access interstate natural gas transportation services. Adelphia proposes to acquire, construct, own, and operate certain facilities, some of which are currently owned and operated in either oil-only service or in dual-phase oil or natural gas service, and in all cases, non-FERC jurisdictional service by IEC. These facilities include (i) an approximately 84-mile, 18-inch-diameter mainline (the "18-inch Mainline," as described in Section IV, below), (ii) an approximately 4.4-mile, 20-inch-diameter mainline (the "20-inch Mainline," as described in Section IV, below), and (iii) various appurtenant and auxiliary facilities (collectively, the "Existing System"). The remainder of the facilities proposed for interstate service include two new compressor stations, lateral pipeline facilities, and meter and regulator ("M&R") facilities, and various appurtenant facilities along the Existing System (collectively, the "New Facilities"). Together, the Existing System and New Facilities will comprise the Adelphia Gateway Pipeline.

The Pennsylvania Public Utility Commission ("PUC") previously granted to IEC a certificate of public convenience and necessity pursuant to state law for use of the Existing System in oil and gas transportation service within the Commonwealth of Pennsylvania. For the transportation of gas, these facilities are currently operating as a Hinshaw pipeline,

exempt from the Commission's jurisdiction pursuant to Section 1(c) of the NGA. Adelphia proposes herein to acquire the Existing System, to terminate the current PUC-jurisdictional oil transportation service provided on the 18-inch Mainline and gas transportation service provided on the 18-inch Mainline and 20-inch Mainline, to construct the New Facilities, and to solely provide open-access interstate natural gas transportation service on the Adelphia Gateway Pipeline. Adelphia will operate the Adelphia Gateway Pipeline as an interstate natural gas pipeline subject to the NGA jurisdiction of the FERC. Certain auxiliary facilities that are currently used to allow for oil transportation service will no longer be needed when the facilities solely provide interstate natural gas transportation service and have been disconnected by IEC, including removal of equipment for oil heating, check valves, and pump stations.

The Adelphia Gateway Pipeline is proposed to consist of three zones: (1) "Zone North A" consisting of approximately 34.5 miles of the 18-inch Mainline, extending north from an existing interconnection with Texas Eastern Transmission, LP ("Texas Eastern") in Bucks County, Pennsylvania, to the Martins Creek Terminal in Lower Mount Bethel Township, Northampton County, Pennsylvania;² (2) "Zone North B" consisting of the 20-inch Mainline and extending north from the interconnection with Transcontinental Gas Pipe Line Company, LLC ("Transco") in Northampton County, Pennsylvania, to the Martins Creek Terminal (the Zone North A facilities and the Zone North B facilities are

² IEC has operated the Zone North A facilities to transport either oil or natural gas to the Martins Creek Terminal. Note also that the gas facilities located at Martins Creek Terminal that Adelphia is acquiring as part of the Existing Facilities are sometimes referred to in this Application and in the Resource Reports as the "Martins Creek Station" when necessary to distinguish the gas facilities from the remaining oil and other facilities located at Martins Creek Terminal that Adelphia is not acquiring.

collectively referred to herein as “Zone North”);³ and (3) “Zone South” consisting of approximately 50 miles of the 18-inch Mainline extending south from a new interconnection (adjacent to the existing interconnection) with Texas Eastern in Bucks County, Pennsylvania, to Marcus Hook, Pennsylvania,⁴ and two new 16-inch-diameter laterals approximately 4.4 miles and 0.25 mile in length, respectively, extending from the planned Marcus Hook Compressor Station to interconnections in Chester, Delaware County, Pennsylvania and Claymont, New Castle County, Delaware.

The Adelpia Gateway Pipeline is designed to provide approximately 175,000 dekatherms of natural gas per day (“Dth/d”) of capacity on Zone North A, 350,000 Dth/d of capacity on Zone North B, and 250,000 Dth/d on Zone South, giving shippers access to diverse and abundant natural gas supplies through existing interconnects with three interstate pipelines and access to demand centers and end-users near the greater Philadelphia area and the Marcus Hook Industrial Complex.⁵ Pursuant to new firm service agreements for which Adelpia is seeking Commission approval herein as non-conforming agreements, the Adelpia Gateway Pipeline will continue to serve Lower Mount Bethel Energy, LLC and Martins Creek, LLC with firm transportation service (the “Existing Shippers”).⁶ Through these contracts with the Existing Shippers, the Adelpia Gateway Pipeline will continue to provide service to the two power plants that are currently served by the Existing System.

³ IEC has operated the Zone North B facilities to transport natural gas from the Transco interconnect to the Martins Creek Terminal.

⁴ IEC has operated the Zone South facilities to transport oil only.

⁵ The Marcus Hook Industrial Complex, located on the Delaware River, is a state-of-the-art terminalling and natural gas liquids storage facility.

⁶ Each of the Existing Shippers is an indirect, wholly owned subsidiary of Talen Energy Corporation (“Talen Energy”).

In addition to maintaining service to the Existing Shippers to provide supplies to the existing power plants, the Adelphia Gateway Pipeline is well-positioned to expand service to natural gas consumers in Pennsylvania and to consumers in the growing markets in the Northeast. As described below in Section III, Zone North A and Zone North B consist entirely of the Existing System and are fully subscribed by the Existing Shippers for service to the two existing power plants. Upon completing the facilities proposed for Zone South, the Zone South facilities will have capacity of approximately 250,000 Dth/d, with 100,000 Dth/d subscribed pursuant to a precedent agreement for long-term firm capacity on the Project. In addition, Adelphia held an open season between November 2, 2017, and December 8, 2017, as discussed below. The open season resulted in bids for more than twice the capacity of Zone South, and Adelphia is currently negotiating precedent agreements with bidders from the open season. If any unsubscribed capacity remains when the Zone South facilities are placed into service, the capacity will be available pursuant to the provisions of Adelphia's proposed FERC Gas Tariff.

Adelphia requests a certificate of public convenience and necessity pursuant to Section 7(c) of the NGA to acquire the Existing System and operate such facilities as an open-access transporter under the Commission's NGA jurisdiction and to construct, own, and operate the New Facilities, all as more fully described herein. Adelphia is a new company that has not previously provided service in interstate commerce. Therefore, in this proceeding, Adelphia also requests an open-access blanket certificate under Part 284, Subpart G of the Commission's regulations. In addition, Adelphia requests a blanket construction certificate under Part 157, Subpart F of the Commission's regulations. Pursuant to Sections 284.221(c) and 157.204(d)(2) of the Commission's regulations,

Adelphia will comply with the conditions of Part 284, Subpart A of the Commission's regulations and the terms, conditions and procedures specified in Part 157, Subpart F of the Commission's regulations.

Further, Adelphia is seeking approval of its *pro forma* Tariff included in Exhibit P hereto. Adelphia's Tariff proposes to use zone-gate rates for each of the three zones, Zone South, Zone North A and Zone North B, for its initial recourse rates for firm transportation. The rates and facilities are proposed to be placed into service in two phases. The first phase of rates and service will become effective immediately upon closing of the acquisition of the Existing System, which is expected to occur shortly after a Commission order in this proceeding. The rates that will become effective at that time are for Zone North A and Zone North B. The proposed initial reservation rates for Zone North A and Zone North B are \$0.1422 per Dth/d and \$0.0071 per Dth/d, respectively, with usage rates of \$0.0042 per Dth in each zone. The one-part usage rate for interruptible transportation service in these zones pursuant to Rate Schedule ITS will equal \$0.1464 per Dth for Zone North A and \$0.0113 for Zone North B (each the 100 percent load factor equivalent of the Rate Schedule FTS reservation and usage rates).

Following the conversion described herein on the Zone South facilities, Adelphia proposes to place those facilities into service with rates applicable to service in that zone only. Adelphia proposes that the effective date for the Zone South rates will be delayed until the Zone South facilities are converted and all new facilities in Zone South, including the compressor stations and pipeline facilities proposed herein, are placed into service.

Upon completion of these facilities, the Zone South facilities will be placed into service, with an initial reservation rate of \$0.5752 per Dth/d of Maximum Daily Quantity

(“MDQ”) and a Zone South usage rate of \$0.0042 per Dth delivered for Rate Schedule FTS with a one-part usage rate for interruptible transportation service pursuant to Rate Schedule ITS that is equal to \$0.5794, the 100 percent load factor equivalent of the Rate Schedule FTS reservation and usage rates. Adelphia has estimated its cost of service in accordance with recognized cost-of-service ratemaking principles calculated as shown in Schedule 1 attached hereto in Exhibit P. Consistent with Commission policy, Adelphia will also offer interruptible parking and lending service.

A detailed description of the New Facilities is included in Resource Report No. 1 to the Environmental Report, included herewith as Exhibit F-I. The Environmental Report demonstrates that the Project will result in minimal environmental impacts as the majority of the Project facilities are already existing and the New Facilities Adelphia proposes to construct are limited and have been designed to mitigate environmental impacts. The Environmental Report also demonstrates that the Project has been designed using all necessary equipment to satisfy applicable safety and security requirements.

In light of the limited construction necessary to complete the Project and the fact that the majority of the Project facilities are already existing, impacts to landowners and communities will be limited. In addition, the need to acquire new easements for the Project is limited. Adelphia intends to enter into voluntary easements with landowners and to use eminent domain only if necessary after significant efforts to reach agreement.

As demonstrated herein, the Adelphia Gateway Pipeline is required by the public convenience and necessity and satisfies the criteria set forth in the Commission’s Certificate Policy Statement. Adelphia respectfully requests the authorizations proposed herein by August 1, 2018.

II. IDENTITY OF APPLICANT AND COMMUNICATION

The exact legal name of Adelphia is Adelphia Gateway, LLC. Adelphia is a Delaware limited liability company with its primary place of business located at 1415 Wyckoff Road, Wall, New Jersey, 07719. Adelphia is wholly owned by NJR Pipeline Company, a subsidiary of New Jersey Resources Corporation. Adelphia is authorized to conduct business in Delaware and as a foreign limited liability company in the Commonwealth of Pennsylvania in order to own and operate natural gas transmission facilities and engage in open-access transportation services.⁷ Upon acceptance of the certificate of public convenience and necessity sought in this Application and the commencement of service authorized thereunder, Adelphia will be a natural gas company subject to the Commission's jurisdiction.

The persons to whom correspondence and communications concerning this Application should be directed and upon whom service is to be made are as follows:⁸

⁷ Adelphia's state authorizations for Delaware and Pennsylvania are included as Exhibit B.

⁸ Adelphia respectfully requests that the Commission waive Rule 203(b)(3), 18 C.F.R. § 385.203(b)(3), in order to allow each of the designated representatives to be included on the official service list.

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III. PROJECT NEED

The Project is designed to meet the growing demand for natural gas by the electric generation, distribution and end-use markets in Pennsylvania and in the northeastern United States. For decades, the Existing System has been transporting oil and natural gas to an approximately 555 megawatt combined-cycle plant and an approximately 1,708 megawatt conventional steam boiler plant, both of which generate electricity for the region. The Project will continue to provide natural gas to these plants using the previously dual-phase (oil and natural gas) Zone North A facilities and the Zone North B facilities, while offering natural gas service using the previously oil-only Zone South facilities into markets near Philadelphia and surrounding areas that need additional natural gas for end-use consumption.

Through existing interconnects with three interstate pipelines, shippers will be able to transport diverse and abundant natural gas supplies to demand centers and end-users in

the greater Philadelphia area. The Project will thereby enable Adelpia to put underutilized intrastate oil pipeline facilities in Zone South to use by converting the facilities to first-time gas service and transforming all of the Existing System into interstate service capable of moving gas supply into markets with gas demand. At the same time, the Project will strengthen the reliability of the interconnecting pipelines and the region's natural gas infrastructure as a whole by providing additional interconnections.

In addition to these benefits, continuing to provide the Existing Shippers with firm transportation is critical to the ability of these power plants to reliably and efficiently supply energy, capacity, and ancillary services into the wholesale markets operated by PJM Interconnection, L.L.C. The Commission has consistently recognized the importance of fuel security to maintaining regional reliability and has taken steps to help ensure that natural gas-fired generators are able to procure the transportation necessary to support their participation in wholesale electric markets.⁹

Adelpia also conducted an open season between November 2, 2017, and December 8, 2017, for the new natural gas transmission capacity in Zone South. The open season materials, attached in Exhibit Z-3 hereto, stated that bidders will be deemed Foundation Shippers by submitting a conforming bid during the open season agreeing to a minimum initial MDQ of 100,000 Dth/d for a minimum initial term of fifteen (15) years for service in Zone South and will be deemed Anchor Shippers by submitting a conforming bid during the Open Season agreeing to a minimum initial MDQ of 75,000 Dth/d for a minimum initial term of ten (10) years for service in Zone South. Adelpia is currently

⁹ See, e.g., *Coordination of the Scheduling Processes of Interstate Natural Gas Pipelines and Public Utilities*, Order No. 809, FERC Stats. & Regs. ¶ 31,368 (2015) (modifying FERC regulations to better coordinate the scheduling of wholesale natural gas and electricity markets to take into account the increasing role of natural gas-fired generation in preserving regional reliability).

negotiating precedent agreements with bidders from the open season. Adelphia received bids for more than twice the capacity of the Zone South facilities. Adelphia will offer any additional available capacity in a not unduly discriminatory manner until the Adelphia Gateway Pipeline is placed into FERC-jurisdictional service, at which point Adelphia will continue to offer any available capacity pursuant to the terms of its Tariff. Firm transportation will be offered under Rate Schedule FTS and interruptible services will be offered under Rate Schedule ITS and Rate Schedule PALS. In sum, the Project will serve both new and existing markets by moving clean-burning natural gas from diverse supply sources connected to the interconnecting interstate pipelines into markets with demand, while continuing to transport gas to two power plants currently served by the Existing System in Zone North.

IV. DESCRIPTION OF FACILITIES

The Adelphia Gateway Pipeline will include the following facilities:

- The existing approximately 84-mile, 18-inch Mainline extending from Marcus Hook to the Martins Creek Terminal in Lower Mount Bethel Township;
- The existing approximately 4.5-mile, 20-inch Mainline extending from Northampton County to the Martins Creek Terminal;
- Two new 5,625 horsepower (“hp”) compression facilities, the Marcus Hook Compressor Station and the Quakertown Compression Station;
- A new 16-inch-diameter lateral pipeline extending approximately 4.5 miles from the Marcus Hook Compressor Station and terminating at an interconnection with Texas Eastern and the Philadelphia Electric Company (“PECO”) in Chester, Delaware County, Pennsylvania (“Tilghman Lateral”); ;
- A new, 16-inch-diameter lateral pipeline extending approximately 0.25 mile from the Marcus Hook Compressor Station and terminating at the existing meter station owned by Delmarva Power & Light Company (“Delmarva”) in Claymont, New Castle County, Delaware (such station the “Delmarva Station” and the lateral pipeline the “Parkway Lateral”);

- A total of twelve M&R facilities, including four existing stations and eight new stations:
 - the existing Quakertown M&R Station connecting to Texas Eastern approximately at milepost (MP) 50 on the 18-inch Mainline;
 - the existing Columbia Gas Transmission, LLC (“TCO”) Meter Station approximately located at MP 66 on the 18-inch Mainline;
 - the existing Transco M&R station located in Easton Township, Northampton County, Pennsylvania on the 20-inch Mainline;
 - the existing Martins Creek Station, located at the terminus of both the 18-inch Mainline and the 20-inch Mainline and connected to two power generation stations served by the Project;
 - a new meter station, called the Skippack Meter Station in Skippack, Montgomery County, Pennsylvania, that would serve as a new delivery interconnect to an existing PECO pipeline;
 - a new M&R facility at the existing Quakertown M&R Station in Bucks County, Pennsylvania, that will interconnect the 18-inch Mainline with Texas Eastern;
 - M&R facilities for three new delivery interconnects to the Parkway Lateral, located on the property of the existing Delmarva Station, including interconnections with Texas Eastern (TETCO Meter Station), TCO (TCO Meter Station), and Delmarva (Delmarva Meter Station);
 - M&R facilities for three new delivery interconnects along the Tilghman Lateral, including an interconnection with Transco near MP 0.3 on the Tilghman Lateral (Transco Meter Station), an interconnection with the Monroe Refinery near MP 2.7 on the lateral (Monroe Meter Station), and an interconnection with PECO at the terminus of the lateral (PECO Meter Station); and
- one new mainline valve (“MLV”) located at one of two optional locations in Delaware County, Pennsylvania, as further set forth in Resource Report No. 1 in Exhibit F-I; eight new blowdown assemblies at existing MLV sites (one in Delaware County, two in Montgomery County, and five in Chester County, Pennsylvania); a wareyard to be located within an existing industrial facility in Lower Chichester Township, Delaware County, Pennsylvania; and other auxiliary facilities including pig launchers and cathodic protection, all as further described in Resource Report No. 1, Exhibit F-I.

The 18-inch Mainline and 20-inch Mainline and existing appurtenant and auxiliary facilities are currently owned and operated in non-FERC-jurisdictional service by IEC. The

18-inch Mainline consists of Zone North A, extending approximately 34 miles north from an existing interconnection with Texas Eastern in Bucks County, Pennsylvania, to the Martins Creek Terminal, and Zone South, extending approximately 50 miles south from a new second interconnection with Texas Eastern in Bucks County to Marcus Hook, Pennsylvania. Zone South also includes the Tilghman and Parkway Laterals. In addition, the approximately 4.4-mile 20-inch Mainline will comprise Zone North B extending north from the interconnection with Transco in Northampton County, Pennsylvania to the Martins Creek Terminal. Zone North A and Zone North B are designed to have a capacity of approximately 175,000 Dth/d and 350,000 Dth/d, respectively, while Zone South is designed to have a design capacity of 250,000 Dth/d.

The Zone South facilities have been inactive since 2014, but historically provided oil transportation service, including transportation for No. 2 fuel oil. The Zone North A facilities have been dual-use facilities, capable of transporting oil and natural gas but have been transporting natural gas exclusively since 2014. When transporting oil to the Martins Creek Terminal, the Zone North A facilities received oil from IEC's pumping station at Marcus Hook. In contrast, when transporting gas to the Martins Creek Terminal, the Zone North A facilities receive gas from its interconnect with Texas Eastern and an interconnect with TCO at approximately MP 67. The Zone North A facilities currently provide natural gas for use as fuel at the Lower Mount Bethel and Martins Creek power plants located in Northampton County, Pennsylvania.¹⁰ The 20-inch Mainline parallels the northernmost

¹⁰ The Lower Mount Bethel and Martins Creek power plants are owned by Lower Mount Bethel Energy, LLC and Martins Creek, LLC, respectively, each an indirect, wholly owned subsidiary of Talen Energy. For purposes of this Application, hereinafter the Lower Mount Bethel and Martins Creek power plants may be referred to as "Talen Energy's" or the "Talen Energy" power plants.

four miles of the Zone North A facilities and delivers natural gas from an interconnection with Transco to Talen Energy's two power plants.

In addition to the Existing System described above, the Project will also include construction of certain additional facilities. As further set forth above, Adelphia proposes to construct the two new pipeline laterals and eight new M&R stations listed herein. Adelphia also proposes to construct two 5,625 hp compressor stations: one at the existing Quakertown M&R Station and a second at the existing Marcus Hook Station. The New Facilities further include eight new blowdown assemblies located at existing mainline valves, one new mainline valve, and the use of an existing, previously disturbed site as a wareyard. As described further in Exhibit F-I, Environmental Report, Adelphia has worked to minimize the effect of construction of these additional facilities, including constructing such New Facilities within or adjacent to the existing footprint of the Existing System or co-located in pre-disturbed rights-of-way ("ROW") where feasible.

V. ACQUISITION OF FACILITIES

In support of this Application, Adelphia provides the following information required by Section 157.15 of the Commission's regulations.

A. Description of IEC

In accordance with Section 157.15(a) and 157.15(b) of the Commission's regulations,¹¹ the exact legal name of IEC is Interstate Energy Company LLC. IEC is a limited liability company organized under the laws of the State of Delaware with its principal place of business at 214 Shoemaker Road, Pottstown, Pennsylvania, 19464. IEC

¹¹ 18 C.F.R. §§ 157.15 (a), (b).

is a subsidiary of Talen Generation, LLC and an indirect, wholly owned subsidiary of Talen Energy Corporation.¹² IEC is focused on owning, operating, and maintaining pipelines in eastern Pennsylvania that transport fuel oil or natural gas to serve two facilities operated by affiliates of Talen Energy, the Lower Mount Bethel and Martins Creek power plants. IEC currently owns and operates the facilities that would be acquired by Adelphia for use as the Adelphia Gateway Pipeline. IEC does not own or operate any facilities certificated by the Commission and the Commission has declared that IEC is not subject to its jurisdiction under the Interstate Commerce Act.¹³

B. Proposed Acquisition

Pursuant to Section 157.15(c) of the Commission's regulations,¹⁴ on October 27, 2017, Adelphia entered into a purchase and sale agreement with Talen Generation, LLC to acquire the Existing System by means of a purchase of all of IEC's membership interest for \$189,000,000.¹⁵ The agreement to acquire these facilities was the result of an arms' length transaction following an extensive bid process involving several other parties interested in acquiring the facilities.

C. Description and Use of the Acquired Facilities

Pursuant to Section 157.15(d) of the Commission's regulations, Adelphia proposes to acquire the Existing System owned by IEC, as described herein and as shown on Exhibit

¹² IEC was previously indirectly owned by PPL Corporation. IEC became an indirect, wholly owned subsidiary of Talen Energy Corporation pursuant to a larger transaction involving the transfer and merger of public utility subsidiaries and assets by PPL Corporation to form a new company, Talen Energy Corporation, approved by the Commission on December 18, 2014. *PPL Corporation*, 149 FERC ¶ 61,260 (2014).

¹³ *Interstate Energy Co.*, 32 FERC ¶ 61,294 (1985).

¹⁴ 18 C.F.R. § 157.15(c).

¹⁵ Note that of the \$189,000,000 aggregate cash consideration for the sale, \$23,000,000 is contingent cash consideration based on certain specified conditions.

F attached hereto. Adelphia will acquire all of the membership interest in IEC and merge IEC up into Adelphia, such that the remaining company will be Adelphia Gateway, LLC. The Existing System to be acquired is owned by IEC, and is presently used for the transmission of natural gas, as described in this Application, to provide fuel for Talen Energy's two power plants.

After the proposed acquisition, Adelphia will convert such pipeline facilities to be used full-time as natural gas transmission facilities and will own and operate the facilities as a FERC-jurisdictional interstate natural gas transmission system. Specifically, Adelphia will place Zone North A and Zone North B into service promptly following acceptance of the certificate authorizations requested herein to continue service to the Talen Energy power plants without interruption. Adelphia proposes to place Zone South into service by April 1, 2019, after the construction of the New Facilities is complete. Adelphia will continue service to the Talen Energy power plants pursuant to contracts that are designed to replicate the existing service received from IEC and will transport natural gas to and from Texas Eastern, Transco, and TCO on behalf of Talen Energy and Adelphia's new shippers.

IEC's Existing System is currently operated as a common carrier pipeline pursuant to a Pennsylvania PUC certificate.¹⁶ The acquisition by Adelphia will result in the facilities being regulated by the Commission, superseding the current Pennsylvania PUC certificate authorization. The jurisdictional change from Pennsylvania PUC to FERC jurisdiction is

¹⁶ *Order Granting Certificate of Public Convenience to Interstate Energy Company*, PUC Docket No. 97032, 46 Pa. PUC 524 (Feb. 6, 1973), as modified 53 Pa. PUC 314 (June 7, 1979).

the only effect the acquisition will have on any franchise, license, or permit related to the Existing System.¹⁷

**VI.
CERTIFICATE POLICY STATEMENT AND
PUBLIC CONVENIENCE AND NECESSITY**

In determining whether a proposed pipeline is required by the public convenience and necessity, the Commission considers whether the proposal meets the criteria set forth in its Certificate Policy Statement addressing new facilities.¹⁸ The Certificate Policy Statement requires an applicant to demonstrate that a new project: (i) will not rely on subsidization from existing customers, (ii) has eliminated or minimized any adverse effects the project may have on existing customers, competing pipelines, and its captive customers, and (iii) has eliminated or minimized any adverse effects the project may have on the interests of landowners and surrounding communities.¹⁹ Under the standards established in the Certificate Policy Statement, the Commission must evaluate a proposed project by balancing the likely public benefit against the adverse impacts associated with the project.²⁰

As demonstrated in this Application and in the Resource Reports included herewith, the Adelpia Gateway Pipeline meets the criteria of the Certificate Policy Statement, and approval of the Project will serve the public interest and is required by the public convenience and necessity.

¹⁷ Adelpia has advised the Pennsylvania PUC of the proposed transaction and Adelpia's desire to operate the Existing System as a natural gas company subject to this Commission's NGA jurisdiction.

¹⁸ *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227 (1999) ("Certificate Policy Statement"), *clarified*, 90 FERC ¶ 61,128, *further clarified*, 92 FERC ¶ 61,094 (2000).

¹⁹ Certificate Policy Statement at p. 61,745-61,746.

²⁰ *Id.*

A. Threshold No-Subsidy Requirement

The Certificate Policy Statement contains a threshold requirement for existing pipelines proposing new construction stating that the pipeline must be prepared to financially support the project without relying on subsidization from existing customers.²¹ As explained herein, two Talen Energy power plants, the Lower Mount Bethel and Martins Creek power plants, have been the sole customers receiving service on the Existing System. Adelphia has executed precedent agreements for long-term transportation arrangements with Talen Energy that are designed to replicate this pre-existing service and to ensure ongoing, reliable service to these plants at rates acceptable to Talen Energy.²² While it is not clear whether the threshold no-subsidy test applies under the circumstances at hand, Adelphia submits that the Project is proceeding without subsidy from Talen Energy and therefore this threshold requirement has been satisfied.

B. No Adverse Effects on Existing Customers, or on Existing Pipelines and Their Captive Customers

Under the Certificate Policy Statement, an analysis must be conducted to (i) identify potential adverse impacts on existing customers, competing pipelines and their captive customers, or landowners and communities affected by the construction and (ii) determine whether the applicant has made efforts to eliminate or minimize such adverse effects.²³ If residual adverse effects are identified after efforts have been made to minimize them, the Commission will “evaluate the project by balancing the evidence of public benefits to be achieved against residual adverse effects.”²⁴

²¹ *Id.* at p. 61,746.

²² The Talen Energy precedent agreements are contained in Exhibit I.

²³ Certificate Policy Statement at p. 61,745.

²⁴ *Id.* at p. 61,745.

The Adelpia Gateway Pipeline will not result in any adverse impact on Talen Energy because agreements are in place to ensure continued firm service and rates acceptable to Talen Energy, nor will the Project result in any adverse impact to competing pipelines and their captive customers because the Project will be an open-access pipeline providing nondiscriminatory service in a competitive market. As described above, the demand for low-cost, clean-burning natural gas in this region of the country has steadily increased, and the interconnecting interstate pipelines provide an abundant and diverse source of gas supply near the demand area. The Project provides facilities to move this gas supply into markets that need it, while continuing to serve Talen Energy's power plants. Further, the Project will increase grid reliability with the increased interstate pipeline interconnections and will satisfy increasing demand with additional flow of natural gas. Acquisition and operation of the Project will serve to further enhance competition in the market by providing additional competitive service options.

C. Minimal Potential for Adverse Impacts to Landowners and Communities Affected by the Project

The vast majority of the Project facilities, including the 18-inch Mainline and the 20-inch Mainline, are already existing and in operation. Thus, the Project will entail only minimal impacts to surrounding landowners and communities from construction of the additional facilities needed to place the Project into FERC jurisdictional service. Adelpia has designed the New Facilities to minimize the additional temporary and permanent ROW required by proposing to construct the facilities within existing stations and ROW. Adelpia is committed to reaching voluntary easement agreements with landowners for any new parcels required for the Project and to using eminent domain only if necessary after significant efforts to reach agreement.

Adelphia has contacted landowners and stakeholders consistent with the Commission's requirements. In areas where Adelphia will be constructing the New Facilities, Adelphia has reached out to community leaders, office holders, and potentially affected landowners. Through the stakeholder outreach completed to date, Adelphia is identifying and seeking to minimize impacts to the extent possible on all potential landowners. A detailed description of the agencies and other stakeholders with whom Adelphia has consulted is contained in Appendix 1D of Resource Report No. 1. Additionally, a list of applicable permits and approvals, responsible agencies, and the filing status and schedule of each authorization is provided in Table 1.9-1 in Resource Report No. 1.

The potential environmental impacts associated with the Project and the mitigation measures proposed regarding such impacts are discussed more fully in the Environmental Impacts section in Article VII of this Application and in the accompanying Resource Reports attached hereto as Exhibit F-I. Adelphia certifies that the additional facilities proposed herein will be designed, constructed, installed, inspected, tested, operated, replaced, and maintained in accordance with the Natural Gas Pipeline Safety Act of 1968, as amended and recodified,²⁵ and pursuant to the implementing regulations of the Department of Transportation²⁶ and any other applicable safety standards. Adelphia will incorporate all environmental information and National Environmental Policy Act ("NEPA") compliance requirements into construction contract bid documents and, as needed, give appropriate instruction and training to contractors and inspectors in carrying

²⁵ 49 U.S.C. §§ 60101-60128.

²⁶ 49 C.F.R. Part 192.

out the Commission's guidelines. Consistent with the Commission's landowner notification requirements, and as described in Section VIII, Adelphia will send out notices to all affected landowners of record (as reflected on the landowner list included in Resource Report 1). Adelphia will continue to be in contact with appropriate authorities regarding measures to mitigate any adverse environmental impacts along its route to the extent practicable.

D. Benefits Associated with the Project Outweigh the Adverse Effects

The Commission balances the public benefits to be achieved by the project against the residual adverse impacts of the proposed project when evaluating whether a proposed project is needed and will serve the public interest.²⁷ The overall purpose of the Project is to acquire and convert existing oil and intrastate natural gas facilities to natural gas interstate transmission service within the jurisdiction of the Commission. The Project will allow for conversion and placement into FERC-jurisdictional service of currently underutilized facilities to meet growing demand. The facilities proposed for acquisition and conversion are currently underutilized, because the Existing System only provides service for the benefit of Talen Energy to serve two of its power plants. As set forth in Section III of this Application, Adelphia will continue to provide this service but will also expand service by converting the 50-mile, oil-only Zone South facilities to natural gas service. Because a significant portion of the Project's facilities are already constructed and available, the impacts of the Project on landowners and communities along the pipeline route are substantially mitigated. The issuance of the requested certificate authorizations will allow Adelphia to acquire and operate pipeline facilities necessary to provide

²⁷ Certificate Policy Statement at p. 61,745.

customers the opportunity to transport gas supplies in interstate commerce from and to interconnections with various interstate pipelines on the acquired facilities. The Project will transport gas supply volumes to demand centers and end-users in the greater Philadelphia area and the Marcus Hook Industrial Complex. The Project will also increase the reliability and flexibility of the natural gas pipeline grid in the area by adding new capacity to the market and increasing the number of interconnections along the grid. The Project thus offers cost-effective and reliable transportation service to meet the demand. The benefit of the Project is further confirmed by the executed precedent agreement between Adelpia and its new Project shipper for long-term firm capacity on the Project facilities.

For all the reasons set forth herein, the benefits associated with the Adelpia Gateway Pipeline far outweigh any potential adverse effects, which have been or will be significantly mitigated through Adelpia's efforts, as described in this Application and the accompanying Resource Reports attached hereto as Exhibit F-I.

E. The Project Is Required by the Public Convenience and Necessity.

For the reasons discussed above and consistent with the criteria set forth in the Certificate Policy Statement, authorization of the Adelpia Gateway Pipeline as proposed is consistent with, and required by, the public convenience and necessity. The Project will provide numerous benefits to the region it serves, including:

1. Meeting existing and growing natural gas fuel supply demands of electric generators and other natural gas users in Pennsylvania and the northeastern United States;
2. Providing access for the demand markets to multiple supply sources; and

3. Adding reliability and flexibility to the natural gas transmission grid in the northeastern United States.

For the foregoing reasons, Adelphia respectfully submits that granting the authorizations requested herein is required by the public convenience and necessity.

In summary, the Project satisfies the Commission's Certificate Policy Statement and is consistent with the Commission's economic, competition and environmental goals. As described in detail in this Application and in the accompanying exhibits, the Project benefits far outweigh the Project's potential adverse impacts, which have been or will be mitigated through Adelphia's efforts, as described in this Application. Accordingly, the Project meets the Certificate Policy Statement's standards, is in the public interest, and is required by the public convenience and necessity.

VII. ENVIRONMENTAL IMPACT

The entire Existing System, including the pipelines and most of the appurtenant facilities, were constructed and in operation in non-FERC jurisdictional service pursuant to state regulatory authorizations, and no environmental impact is anticipated for the Existing System. Construction and ground-disturbing activities for the New Facilities will largely take place within the existing right of way for the facilities and in previously disturbed areas. Accordingly, environmental impacts associated with the Project will not be significant and will be further minimized through implementation of mitigation and impact-avoidance measures.

Adelphia's Resource Reports, included herewith as Exhibit F-I, provide the information necessary for the Commission to complete its environmental analysis of the Project, as required by NEPA, 42 U.S.C. §§ 4321-4370d. The Resource Reports were

prepared pursuant to Part 380 of Commission's regulations.²⁸ In addition to discussions with Adelphia, interested parties will have the opportunity to submit comments on the Project to FERC and to review the public filings of the Resource Reports contained herein. As the Resource Reports show, the environmental impacts associated with the construction of the Project will be adequately mitigated. Adelphia intends to incorporate the Commission's *Upland Erosion Control, Revegetation and Maintenance Plan* and *Wetland and Waterbody Construction and Mitigation Procedures* (May 2013 versions of both) into the Erosion and Sedimentation Control Plan to be used for the Project. Adelphia will also incorporate standard environmental mitigation measures into its construction specifications.

The Resource Reports demonstrate that (i) any adverse impacts associated with the Project will be adequately mitigated or avoided, (ii) the proposed action is the best alternative, and (iii) significant resources will not be irreversibly or irretrievably lost due to construction activities. Under these circumstances, approval of the proposed facilities described herein will not be a major federal action significantly affecting the quality of the human environment.

The Project will be constructed in accordance with all applicable environmental permits, approvals and regulations. Adelphia is committed to minimizing the environmental impact of the Project and to reclaiming all disturbed areas to a consistently high standard, regardless of ownership. The construction activities are not anticipated to have any significant adverse effects on residents or industrial areas and the impacts to

²⁸ 18 C.F.R. § 380.12.

public, recreational or scenic areas, as well as vegetation, wildlife and cultural resources can be adequately mitigated.

In accordance with the Commission's requirements, Adelphia has evaluated ambient and Project noise levels associated with the Project facilities, assessed impacts, and proposed mitigation measures that can be implemented, if necessary, to ensure that noise levels comply with FERC and state noise standards. Construction and operation emissions associated with the new compressor stations will comply with all applicable air quality regulations. In this regard, air quality impacts from operation of the proposed compressor stations will be minimized by the use of equipment, emissions controls and best operating practices.

VIII. LANDOWNER NOTIFICATION AND OUTREACH

Adelphia has established a toll-free phone number (800-483-3179) to address any concerns raised by landowners or other interested parties before, during, and after construction of the Project. Adelphia may also be contacted by e-mail at info@adelphiagateway.com. In addition, Adelphia has created a website for the Project (www.adelphiagateway.com). This website will be updated periodically as new information about the Project becomes available.

Adelphia has complied with, and will continue to comply with, the landowner notification requirements set forth in Section 157.6(d) of the Commission's regulations.²⁹ A list of affected landowners, provided as Appendix 1E to Resource Report No. 1 and included in Volume III of this Application, contains privileged landowner contact

²⁹ 18 C.F.R. § 157.6(d).

information and is marked “CUI//PRIV Contains Privileged Information – Do Not Release.”

Adelphia, within three business days following the Commission’s issuance of a notice of this application, will mail the required notification letter to each affected landowner, town, community, and federal, state, and local governments and agencies involved in the Project.³⁰ Further, within three business days after the Commission assigns a docket number for this Application, a copy of the Application will be made available for inspection in centrally located public libraries in the counties across the Project area. Within 14 days after the Commission assigns a docket number to this Application, a notice that this application has been filed with the Commission will be published twice in newspapers of general circulation in each county in which the Project is located.

IX. SUPPLY

Adelphia proposes only to provide open-access transportation service on the Adelphia Project and, accordingly, Adelphia’s shippers are responsible for obtaining supplies to be transported on the capacity created by the Project.

X. RATES

A. Recourse and Negotiated Rates

The calculation of Adelphia’s initial rates for service is detailed on Pages 3-13 of Schedule 1 located in Exhibit P and described in this Article X, Section B, below. Adelphia’s proposed maximum reservation recourse rate for Rate Schedule FTS in Zone

³⁰ Within 30 days after the application filing date, Adelphia will file an updated list of affected landowners, including information concerning any notices that were returned as undeliverable.

South is \$0.5752 per Dth and the maximum recourse usage rate is \$0.0042 per Dth. For Zone North, Adelphia's proposed initial reservation rates for Zone North A and Zone North B are \$0.1422 per Dth/d and \$0.0071 per Dth/d, respectively, with usage rates of \$0.0042 per Dth in each zone. Adelphia further proposes that the usage rate for service in each zone under Rate Schedules ITS and PALS will be the respective 100% load factor derivative of the FTS service rate. The one-part usage rate in these zones for interruptible transportation service pursuant to Rate Schedule ITS and parking and lending service pursuant to Rate Schedule PALS will equal \$0.1464 per Dth for Zone North A, \$0.0113 for Zone North B, and \$0.5794 for Zone South (each the 100 percent load factor equivalent of the Rate Schedule FTS reservation and usage rates). Consistent with Commission policy, Adelphia has allocated \$1 million of its cost of service to interruptible services instead of crediting interruptible revenues to firm shippers.³¹

As explained above, Adelphia proposes to place its Zone North facilities into service promptly following receipt of the certificate authorizations requested herein. Adelphia proposes that, at that time, the Zone North rates will become effective, but the effective date for the Zone South rates will be delayed until the Zone South facilities are converted and all new facilities in Zone South are constructed and placed into service. Upon the in-service date of the new facilities proposed for Zone South, the rates set forth above in the first paragraph of this Section X.A shall apply.

In addition to the rates for the firm and interruptible services provided, applicable charges and surcharges include in-kind fuel retainage and fuel and lost and unaccounted-

³¹ See *Gulf Shore Energy Partners, LP*, 142 FERC ¶ 61,227 at P 14 (2013) (citing *Fayetteville Express*, at P 29; *Midcontinent Express Pipeline LLC*, 124 FERC ¶ 61,089, at P 93 (2008); *Cameron Interstate Pipeline, LLC*, 117 FERC ¶ 61,297 at P 22 & n.22 (2006)).

for gas (“L&U”). The initial fuel retainage percentages will be 0.76% on Zone South and 0.00% on each of Zone North A and Zone North B; the L&U percentage for each of Zone South, Zone North A, and Zone North B will be 0.05%. The calculations for these percentages are set forth in Exhibit Z-2, and an explanation of how Adelphia will annually update these periodic rate adjustment components is contained in Article XI, Section D below.

Adelphia will provide service to the Project shippers at negotiated rates in accordance with the negotiated rate authority set forth in Section 3.5 of Rate Schedule FTS and Section 30 of the General Terms and Conditions of Adelphia’s proposed Tariff. Adelphia will file tariff records reflecting its negotiated rate agreements with its shippers within 30 to 60 days prior to when the underlying negotiated rates are proposed to become effective.

B. Cost of Service and Rate Design

Adelphia’s cost of service is based on the total capital costs for the proposed Project, as presented in Exhibit K to this Application. Adelphia then calculates its proposed recourse rates based on this cost of service and on billing determinants that reflect the total design capacity of each Zone in the Adelphia system.

As described in Exhibit P, Schedule 1 pages 1-2, the rate derivation for the initial recourse rates shown on Schedule 1 includes a proposed depreciation rate of 3.33%, a proposed negative salvage rate of 0.25%, a 21% federal income tax rate and a 9.56% state income tax rate. The rate derivation includes a proposed overall rate of return of 10.00% based on Adelphia’s expected 50% debt and 50% equity capital structure with a debt cost of 6% and a return on equity (“ROE”) of 14.00%.

The imputed capital structure for Adelphia is reflective of debt levels associated with fully amortizing, term loan arrangements that could be supported by revenues from Adelphia's firm transportation commitments. Adelphia's weighted average cost of capital under its proposed capital structure is 10.00%, which is consistent with the range that the Commission has found acceptable for similar interstate pipeline projects.³² Adelphia proposes a 14.00% ROE, which the Commission also has found acceptable for new interstate pipeline projects.³³ Adelphia notes that the 14.00% ROE for new interstate pipeline projects typically involves construction. Here, like the investment made in a new greenfield pipeline project, Adelphia is making a substantial capital investment in facilities that will be placed into FERC-jurisdictional natural gas service for the first time. Moreover, Adelphia is also undertaking additional construction to convert the facilities to natural gas-only service and to allow Zone South to operate in accordance with the certificate authorizations that Adelphia requests herein.³⁴

³² See *NEXUS Gas Transmission*, 160 FERC ¶ 61,022 at P 81 (2017) (approving a weighted average cost of capital of 10.7 percent based on an ROE of 14 percent, a cost of debt of 5.75 percent, and a 50/50 capital structure); *ETC Tiger Pipeline, LLC*, 131 FERC ¶ 61,010 at P 26 (2010) (approving a weighted average cost of capital of 11.375 percent based on an ROE of 14 percent, an assumed cost of debt of 8.75 percent, and a 50/50 capital structure); *Bison Pipeline LLC*, 131 FERC ¶ 61,013 at P 29 (2010) (approving a weighted average cost of capital of 11 percent based on an ROE of 14 percent, an assumed cost of debt of 8 percent, and a 50/50 capital structure); *Ruby Pipeline, LLC*, 128 FERC ¶ 61,224 at P 52 (2009) (approving a weighted average cost of capital of 11.18 percent based on an ROE of 14 percent, an assumed cost of debt of 9.3 percent, and a capital structure of 60 percent debt and 40 percent equity).

³³ See *NEXUS Gas Transmission*, 160 FERC ¶ 61,022 at P 81 (2017) (approving a 14 percent ROE); *Sabal Trail Transmission*, 154 FERC ¶ 61,080 (2016) (approving a 14 percent ROE); *Vista Pipeline*, 111 FERC P 61,432 (2005) (finding a 13 percent ROE "reasonable for a new pipeline entity such as Vista Pipeline"); *Bison Pipeline LLC*, 131 FERC P 61,013 (2010) (approving a 14 percent ROE because the project was consistent with other projects the Commission approved for new pipelines); *Ruby Pipeline, L.L.C.*, 128 FERC ¶ 61,224 (2009) (approving a 14 percent ROE).

³⁴ Unlike in *First ECA Midstream LLC*, 155 FERC ¶ 61,222 (2016), where the Commission adopted a lower ROE for an acquisition involving no construction or capital expenditures of any kind by the applicant, Adelphia is making a substantial capital investment, along with the related investment risk, to acquire pipeline facilities utilized for the Project, and will be required to undertake substantial construction, replacement, and conversion activities to place oil transportation facilities into natural gas transportation service at significant expense and risk. Adelphia expects that any Commission order approving the Project as a new interstate natural gas pipeline system will require Adelphia to submit a three-year cost and revenue study to determine

Further, unlike in rate proceedings involving an existing pipeline, which can design its rates based on billing determinants reflecting actual subscriptions for firm capacity on its system, Adelphia is basing its rates on the full capacity of its system comparable to the methodology for a greenfield pipeline where the Commission has approved a 14.00% ROE. In this case, as of the date of this filing, there is unsubscribed capacity in Zone South, placing Adelphia at risk for recovery of the costs associated with that capacity in the same way that a greenfield pipeline would be at risk for such capacity. Accordingly, Adelphia proposes that a 14.00% ROE accurately reflects Adelphia's level of risk and investment in the acquisition, construction, and conversion activities necessary to place the Project into FERC-jurisdictional natural gas service for the first time. However, to the extent the Commission does not approve Adelphia's proposed ROE and instead looks to its most recently approved proxy group and ROE analysis from *El Paso Natural Gas Company*, Adelphia requests that the Commission apply the highest ROE of 11.08% contained in that Commission-approved proxy group to reflect the additional risk Adelphia is taking on in connection with the Project as described above.³⁵

In accordance with the Commission's policy for acquisition costs, the rate base for the initial rates for the Project includes the acquisition price of the Existing System. The Commission has determined that the acquisition price is the correct cost to use for rate base purposes when the *Longhorn* two factor-test is met.³⁶ Under the *Longhorn* test, the acquiring company must (1) show that the facilities will be converted from one public use

actual costs and revenues following placing the Project into service. Accordingly, Adelphia submits that the Commission's longstanding precedent approving a 14 percent ROE for new interstate pipeline projects is more applicable than pure acquisition cases involving no related investment or investment risk.

³⁵ See *El Paso Nat. Gas Co.*, 145 FERC ¶ 61,040, at P 642 (2013).

³⁶ See *Longhorn Partners Pipeline*, 73 FERC ¶ 61,355, p. 62,112-13 (1995).

to a different public use or that the asset will be placed into FERC-jurisdictional service for the first time; and (2) show clear and convincing evidence that its acquisition of the facilities will still provide substantial, quantifiable benefits to ratepayers even if the full purchase price, including the acquisition premium, is included in rate base for rate-making purposes.³⁷

Adelphia readily meets the *Longhorn* test. First, the acquisition will result in the Adelphia Gateway Pipeline being placed into FERC-jurisdictional natural gas transportation service for the first time. Moreover, the acquisition will also result in conversion of the Existing System from dual-use oil service and natural gas service on the Zone North A facilities and oil-only transportation service on the Zone South facilities to solely interstate natural gas transportation service on all of the facilities. Second, the acquisition will result in substantial, quantifiable benefits to ratepayers because the acquisition cost is lower than the cost to replicate these facilities for interstate natural gas transportation service with entirely new construction.³⁸

C. Fuel Rates

Consistent with the Commission's policy on fuel use recovery, Adelphia proposes an in-kind system fuel retention with an annual tracker mechanism. As with its recourse rates, the fuel reimbursement mechanism imbedded in Adelphia's Tariff is designed to recover fuel use and L&U on a zone-gate basis, as a percentage of gas transported in each

³⁷ *Id.*

³⁸ See *NEXUS Gas Transmission*, 160 FERC ¶ 61,022 at P 81 (2017) (explaining how utilizing existing facilities through a lease agreement "benefits the environment and reduces costs by enabling NEXUS to use existing unsubscribed capacity on Vector, eliminating the need for it to construct greenfield facilities that would generally duplicate Vector's existing facilities); *Columbia Gas Transmission Corp.*, 4 FERC ¶ 61,242 (1978) ("Acquisition of the line eliminates the need for GT to construct a new line and obviates the need for duplicate facilities.").

applicable zone. Each year, as described in Article XI(D) below, Adelphia will make a fuel tracker filing pursuant to Section 4 of the NGA to true-up any differences between the fuel retained from shippers and the actual fuel consumed and L&U in the respective zones.

D. AFUDC Representation

Adelphia hereby provides its statement representing that the Allowance for Funds Used During Construction (“AFUDC”) accruals included in the cost of the Project, reflected in Exhibit K hereto, are in compliance with the Commission’s policy on AFUDC accruals as set forth in the Docket No. AD10-3-000 proceeding.³⁹ Adelphia began accruing AFUDC for the Project on December 1, 2017, which was after Adelphia’s execution in October 2017 of a purchase and sale agreement with Talen Generation, LLC to acquire the Existing System. In accordance with the Commission’s AFUDC policy, Adelphia hereby affirms that it had begun to incur capital expenditures for the Project on that date and that activities necessary to develop the Project for its intended use were in progress at that time.

**XI.
TARIFF**

As part of this Application, Adelphia is requesting approval of the Tariff contained in Exhibit P. The Tariff contains the General Terms and Conditions and the Rate Schedules and associated form of service agreement for each service under which Adelphia’s services will be offered. Adelphia prepared the proposed Tariff in conformance with the requirements of Parts 154 and 284 of the Commission’s regulations,⁴⁰ in full compliance with Commission-approved North American Energy Standards Board (“NAESB”)

³⁹ *Southern Natural Gas Co., et al.*, 130 FERC ¶ 61,193 (2010); *see also Texas Eastern Transmission, LP*, 131 FERC ¶ 61,164 (2010).

⁴⁰ 18 C.F.R. Parts 154 and 284 (2017).

standards in effect as of the date hereof, and consistent with the Commission's open-access policies and precedent. The proposed Tariff is fully compliant with Order Nos. 636⁴¹ and 637,⁴² including offering, among other items, secondary point rights, segmentation rights and provisions to effectuate capacity release transactions, as discussed in more detail below.

A. Description of Services

Adelphia will provide its transportation services on an unbundled, open-access basis under terms and conditions that are not unduly discriminatory. Adelphia's Tariff includes firm transportation service under Rate Schedule FTS. Adelphia's Rate Schedule FTS provides customers with the right to deliver gas to Adelphia at the primary receipt point on a firm basis and receive gas from Adelphia at a primary delivery point up to the MDQ. The firm service offered will give shippers certainty as to their ability to transport gas and the assurance that such capability will be available to them at the highest scheduling priority on the system.

⁴¹ *Pipeline Service Obligations and Revisions to Regulations Governing Self-Implementing Transportation and Regulation of Natural Gas Pipelines After Partial Wellhead Decontrol*, Order No. 636, FERC Stats. & Regs. Regulations Preambles ¶ 30,939 (1992), 57 Fed. Reg. 13,267 (Apr. 16, 1992), *order on reh'g*, Order No. 636-A, FERC Stats. & Regs. Regulations Preambles ¶ 30,950 (1992), 57 Fed. Reg. 36,128 (Aug. 12, 1992), *order on reh'g*, Order No. 636-B, 61 FERC ¶ 61,272 (1992), 57 Fed. Reg. 57,911 (Dec. 8, 1992), *reh'g denied*, 62 FERC ¶ 61,007 (1993), *aff'd in part and remanded in part sub nom., United Distribution Co. v. FERC*, 88 F.3d 1105 (D.C. Cir. 1996), *order on remand*, Order No. 636-C, 78 FERC ¶ 61,186 (1997), *cert. denied*, 520 U.S. 1224 (1997), *reh'g denied*, Order No. 636-D, 83 FERC ¶ 61,210 (1998), 63 Fed. Reg. 30,127 (June 3, 1998).

⁴² *Regulation of Short-Term Natural Gas Transportation Services and Regulation of Interstate Natural Gas Transportation Services*, Order No. 637, FERC Stats. & Regs. [Regs. Preambles 1996-2000] ¶ 31,091 (2000), 65 Fed. Reg. 10,156 (Feb. 25, 2000), *order on reh'g*, Order No. 637-A, FERC Stats. & Regs. [Regs. Preambles 1996-2000] ¶ 31,099 (2000), 65 Fed. Reg. 35,706 (June 5, 2000), *reh'g denied*, Order No. 637-B, 65 Fed. Reg. 47,284 (Aug. 2, 2000), 92 FERC ¶ 61,062 (2000), *aff'd in part and remanded in part, Interstate Natural Gas Assoc. of Am. v. FERC*, 285 F.3d 18 (D.C. Cir. 2002), *order on remand*, 101 FERC ¶ 61,127 (2002) ("Order No. 637").

In addition to firm transportation service, Adelphia's Tariff provides for interruptible transportation service under Rate Schedule ITS and parking and lending service under Rate Schedule PALS. Rate Schedule ITS allows shippers to obtain transportation service on an as-needed and as-available basis by tendering gas for delivery to Adelphia up to the shipper's MDQ and only paying for the service received. The parking service under Rate Schedule PALS is an interruptible service that allows a shipper to deliver gas quantities at a receipt point that will remain on the Adelphia pipeline system until returned to the shipper. The lending service under Rate Schedule PALS is an interruptible service that allows a shipper to receive quantities of gas from Adelphia at a delivery point and subsequently return the loaned gas to Adelphia. Interruptible service will only be available to the extent that capacity is available from day to day and from time to time during the gas day, under current conditions and will be provided in accordance with the priorities set forth in the General Terms and Conditions.

B. Compliance with Commission Requirements

Adelphia's Tariff complies with the requirements of Order No. 587⁴³ and Order No. 637,⁴⁴ and accordingly, Adelphia will furnish its services on an open-access basis, under

⁴³ *Standards for Business Practices of Interstate Natural Gas Pipelines*, Order No. 587, FERC Stats. & Regs. ¶ 31,038 (1996), 61 Fed. Reg. 39,053 (July 26, 1996), Order No. 587-B, FERC Stats. & Regs. ¶ 31,046 (1997), 62 Fed. Reg. 5,521 (Feb. 6, 1997), Order No. 587-C, FERC Stats. & Regs. ¶ 31,050 (1997), 62 Fed. Reg. 10,684 (Mar. 10, 1997), Order No. 587-G, FERC Stats. & Regs. ¶ 31,062 (1998), 63 Fed. Reg. 20,072 (Apr. 23, 1998), Order No. 587-H, FERC Stats. & Regs. ¶ 31,063 (1998), 63 Fed. Reg. 39,509 (July 23, 1998), Order No. 587-I, FERC Stats. & Regs. ¶ 31,067 (1998), 63 Fed. Reg. 53,565 (Oct. 6, 1998), *order on reh'g*, Order No. 587-K, FERC Stats. & Regs. ¶ 31,072 (1999), 64 Fed. Reg. 17,276 (Apr. 9, 1999), Order No. 587-M, FERC Stats. & Regs. ¶ 31,114 (2000), 65 Fed. Reg. 77,285 (Dec. 11, 2000), Order No. 587-N, FERC Stats. & Regs. ¶ 31,125 (2002), 67 Fed. Reg. 11,906 (Mar. 18, 2002), Order No. 587-O, FERC Stats. & Regs. ¶ 31,129 (2002), 67 Fed. Reg. 30,788 (May 8, 2002), Order No. 587-R, FERC Stats. & Regs. ¶ 31,141 (2003), 68 Fed. Reg. 13,813 (Mar. 21, 2003), Order No. 587-S, FERC Stats. & Regs. ¶ 31,179 (2005), 70 Fed. Reg. 28,204 (May 17, 2005), Order No. 587-T, 126 FERC ¶ 61,129 (Feb. 24, 2009), Order No. 587-U, 130 FERC ¶ 61,212 (Mar. 24, 2010), Order No. 587-V, 140 FERC ¶ 61,036 (July 19, 2012) ("Order No. 587"), 18 C.F.R. § 284.12(a) (2014) (incorporation by reference of NAESB standards).

⁴⁴ Order No. 637.

non-discriminatory terms and conditions. Adelphia will also make the appropriate arrangements to transmit and receive information on an electronic basis for all transactions, and Adelphia will provide all information required by the Commission through an electronic bulletin board.⁴⁵

C. Gas Quality

With respect to requirements set forth in FERC's *Policy Statement on Provisions Governing Natural Gas Quality and Interchangeability in Interstate Natural Gas Pipeline Company Tariffs*, Adelphia has included as Exhibit Z-4 hereto, a chart showing "relevant information about the gas quality and interchangeability specifications of interconnecting pipelines and of the competing pipelines serving customers to be served directly by" Adelphia.⁴⁶ Specifically, the chart shows the gas quality provisions of Adelphia in comparison to the existing gas quality specifications of Transco, TCO, and Texas Eastern. Adelphia derived its proposed gas quality specifications by considering the gas quality specifications of the natural gas being delivered to Adelphia at various receipt point interconnections in the eastern Pennsylvania region and the requirements that Adelphia must meet in delivering gas into downstream pipeline markets. Adelphia also considered the gas quality needs for end-use delivery points on its system. Adelphia's goal in deriving its proposed quality specifications was to ensure that gas flowing on Adelphia will be compatible, to the maximum extent possible, with the gas quality specifications of upstream and downstream pipeline systems and gas quality needs of directly connected end-users.

⁴⁵ See Section 2 of the General Terms and Conditions of the Tariff.

⁴⁶ *Policy Statement on Provisions Governing Natural Gas Quality and Interchangeability in Interstate Natural Gas Pipeline Company Tariffs*, 115 FERC ¶ 61,325 at P 45 (2006) ("Gas Quality Policy Statement").

D. Periodic Rate Adjustments

Adelphia proposes to use an in-kind fuel tracking mechanism, referred to as its Transporter's Use (%) ("TUP"), to recover fuel and L&U. The proposed initial TUP for Zone North A is 0.05% and for Zone North B is 0.05%. The initial TUP for Zone South will be 0.81% and is calculated using engineering principles and manufacturer's specifications for the proposed compressor engines. Adelphia will re-determine the TUP by zone by dividing Adelphia's projection of fuel usage and any lost and unaccounted for gas for the 12-month period beginning April 1, plus any under-collections and less any over-collections for the prior period, by Adelphia's projection of applicable throughput for the same 12-month period. Adelphia will make annual filings with the Commission to restate its TUP to be effective on April 1 of each year after the pipeline is placed in service.

Additionally, Adelphia will maintain a separate System Balancing Adjustment ("SBA") account that will be credited for all sales of excess fuel collected under its TUP, debited for all purchases of gas for Transporter's Use and further adjusted for certain operational activities. Such operational activities include: (1) net annual system Cashout balance determined in accordance with Section 8 of the General Terms and Conditions and Operational Balancing Agreement Cashouts; (2) the net Transporter's Use Adjustment balance, determined in accordance with Section 22.1 of the General Terms and Conditions; and (3) any other account balance as may be approved by the FERC. The annual net SBA balance for each year ending December 31 will be refunded or recovered from the Adelphia shippers based upon each shipper's actual throughput during the 12-month accumulation period.

XII. OTHER APPLICATIONS

With the exception of the instant Application, Adelphia knows of no other applications pending or required before the Commission under the NGA for the proposed Project or which affect the Application. Adelphia will require other federal, state and local authorizations or permits for the proposed facilities. A listing of the particular permits and approvals required (to the extent that the state or local permits or approvals do not conflict with the Commission's certificate and associated conditions) is included in Table 1.9-1 of Resource Report 1, Exhibit F-I. All of the required Federal Authorizations, including those delegated to a state authority, are set forth in Exhibit J attached hereto.

XIII. REQUEST FOR APPROVAL OF NON-CONFORMING PROVISIONS

As part of this Application, Adelphia is requesting an upfront Commission approval of the two new firm service agreements contemplated by the precedent agreements with the Existing Shippers that will contain non-conforming provisions to replace the Existing Shippers' long-term legacy capacity commitments on the Existing System to be acquired by Adelphia ("Existing Shipper Agreements"). Sections 154.1(d) and 154.112(b) of the Commission's regulations require pipelines to file any agreement that deviates "in any material aspect from the form of service agreement" in the pipeline's tariff.⁴⁷ The Commission defines "a material deviation as any provision of a service agreement that goes beyond the filling-in of the spaces in the form of service agreement with the appropriate information provided for in the tariff and that affects the substantive rights of

⁴⁷ 18 C.F.R. §§ 154.1, 154.112(b) (2017).

the parties.”⁴⁸ The Commission’s policy is that such material deviations may be acceptable if “such deviations do not change the conditions under which service is provided and do not present a risk of undue discrimination.”⁴⁹

The non-conforming provisions in the Existing Shipper Agreements pose no risk of undue discrimination and no change in the conditions under which service is provided. The Existing Shipper Agreements will allow Adelphia to continue service that the Existing System already provides to supply the two Talen Energy power plants. The Existing Shipper Agreements conform in all respects to the form of service agreement for Rate Schedule FTS under Adelphia’s pro forma Tariff included in Exhibit P hereto, with the exception of one material non-conforming provision contained in Article II of the Existing Shipper Agreements, which Adelphia will file redlines of in this proceeding. Specifically, the Existing Shipper Agreements grant each of the Existing Shippers the one-time right to extend the initial ten-year primary term by one additional five-year period, which right may be exercised no later than eighteen months prior to the end of the Primary Term.

The one-time five-year extension right contained in the Existing Shipper Agreements does not pose any risk of undue discrimination and meets the Commission’s standards for approval of non-conforming provisions. The extension rights in the Existing Shipper Agreements are consistent with Commission approvals of similar five-year extension rights as non-conforming provisions, including in service agreements with initial shippers on a new pipeline system.⁵⁰ Moreover, due to the unique circumstances of the

⁴⁸ *Nat. Gas Pipeline Negotiated Rate Policy and Practice*, 104 FERC ¶ 61,134 at P 27 (2003).

⁴⁹ *Id.* (citing *Columbia Gas Transmission Corp.*, 97 FERC ¶ 61,221, p. 62,001-02 (2001)); *see also ANR Pipeline Co.*, 97 FERC ¶ 61,224 (2001).

⁵⁰ *See, e.g., Atlantic Coast Pipeline, LLC et al.*, 161 FERC ¶ 61,042, PP 116-118 (2017).

Existing Shipper Agreements as replacement contracts for long-term firm legacy commitments for firm transportation service on the Existing System, the extension right poses no risk of undue discrimination.⁵¹ Accordingly, Adelphia requests a predetermination from the Commission that the extension rights contained in Article II of the Existing Shipper Agreements are permissible non-conforming provisions.

The Commission has stated that “for a pipeline to receive an upfront determination in a certificate proceeding regarding potentially non-conforming provisions, the pipeline must file redline/strikeout versions of the service agreements.”⁵² Adelphia is preparing the redline versions of the Existing Shipper Agreements showing the differences between the Existing Shipper Agreements and the form of service agreement in Adelphia’s pro forma Tariff as described above, and will submit the redline on the docket in this proceeding.

XIV. FORM OF NOTICE

In accordance with Section 157.6(b)(7) of the Commission’s regulations, Adelphia has included herewith a Form of Notice of this Application suitable for publication in the *Federal Register*.

⁵¹ See, e.g., *Rockies Express Pipeline LLC*, 116 FERC ¶ 61,272, at PP 77-78 (2006) (“We have accepted deviations from the pipeline’s form of service agreement that reflect the unique circumstance involved with the construction of new infrastructure and provide the needed security to ensure that the project gets built. . . . [W]e find that each of these provisions was tailored to address the unique circumstance of the respective shipper. In these circumstances, we find that these non-conforming provisions do not present a risk of undue discrimination.”).

⁵² *Tennessee Gas Pipeline Company, L.L.C. et al.*, 150 FERC P 61,160, P 44 (2015).

**XV.
LIST OF EXHIBITS**

Pursuant to Section 157.6(b)(6) of the Commission's regulations, set forth below is the listing of exhibits which are included, unless stated otherwise, in this Application in compliance with Sections 157.5 through 157.18.

- | | |
|-------------|---|
| Exhibit A | <u>Article of Incorporation and Bylaws</u>

Attached. |
| Exhibit B | <u>State Authorization</u>

Attached. |
| Exhibit C | <u>Company Officials</u>

Attached. |
| Exhibit D | <u>Subsidiaries and Affiliation</u>

Attached. |
| Exhibit E | <u>Other Pending Applications and Filings</u>

This information is contained in Article XII of this Application. |
| Exhibit F | <u>Location of Facilities</u>

Attached. |
| Exhibit F-I | <u>Environmental Report</u>

Attached hereto in Volumes II through IV. Resource Report Nos. 1 through 12 as specified in Sections 380.3 and 380.12 of the Commission's regulations are included herewith. Volumes II-A and II-B contain the public version of Exhibit F-I. Volume III contains privileged and confidential information and includes Appendix 1E |

(Project Landowner List), and Appendix 1D-2 (certain portions of Agency Correspondence), Appendix 04A (Cultural Resource Survey Report), and Existing System alignment sheets. Volume IV contains Critical Energy Infrastructure Information and includes Appendix B (Plot Plans).

Exhibits G
through G-II

Flow Diagrams and Flow Diagram Data

Attached hereto in Volume IV which contains Critical Energy Infrastructure Information.

Exhibit H

Total Gas Supply

Not applicable. Adelphia will provide only open-access, transportation-related services.

Exhibit I

Market Data

Attached. This exhibit includes a copy of the Adelphia precedent agreements with the Existing Shippers and the new Project shipper, all of which contain privileged information, and are included in Volume III.

Exhibit J

Federal Authorizations

Attached. This exhibit identifies the following: each federal authorization that the Project will require; the federal or state agency or officer that will issue each required authorization; the date each request for authorization was submitted; why any request was not submitted and the date submission is expected; and the date by which final action on each federal authorization has been requested or is expected.

Exhibit K

Cost of Facilities

Attached.

Exhibit L

Financing

Attached.

- Exhibit M Construction, Operation and Management
- Omitted. Adelphia will construct or cause the proposed facilities to be constructed, and will manage and operate the Project.
- Exhibit N Revenues, Expenses and Income
- Attached.
- Exhibit O Depreciation and Depletion
- Attached.
- Exhibit P Rate Derivation and Tariff
- Attached.
- Exhibit Q Effect of Acquisition on Existing Contracts and Tariffs
- As discussed herein, the Existing System is presently used to provide transmission of natural gas services to deliver fuel to Talen Energy's two power plants under long-term transportation arrangements. As further described in detail in this Application, Adelphia has executed precedent agreements that provide for Adelphia continuing service to the Talen Energy power plants pursuant to contracts that are designed to replicate the existing service currently received by these customers. Accordingly, there will be no negative impacts on the contracts currently served by the Existing System.
- Exhibit R Acquisition Contract
- Attached. The Acquisition Contract is included in Volume III. There is no affiliation between Adelphia and the counterparty seller of the Existing System.
- Exhibit S Accounting
- Attached.

- Exhibit Z-1 Form of Protective Agreement
Pursuant to 18 C.F.R. § 388.112(b)(2)(i), a proposed form of Protective Agreement is submitted herewith.
- Exhibit Z-2 Fuel Study
Attached.
- Exhibit Z-3 Open Season Notice
Attached.
- Exhibit Z-4 Gas Quality and Interchangeability Chart
Attached.

**XVI.
REQUEST FOR WAIVERS**

Adelphia submits that this Application may be granted based upon the submissions herein and without a trial-type evidentiary hearing. In accordance with Rule 801 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.801, Adelphia waives oral hearing in this proceeding.

Adelphia requests that the Commission grant any waivers that the Commission may deem necessary to grant the relief and issue the certificates and approvals requested herein.

**XVII.
SUMMARY OF AUTHORIZATIONS REQUESTED**

In summary, Adelphia requests that the Commission grant the following:

- i. a certificate of public convenience and necessity by August 1, 2018, under Section 7(c) of the NGA and 18 C.F.R. Part 157, Subpart A, authorizing Adelphia to construct, own, and operate a new natural gas pipeline facility, as specifically described in this Application;

- ii. a blanket certificate of public convenience and necessity by August 1, 2018, under 18 C.F.R. Part 157, Subpart F, authorizing Adelphia to construct, operate, acquire and abandon certain facilities following construction of the Project;
- iii. a blanket certificate of public convenience and necessity by August 1, 2018, under 18 C.F.R. Part 284, Subpart G, authorizing Adelphia to transport natural gas on behalf of others, on an open-access and self-implementing basis, consistent with the Commission's regulations and Adelphia's Tariff;
- iv. approval of Adelphia's initial rates and *pro forma* FERC Gas Tariff attached to this Application as part of Exhibit P;
- v. approval of non-conforming provisions in transportation service agreements between Adelphia and Lower Mount Bethel Energy, LLC and Martins Creek, LLC; and
- vi. waivers of the Commission's regulations and policies as set forth herein or as deemed necessary by the Commission to grant the relief and issue the certificates and approvals requested.

XVIII. OTHER

Pursuant to the Commission's electronic filing guide, Adelphia is eFiling this Application and will provide two complete copies to OEP Room 62-46 and one complete copy to OGC-EP Room 101-56. Exhibits G through G-II and the plot plans are found in Volume IV and contain Critical Energy Infrastructure Information ("CEII") regarding system pressure and flow. Pursuant to Section 388.112 of the Commission's regulations,

Adelphia hereby requests privileged treatment of these exhibits, which are marked “CUI//CEII” and “Contains Critical Energy Infrastructure Information—Do Not Release.” In addition, Adelphia is marking Volume III as privileged because it contains cultural resource location information, landowner information, and portions of agency correspondence from Exhibit F-I, and confidential business contracts from Exhibit I and Exhibit R. Adelphia requests privileged treatment for this volume and has marked it “CUI//PRIV” and “Contains Privileged Information—Do Not Release.”

XIX. CONCLUSION

The Adelphia Gateway Pipeline will provide approximately 525,000 Dth/d of natural gas transportation capacity on the Zone North portion of the 18-inch Mainline and the 20-inch Mainline and 250,000 Dth/d of natural gas transportation capacity on the Zone South portion of the 18-inch Mainline, providing capacity needed for service to existing and new customers. Adelphia will provide interstate natural gas transportation service to Existing Shippers on the same terms as the legacy firm transportation service agreements and interstate service to new customers under a long-term firm transportation agreement, as well as to any additional customers that may subscribe to available capacity on the Project. The Project will provide its shippers with access to diverse and abundant natural gas supplies through interconnections with three interstate pipelines to meet existing and growing demand in the Pennsylvania and Northeast markets.

WHEREFORE, for the foregoing reasons, Adelpia respectfully requests that the Commission issue the certificates of public convenience and necessity and blanket certificates requested herein, approve Adelpia's *pro forma* FERC Gas Tariff, approve the non-conforming provisions in firm service agreements, and grant such other authorizations and waivers as may be necessary from the Commission to allow Adelpia to undertake the activities described in this Application, all as further set forth herein.

Adelpia Gateway, LLC

/s/ Mark F. Valori
Mark F. Valori
Vice President

January 11, 2018

VERIFICATION

THE STATE OF NEW JERSEY)
)
COUNTY OF MONMOUTH)

Mark F. Valori being first duly sworn, states that he is the Vice President, for Adelpia Gateway, LLC; that he is authorized to execute this Verification; that he has read the foregoing application and is familiar with the contents thereof; and that all allegations of fact therein contained are true and correct to the best of his knowledge and belief.

Adelpia Gateway, LLC



Mark F. Valori
Vice President

Subscribed and sworn to before me this 11th day of January, 2018.



Notary Public,
State of New Jersey

My Commission Expires:

12-4-21

LORI S. CASTELLO
ID# 2353137
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES 12-4-21

Adelphia Gateway, LLC
Adelphia Project

DOCKET NO. CP18-____-000

NOTICE

compression facilities and additional pipeline facilities in Pennsylvania and Delaware; and (iv) to construct, install, own, and operate certain other appurtenant facilities;

- a blanket certificate pursuant to Part 157, Subpart F of the Commission's regulations, authorizing Adelphia to construct, operate, acquire and abandon certain facilities as described in Part 157, Subpart F;
- a blanket certificate pursuant to Part 284, Subpart G of the Commission's regulations authorizing Adelphia to provide open-access firm and interruptible interstate natural gas transportation services on a self-implementing basis with pre-granted abandonment authority for such services;
- approval of the pro forma FERC Gas Tariff attached to the Application as part of Exhibit P;
- approval of non-conforming provisions in firm service agreements with existing shippers on the IEC system in light of their long-term legacy capacity commitments on IEC's existing facilities; and
- such other authorizations and waivers as may be necessary from the Commission to allow Adelphia to undertake the activities described in this Application.

Adelphia requests that the Commission issue these authorizations and waivers by August 1, 2018. Any questions regarding this Application should be directed to the following:

William P. Scharfenberg
Assistant General Counsel
Adelphia Gateway, LLC
1415 Wyckoff Road
Wall, NJ 07719
Phone: (732) 938-1134
Fax: (732) 938-1226
WScharfenberg@NJResources.com

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 C.F.R. §§ 385.211, 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing to become a party must file a notice of intervention or motion to intervene, as appropriate. Such notices, motions, or protests must be filed on or before the comment date. Anyone filing a motion to intervene or protest must serve a copy of that document on the Applicant. On or before the comment date, it is not necessary to serve motions to intervene or protests on persons other than the Applicant.

The Commission encourages electronic submission of protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically should

submit an original and 5 copies of the protest or intervention to the Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426.

This filing is accessible on-line at <http://www.ferc.gov>, using the “eLibrary” link and is available for review in the Commission’s Public Reference Room in Washington, DC. There is an “eSubscription” link on the web site that enables subscribers to receive email notification when a document is added to a subscribed docket(s). For assistance with any FERC Online service, please email FERCOnlineSupport@ferc.gov, or call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

Comment Date: 5:00 pm Eastern Time on **(insert date)**.

Kimberly D. Bose
Secretary

Adelphia Gateway, LLC

Adelphia Project

DOCKET NO. CP18-____-000

Exhibit C

Company Officials

Docket No. CP18-____-000
Adelphia Gateway, LLC
Exhibit C

Company Officials

<u>Name</u>	<u>Company</u>	<u>Title</u>	<u>Address</u>
Stephen D. Westhoven	Adelphia Gateway, LLC	President	1415 Wyckoff Road Wall, NJ 07719
Mark F. Valori	Adelphia Gateway, LLC	Vice President	1415 Wyckoff Road Wall, NJ 07719
Patrick J. Migliaccio	Adelphia Gateway, LLC	Treasurer	1415 Wyckoff Road Wall, NJ 07719
Richard Reich	Adelphia Gateway, LLC	Corporate Secretary	1415 Wyckoff Road Wall, NJ 07719

Adelphia Gateway, LLC
Adelphia Project

DOCKET NO. CP18-____-000

Exhibit O

Depreciation and Depletion

Adelphia Gateway, LLC
Docket No. CP18-___-000
Exhibit O

**Adelphia Gateway, LLC
Depreciation**

Adelphia proposes to set its depreciation rate at 3.33% per year for Transmission Plant.

Adelphia Gateway, LLC
Adelphia Project

DOCKET NO. CP18-____-000

Exhibit Z-1

Form of Protective Agreement

PROTECTIVE AGREEMENT

This Protective Agreement (“Protective Agreement”), is made and entered into as of _____, 201_ (“Effective Date”), by and between Adelphia Gateway, LLC, a Delaware limited liability company (“Adelphia”) and [Counterparty], a [jurisdiction and organization type] (“Participant,” and together with Adelphia, the “Parties”).

WHEREAS, a certificate application regarding Adelphia’s Gateway Pipeline Project (“Project”) is currently pending before the Federal Energy Regulatory Commission (“Commission”) in Docket No. CP18-____-000 (“Certificate Proceeding”);

WHEREAS, pursuant to Section 388.112(b) of the Commission’s regulations, 18 C.F.R. § 388.112(b) (2017), this Protective Agreement will apply to requests for a copy of the complete, non-public version of any document filed by Adelphia as privileged or as Critical Energy Infrastructure Information (CEII) in the Certificate Proceeding; and

WHEREAS, Participant is submitting this Protective Agreement as part of its request pursuant to 18 C.F.R. § 388.112(b)(iii) for a complete, non-public version of [name of document(s)] included in the Commission’s eLibrary under Accession No[s]. [_____] (“Protected Materials”) subject to the terms of this Protective Agreement;

NOW, THEREFORE, Adelphia and Participant agree as follows:

1. This Protective Agreement shall govern the use of all Protected Materials produced by, or on behalf of, Adelphia to Participant hereunder. Notwithstanding any order terminating the Certificate Proceeding, this Protective Agreement shall remain in effect until specifically modified or terminated by (i) written agreement of the Parties, (ii) the Commission or (iii) any applicable Presiding Administrative Law Judge (“Presiding Judge”) (which includes the Chief Administrative Law Judge).

2. This Protective Agreement applies to the Protected Materials, as defined in the recitals to this Protective Agreement. Notwithstanding anything herein to the contrary, Adelphia’s delivery of Protected Materials to Participant pursuant to this Protective Agreement shall not affect the Protected Materials’ protected status under the Commission’s regulations and Freedom of Information Act, 5 U.S.C. 552 (“FOIA”).

3. Definitions -- For purposes of this Protective Agreement:

- (a) The term “Notes of Protected Materials” means memoranda, handwritten notes, or any other form of information (including electronic form) which copies or discloses materials described in

the Protected Materials. Except as specifically provided in this Protective Agreement, Notes of Protected Materials are subject to the same terms and restrictions as the Protected Materials under this Protective Agreement.

- (b) The term “Non-Disclosure Certificate” shall mean the certificate annexed to this Protective Agreement by which the Reviewing Representative(s) of the Participant who have been granted access to Protected Materials shall certify their understanding that such access to Protected Materials is provided pursuant to the terms and restrictions of this Protective Agreement, and that such Reviewing Representative has read the Protective Agreement and agrees to be bound by it.
- (c) The term “Reviewing Representative” shall mean a person who has signed a Non-Disclosure Certificate and who is: (i) an attorney who has made an appearance in this Certificate Proceeding for Participant; (ii) attorneys, paralegals, and other employees associated for purposes of this Certificate Proceeding with an attorney described in Paragraph 3(c)(i); (iii) an expert or an employee of an expert retained by Participant for the purpose of advising, preparing for or testifying in this Certificate Proceeding; or (iv) employees or other representatives of Participant appearing in this Certificate Proceeding with significant responsibility for this docket.

4. Protected Materials shall be made available under the terms of this Protective Agreement only to Participant’s Reviewing Representatives; provided that if the Protective Materials include rates, rate-related provisions and/or credit support provisions, Adelphia may redact the rates, rate-related provisions and credit support provisions from the version of the Protected Materials provided to Participant’s Reviewing Representatives. In the event that Adelphia redacts any such information, if requested by Participant the Parties shall meet to discuss the terms and conditions under which one or more of Participant’s Reviewing Representatives may be provided such redacted information. If no agreement is reached, Participant may submit such dispute to the Commission or the Presiding Judge, if any, for resolution.

5. Protected Materials shall remain available to Participant until the later of the date that an order terminating this Certificate Proceeding becomes no longer subject to judicial review, or the date that any other Commission proceeding relating to the Protected

Materials is concluded and no longer subject to judicial review. If requested to do so in writing after that date, Participant shall, within fifteen (15) days of such request, return the Protected Materials (excluding Notes of Protected Materials) to Adelphia, or shall destroy the materials, except that copies of filings, official transcripts and exhibits in this proceeding that contain Protected Materials, and Notes of Protected Materials may be retained, if they are maintained in accordance with Paragraph 6, below. Within such time period, Participant, if requested to do so, shall also submit to Adelphia an affidavit stating that, to the best of its knowledge, all Protected Materials and all Notes of Protected Materials have been returned or have been destroyed or will be maintained in accordance with Paragraph 6. To the extent Protected Materials are not returned or destroyed, they shall remain subject to the Protective Agreement.

6. All Protected Materials shall be maintained by Participant in a secure place. Access to those materials shall be limited to those Reviewing Representatives specifically authorized pursuant to Paragraphs 8-9.

7. Protected Materials shall be treated as confidential by Participant and by the Reviewing Representative in accordance with the Non-Disclosure Certificate executed pursuant to Paragraph 9. Protected Materials shall not be used by Participant or a Reviewing Party except as necessary for the conduct of the Certificate Proceeding, nor shall they be disclosed in any manner to any person except a Reviewing Representative of Participant who is engaged in the conduct of the Certificate Proceeding and who needs to know the information in order to carry out that person's responsibilities in the Certificate Proceeding. Reviewing Representatives may make copies of Protected Materials, but such copies become Protected Materials. Reviewing Representatives may make notes of Protected Materials, which shall be treated as Notes of Protected Materials if they disclose the contents of Protected Materials.

8. (a) A Reviewing Representative may not use information contained in any Protected Materials obtained through this proceeding to give Participant, any customer or potential customer of Adelphia or any competitor of Adelphia a commercial advantage or for any other purpose other than the prosecution or defense of the proceedings conducted under this Certificate Proceeding.

(b) In the event that Participant wishes to designate as a Reviewing Representative a person not described in Paragraph 3(c) above, Participant shall seek agreement from Adelphia. If an agreement is reached, that person shall be a Reviewing Representative pursuant to Paragraph 3(c) above with respect to those materials. If no agreement is reached, Participant may submit the disputed designation to the Commission or the Presiding Judge, if any, for resolution.

9. (a) A Reviewing Representative shall not be permitted to inspect, participate in discussions regarding, or otherwise be permitted access to Protected Materials pursuant to this Protective Agreement unless that Reviewing Representative has first executed a Non-Disclosure Certificate; provided, that if an attorney qualified as a Reviewing Representative has executed such a certificate, the paralegals, secretarial and clerical personnel employed by the same entity as the attorney and under the attorney's instruction, supervision or control need not do so. A copy of each Non-Disclosure Certificate shall be provided to counsel for Adelphia prior to disclosure of any Protected Material to that Reviewing Representative.

(b) Attorneys qualified as Reviewing Representatives are responsible for ensuring that persons under their instruction, supervision or control comply with this Protective Agreement.

10. Subject to Paragraph 4 above, any Reviewing Representative may disclose Protected Materials to any other Reviewing Representative of Participant as long as the disclosing Reviewing Representative and the receiving Reviewing Representative both have executed a Non-Disclosure Certificate. In the event that any Reviewing Representative to whom the Protected Materials are disclosed ceases to be engaged in this Certificate Proceeding, or is employed or retained for a position whose occupant is not qualified to be a Reviewing Representative under Paragraph 3(c), access to Protected Materials by that person shall be terminated. Even if no longer engaged in this Certificate Proceeding, every person who has executed a Non-Disclosure Certificate shall continue to be bound by the provisions of this Protective Agreement and the certification.

11. Subject to Paragraph 18, the Commission or Presiding Judge, if any, shall resolve any disputes arising under this Protective Agreement. Prior to presenting any dispute under this Protective Agreement to the Commission or Presiding Judge, the Parties shall use their best efforts to resolve it.

12. All copies of all documents reflecting Protected Materials, including the portion of the hearing testimony, exhibits, transcripts, briefs and other documents which refer to Protected Materials, shall be filed and served in sealed envelopes or other appropriate containers endorsed to the effect that they are sealed pursuant to this Protective Agreement. Such documents shall be marked "PROTECTED MATERIALS" and shall be filed under seal and served under seal upon the Commission, the Presiding Judge, if any, and the other Party. Any such documents containing Critical Energy Infrastructure Information shall be additionally marked "Contains Critical Energy Infrastructure Information – Do Not Release". For anything filed under seal, redacted versions or, where an entire document is protected, a letter indicating such, will also be filed with the Commission and served on the other Party and the Presiding Judge, if any. Counsel shall

take all reasonable precautions necessary to assure that Protected Materials are not distributed to unauthorized persons.

13. If Participant desires to include, utilize or refer to any Protected Materials or information derived therefrom in any submission during this proceeding in such a manner that might require disclosure of such material to other participants in the Certificate Proceeding, Participant shall first notify counsel for Adelphia and the Commission or Presiding Judge, if any, of such desire, identifying with particularity each of the Protected Materials. Thereafter, use of such Protected Materials will be governed by procedures determined by the Commission or Presiding Judge, if any.

14. Nothing in this Protective Agreement shall be construed as precluding Adelphia from objecting to the use of Protected Materials on any legal grounds.

15. Nothing in this Protective Agreement shall preclude Participant from requesting the Commission, the Presiding Judge, if any, or any other body having appropriate authority, to find that this Protective Agreement should not apply to all or any materials previously designated as Protected Materials pursuant to this Protective Agreement.

16. [Intentionally omitted]

17. All Protected Materials filed with the Commission, the Presiding Judge, if any, or any other judicial or administrative body, in support of, or as a part of, a motion, other pleading, brief, or other document, shall be filed and served in sealed envelopes or other appropriate containers bearing prominent markings indicating that the contents include Protected Materials subject to this Protective Agreement.

18. If the Commission or Presiding Judge, if any, finds at any time in the course of this proceeding that all or part of the Protected Materials need not be protected, those materials shall, nevertheless, be subject to the protection afforded by this Protective Agreement for three (3) business days from the date of issuance of the Commission or Presiding Judge's determination, and if Adelphia files an interlocutory appeal or, if applicable, requests that the issue be certified to the Commission, for an additional seven (7) business days. Adelphia has not waived its rights to seek additional administrative or judicial remedies after any decision respecting Protected Materials or Reviewing Representatives. The provisions of 18 C.F.R. §§ 388.112 and 388.113 shall apply to any requests under the FOIA for Protected Materials in the files of the Commission.

19. Nothing in this Protective Agreement shall be deemed to preclude either Party from independently seeking through discovery in any other administrative or judicial

proceeding information or materials produced in this proceeding under this Protective Agreement.

20. Adelphia does not waive its right to pursue any other legal or equitable remedies that may be available in the event of actual or anticipated disclosure of Protected Materials.

21. Participant shall not disclose the contents of Protected Materials or any other form of information that copies or discloses Protected Materials to anyone other than in accordance with this Protective Agreement and only use such contents and information in connection with this Certificate Proceeding. Any violation of this Protective Agreement and of any Non-Disclosure Certificate executed hereunder shall constitute a breach of the Protective Agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Protective Agreement to be duly executed in several counterparts by their proper officers duly authorized as of the Effective Date.

ADELPHIA GATEWAY, LLC

By _____

Title _____

[COUNTERPARTY]

By _____

Title _____

NON-DISCLOSURE CERTIFICATE

I hereby certify my understanding that access to Protected Materials is provided to me pursuant to the terms and restrictions of the Protective Agreement between Adelpia Gateway, LLC and [Counterparty] dated _____, 201_, that I have been given a copy of and have read the Protective Agreement, and that I agree to be bound by it. I understand that the contents of the Protected Materials, any notes or other memoranda, or any other form of information that copies or discloses Protected Materials shall not be disclosed to anyone other than in accordance with that Protective Agreement. I acknowledge that a violation of this certificate constitutes a breach of the Protective Agreement.

By: _____

Printed Name: _____

Title: _____

Representing: Date: _____

Adelphia Gateway, LLC

Adelphia Project

DOCKET NO. CP18-__-000

Appendix 2A

Wetland and Waterbody Identification and Delineation Report

Wetland and Waterbody Identification and Delineation Report

Adelphia Gateway, LLC

Adelphia Gateway Project

Pennsylvania and Delaware

Prepared by:

NV5

850 Bear Tavern Road, Suite 106

West Trenton, NJ 08628

December 2017

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This Wetland and Waterbody Identification and Delineation Report has been prepared to describe wetlands and waterbodies that may be affected by Adelphia Gateway, LLC's (Adelphia) proposed Adelphia Gateway Project (Project).

1.0 Project Description

Adelphia Gateway, LLC, is proposing modifications to its existing natural gas and oil pipeline and associated facilities located in Delaware, Chester, Bucks, Montgomery, and Northampton Counties, Pennsylvania. The Project consists of the following primary components: the approximately 4.4-mile 20-inch Mainline; the approximately 84-mile 18-inch Mainline consisting of the Southern Segment and the Northern Segment that will both transport solely natural gas; two new compressor stations (the Marcus Hook Compressor Station [Marcus Hook CS] and the Quakertown Compressor Station [Quakertown CS]); two laterals, including an approximately 0.25-mile 16-inch pipeline lateral (the Parkway Lateral) and an approximately 4.5-mile 16-inch pipeline lateral (the Tilghman Lateral); four existing meter and regulator (M&R) facilities that do not require any modifications and accordingly do not have any environmental impacts for review in this resource report; eight new M&R facilities at receipt and delivery interconnects located along the 18-inch Mainline and the laterals; eight new blowdown assemblies located at existing mainline valves; one new mainline valve (MLV); and use of an existing disturbed site located within the boundaries of the proposed Marcus Hook CS as a wareyard.

2.0 Regulatory Overview

NV5 conducted field surveys on June 19 and 20, 2017 and December 13 and 14, 2017 to identify and delineate the extent and location of jurisdictional waters and wetlands within the Project study area pursuant to Sections 404 and 401 of the Clean Water Act (CWA). Adelphia is continuing to identify and delineate wetlands and waterbodies that may be along and in proximity to the proposed Adelphia Gateway Project. Section 404 regulates the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands (EPA, no date), and Section 401 allows for individual states to grant or deny federally approved actions that would result in discharges to WOUS through the use of Water Quality Certifications (EPA, 2010).

The CWA defines WOUS as:

- all waters that are, were, or could be used in interstate or foreign commerce;
- all waters that cross state lines, including wetlands;
- all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- all impoundments of waters otherwise defined as WOUS;

- tributaries of WOUS;
- the territorial sea; and
- wetlands adjacent to WOUS (other than waters that are themselves wetlands).

Under the CWA, waste treatment systems and prior converted cropland are not considered to be WOUS (EPA, 2017).

The U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) use the 1987 USACE Wetlands Delineation Manual (Manual) to identify wetlands for the CWA Section 404 permit program. In the Manual, wetlands are defined as, "... those areas that are inundated or saturated by surface or ground water 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." Wetlands generally include swamps, marshes, bogs (Environmental Laboratory, 1987). The Manual organizes the environmental characteristics of a potential wetland into three categories: soils, vegetation, and hydrology. The Manual contains criteria for each category. Using this approach, an area that meets all three criteria is considered a wetland (EPA, no date).

To address regional variation across wetlands in the U.S. that could affect the validity and usefulness of the Manual, the USACE also developed regional supplements to the Manual that provide delineation techniques specifically developed for a particular geographical region (Wakeley, 2002). The Project encompasses an area that is covered by two regional supplements to the Manual: the Eastern Mountains and Piedmont; and the Gulf Coast Coastal Plain Regional Supplements (USACE, no date). NV5 conducted wetland delineations in accordance with the methodologies in the Manual and applicable supplements.

3.0 Records Research

Prior to field surveys, NV5 reviewed 7.5-minute USGS topographic quadrangle maps, the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) web-based Interactive Mapper, the Pennsylvania Department of Environmental Protection's (PADEP) eMap database, the Delaware Department of Natural Resources and Environmental Control's (DNREC) NavMap database, Google Earth imagery, and the U.S. Department of Agriculture's Web Soil Survey to identify potential vernal pools, natural areas, areas with topographical configurations, mapped wetlands, and hydric soils, which may suggest the presence of wetlands and waterbodies.

Records research did not identify any wetlands within the Project area. The desktop review identified two waterbodies, Marcus Hook Creek and Stoney Creek, that would be crossed by the Project (both along the Tilghman Lateral).

4.0 Survey Area

NV5 conducted field surveys to verify the mappings and identify the presence of any regulated wetland and water resources that were not identified during the records research. At identified features, NV5 collected GPS data, took representative photographs, and flagged features with high visibility flagging. NV5 conducted wetland and waterbody surveys at the Marcus Hook CS (and wareyard), the Parkway Lateral (and its associated interconnects/meter stations), the Martins Creek Station, the Skippack Meter Station, and portions of the Quakertown CS and the Tilghman Lateral. NV5 is continuing to survey along the Tilghman Lateral (and its associated interconnects/meter stations), the Quakertown CS, the new MLV site (there are two locations being considered), and the eight blowdown assembly sites, and will file the information with the Federal Energy Regulatory Commission (FERC) upon completion as a supplemental filing. Wetlands were identified in proximity to the proposed Skippack Meter Station but not within the proposed facility boundaries. A wetland was also identified in proximity to the Quakertown CS but not within the portion of the proposed facility boundaries that were surveyed. No wetlands were identified at the Martins Creek Station, Parkway Lateral, or the portions of the Tilghman Lateral that have been surveyed.

Adelphia has not surveyed the portions of the Tilghman Lateral that would be crossed by Marcus Hook Creek and Stoney Creek. Adelphia will conduct these surveys upon access approval and file the reports as a supplemental filing with the FERC.

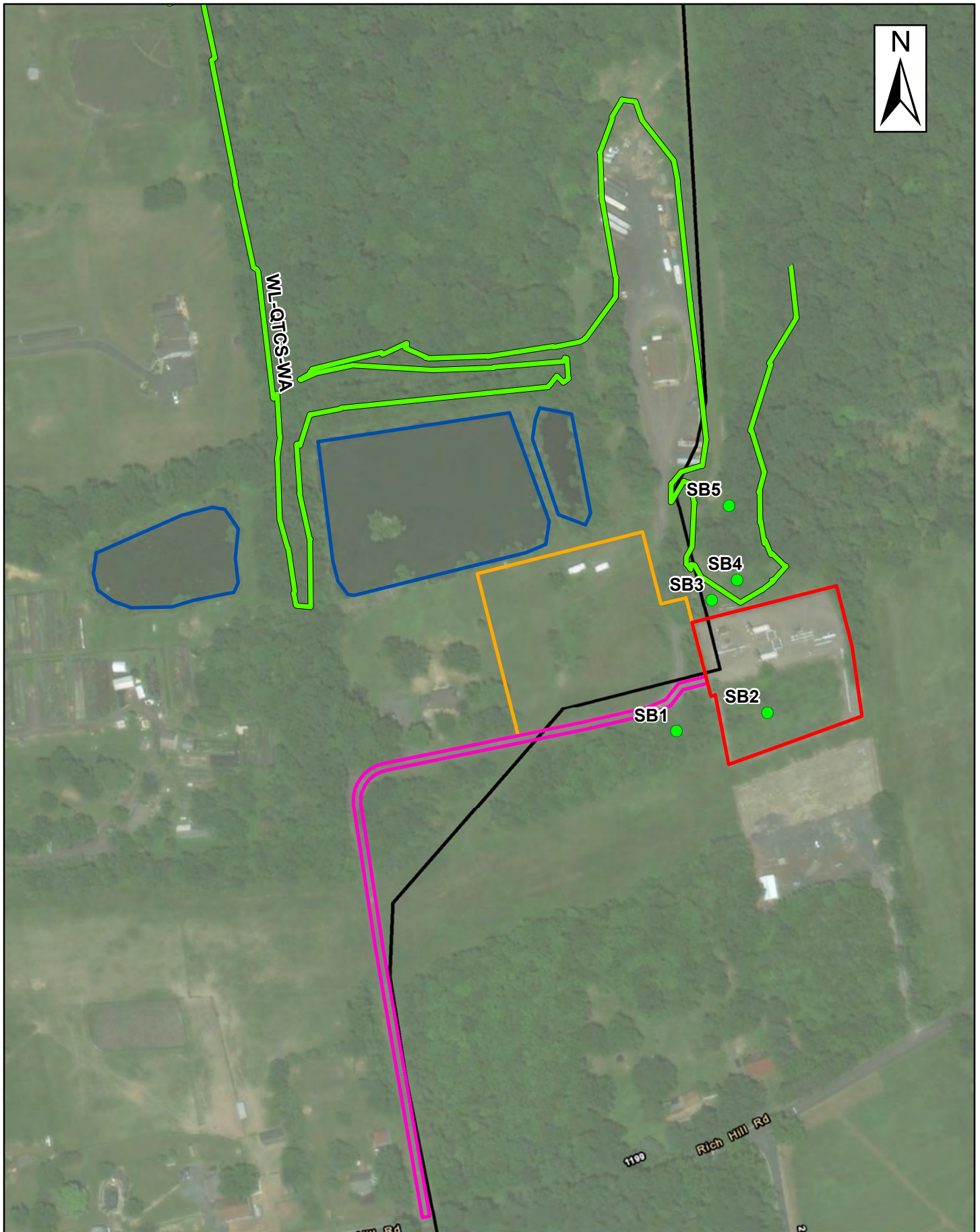
5.0 Survey Findings

Adelphia field identified three wetlands in proximity to the Project area. None were identified within the portions of the Project workspace that were surveyed. WL-QTCS-WA is a palustrine forested (PFO) wetland located north of the proposed Quakertown CS. WL-SKIP-WA is a palustrine emergent (PEM) wetland located west of the proposed Skippack Meter Station, and WL-SKIP-WB is a PEM wetland located south of the proposed Skippack Meter Station. Appendix A depicts the location of the identified wetlands, and appendix B provides the associated datasheets.

6.0 References

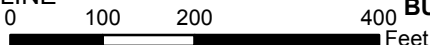
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- U.S Environmental Protection Agency (EPA). 2017. Section 404 of the Clean Water Act. Definition of Waters of the United States Under the Clean Water Act. Available at: <https://www.epa.gov/cwa-404/definition-waters-united-states-under-clean-water-act>.
- Wakeley, J. S. (2002). "Developing a 'Regionalized' Version of the Corps of Engineers Wetlands Delineation Manual: Issues and Recommendations," ERDC/EL TR-02-20, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Appendix A - Figures

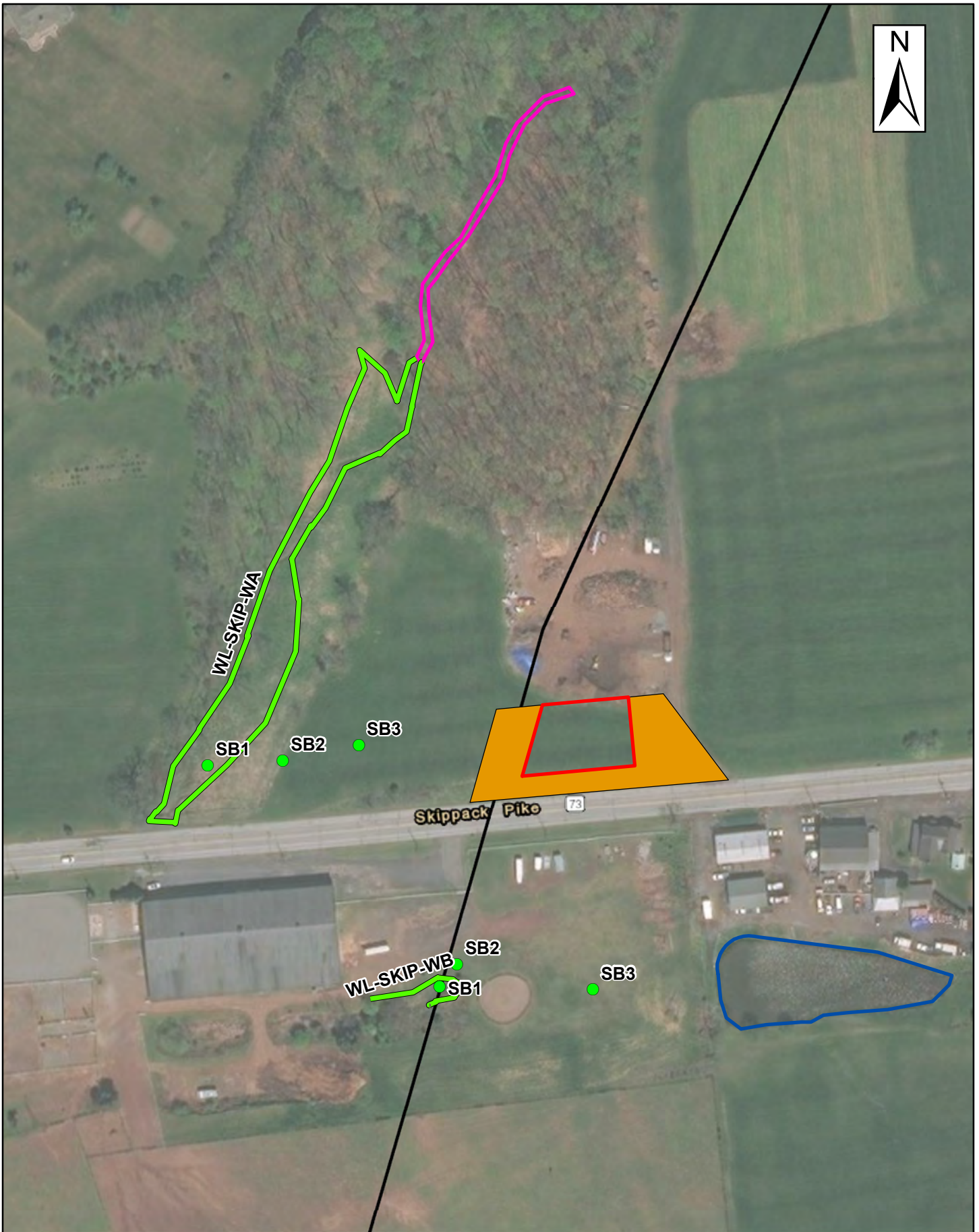


- Data Points
- Wetlands
- Waterbodies
- Quakertown Station Site

- Quakertown Access Road
- Quakertown TWS
- EXISTING PIPELINE

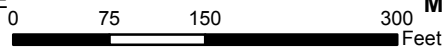


**ADELPHIA GATEWAY PROJECT
WETLANDS AND WATERBODIES MAP
QUAKERTOWN STATION SITE
BUCKS COUNTY, PENNSYLVANIA**



- Data Points
- ▬ Wetlands
- ▭ Waterbodies
- ▭ Drainage Feature

- Skippack Interconnect
- Skippack Interconnect TWS
- EXISTING PIPELINE



**ADELPHIA GATEWAY PROJECT
WETLANDS AND WATERBODIES MAP
SKIPPACK INTERCONNECT
MONTGOMERY COUNTY, PENNSYLVANIA**

Appendix B - Datasheets

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Quakertown CS City/County: Bucks Sampling Date: 6/19/17
 Applicant/Owner: _____ State: PA Sampling Point: SB1
 Investigator(s): NV5, LLC - SA/HA Section, Township, Range: Quakertown
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.403943° Long: -75.348731° Datum: WGS84
 Soil Map Unit Name: Amwell silt loam, 3- 8% slopes (AmB) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks: Significant rain yesterday, which provided false secondary indicator of hydro	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SB1

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: _____)																				
1. <u>Quercus palustris</u>	10	No	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25.00</u> (A/B)																
2. <u>Q. alba</u>	15	Yes	FACU																	
3. <u>Q. velutina</u>	20	Yes	NI																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
_____ = Total Cover 50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right">Total % Cover of:</td> <td style="width:50%; text-align:right">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>25</u></td> <td>x 3 = <u>75</u></td> </tr> <tr> <td>FACU species <u>50</u></td> <td>x 4 = <u>200</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>85</u> (A)</td> <td><u>295</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center">Prevalence Index = B/A = <u>3.47</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>25</u>	x 3 = <u>75</u>	FACU species <u>50</u>	x 4 = <u>200</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>85</u> (A)	<u>295</u> (B)	Prevalence Index = B/A = <u>3.47</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = <u>0</u>																			
FACW species <u>10</u>	x 2 = <u>20</u>																			
FAC species <u>25</u>	x 3 = <u>75</u>																			
FACU species <u>50</u>	x 4 = <u>200</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>85</u> (A)	<u>295</u> (B)																			
Prevalence Index = B/A = <u>3.47</u>																				
Sapling/Shrub Stratum (Plot size: _____)																				
1. <u>Viburnum dentatum</u>	15	Yes	FAC		Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)															
2. <u>Lonicera morrowii</u>	5	No	FACU																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
_____ = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
Herb Stratum (Plot size: _____)																				
1. <u>Penstemon digitalis</u>	5	No	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																
2. <u>Potentilla simplex</u>	5	No	FACU																	
3. <u>Oxalis stricta</u>	5	No	FACU																	
4. <u>Glechoma hederacea</u>	5	No	FACU																	
5. <u>Toxicodendron radicans</u>	5	No	FAC																	
6. <u>Parthenocissus quinquefolia</u>	15	Yes	FACU																	
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
12. _____																				
_____ = Total Cover 50% of total cover: <u>20</u> 20% of total cover: <u>8</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
Remarks: (If observed, list morphological adaptations below).																				

SOIL

Sampling Point: **SB1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-4	7.5YR 5/2					SiL	
4-12	10YR 4/4	90	10YR 3/6	10		SiL	
12+							

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> (MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> (MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: SB1

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Quakertown CS City/County: Bucks Sampling Date: 6/19/17
 Applicant/Owner: _____ State: PA Sampling Point: SB2
 Investigator(s): NV5, LLC - SA/HA Section, Township, Range: Quakertown
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.403971° Long: -75.348136° Datum: WGS84
 Soil Map Unit Name: Amwell silt loam, 3- 8% slopes (AmB) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Significant rain yesterday.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SB2

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.33</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>35</u> x 3 = <u>105</u> FACU species <u>75</u> x 4 = <u>300</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>110</u> (A) <u>405</u> (B) Prevalence Index = B/A = <u>3.68</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
$\underline{0} = \text{Total Cover}$ 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. <i>Cornus racemosa</i>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <i>Lonicera morrowii</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. <i>Juniperus virginiana</i>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	
4. <i>Fraxinus americana</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
$\underline{45} = \text{Total Cover}$ 50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				
<u>Herb Stratum</u> (Plot size: _____)				
1. <i>Penstemon digitalis</i>	<u>5</u>	<u>No</u>	<u>FAC</u>	
2. <i>Potentilla simplex</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. <i>Oxalis stricta</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <i>Glechoma hederacea</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. <i>Apocynum cannabinum</i>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	
6. <i>Solidago canadensis</i>	<u>10</u>	<u>No</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
$\underline{55} = \text{Total Cover}$ 50% of total cover: <u>27.5</u> 20% of total cover: <u>11</u>				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. <i>Convolvulus arvensis</i>	<u>5</u>	<u>No</u>	<u>NI</u>	
2. <i>Toxicodendron radicans</i>	<u>10</u>	<u>No</u>	<u>FAC</u>	
3. <i>Parthenocissus quinquefolia</i>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
$\underline{20} = \text{Total Cover}$ 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				
Remarks: (If observed, list morphological adaptations below). 				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.				

SOIL

Sampling Point: **SB2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-12	10YR 4/4	100				CL	
12+	rock						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: SB2

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Quakertown City/County: Bucks Sampling Date: 6/19/17
 Applicant/Owner: _____ State: PA Sampling Point: SB3
 Investigator(s): NV5, LLC - SA/HA Section, Township, Range: Quakertown
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.404622° Long: -75.348018° Datum: WGS84
 Soil Map Unit Name: Amwell silt loam, 3- 8% slopes (AmB) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks: Significant rain yesterday, which provided false secondary indicator of hydro	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SB3

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>5</u> x 2 = <u>10</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species <u>85</u> x 4 = <u>340</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>120</u> (A) <u>440</u> (B) Prevalence Index = B/A = <u>3.67</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. <i>Viburnum prunifolium</i>	10	No	FAC	
2. <i>Lonicera morrowii</i>	10	No	FACU	
3. <i>Cornus racemosa</i>	10	No	FAC	
4. <i>Fraxinus pennsylvanica</i>	5	No	FACW	
5. <i>Juniperus virginiana</i>	10	No	FACU	
6. <i>Malus sp.</i>	20	Yes		
7. <i>Elaeagnus umbellata</i>	10	No	NI	
8. _____	_____	_____	_____	
<u>75</u> = Total Cover 50% of total cover: <u>37.5</u> 20% of total cover: <u>15</u>				
<u>Herb Stratum</u> (Plot size: _____)				
1. <i>Penstemon digitalis</i>	5	No	FAC	
2. <i>Potentilla simplex</i>	20	Yes	FACU	
3. <i>Apocynum cannabinum</i>	10	No	FACU	
4. <i>Solidago canadensis</i>	10	No	FACU	
5. <i>Toxicodendron radicans</i>	5	No	FAC	
6. <i>Parthenocissus quinquefolia</i>	5	No	FACU	
7. <i>Schizachyrium scoparium</i>	5	No	FACU	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>60</u> = Total Cover 50% of total cover: <u>30</u> 20% of total cover: <u>12</u>				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. <i>Parthenocissus quinquefolia</i>	15	Yes	FACU	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>15</u> = Total Cover 50% of total cover: <u>7.5</u> 20% of total cover: <u>3</u>				
Remarks: (If observed, list morphological adaptations below).				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:
Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vine – All woody vines greater than 3.28 ft in height.

SOIL

Sampling Point: **SB3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-4	7.5YR 5/2					SiL	
4-12	10YR 4/4	90	10YR 3/6	10		SiL	
12+							

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> (MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> (MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: SB3

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Quakertown CS City/County: Bucks Sampling Date: 6/19/17
 Applicant/Owner: _____ State: PA Sampling Point: SB4
 Investigator(s): NV5, LLC - SA/HA Section, Township, Range: Quakertown
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.404636° Long: -75.348330° Datum: WGS84
 Soil Map Unit Name: Amwell silt loam, 3- 8% slopes (AmB) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>surface</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Significant rain yesterday.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SB4

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)																
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)																
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)																
4. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>60</u></td> <td>x 3 = <u>180</u></td> </tr> <tr> <td>FACU species <u>15</u></td> <td>x 4 = <u>60</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>285</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.85</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>5</u>	x 1 = <u>5</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>60</u>	x 3 = <u>180</u>	FACU species <u>15</u>	x 4 = <u>60</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>285</u> (B)	Prevalence Index = B/A = <u>2.85</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>5</u>	x 1 = <u>5</u>																			
FACW species <u>20</u>	x 2 = <u>40</u>																			
FAC species <u>60</u>	x 3 = <u>180</u>																			
FACU species <u>15</u>	x 4 = <u>60</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>100</u> (A)	<u>285</u> (B)																			
Prevalence Index = B/A = <u>2.85</u>																				
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																				
1. <u>Salix discolor</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
2. <u>Rosa multiflora</u>	<u>10</u>	<u>No</u>	<u>FACU</u>																	
3. <u>Cornus racemosa</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>																	
4. <u>Fraxinus pennsylvanica</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>50</u> = Total Cover 50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
<u>Herb Stratum</u> (Plot size: _____)																				
1. <u>Penstemon digitalis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																	
2. <u>Euthamia graminifolia</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Cinna arundinacea</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
4. <u>Geum canadense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
5. <u>Toxicodendron radicans</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																	
6. <u>Scirpus atrovirens</u>	<u>5</u>	<u>No</u>	<u>OBL</u>																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>50</u> = Total Cover 50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
<u>Woody Vine Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
Remarks: (If observed, list morphological adaptations below).																				

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: **SB4**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-8	7.5YR 4/1						SiL	
8-12	7.5YR 4/1	80	10YR 5/6	20	C	PL	SiL	
12+								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: SB4

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Quakertown CS City/County: Bucks Sampling Date: 12/13/17
 Applicant/Owner: _____ State: PA Sampling Point: SB5
 Investigator(s): NV5, LLC - SA Section, Township, Range: Quakertown
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.404941° Long: -75.348027° Datum: WGS84
 Soil Map Unit Name: Amwell silt loam, 3- 8% slopes (AmB) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>surface</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Significant rain yesterday.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SB5

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: _____)																				
1. <u>Quercus palustris</u>	10	No	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	30	Yes	FACW																	
3. <u>Acer rubrum</u>	20	Yes	FAC																	
4. <u>Q. alba</u>	10	No	FACU																	
5. _____																				
6. _____																				
7. _____																				
8. _____																				
_____ = Total Cover 50% of total cover: <u>35</u> 20% of total cover: <u>14</u>				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right">Total % Cover of:</td> <td style="width:50%; text-align:right">Multiply by:</td> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>60</u></td> <td>x 3 = <u>180</u></td> </tr> <tr> <td>FACU species <u>15</u></td> <td>x 4 = <u>60</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>285</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center">Prevalence Index = B/A = <u>2.85</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>5</u>	x 1 = <u>5</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>60</u>	x 3 = <u>180</u>	FACU species <u>15</u>	x 4 = <u>60</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>285</u> (B)	Prevalence Index = B/A = <u>2.85</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>5</u>	x 1 = <u>5</u>																			
FACW species <u>20</u>	x 2 = <u>40</u>																			
FAC species <u>60</u>	x 3 = <u>180</u>																			
FACU species <u>15</u>	x 4 = <u>60</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>100</u> (A)	<u>285</u> (B)																			
Prevalence Index = B/A = <u>2.85</u>																				
Sapling/Shrub Stratum (Plot size: _____)																				
1. _____				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																
Herb Stratum (Plot size: _____)																				
1. <u>Cinna arundinacea</u>	30	Yes	FACW		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>															
2. _____																				
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
12. _____																				
_____ = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
Remarks: (If observed, list morphological adaptations below).																				

SOIL

Sampling Point: **SB5**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-8	7.5YR 4/2	100					SiCL	
8-18	7.5YR 4/1	85	7.5YR 4/2	10	D	M	SiCL	
			7.5YR 5/8	5	C	PL		
18+	Rock							

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: SB5

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WA-SB1
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): floodplain - toeslope Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.242239° Long: -75.448074° Datum: WGS84
 Soil Map Unit Name: RWA Rowland silt loam, 0-3% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA-SB1

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
<u>Herb Stratum</u> (Plot size: _____)				
1. <i>Phalaris arundinacea</i>	80	Yes	FACW	
2. <i>Setaria pumila</i>	10	No	FAC	
3. <i>Polygonum perfoliatum</i>	10	No	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below).				

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:
Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: WA-SB1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-8	5YR 4/2	100					CL	
8-18	5YR 6/2	85	5YR 4/1	10	D	M	SiL	some gravel
			5YR 5/8	5	C	PL		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WA-SB1

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WA-SB2
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): floodplain - slope Local relief (concave, convex, none): convex Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.242273° Long: -75.447591° Datum: WGS84
 Soil Map Unit Name: PeB - Penn Silt Loam 3-8% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Hydrophytic vegetation invasive, likely cover-crop and not dominant.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA-SB2

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)																
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)																
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)																
4. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><u>Total % Cover of:</u></td> <td style="width:50%;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>60</u></td> <td>x 5 = <u>300</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>390</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.90</u></td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>60</u>	x 5 = <u>300</u>	Column Totals: <u>100</u> (A)	<u>390</u> (B)	Prevalence Index = B/A = <u>3.90</u>	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>30</u>	x 2 = <u>60</u>																			
FAC species <u>10</u>	x 3 = <u>30</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>60</u>	x 5 = <u>300</u>																			
Column Totals: <u>100</u> (A)	<u>390</u> (B)																			
Prevalence Index = B/A = <u>3.90</u>																				
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Herb Stratum</u> (Plot size: _____)																				
1. <u>Phalaris arundinacea</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																
2. <u>Setaria pumila</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																	
3. <u>Vulpia myuros</u>	<u>60</u>	<u>Yes</u>	<u>UPL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>100</u> = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>																				
<u>Woody Vine Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation invasive, likely cover-crop and not dominant.

SOIL

Sampling Point: WA-SB2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-4	5YR 4/6	100				L	
8-10	5YR 4/6	100				L	some red gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WA-SB2

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WA-SB3
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): hillslope - summit Local relief (concave, convex, none): convex Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.242549° Long: -75.447065° Datum: WGS84
 Soil Map Unit Name: PeC - Penn Silt Loam 8-15% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA-SB3

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>95</u></td> <td>x 5 = <u>475</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>485</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>4.85</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>95</u>	x 5 = <u>475</u>	Column Totals: <u>100</u> (A)	<u>485</u> (B)	Prevalence Index = B/A = <u>4.85</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>5</u>	x 2 = <u>10</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>95</u>	x 5 = <u>475</u>																			
Column Totals: <u>100</u> (A)	<u>485</u> (B)																			
Prevalence Index = B/A = <u>4.85</u>																				
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Herb Stratum</u> (Plot size: _____)																				
1. <i>Phalaris arundinacea</i>	5	No	FACW																	
2. <i>Vulpia myuros</i>	95	Yes	UPL																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>100</u> = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>																				
<u>Woody Vine Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation invasive and likely covercrop and not dominant.																				

SOIL

Sampling Point: WA-SB3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-8	5YR 4/6	60	5YR 3/4	40			L	red gravel
8+	refusal							red gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WA-SB3

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WB-SB1
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): floodplain - toeslope Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.241517° Long: -75.447094° Datum: WGS84
 Soil Map Unit Name: BWA - Buckingham silt loam, 0-3% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0.5"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>surface</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB-SB1

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:				
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)				
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)				
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.00</u> (A/B)				
4. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><u>0</u> = Total Cover</td> <td style="width:50%;"></td> </tr> <tr> <td>50% of total cover: <u>0</u></td> <td>20% of total cover: <u>0</u></td> </tr> </table>	<u>0</u> = Total Cover		50% of total cover: <u>0</u>	20% of total cover: <u>0</u>
<u>0</u> = Total Cover								
50% of total cover: <u>0</u>	20% of total cover: <u>0</u>							
5. _____	_____	_____	_____					
6. _____	_____	_____	_____					
7. _____	_____	_____	_____					
8. _____	_____	_____	_____					
_____ = Total Cover								
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>								
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><u>0</u> = Total Cover</td> <td style="width:50%;"></td> </tr> <tr> <td>50% of total cover: <u>0</u></td> <td>20% of total cover: <u>0</u></td> </tr> </table>	<u>0</u> = Total Cover		50% of total cover: <u>0</u>	20% of total cover: <u>0</u>
<u>0</u> = Total Cover								
50% of total cover: <u>0</u>	20% of total cover: <u>0</u>							
1. _____	_____	_____	_____					
2. _____	_____	_____	_____					
3. _____	_____	_____	_____					
4. _____	_____	_____	_____					
5. _____	_____	_____	_____					
6. _____	_____	_____	_____					
7. _____	_____	_____	_____					
8. _____	_____	_____	_____					
_____ = Total Cover								
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>								
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p>				
1. <i>Phalaris arundinacea</i>	40	Yes	FACW					
2. <i>Microstegium vimineum</i>	40	Yes	FAC					
3. <i>Polygonum perfoliatum</i>	20	No	FAC					
4. _____	_____	_____	_____					
5. _____	_____	_____	_____					
6. _____	_____	_____	_____					
7. _____	_____	_____	_____					
8. _____	_____	_____	_____					
9. _____	_____	_____	_____					
10. _____	_____	_____	_____					
11. _____	_____	_____	_____					
12. _____	_____	_____	_____					
_____ = Total Cover								
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>								
<u>Woody Vine Stratum</u> (Plot size: _____)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.				
1. _____	_____	_____	_____					
2. _____	_____	_____	_____					
3. _____	_____	_____	_____					
4. _____	_____	_____	_____					
5. _____	_____	_____	_____					
_____ = Total Cover								
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>								
Remarks: (If observed, list morphological adaptations below).				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

SOIL

Sampling Point: WB-SB1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-10	5YR 2.5/1	100				SiL	mucky
10-24	5YR 2.5/1	85	5YR 5/8	5	C	PL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input checked="" type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input checked="" type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WB-SB1

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WB-SB2
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.241665° Long: -75.447080° Datum: WGS84
 Soil Map Unit Name: BWA - Buckingham silt loam, 0-3% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB-SB2

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>95</u></td> <td>x 5 = <u>475</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>485</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>4.85</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>95</u>	x 5 = <u>475</u>	Column Totals: <u>100</u> (A)	<u>485</u> (B)	Prevalence Index = B/A = <u>4.85</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>5</u>	x 2 = <u>10</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>95</u>	x 5 = <u>475</u>																			
Column Totals: <u>100</u> (A)	<u>485</u> (B)																			
Prevalence Index = B/A = <u>4.85</u>																				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
<u>Herb Stratum</u> (Plot size: _____)																				
1. <i>Phalaris arundinacea</i>	5	No	FACW																	
2. <i>Vulpia myuros</i>	95	Yes	UPL																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>100</u> = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>																				
<u>Woody Vine Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation invasive and likely covercrop and not dominant.																				

SOIL

Sampling Point: WB-SB2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-6	5YR 4/6	100				L	
6+	refusal						rock and red gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

Remarks:
 Photo below looking towards Wetland WB.

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WB-SB2

Feature Photo: Facing - N S E W NE NW SE SW



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Skippack City/County: Montgomery Sampling Date: 12/14/17
 Applicant/Owner: _____ State: PA Sampling Point: WB-SB3
 Investigator(s): NV5, LLC - SA Section, Township, Range: Skippack
 Landform (hillslope, terrace, etc.): hillslope - summit Local relief (concave, convex, none): convex Slope (%): 0
 Subregion (LRR or MLRA): MLRA 148/LRR S Lat: 40.241614° Long: -75.446539° Datum: WGS84
 Soil Map Unit Name: PeC - Penn Silt Loam 8-15% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Overnight light snow

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB-SB3

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u> (A)</td> <td><u>0</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = _____</p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>0</u> (A)	<u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>0</u> (A)	<u>0</u> (B)																	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
<u>Sapling/Shrub Stratum</u> (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
<u>Herb Stratum</u> (Plot size: _____)																		
1. <i>Plantago lanceolata</i>	5	No	UPL															
2. <i>Vulpia myuros</i>	95	Yes	UPL															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>																		
<u>Woody Vine Stratum</u> (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
Remarks: (If observed, list morphological adaptations below). 				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain)																		
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																		

SOIL

Sampling Point: WB-SB3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-6	5YR 4/6	100				L	red gravel
6+	refusal						rock or dense red gravel

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: WB-SB3

Feature Photo: Facing - N S E W NE NW SE SW



Adelphia Gateway, LLC

Adelphia Project

DOCKET NO. CP18-__-000

Appendix 1D-1

Agency Correspondence – Public

PART 1 OF 2

Appendix 1D-1

DNREC Correspondence

ADELPHIA GATEWAY PROJECT



August 17, 2017

Ms. Kate Fleming
Delaware Department of Natural Resources and Environmental Control
Division of Fish and Wildlife
Wildlife Species Conservation & Research Program

Subject: **Environmental Review Request**

Dear Ms. Fleming,

Interstate Energy Company (IEC) is evaluating improvements to their current pipeline system located in eastern Pennsylvania. The modifications would be located in Pennsylvania and Delaware. The Delaware portion of the Project is limited to the construction and operation of a new, 18-inch-diameter natural gas pipeline lateral that would originate at an interconnect at existing Marcus Hook Terminal in Linwood, Pennsylvania and terminate at an existing receipt station in Claymont, New Castle County, Delaware. Construction of the Project would affect approximately 3 acres of paved transportation rights-of-ways and commercial/industrial use land.

As IEC's environmental consultant, NV5 conducted wetland and waterbody surveys of the Project area in Delaware on June 20, 2017. No wetlands or waterbodies were identified within the Delaware portion of the Project area.

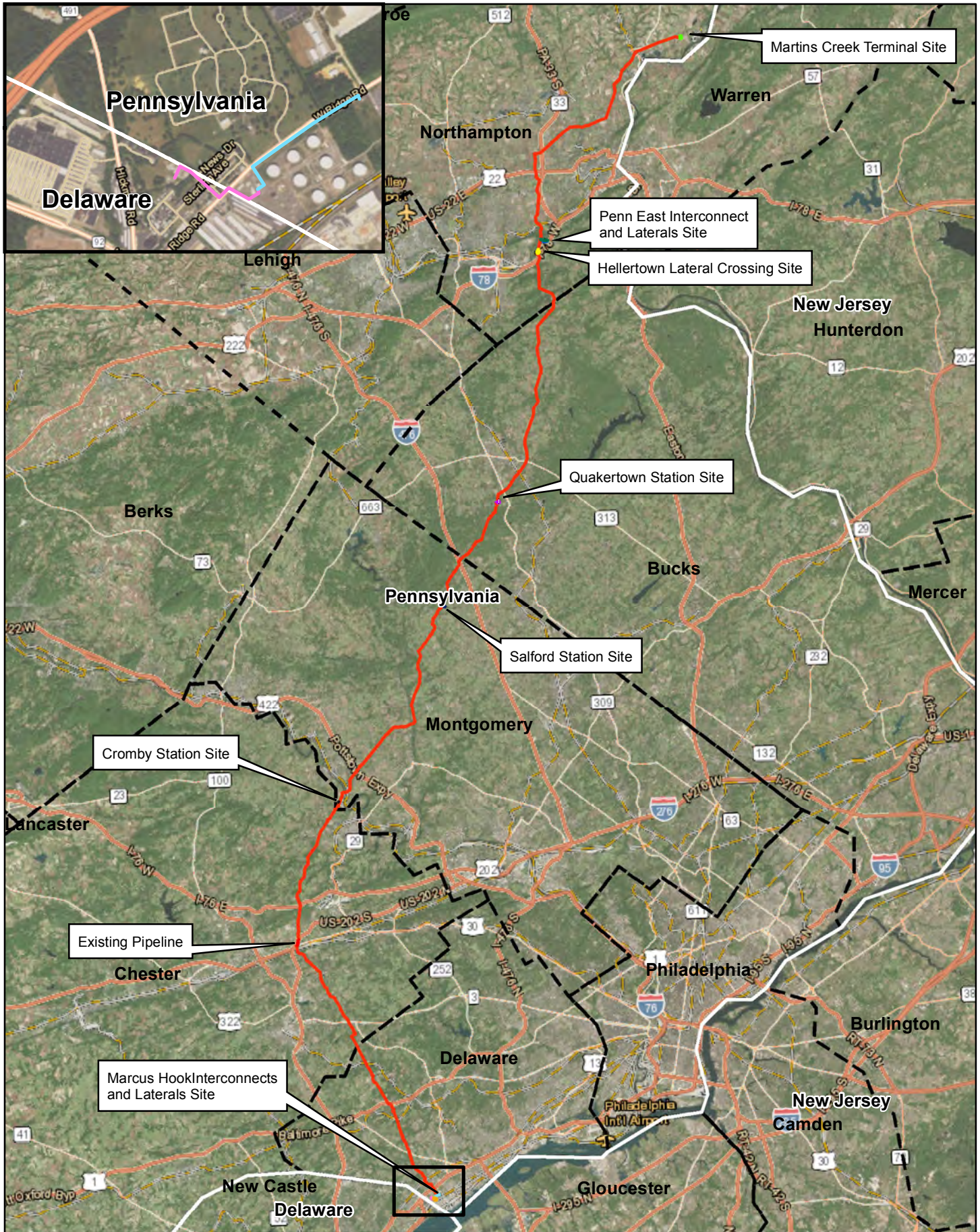
Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. On behalf of IEC, NV5 is requesting an environmental review for rare, candidate, threatened, and endangered species under the jurisdiction of the Delaware Department of Natural Resources and Environmental Control, for the proposed Project. USGS 7.5-minute quadrangle maps showing the Project area in Delaware are enclosed for your review.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,

A handwritten signature in cursive script that reads "Sara Holmes".

Sara Holmes
Environmental Scientist
NV5



Martins Creek Terminal Site	Cromby Station Site
Hellertown Lateral Crossing Site	PennEast Lateral Option A
Salford Station Site	PennEast Lateral Option B
Marcus Hook Delivery Lateral 1	Existing Pipeline
Marcus Hook Delivery Lateral 2	State Line
Quakertown Station Site	County Line

0 2.5 5 10
Miles

Project Overview Map
 Northampton, Bucks,
 Montgomery, Chester,
 and Delaware Counties, Pennsylvania
 New Castle County, Delaware



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
89 Kings Highway
Dover, Delaware 19901

**OFFICE OF THE
DIRECTOR**

**Phone: (302) 739-9910
Fax: (302) 739-6157**

September 14, 2017

Sarah Holmes
NV5
1315 Walnut Street, Suite 900
Philadelphia, PA 19107

Re: NV5 2017 IEC Pipeline Modification -Marcus Hook

Dear Ms. Holmes,

Thank you for contacting the Species Conservation and Research Program (SCRIP) about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

A review of our database indicates that there are currently no records of state-rare or federally listed plants, animals or natural communities at this project site.

We are continually updating our records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information.

Please feel free to contact me with any questions or if you require additional information.

Sincerely,

Kate Fleming
Wildlife Biologist/Environmental Review Coordinator
(302) 735-8658; fax: (302) 653-3431; Kate.Fleming@state.de.us

(See invoice on next page)

***We Bring You Delaware's Great Outdoors
through Science and Service***

Find us on Facebook <http://www.facebook.com/DelawareFishWildlife>

INVOICE - PAYMENT DUE

It is our policy to charge a fee for this environmental review service. This letter constitutes an invoice for \$35.00 (\$35.00/hour for a minimum of one hour). Please make your check payable to “Delaware Division of Fish and Wildlife” and submit to:

DE Division of Fish and Wildlife
89 Kings Hwy.
Dover, DE 19901
ATTN: Pamela Severson

**In order for us to properly process your payment, you must reference
“NV5 2017 IEC Pipeline Modification -Marcus Hook” on your check.**

cc: Pamela Severson, Fish and Wildlife Coordination/Accounting; Code to 72900

Appendix 1D-1

PADCNR Correspondence

ADELPHIA GATEWAY PROJECT





August 5, 2017

Department of Conservation and Natural Resources
Division of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Subject: **PNDI Review**

To whom it may concern,

Interstate Energy Company (IEC) is evaluating improvements to their current pipeline system located in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Specifically, IEC is evaluating the following Project components:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- PennEast Lateral and Interconnect Site - a new ~0.5-mile pipeline lateral and meter station interconnect with the proposed PennEast Pipeline in Northampton County, Pennsylvania. IEC is evaluating two route options for the laterals, both of which would cross residential, agricultural, and forested land;
- Hellertown Interconnect Site - a new interconnect adjacent to the intersection of the existing line and the proposed PennEast Pipeline in Northampton County, which would be located on existing pipeline right-of-way and agricultural land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested and agricultural land, and existing pipeline right-of-way;
- Salford Station Site - a material receiving and storage area located within and adjacent to an existing pumping/reheat station in Montgomery County, Pennsylvania, which would be sited on agricultural and industrial land, and existing electrical transmission line right-of-way;
- Cromby Site - new above ground facilities on an agricultural-use site adjacent to an existing above ground delivery interconnect and in close proximity to the retired Cromby power plant in Chester County, Pennsylvania; and

August 5, 2017

- Marcus Hook Interconnects and Laterals Site – two new pipeline laterals (one 0.3-mile line, and one 0.5-mile line) originating at the Marcus Hook Terminal in Delaware County, Pennsylvania and two new meter station interconnects at the Terminal, which would be sited entirely on industrial land and paved roadways.

The evaluation area encompasses approximately 50 acres of land; approximately 12 of which could be affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. On behalf of IEC and as their environmental consultant, NV5 is requesting a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources for the proposed Project.

The following are enclosed to facilitate your review:

- a completed Project Review Form;
- USGS 7.5-minute quadrangle maps showing the Project area; and
- wetland datasheets and photographs.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,



Sara Holmes
Environmental Scientist
NV5

Attachments:

- Attachment A – PNDI Large Project Review Form
- Attachment B – USGS 7.5-minute Quadrangle Maps
- Attachment C – Wetland and Waterbody Delineation Report



OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Interstate Energy Company

Address: 214 Shoemaker Road, Pottstown, PA

Phone Number: 610-327-5325

Email: info@ie c.energy.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: IEC Pipeline Modification Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Upper Salford Township

County: Montgomery

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name:

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 50.2

Acreeage to be Impacted: 12.0

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project? Yes No
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation? Yes. Wetland data are attached.
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 0.0

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

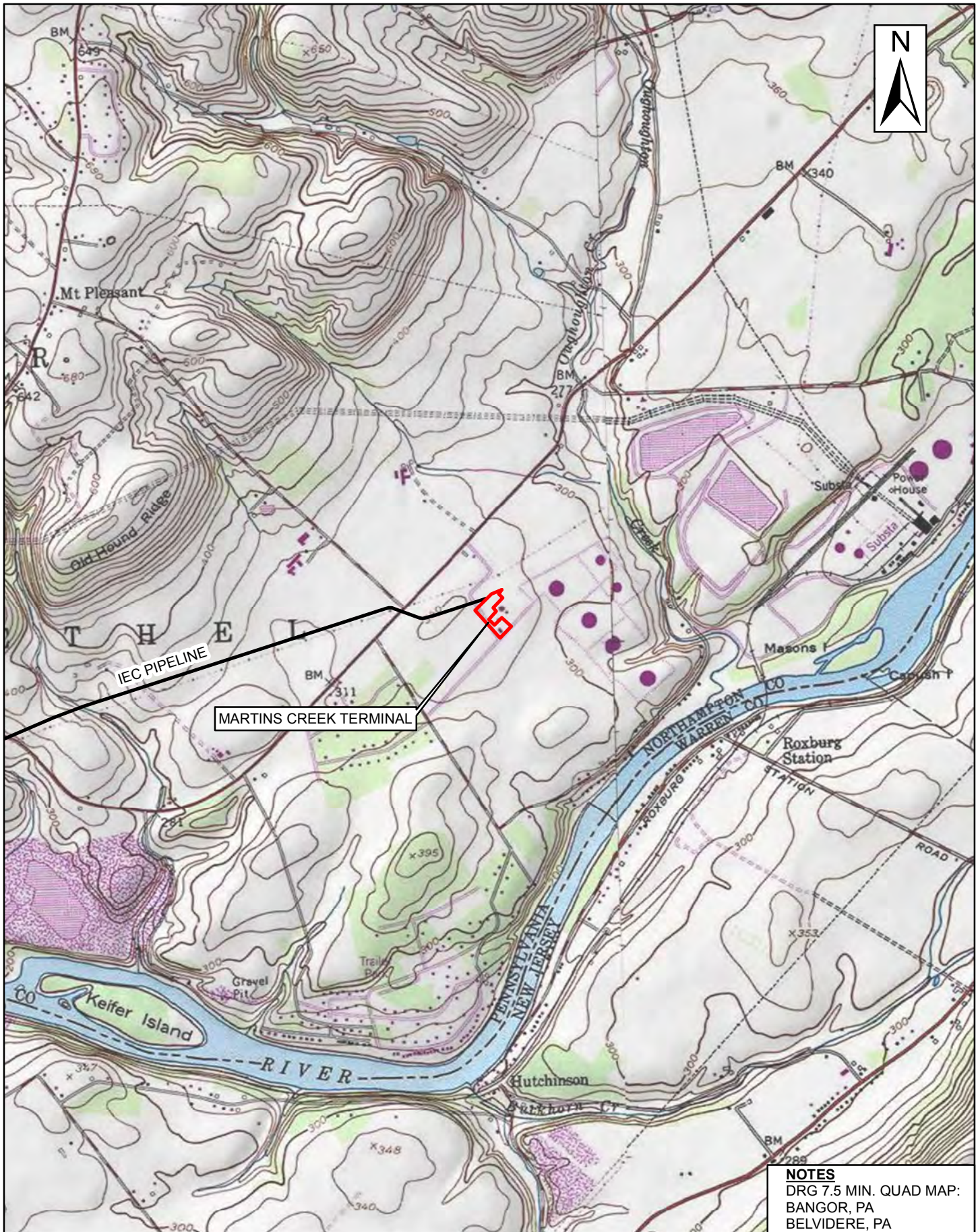
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



MARTINS CREEK TERMINAL

IEC PIPELINE

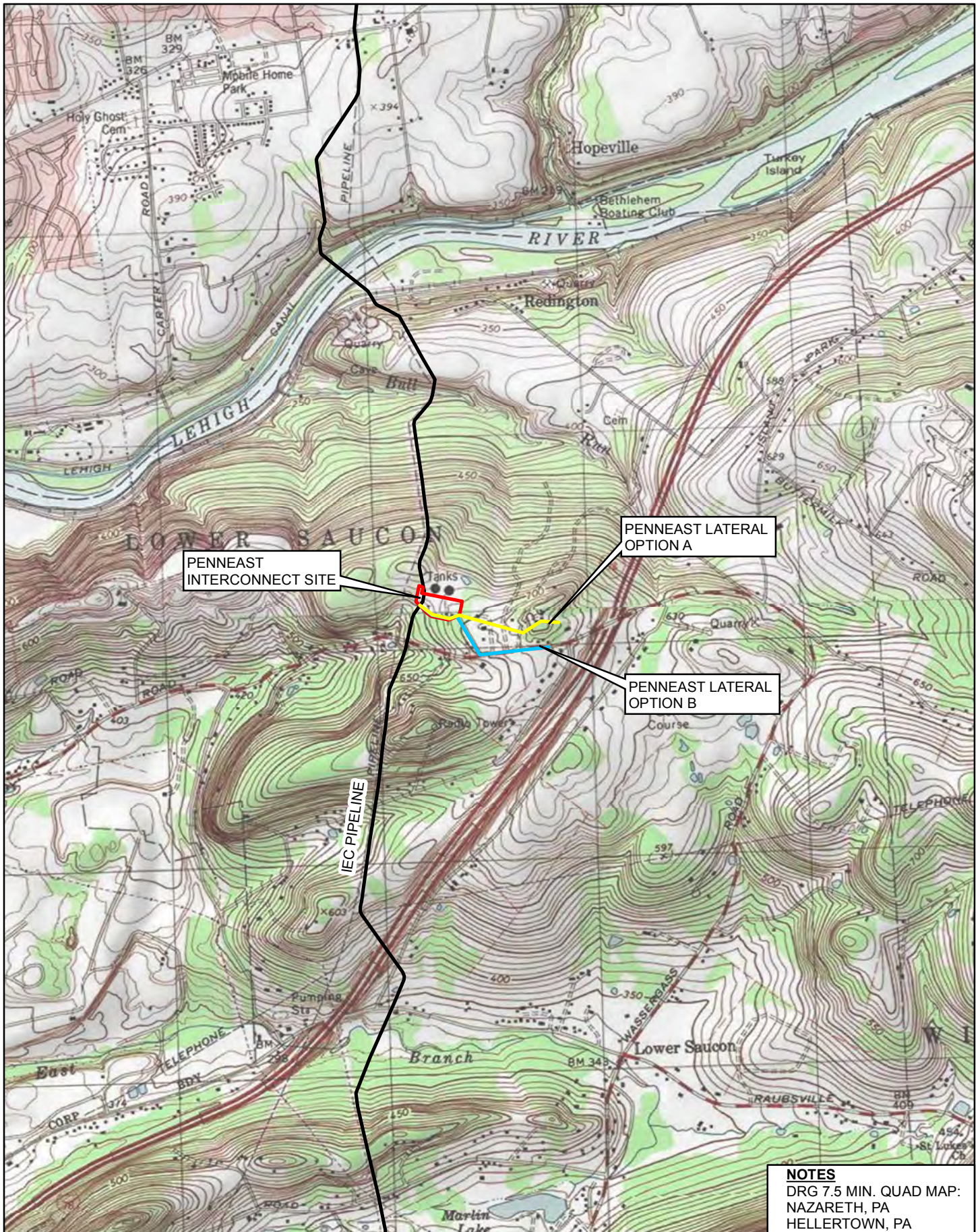
NOTES
 DRG 7.5 MIN. QUAD MAP:
 BANGOR, PA
 BELVIDERE, PA

— MARTINS CREEK TERMINAL
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
MARTINS CREEK TERMINAL
NORTHAMPTON COUNTY, PENNSYLVANIA



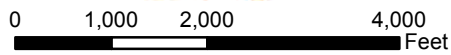
PENNEAST INTERCONNECT SITE

PENNEAST LATERAL OPTION A

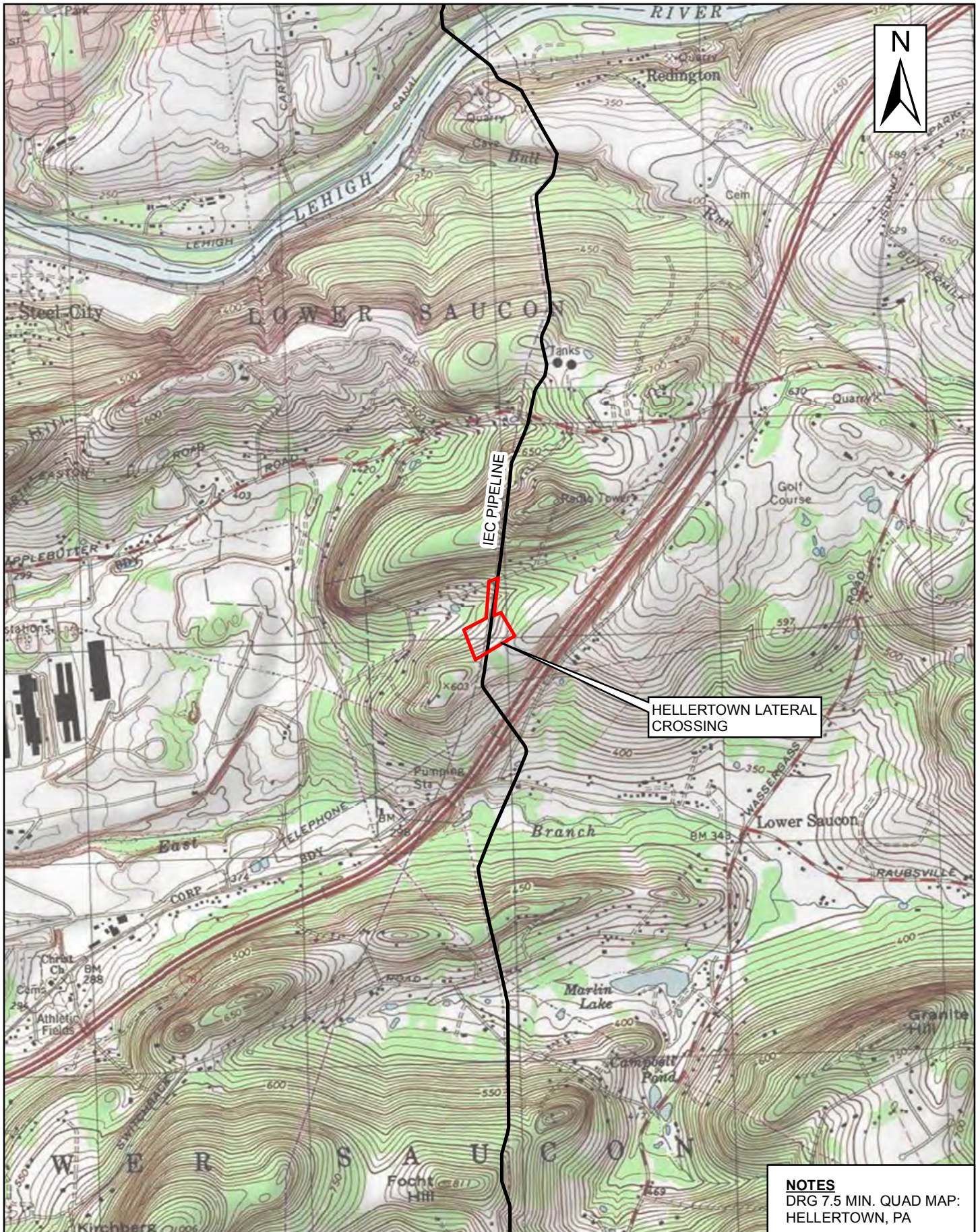
PENNEAST LATERAL OPTION B

NOTES
 DRG 7.5 MIN. QUAD MAP:
 NAZARETH, PA
 HELLERTOWN, PA

- PENNEAST LATERAL OPTION A
- PENNEAST LATERAL OPTION B
- PENNEAST INTERCONNECT SITE
- EXISTING PIPELINE



**PROJECT LOCATION MAP
 PENNEAST INTERCONNECT
 AND LATERALS
 NORTHAMPTON COUNTY, PENNSYLVANIA**



HELLERTOWN LATERAL CROSSING

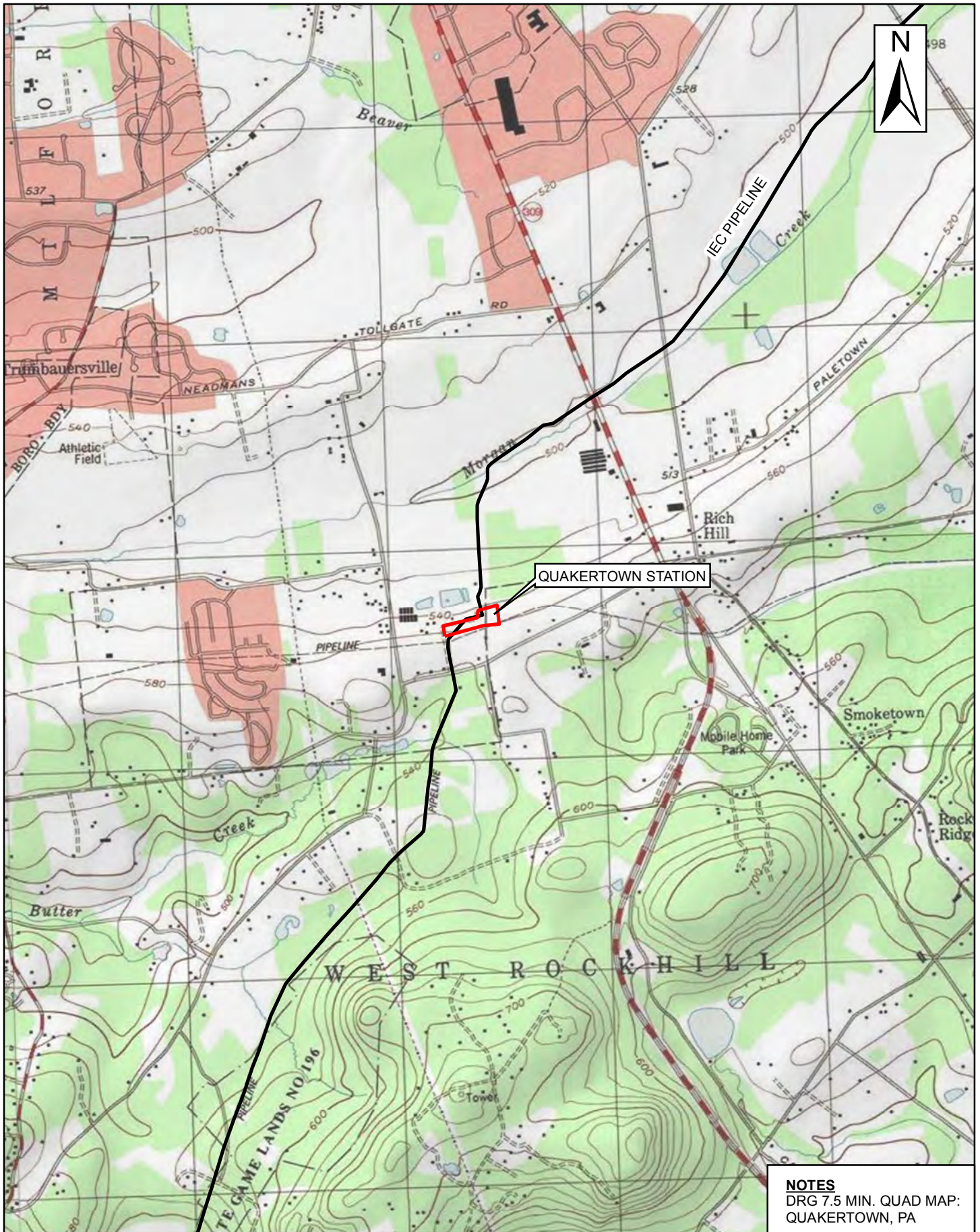
NOTES
DRG 7.5 MIN. QUAD MAP:
HELLERTOWN, PA

— HELLERTOWN LATERAL CROSSING
— EXISTING PIPELINE

N V 5

0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
HELLERTOWN LATERAL CROSSING
NORTHAMPTON COUNTY, PENNSYLVANIA



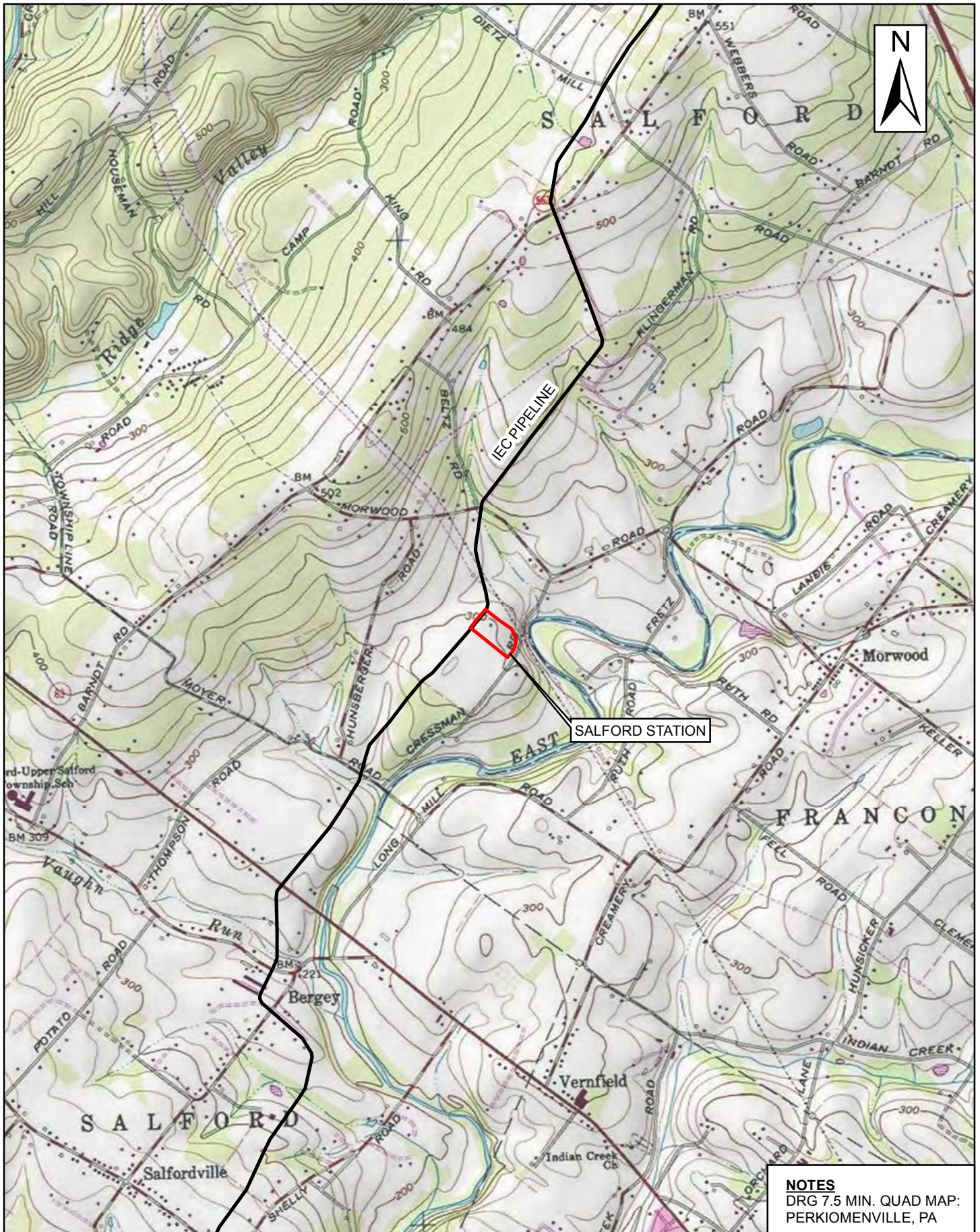
NOTES
 DRG 7.5 MIN. QUAD MAP:
 QUAKERTOWN, PA

— QUAKERTOWN STATION
 — EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

PROJECT LOCATION MAP
QUAKERTOWN STATION
BUCKS COUNTY, PENNSYLVANIA



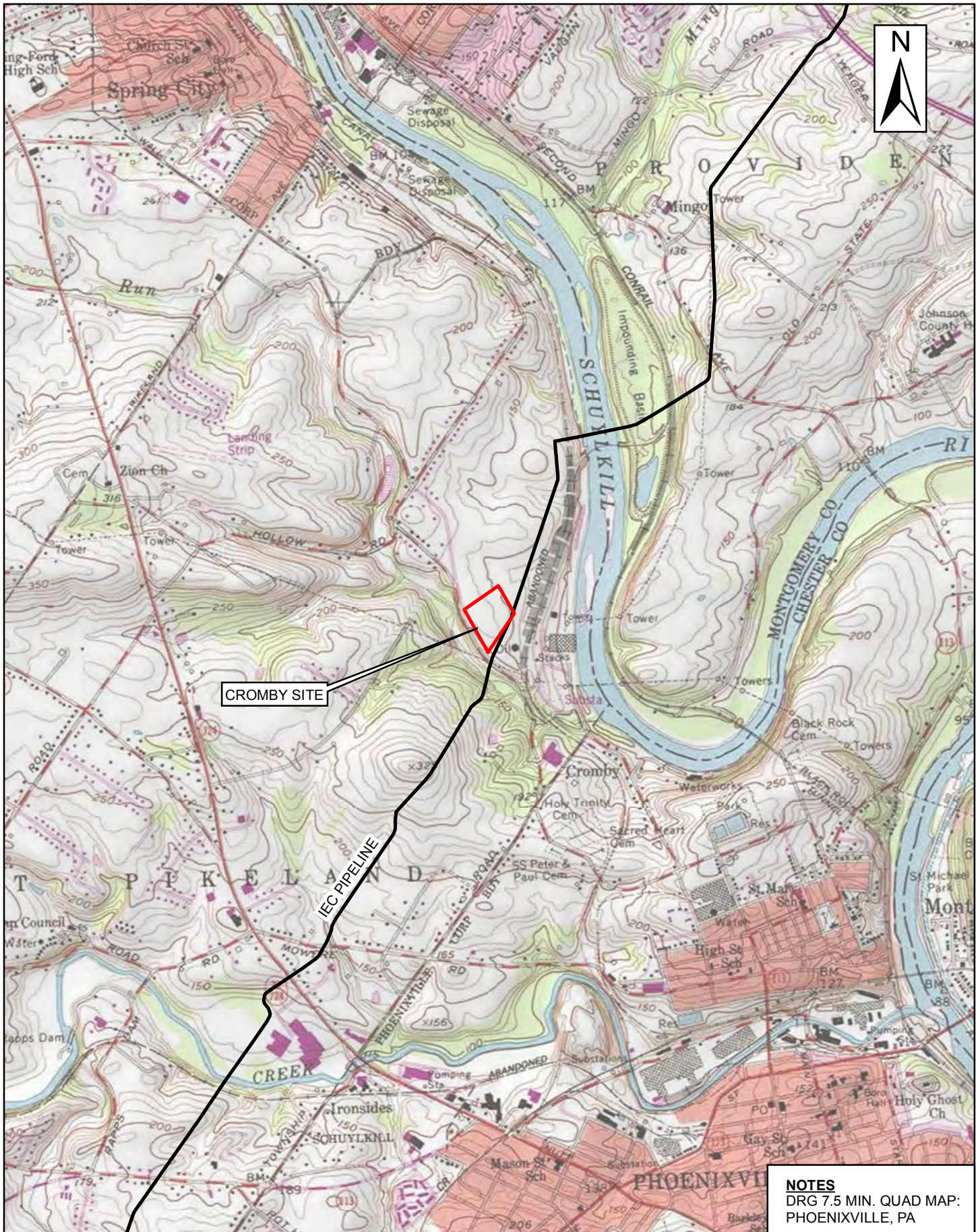
NOTES
 DRG 7.5 MIN. QUAD MAP:
 PERKIOMENVILLE, PA

— SALFORD STATION
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet



PROJECT LOCATION MAP
SALFORD STATION
MONTGOMERY COUNTY, PENNSYLVANIA



CROMBY SITE

IEC PIPELINE

NOTES
 DRG 7.5 MIN. QUAD MAP:
 PHOENIXVILLE, PA

 CROMBY SITE
 EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

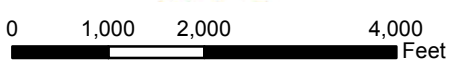
PROJECT LOCATION MAP
CROMBY SITE
CHESTER COUNTY, PENNSYLVANIA



MARCUS HOOK
INTERCONNECTS AND
LATERALS

NOTES:
DRG 7.5 MIN. QUAD MAP
MARCUS HOOK, PA

- MARCUS HOOK DELIVERY LATERAL 1
- MARCUS HOOK DELIVERY LATERAL 2
- MARCUS HOOK INTERCONNECTS
- EXISTING PIPELINE



N V 5

**PROJECT LOCATION MAP
MARCUS HOOK INTERCONNECTS
AND LATERALS
DELAWARE COUNTY, PENNSYLVANIA**

Attachment C

Wetland Data

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Herb Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				
Hydrophytic Vegetation Present? Yes _____ No _____				

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: _____

Feature Photo: Facing - N S E W NE NW SE SW





BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638621

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

Re: Quakertown Station Site

Richland and West Rockhill Townships, Bucks County, PA

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638621** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski". The signature is written in a cursive style.

Greg Podnieszinski, Section Chief
Natural Heritage Section

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P.O. Box 8552, Harrisburg, PA 17015-8552 717-787-3444 (fax) 717-772-0271



BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638634

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

Re: Cromby Site

East Pikeland Township, Chester County, PA

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638634** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

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Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski".

Greg Podnieszinski, Section Chief
Natural Heritage Section

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BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638639

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

**Re: Marcus Hook Interconnects and Laterals Site
Lower Chichester and Marcus Hook Townships, Delaware County, PA**

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638639** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski". The signature is written in a cursive style with a large, prominent "G" and "P".

Greg Podnieszinski, Section Chief
Natural Heritage Section

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BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638630

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

Re: Salford Station Site

Salford Townships, Montgomery County, PA

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638630** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

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Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski". The signature is written in a cursive style.

Greg Podnieszinski, Section Chief
Natural Heritage Section

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BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638608

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

Re: Martins Creek

Lower Mt. Bethel Township, Northampton County, PA

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638608** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski".

Greg Podnieszinski, Section Chief
Natural Heritage Section

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BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638613

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

**Re: PennEast Lateral and Interconnect Site
Lower Saucon Township, Northampton County, PA**

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638613** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski".

Greg Podnieszinski, Section Chief
Natural Heritage Section

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BUREAU OF FORESTRY

August 25, 2017

PNDI Number: 638618

Sara Holmes

NV5

1315 Walnut St., Suite 900

Philadelphia, PA 19107

Email: sara.holmes@nv5.com (hard copy will not follow)

**Re: Hellertown Interconnect Site
Lower Saucon Township, Northampton County, PA**

Dear Sara Holmes,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **638618** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR's jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jaci Braund, Ecological Information Specialist, by phone (717-214-3813) or via email (c-jbraund@pa.gov).

Sincerely

A handwritten signature in black ink that reads "Greg Podnieszinski".

Greg Podnieszinski, Section Chief
Natural Heritage Section

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January 10, 2018

Pennsylvania Department of Conservation and Natural Resources
Division of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Mr. Greg Podniesinski
Section Chief
Natural Heritage Section

Subject: **Revised PNDI Review**

Dear Mr. Podniesinski,

In July 2017 NV5, LLC (NV5) requested a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for resources under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (PADCNR) for the proposed Pipeline Modification Project located in eastern Pennsylvania. The PADCNR responded to the request in a letter dated August 25, 2017 (**PNDI Environmental Review Receipt Numbers 638608, 638613, 638618, 638621, 638630, 638634, 638639**).

The scope of the proposed Project, now called the Adelpia Gateway Project¹, has changed since NV5's original submittal of a request for PNDI review. The Project remains in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Under the revised scope, the following Project components are under evaluation:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested land, paved/graveled industrial-use land, pasture, and existing pipeline right-of-way;
- Skippack Interconnect Site – a new interconnect adjacent to the intersection of the existing line and a PECO-owned natural gas pipeline in Montgomery County. The Site would be located on pasture and existing pipeline right-of-way;
- Marcus Hook Laterals – two new pipeline laterals (one 0.3-mile line and one 4.4-mile line)

¹ See the November 2, 2017 press release available at <https://adelphiagateway.com/wp-content/uploads/2017/11/18-05-Adelpia-Gateway-Announcement.pdf>.

January 10, 2018

originating at the existing Marcus Hook Terminal in Delaware County.

- The Parkway Lateral would be an approximately 0.3-mile, 16-inch-diameter pipeline that terminates at a new interconnect at an existing meter station in Claymont, New Castle County, Delaware;
- The Tilghman Lateral would be an approximately 4.4-mile, 16-inch-diameter pipeline that would terminate at a new delivery point located within the boundaries of an existing meter station in Chester, Delaware County, Pennsylvania. Adelphia would also install five additional delivery points along the Tilghman Lateral, four of which would be installed entirely within existing industrial meter station sites. The remaining delivery point would be installed on a 0.1-acre regularly maintained, grassy site in Lower Chichester. About 80% of the Tilghman Lateral would be installed using horizontal directional drill methods;
- Marcus Hook Station Site - expansion and improvements to above ground facilities at the existing Marcus Hook Terminal in Marcus Hook, Delaware County. The Site would be located entirely on existing paved/graveled industrial-use land; and
- Mainline Valve and Blowdown Assembly Sites – construction of one new mainline valve and eight new blowdown assemblies at various locations along an existing 18-inch-diameter natural gas pipeline in Delaware, Chester, and Montgomery Counties. Construction and operation of the facilities would take place along existing access roads and within the existing pipeline’s permanent, maintained right-of-way.

The current evaluation area encompasses approximately 42 acres of land, about 9 of which would be permanently affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. NV5 is requesting a revised Large Project PNDI review for resources under the jurisdiction of the PADCNr for the proposed Project.

The following are enclosed to facilitate your review:

- a completed revised Project Review Form; and
- USGS 7.5-minute quadrangle maps showing the revised Project area.

The wetland data forms provided with NV5’s previous consultation letter are still valid. Since the original letter, NV5 has performed wetland and waterbody surveys at all of the revised locations except for the Tilghman Lateral (and its associated delivery points), the mainline valve site, and the blowdown assembly sites. No wetlands or waterbodies were identified at the newly surveyed sites. NV5 will provide an updated letter to the PADCNr detailing its findings upon completion of the surveys.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.



January 10, 2018

Sincerely,

A handwritten signature in cursive script that reads "Sara Holmes".

Sara Holmes
Environmental Scientist
NV5

Attachments:

Attachment A – PNDI Large Project Review Form
Attachment B – USGS 7.5-minute Quadrangle Maps

NIV5

OFFICES NATIONWIDE

CONSTRUCTION QUALITY ASSURANCE · INFRASTRUCTURE · ENERGY · PROGRAM MANAGEMENT · ENVIRONMENTAL

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

When to Use the Manual Project Submission Form

Use this form if you do *not* want to use the online Pennsylvania Conservation Explorer to submit your project of any size for environmental review. Due to system limitations and agency requirements, projects should not be submitted piecemeal. The entire project area including roads and infrastructure should be submitted as a single unit. Fill out this form and send it along with your project materials (see What to Send to Jurisdictional Agencies) **to all four agencies** listed at the bottom of this PNDI Project Submission Form. There is no charge for submitting a project manually; however, due to the additional work required of agency staff, online submission is more efficient.

Note: All Projects may be submitted using the Pennsylvania Conservation Explorer online tool (a \$40 fee will be charged per project). Online submission results in greater convenience and possibly faster response times.

What to Send to Jurisdictional Agencies

Send the following information to all of the agencies listed on the Project Submission Form.

Check-list of Minimum Materials to be submitted:

- ___ Completed Manual Project Submission Form
- ___ Supplemental project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- ___ Relevant portion of the USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

- ___ GIS shapefiles depicting the project extent
- ___ A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- ___ Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- ___ Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

PNDI Project Submission Form Definitions

Applicant: Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Proposed Activity: Include **all** earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished.

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities.



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Adelpia Gateway, LLC

Address: 1415 Wyckoff Rd, Wall, NJ 07719

Phone Number: 800-483-3179

Email: info@adelphiagateway.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: Adelpia Gateway Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Multiple

County: Multiple see cover letter.

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Multiple see Attachments

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 42.2 Acreage to be Impacted: 13.9

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No The project would cross 2 creeks: Marcus Hook Creek (HDD) and Stoney Creek (open-cut).
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation?
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 1.5 acres

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

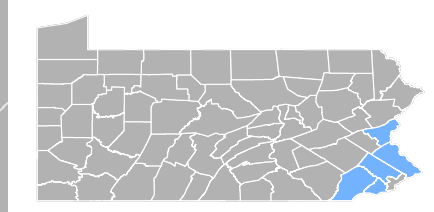
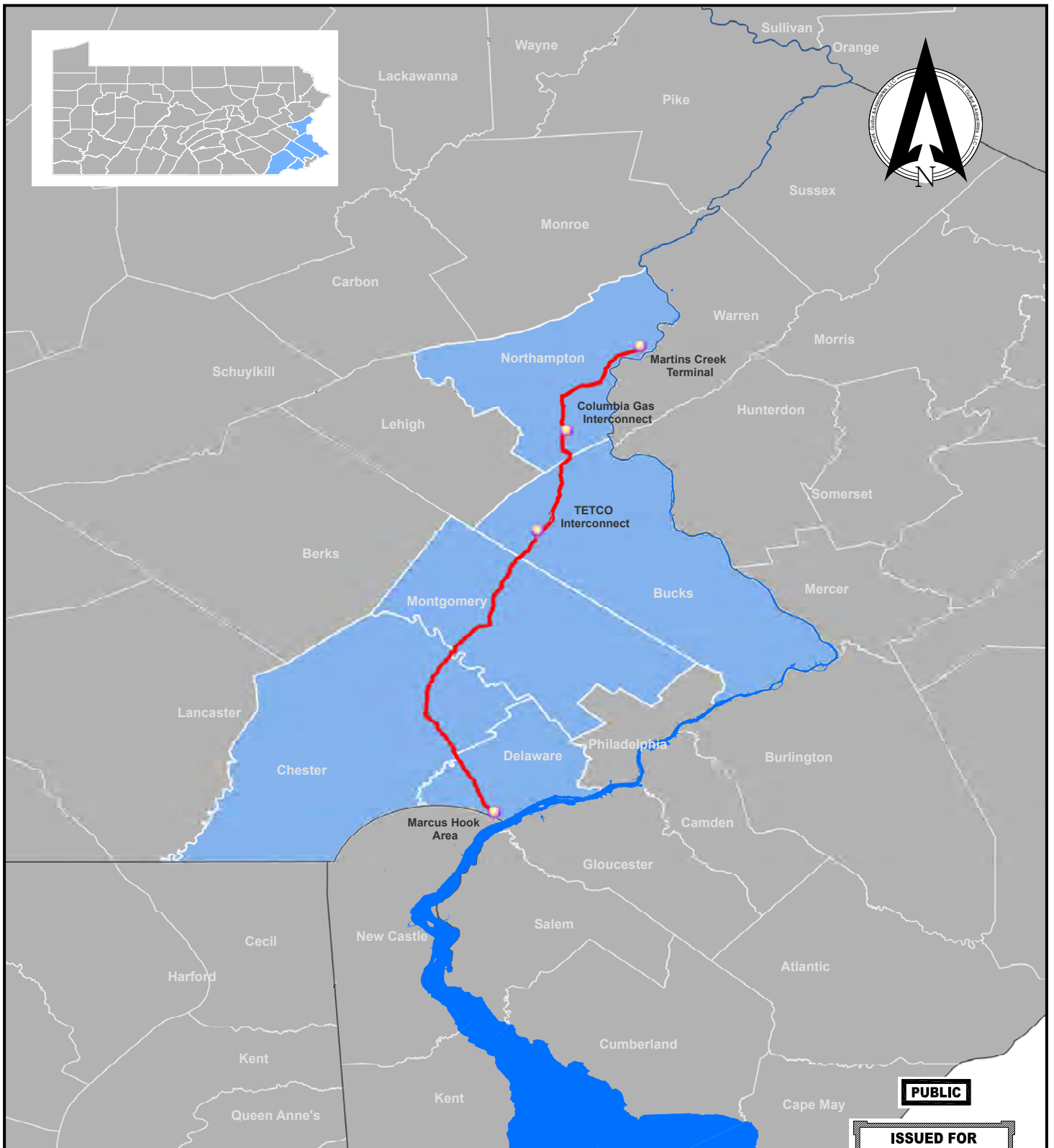
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

Legend

-  Facility
-  Adelpia Gateway

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			

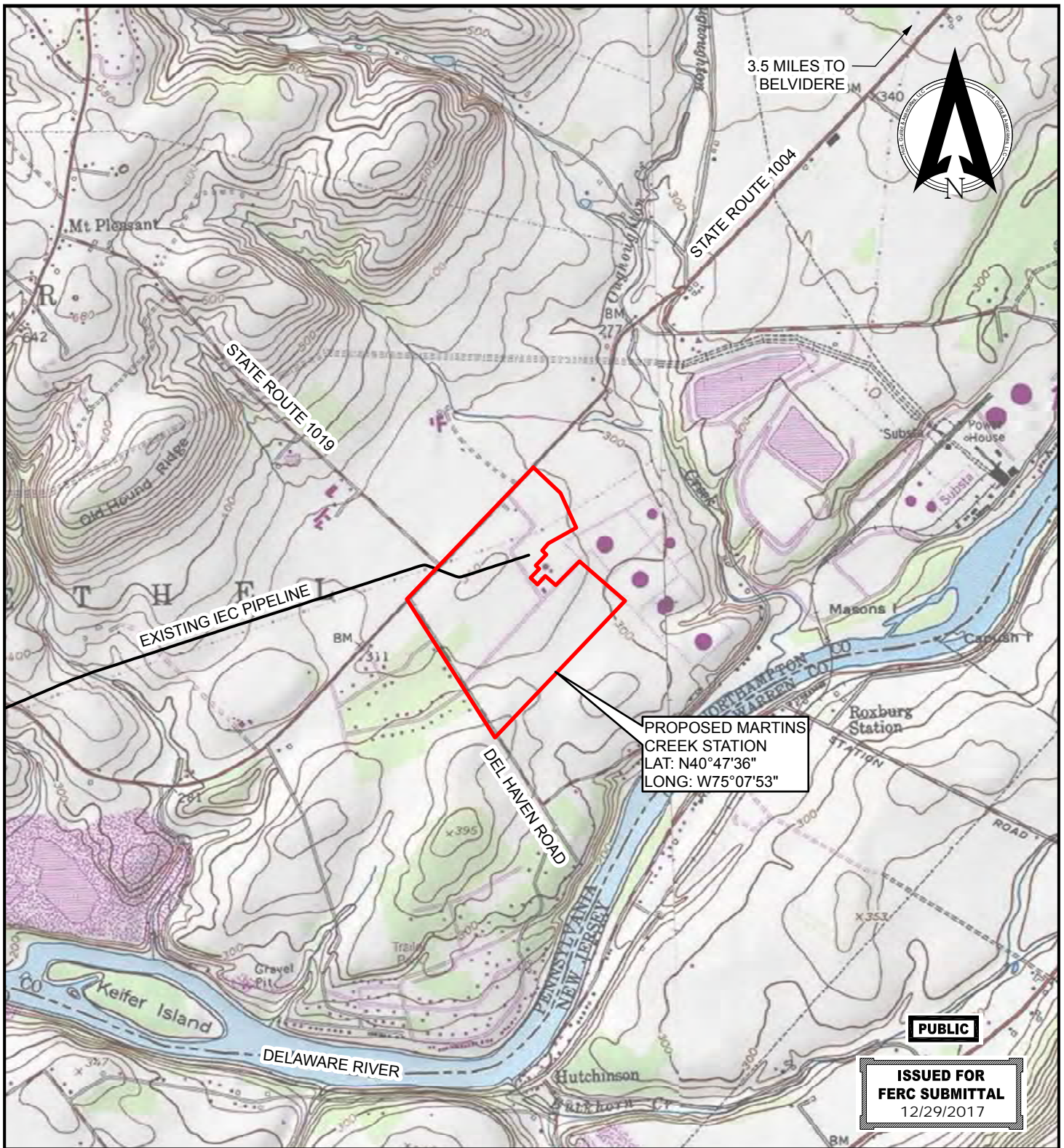


**ADELPIA GATEWAY, LLC
PROJECT VICINITY MAP
BUCKS, CHESTER, DELAWARE,
MONTGOMERY, NORTHAMPTON
COUNTIES, PENNSYLVANIA**

SCALE N.T.S.	DRAWING NUMBER 8.A17022.01-VICINITY	REV 0
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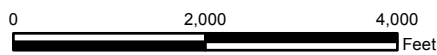
phumphrey 12/27/2017 3:27:15 PM

FIGURE 1



LEGEND

- PROPOSED MARTINS CREEK STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -o40075g2 (BANGOR, PA)
 -o40075g1 (BELVIDERE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MARTINS CREEK STATION
NORTHAMPTON COUNTY,
PENNSYLVANIA

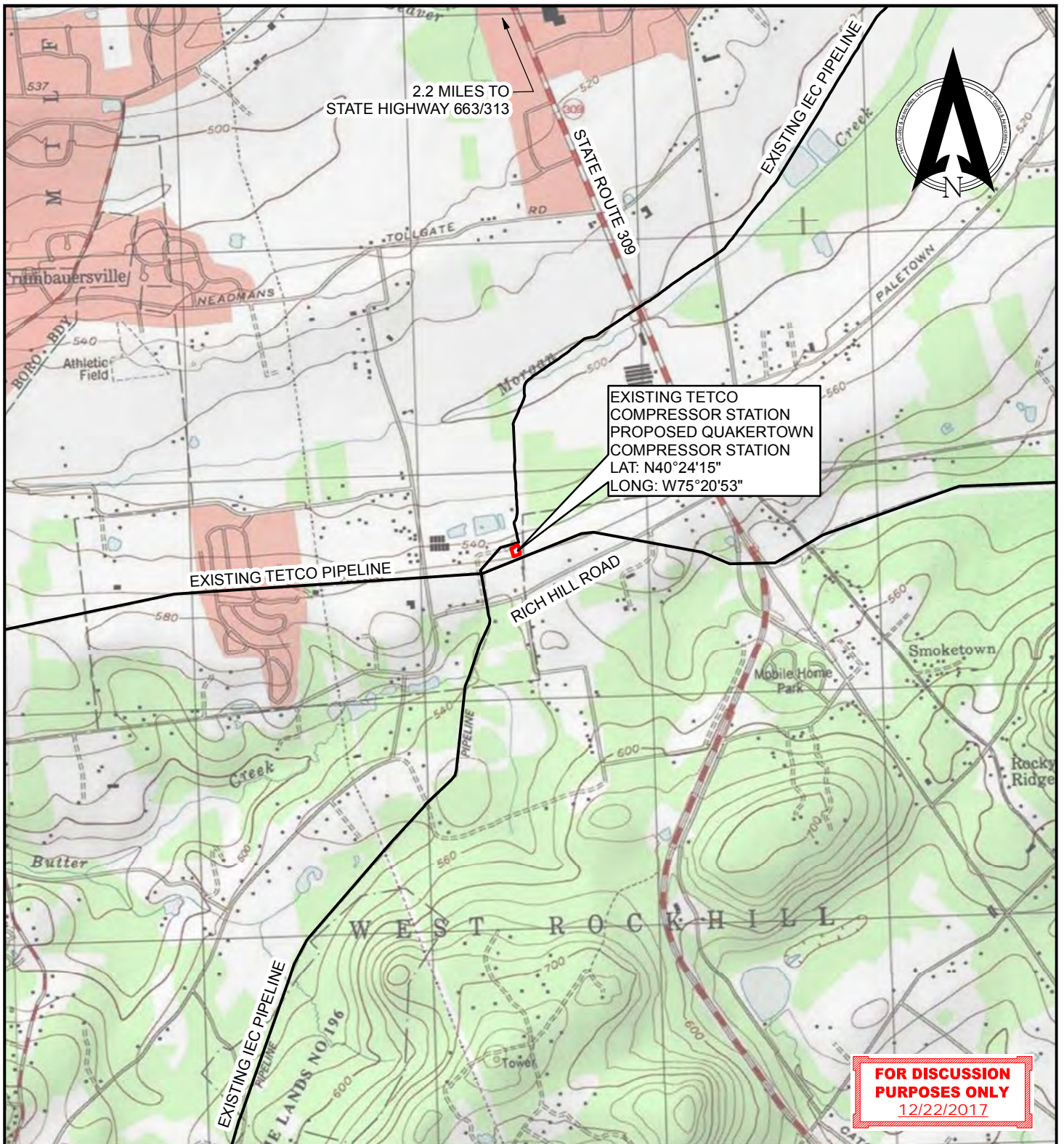
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MARTINS CREEK	REV 0
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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
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						MODEL ID	8.A17022	
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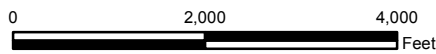
FIGURE 5a



**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- PROPOSED QUAKERTOWN COMPRESSOR STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-o40075d3 (QUAKERTOWN, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

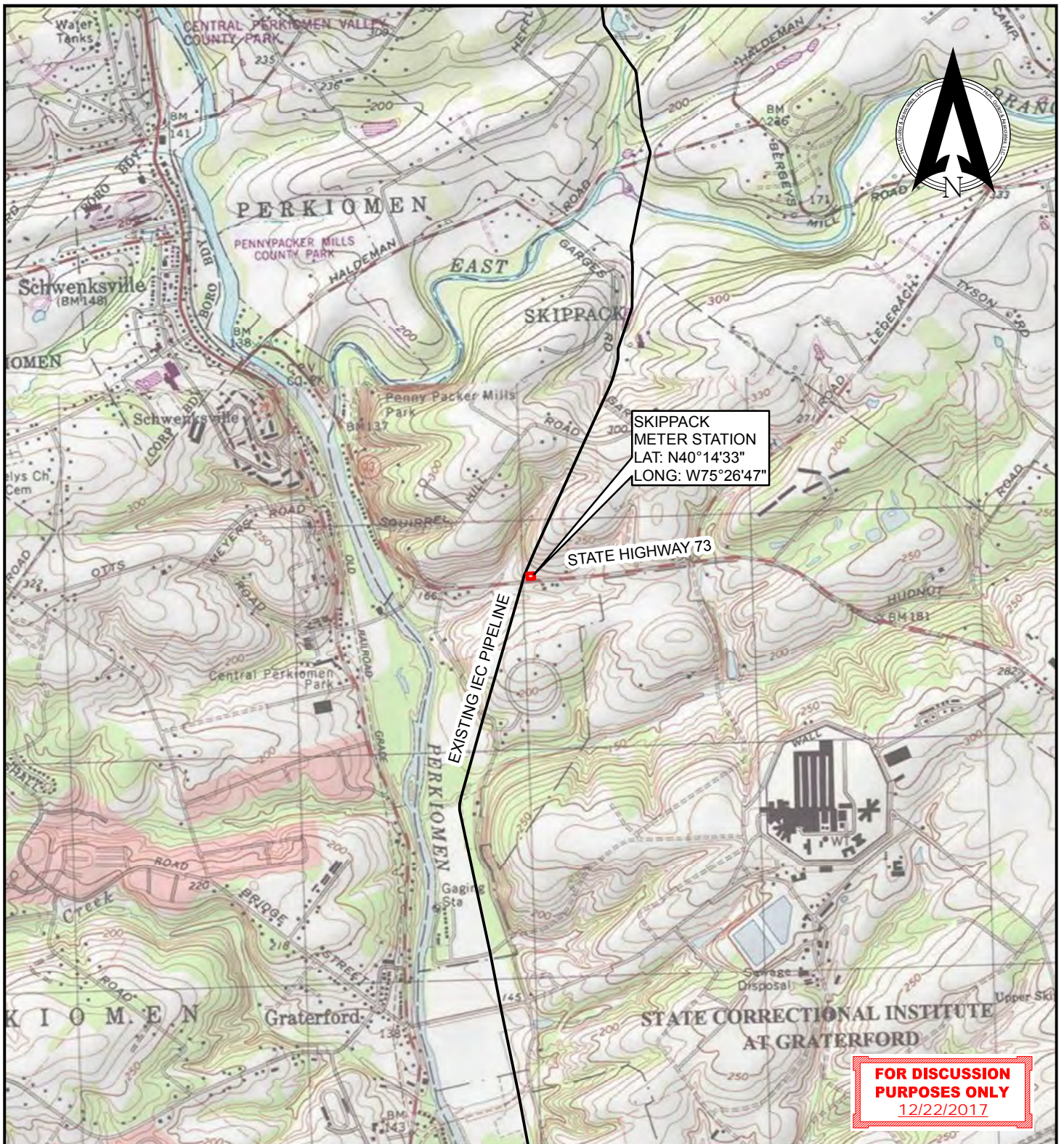
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						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED QUAKERTOWN
COMPRESSOR STATION
BUCKS COUNTY, PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-QUAKERTOWN	REV
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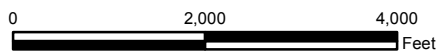
12/20/2017 9:29:53 AM jpreston



**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- SKIPPACK METER STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
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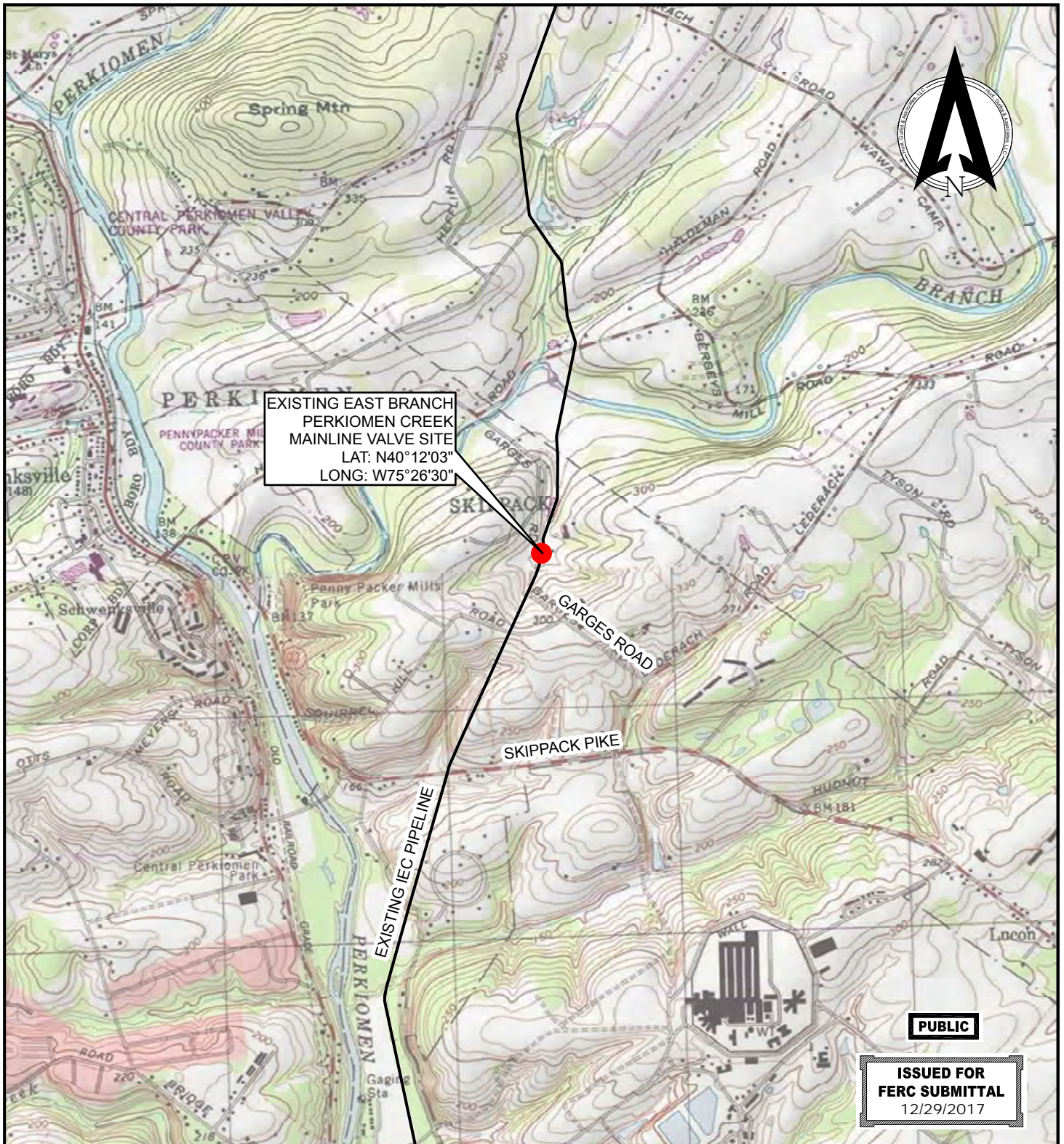
HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
SKIPPACK METER STATION
MONTGOMERY COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-SKIPPACK	REV
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EXISTING EAST BRANCH
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'03"
LONG: W75°26'30"

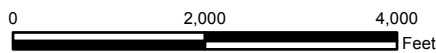


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075c4 (PERKIOMENVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
EAST BRANCH PERKIOMEN CREEK
BLOWDOWN M.P. 36.68
MONTGOMERY COUNTY,
PENNSYLVANIA**

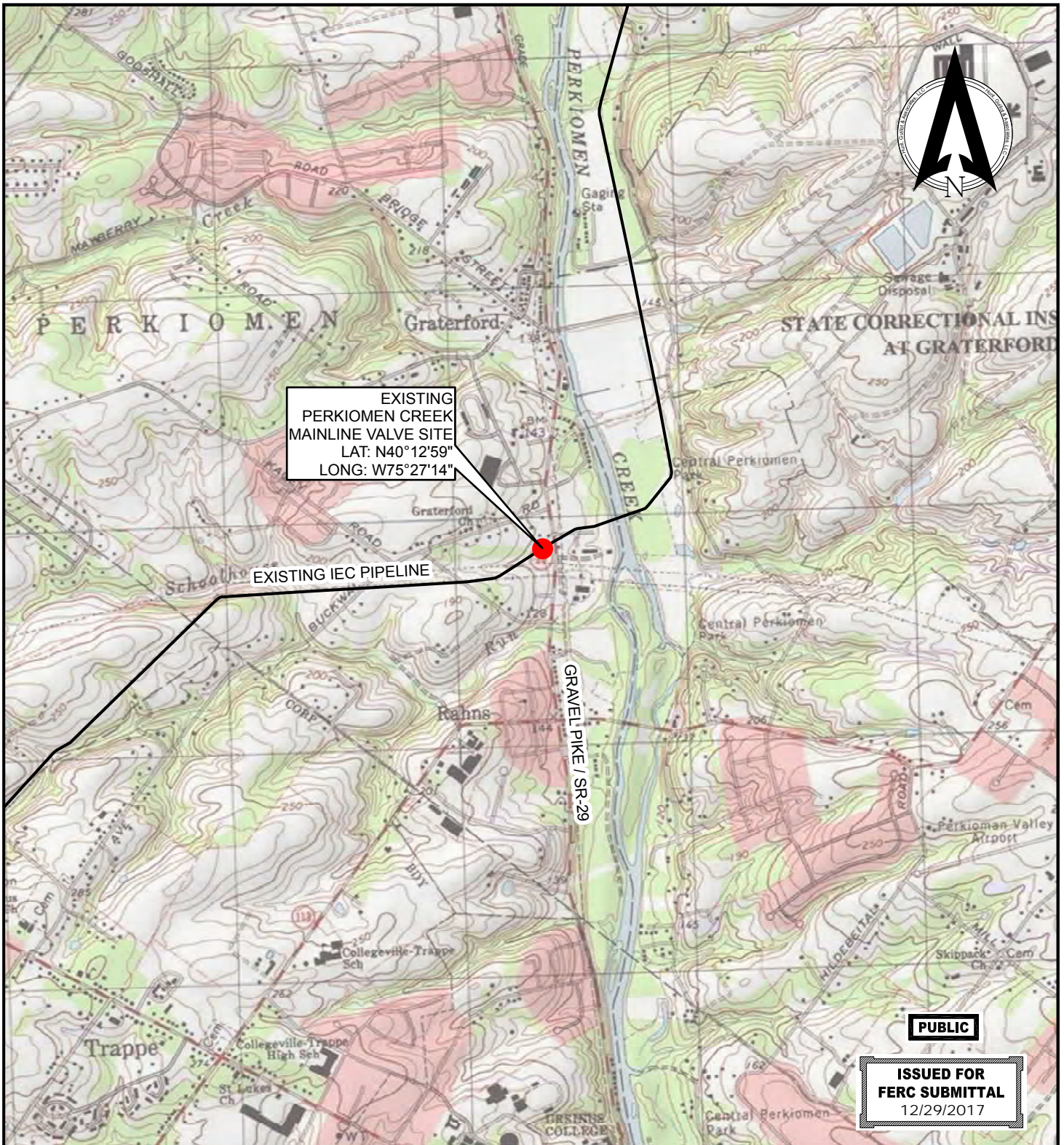
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
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DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 3:06:51 PM

FIGURE 23a



EXISTING
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'59"
LONG: W75°27'14"

EXISTING IEC PIPELINE

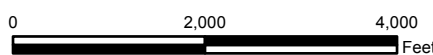


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b4 (COLLEGEVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



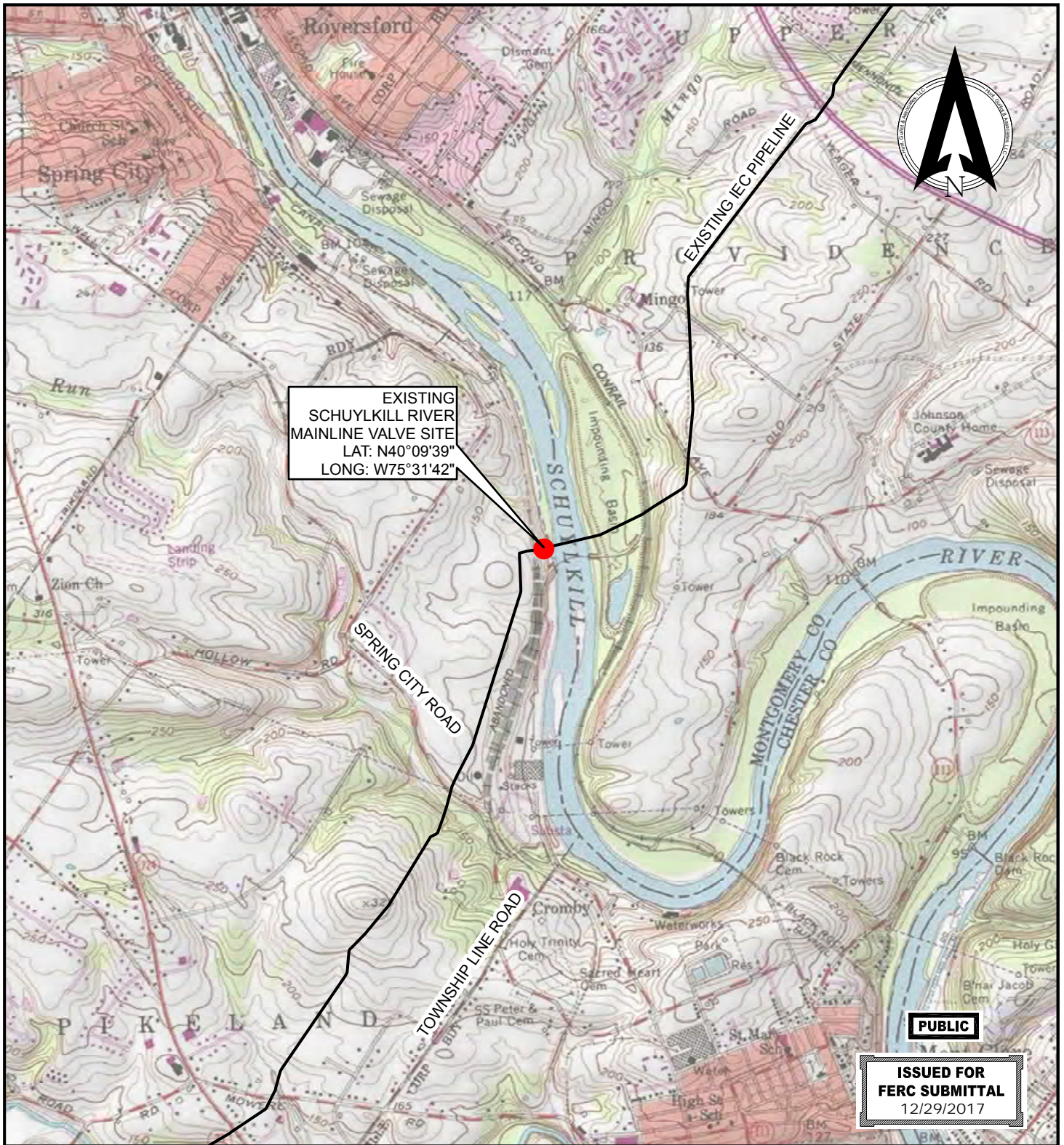
**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PERKIOMEN CREEK
BLOWDOWN M.P. 33.97
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
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						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
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SCALE	DRAWING NUMBER	REV
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phumphrey 12/27/2017 3:04:43 PM

FIGURE 22a



EXISTING SCHUYLKILL RIVER MAINLINE VALVE SITE
 LAT: N40°09'39"
 LONG: W75°31'42"

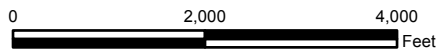


PUBLIC

ISSUED FOR FERC SUBMITTAL
 12/29/2017

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -040075b5 (PHOENIXVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
SCHUYLKILL RIVER
BLOWDOWN M.P. 28.04
CHESTER COUNTY,
PENNSYLVANIA

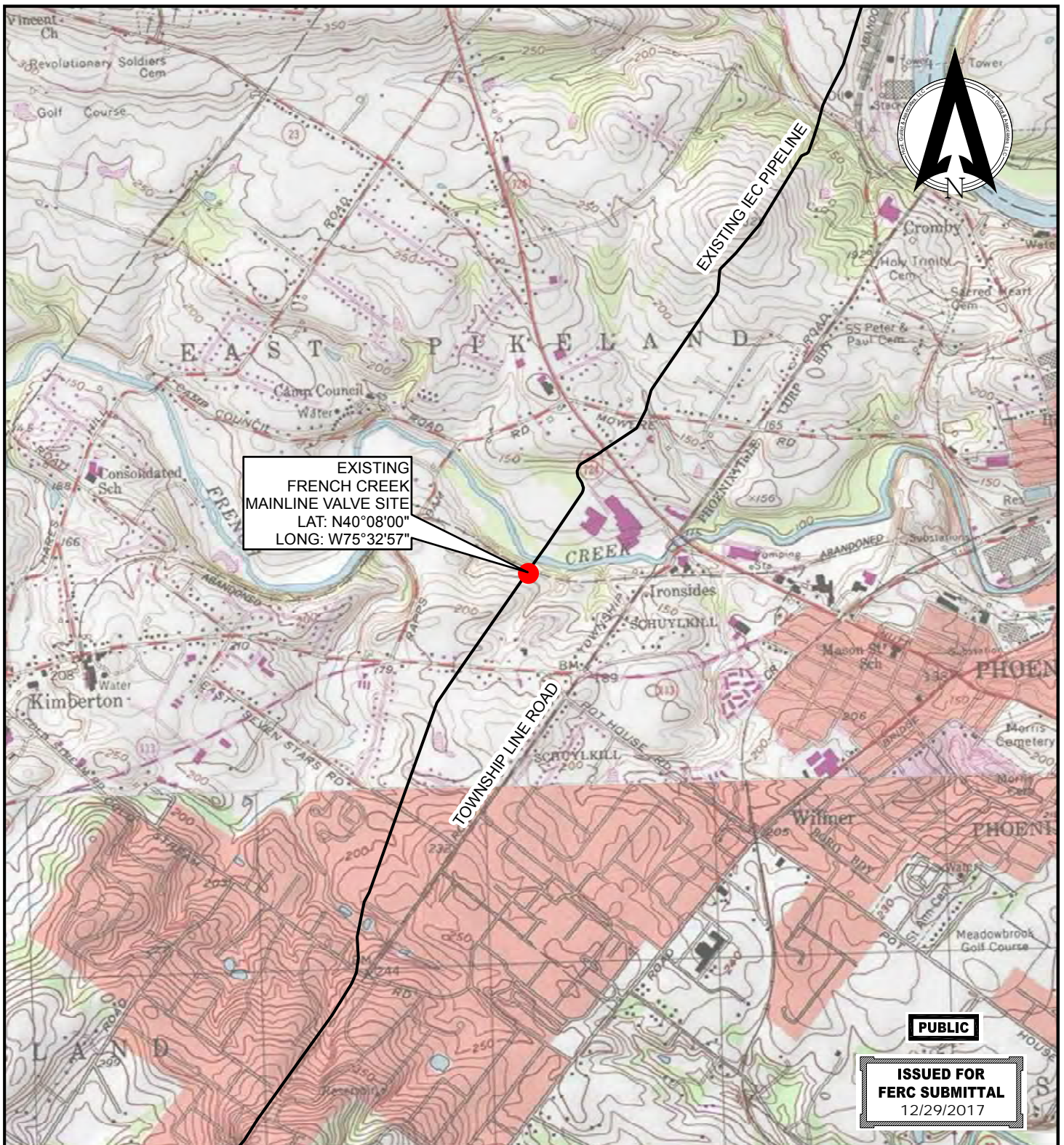


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SCALE	DRAWING NUMBER	REV
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phumphrey 12/27/2017 3:02:34 PM

FIGURE 21a



EXISTING
FRENCH CREEK
MAINLINE VALVE SITE
LAT: N40°08'00"
LONG: W75°32'57"

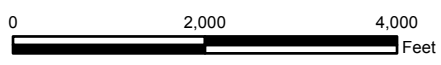


PUBLIC

**ISSUED FOR
FERC SUBMITTAL**
12/29/2017

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b5 (PHOENIXVILLE, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	



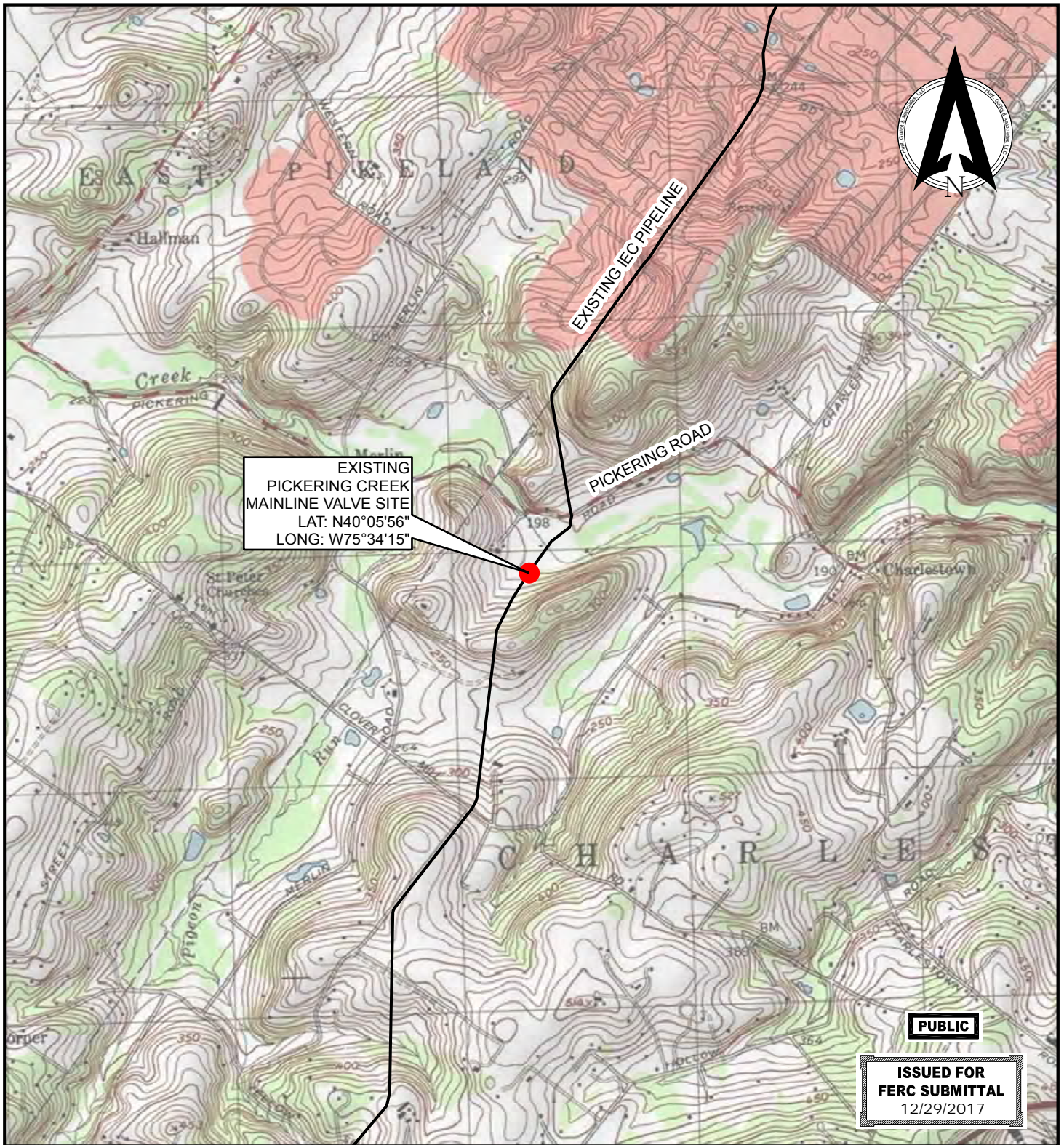
ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
FRENCH CREEK
BLOWDOWN M.P. 25.74
CHESTER COUNTY,
PENNSYLVANIA

SCALE	DRAWING NUMBER	REV
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REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

phumphrey 12/27/2017 2:57:40 PM

FIGURE 19a



EXISTING
PICKERING CREEK
MAINLINE VALVE SITE
LAT: N40°05'56"
LONG: W75°34'15"

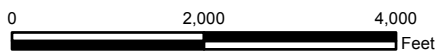


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075a5 (MALVERN, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	12/15/17
						DESIGNED BY	PLH	12/15/17
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						APPROVED BY	RCH	12/21/17
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						PLOT SCALE	1:1	
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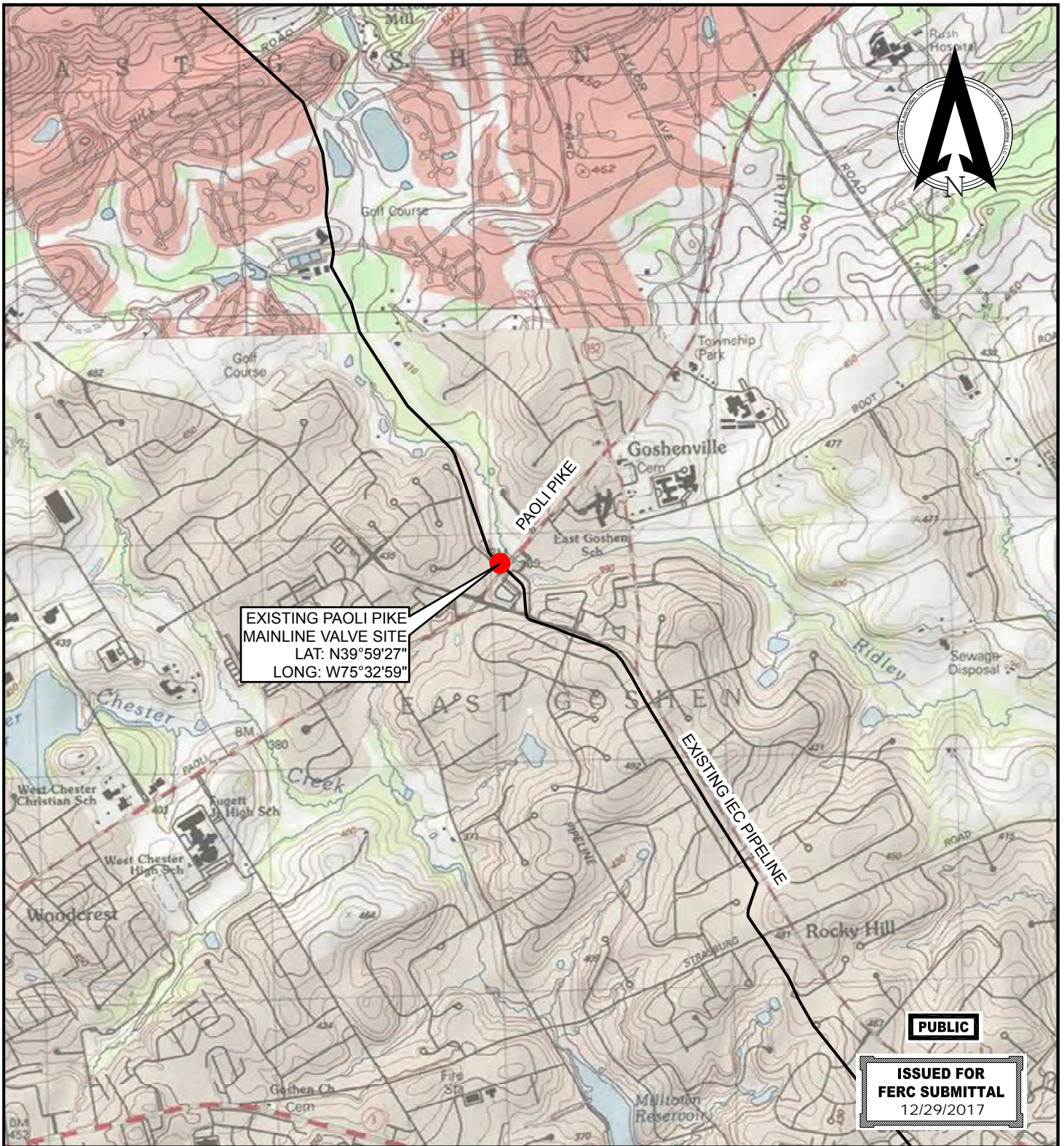


**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PICKERING CREEK
BLOWDOWN M.P. 22.98
CHESTER COUNTY,
PENNSYLVANIA**

SCALE	DRAWING NUMBER	REV
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phumphrey 12/27/2017 2:54:23 PM

FIGURE 18a



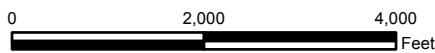
EXISTING PAOLI PIKE
MAINLINE VALVE SITE
LAT: N39°59'27"
LONG: W75°32'59"

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WESTCHESTER, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PAOLI PIKE BLOWDOWN M.P. 14.46
CHESTER COUNTY,
PENNSYLVANIA**

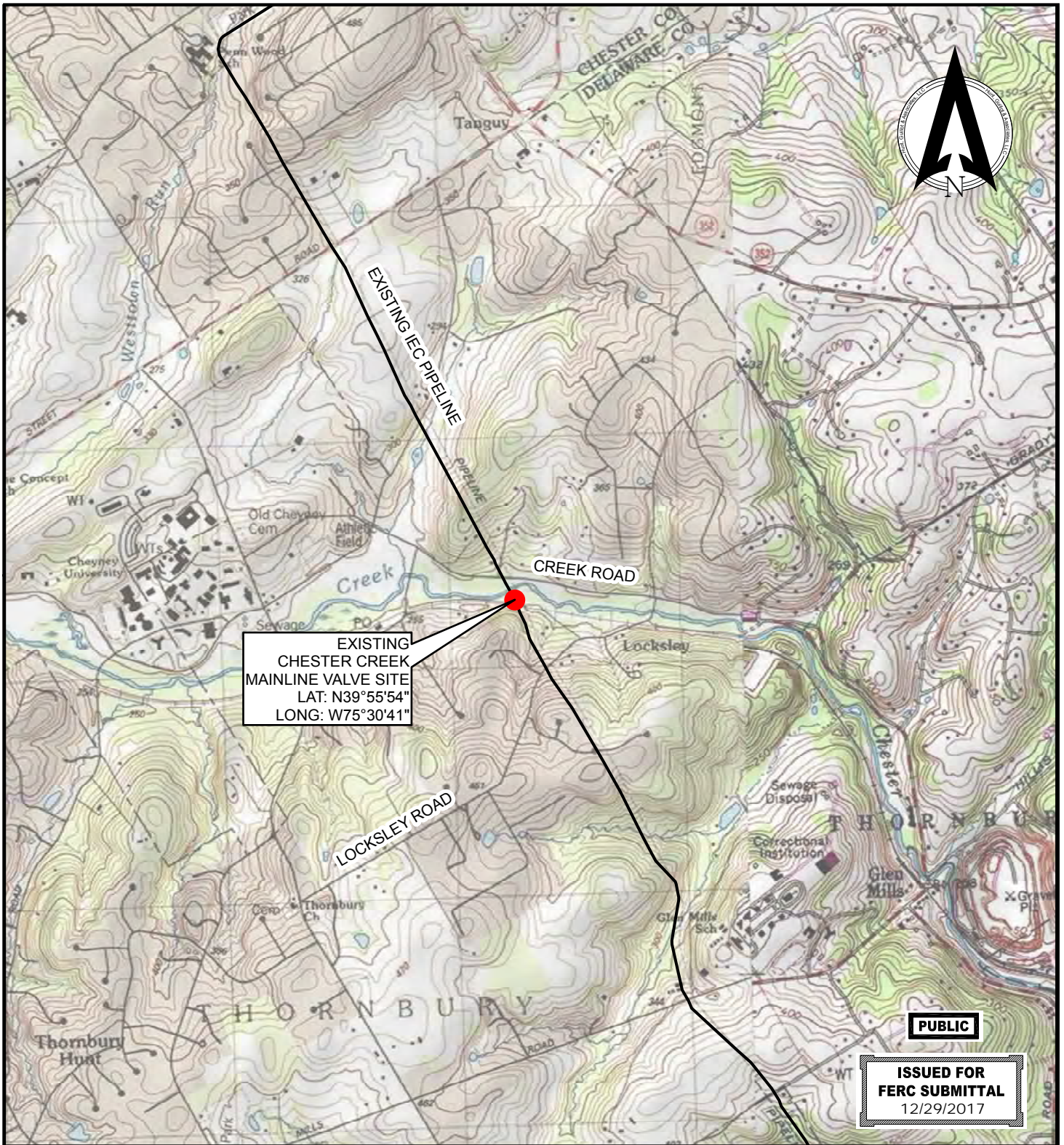


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						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 14.46	REV 0
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phumphrey 12/27/2017 2:51:50 PM

FIGURE 17a



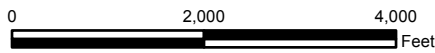
EXISTING
CHESTER CREEK
MAINLINE VALVE SITE
LAT: N39°55'54"
LONG: W75°30'41"

PUBLIC

**ISSUED FOR
FERC SUBMITTAL**
12/29/2017

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-o39075h5 (WEST CHESTER, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
CHESTER CREEK
BLOWDOWN M.P. 9.53
DELAWARE COUNTY,
PENNSYLVANIA**

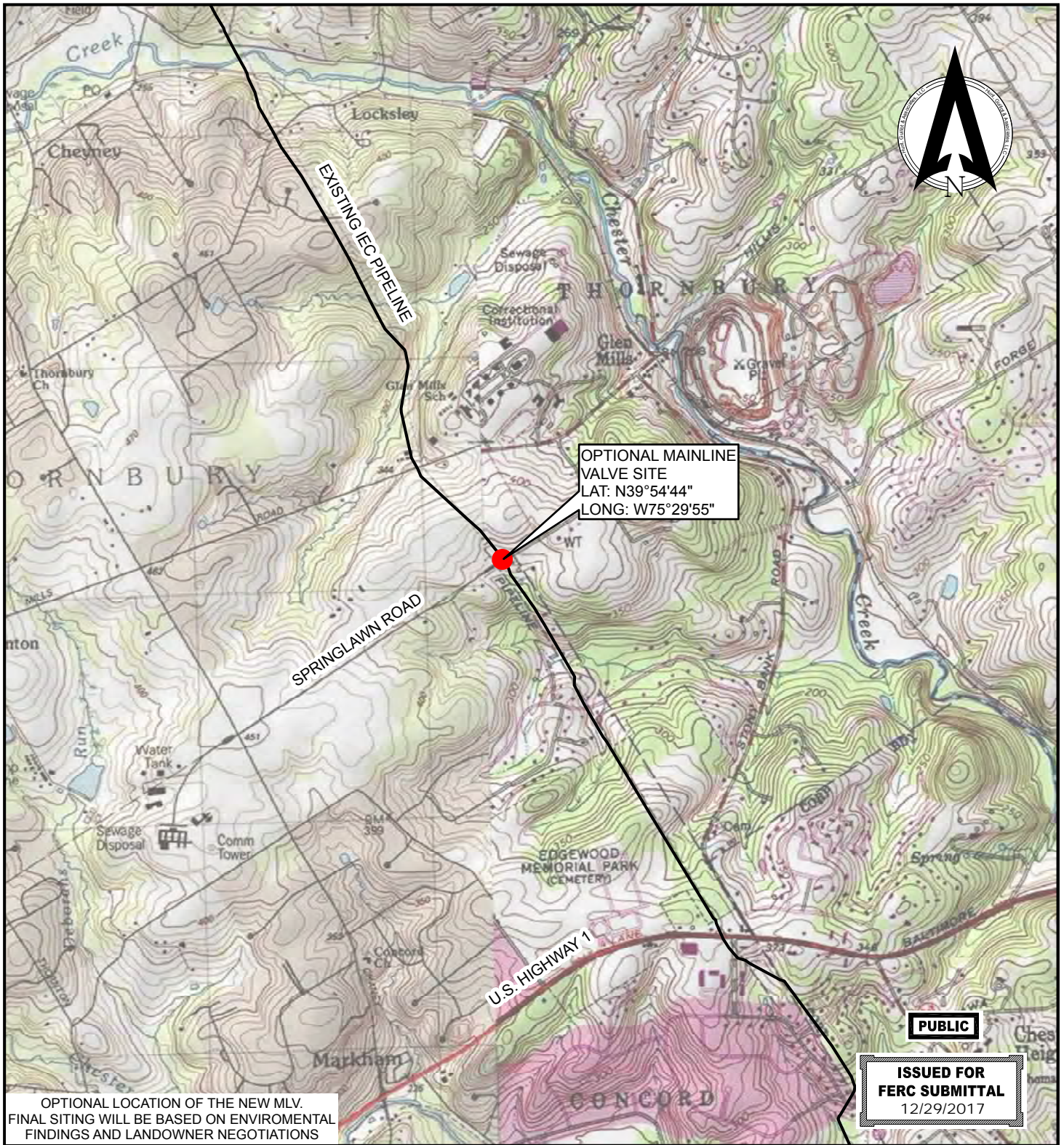
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
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DRAWN BY	MSF	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 2:48:49 PM

FIGURE 16a



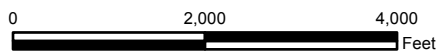
OPTIONAL LOCATION OF THE NEW MLV. FINAL SITING WILL BE BASED ON ENVIRONMENTAL FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

ISSUED FOR FERC SUBMITTAL
12/29/2017

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WEST CHESTER, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
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REV	DESCRIPTION	CHK	DATE	APP	DATE			

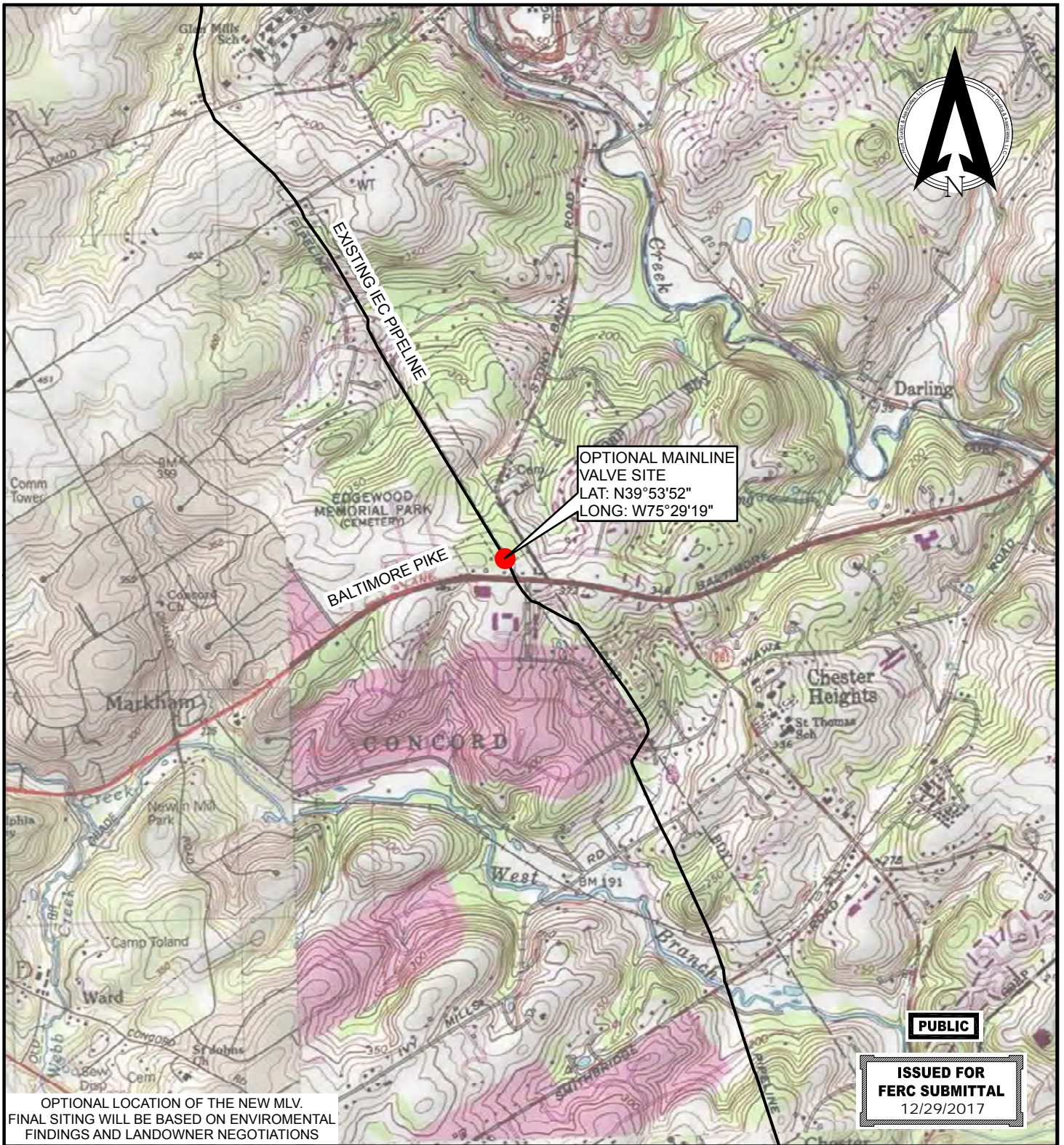


ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 2 AT M.P. 7.94
DELAWARE COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 7.94	REV 0
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phumphrey 12/27/2017 2:45:39 PM

FIGURE 15a



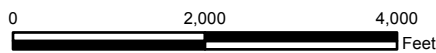
OPTIONAL LOCATION OF THE NEW MLV.
FINAL SITING WILL BE BASED ON ENVIRONMENTAL
FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h4 (MEDIA, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	12/15/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
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						PLOT SCALE	1:1	
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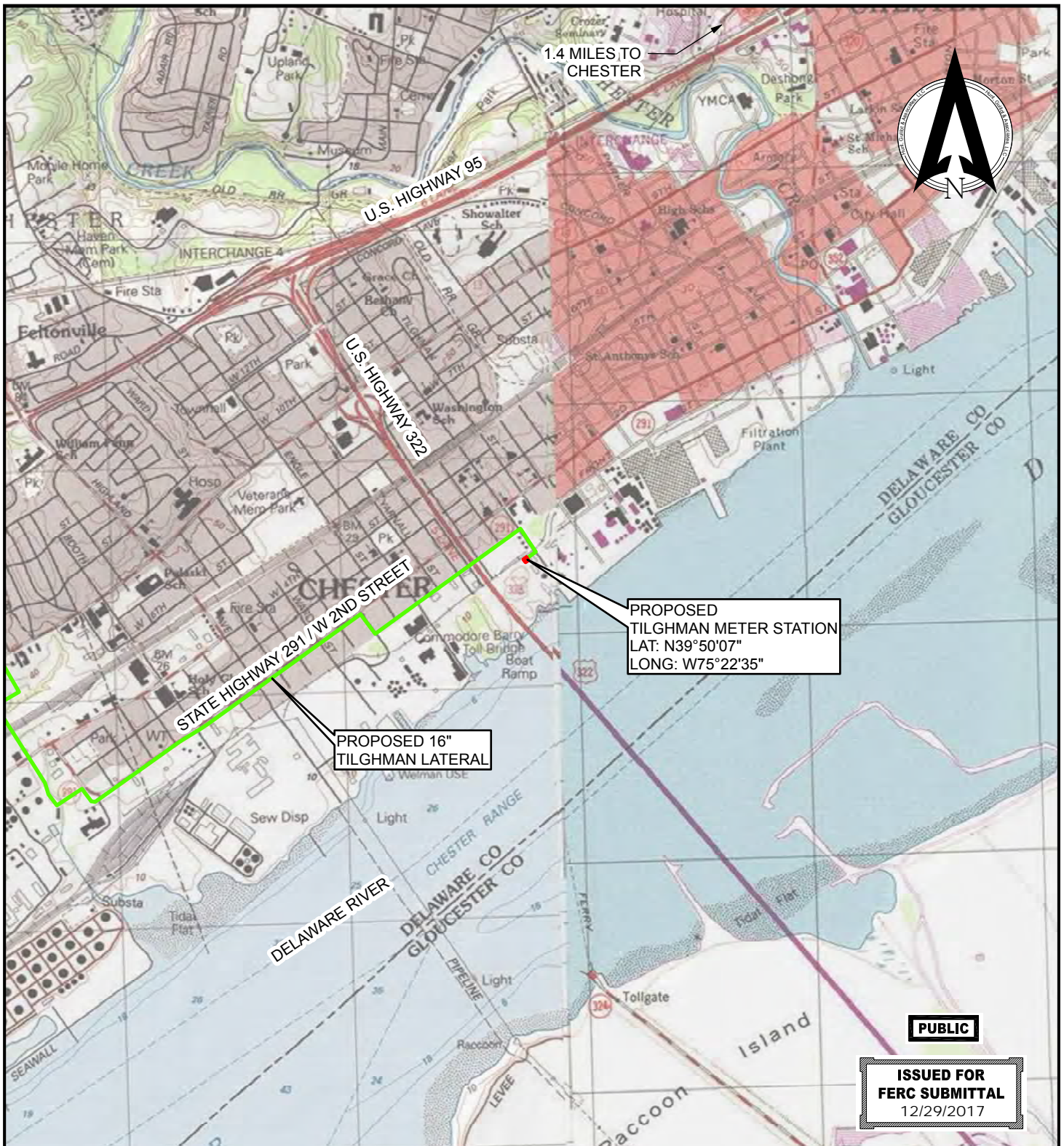


**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 1 AT M.P. 6.66
DELAWARE COUNTY,
PENNSYLVANIA**

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 6.66	REV 0
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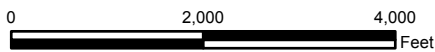
phumphrey 12/27/2017 2:41:10 PM

FIGURE 14a



LEGEND

- PROPOSED TILGHMAN METER STATION
- PROPOSED 16" TILGHMAN LATERAL



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



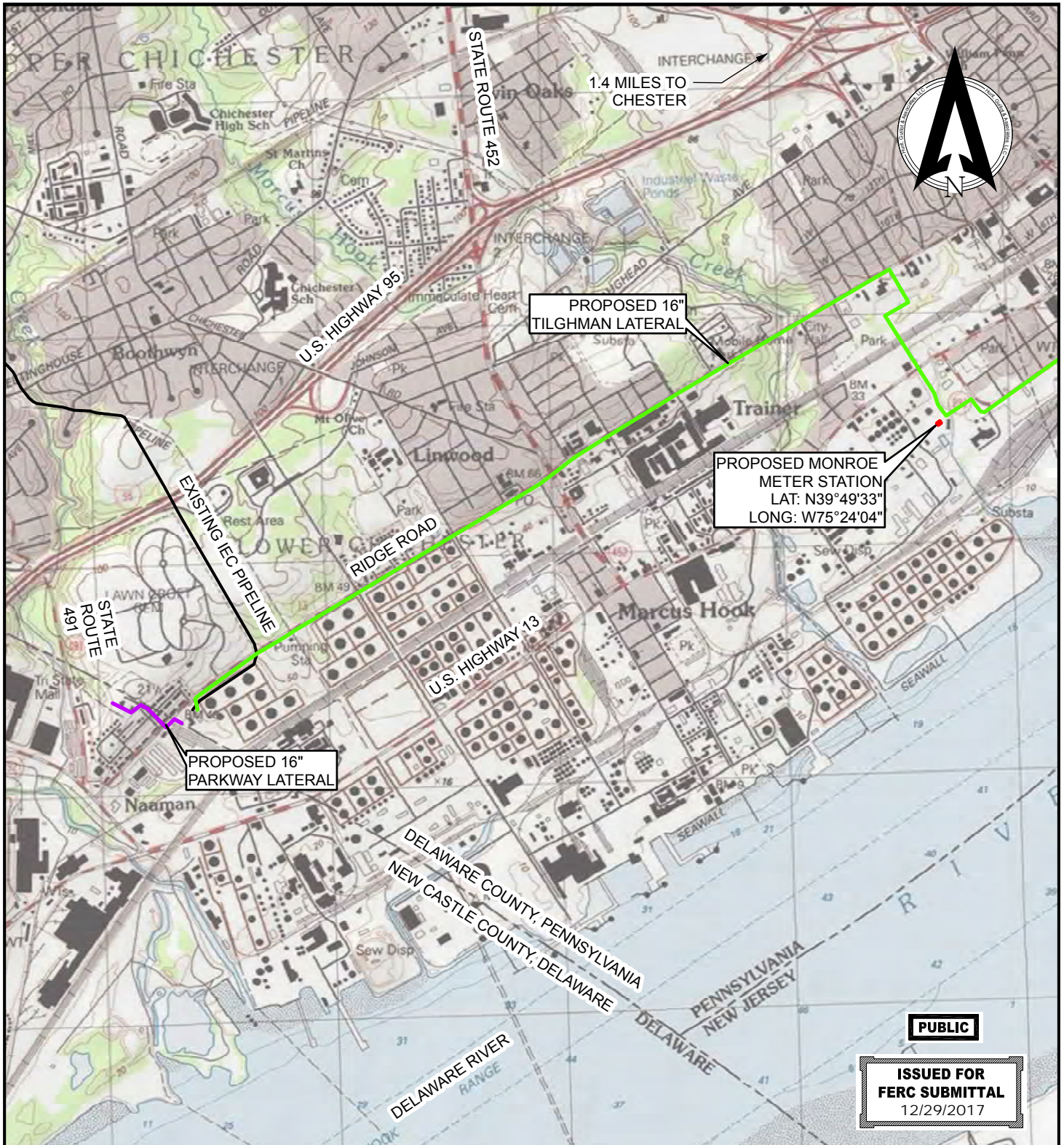
ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED TILGHMAN
METER STATION
DELAWARE COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-TILGHMAN	REV 0
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						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

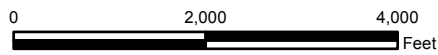
FIGURE 13a

phumphrey 12/28/2017 7:26:05 AM



LEGEND

- PROPOSED MONROE METER STATION
- PROPOSED 16" TILGHMAN LATERAL
- PROPOSED 16" PARKWAY LATERAL
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MONROE METER STATION
DELAWARE COUNTY,
PENNSYLVANIA

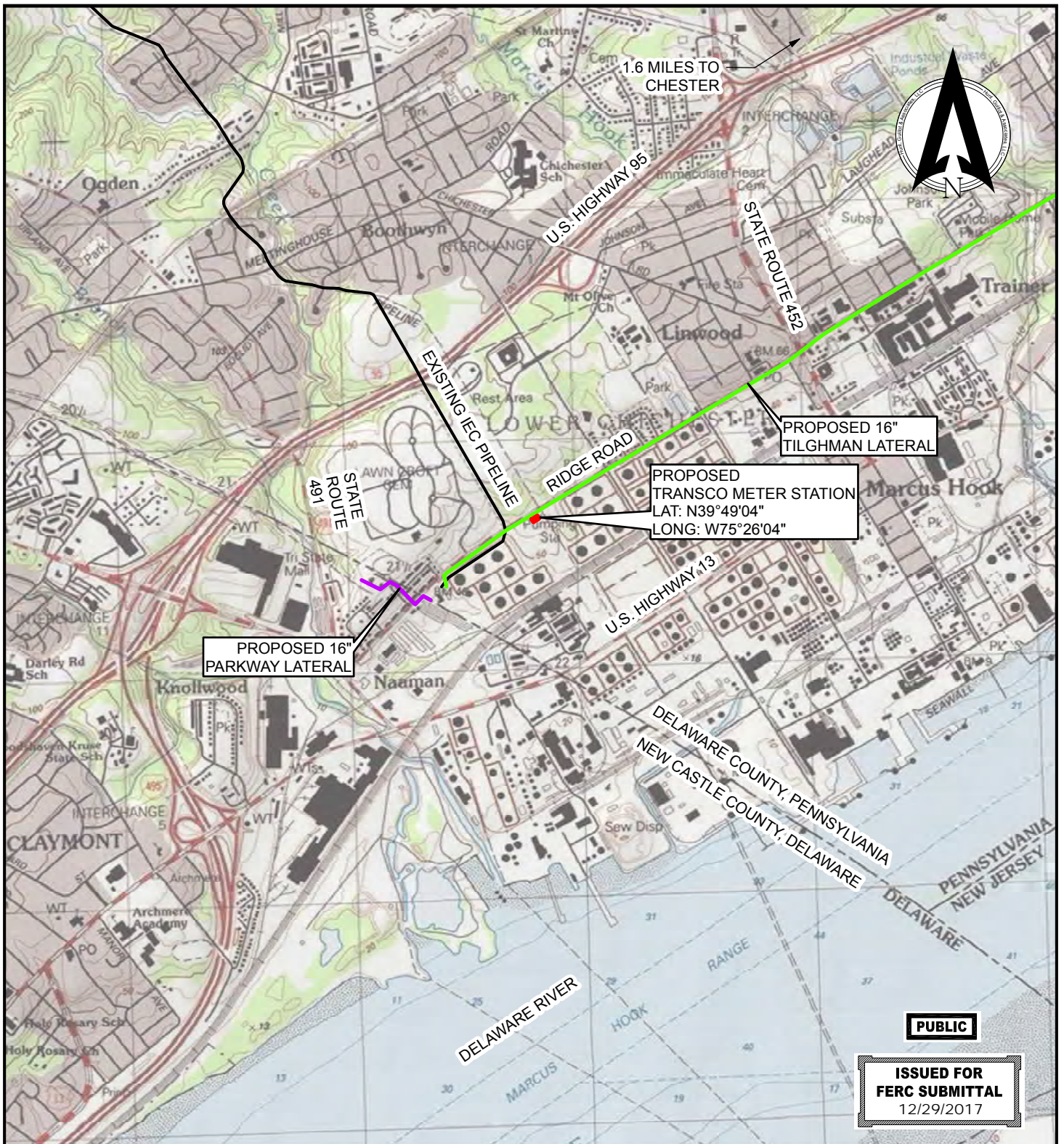
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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
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REV	DESCRIPTION	CHK	DATE	APP	DATE			



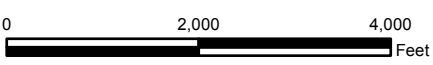
FIGURE 12a

phumphrey 12/28/2017 8:28:41 AM



LEGEND

- ▭ PROPOSED TRANSCO METER STATION
- ▬ PROPOSED 16" TILGHMAN LATERAL
- ▬ PROPOSED 16" PARKWAY LATERAL
- ▬ EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
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						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED TRANSCO
METER STATION
DELAWARE COUNTY,
PENNSYLVANIA

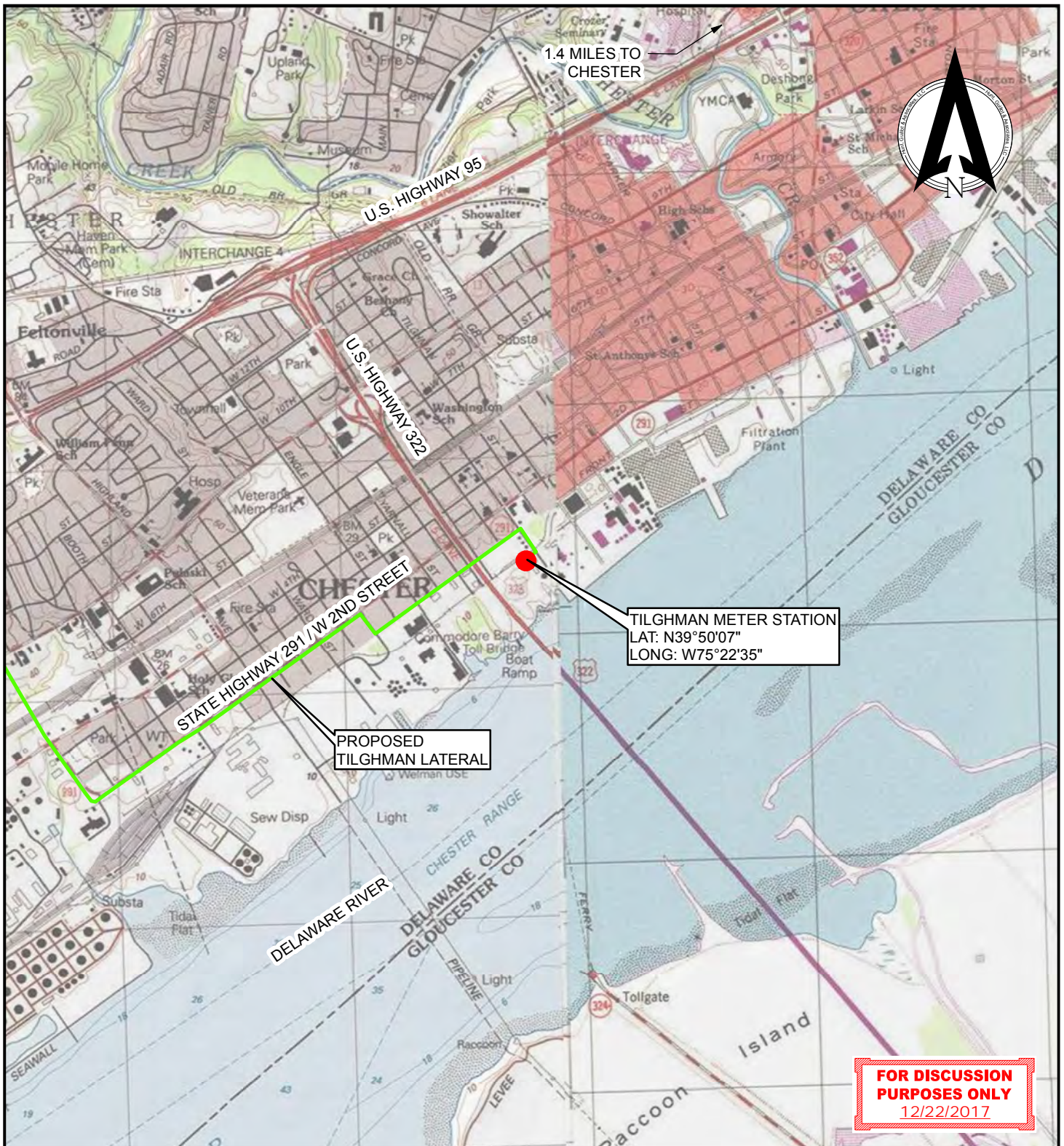
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PUBLIC

ISSUED FOR FERC SUBMITTAL
12/29/2017

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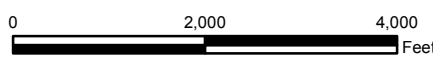
FIGURE 11a



**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- TILGHMAN METER STATION
- PROPOSED TILGHMAN LATERAL



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)

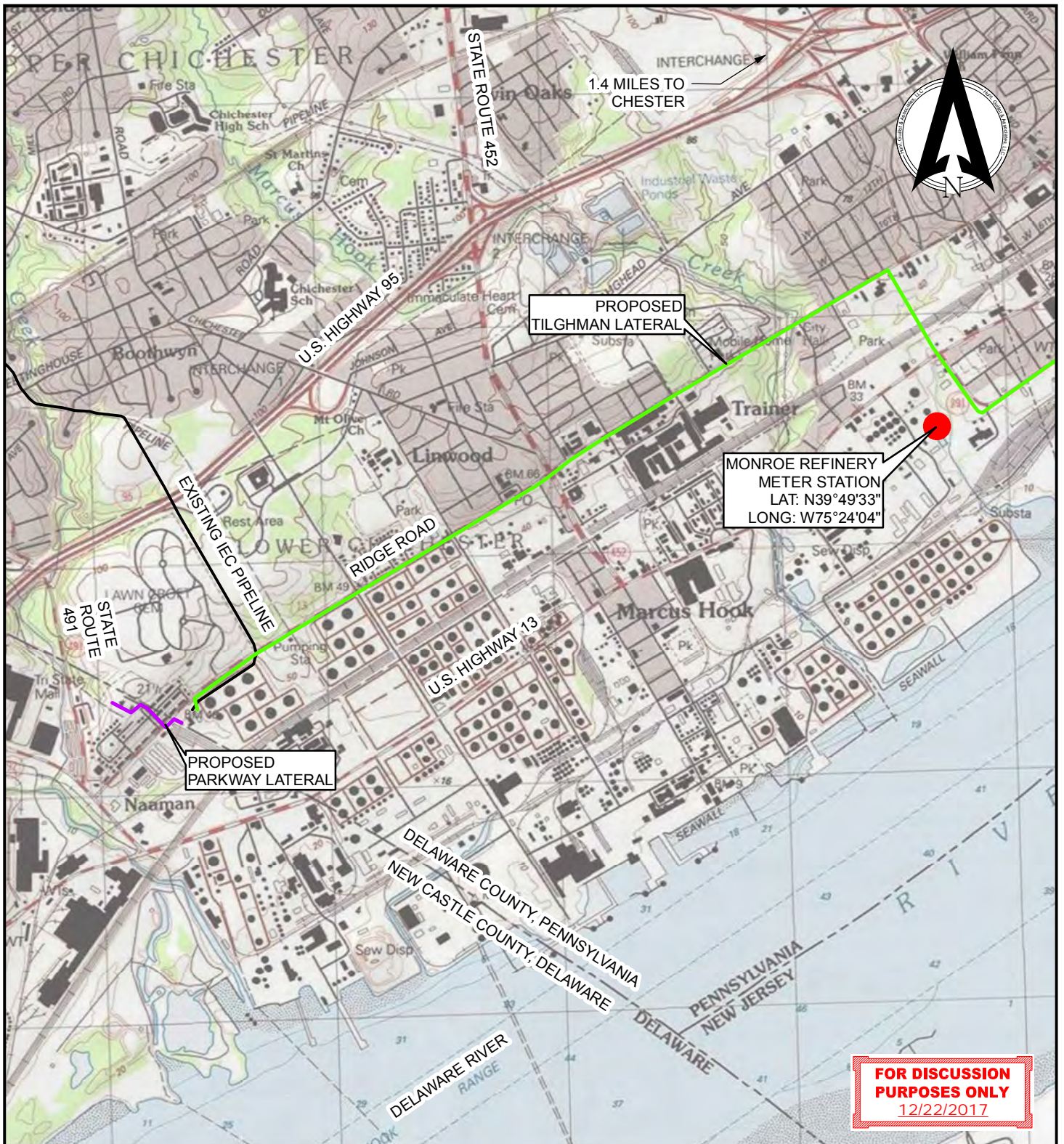
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						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
TILGHMAN METER STATION
DELAWARE COUNTY,
PENNSYLVANIA**

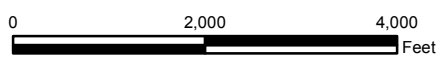
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**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- MONROE REFINERY METER STATION
- PROPOSED TILGHMAN LATERAL
- PROPOSED PARKWAY LATERAL
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)

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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
MONROE REFINERY METER STATION
DELAWARE COUNTY,
PENNSYLVANIA**

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MONROE	REV
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12/20/2017 9:28:32 AM jpreston

Appendix 1D-1

PFBC Correspondence

ADELPHIA GATEWAY PROJECT





August 5, 2017

Pennsylvania Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

Subject: **PNDI Review**

To whom it may concern,

Interstate Energy Company (IEC) is evaluating improvements to their current pipeline system located in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Specifically, IEC is evaluating the following Project components:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- PennEast Lateral and Interconnect Site - a new ~0.5-mile pipeline lateral and meter station interconnect with the proposed PennEast Pipeline in Northampton County, Pennsylvania. IEC is evaluating two route options for the laterals, both of which would cross residential, agricultural, and forested land;
- Hellertown Interconnect Site - a new interconnect adjacent to the intersection of the existing line and the proposed PennEast Pipeline in Northampton County, which would be located on existing pipeline right-of-way and agricultural land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested and agricultural land, and existing pipeline right-of-way;
- Salford Station Site - a material receiving and storage area located within and adjacent to an existing pumping/reheat station in Montgomery County, Pennsylvania, which would be sited on agricultural and industrial land, and existing electrical transmission line right-of-way;
- Cromby Site - new above ground facilities on an agricultural-use site adjacent to an existing above ground delivery interconnect and in close proximity to the retired Cromby power plant in Chester County, Pennsylvania; and

August 5, 2017

- Marcus Hook Laterals and Interconnect Site – two new pipeline laterals (one 0.3-mile line, and one 0.5-mile line) originating at the existing Marcus Hook Terminal in Delaware County, Pennsylvania and two new meter station interconnects within the Terminal's boundary, which would be sited entirely on industrial land and paved roadways.

The evaluation area encompasses approximately 50 acres of land; approximately 12 of which could be affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. On behalf of IEC and as their environmental consultant, NV5 is requesting a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the Pennsylvania Fish and Boat Commission for the proposed Project.

The following are enclosed to facilitate your review:

- a completed Project Review Form;
- USGS 7.5-minute quadrangle maps showing the Project area; and
- wetland datasheets and photographs.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,



Sara Holmes
Environmental Scientist
NV5

Attachments:

- Attachment A – PNDI Large Project Review Form
- Attachment B – USGS 7.5-minute Quadrangle Maps
- Attachment C – Wetland and Waterbody Delineation Report

NV5

OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Interstate Energy Company

Address: 214 Shoemaker Road, Pottstown, PA

Phone Number: 610-327-5325

Email: info@ie c.energy.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: IEC Pipeline Modification Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Upper Salford Township

County: Montgomery

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name:

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 48.2 Acreage to be Impacted: 13.0

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation? Yes. Wetland data are attached.
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 0.0

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

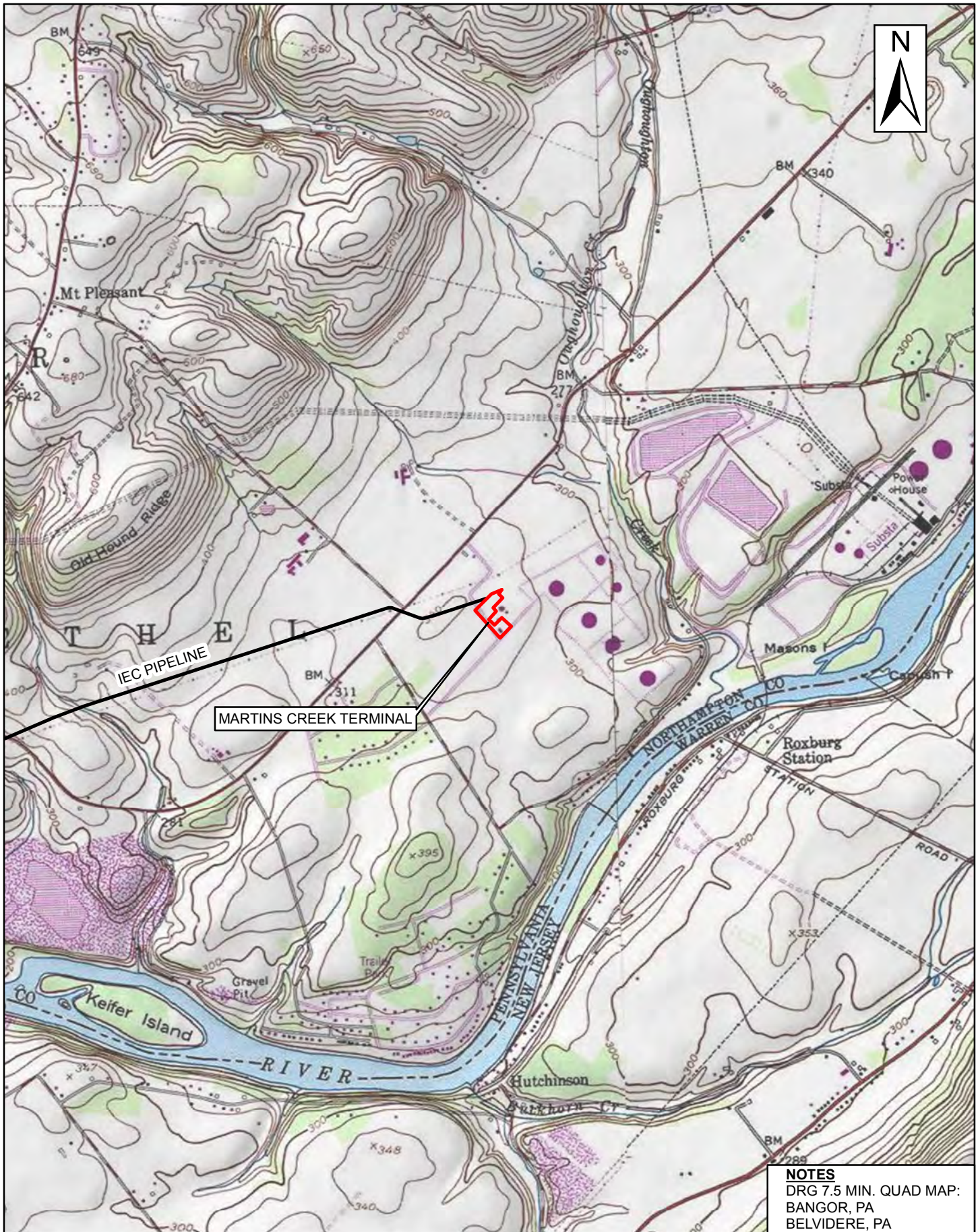
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

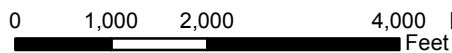
Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps

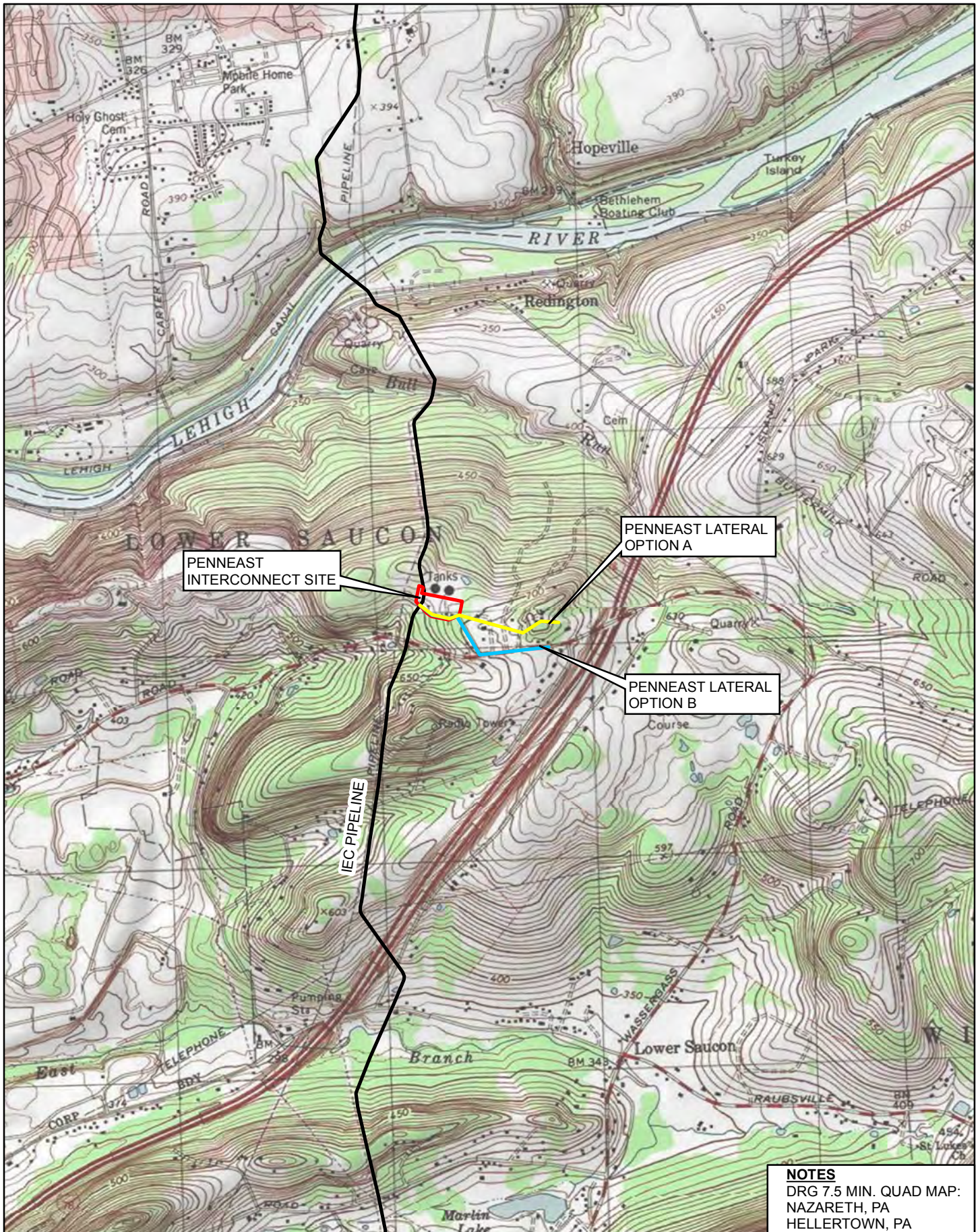


— MARTINS CREEK TERMINAL
 — EXISTING PIPELINE



PROJECT LOCATION MAP
MARTINS CREEK TERMINAL
NORTHAMPTON COUNTY, PENNSYLVANIA

NOTES
 DRG 7.5 MIN. QUAD MAP:
 BANGOR, PA
 BELVIDERE, PA



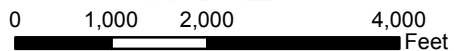
PENNEAST INTERCONNECT SITE

PENNEAST LATERAL OPTION A

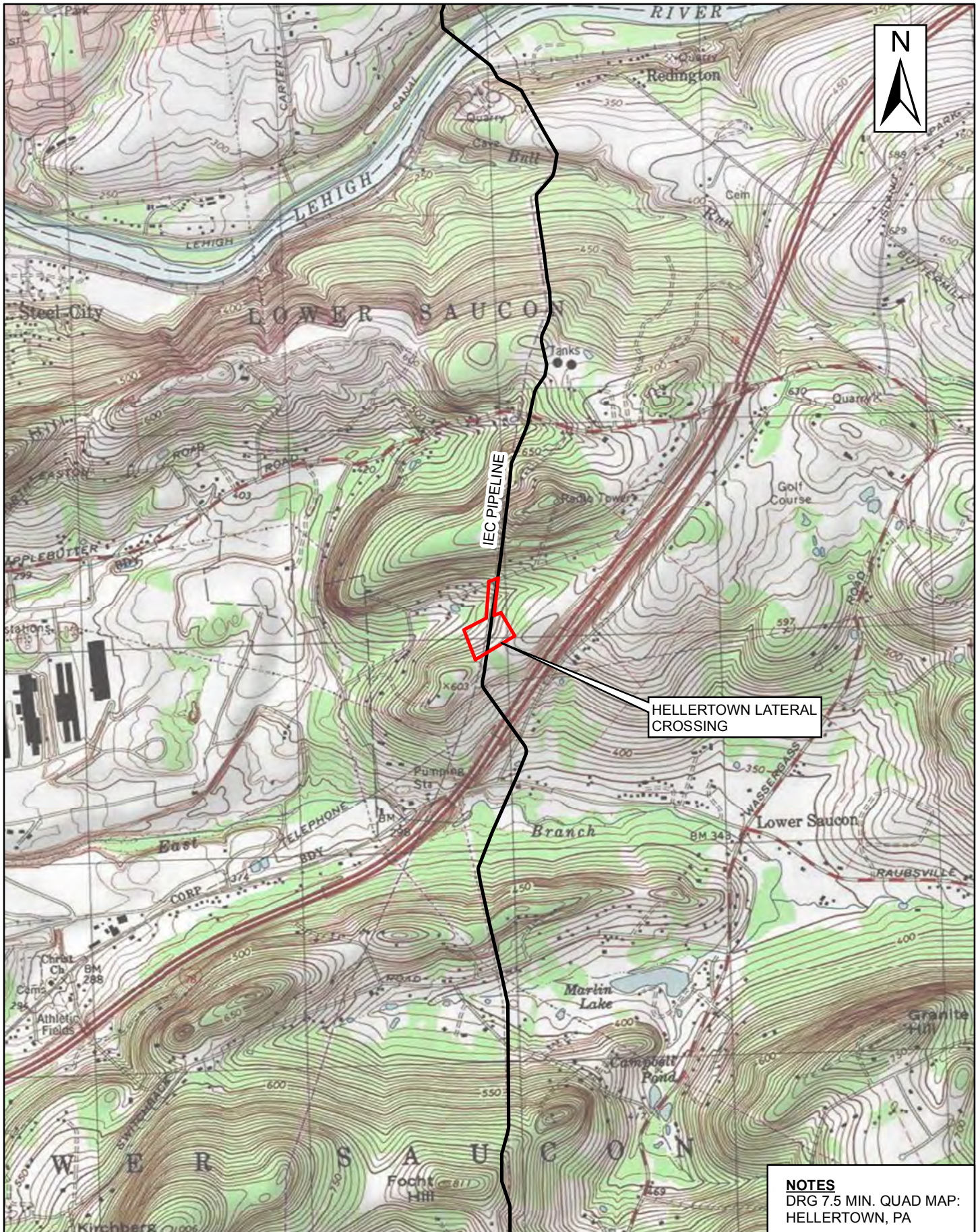
PENNEAST LATERAL OPTION B

NOTES
 DRG 7.5 MIN. QUAD MAP:
 NAZARETH, PA
 HELLERTOWN, PA

- PENNEAST LATERAL OPTION A
- PENNEAST LATERAL OPTION B
- PENNEAST INTERCONNECT SITE
- EXISTING PIPELINE



**PROJECT LOCATION MAP
 PENNEAST INTERCONNECT
 AND LATERALS
 NORTHAMPTON COUNTY, PENNSYLVANIA**



HELLERTOWN LATERAL CROSSING

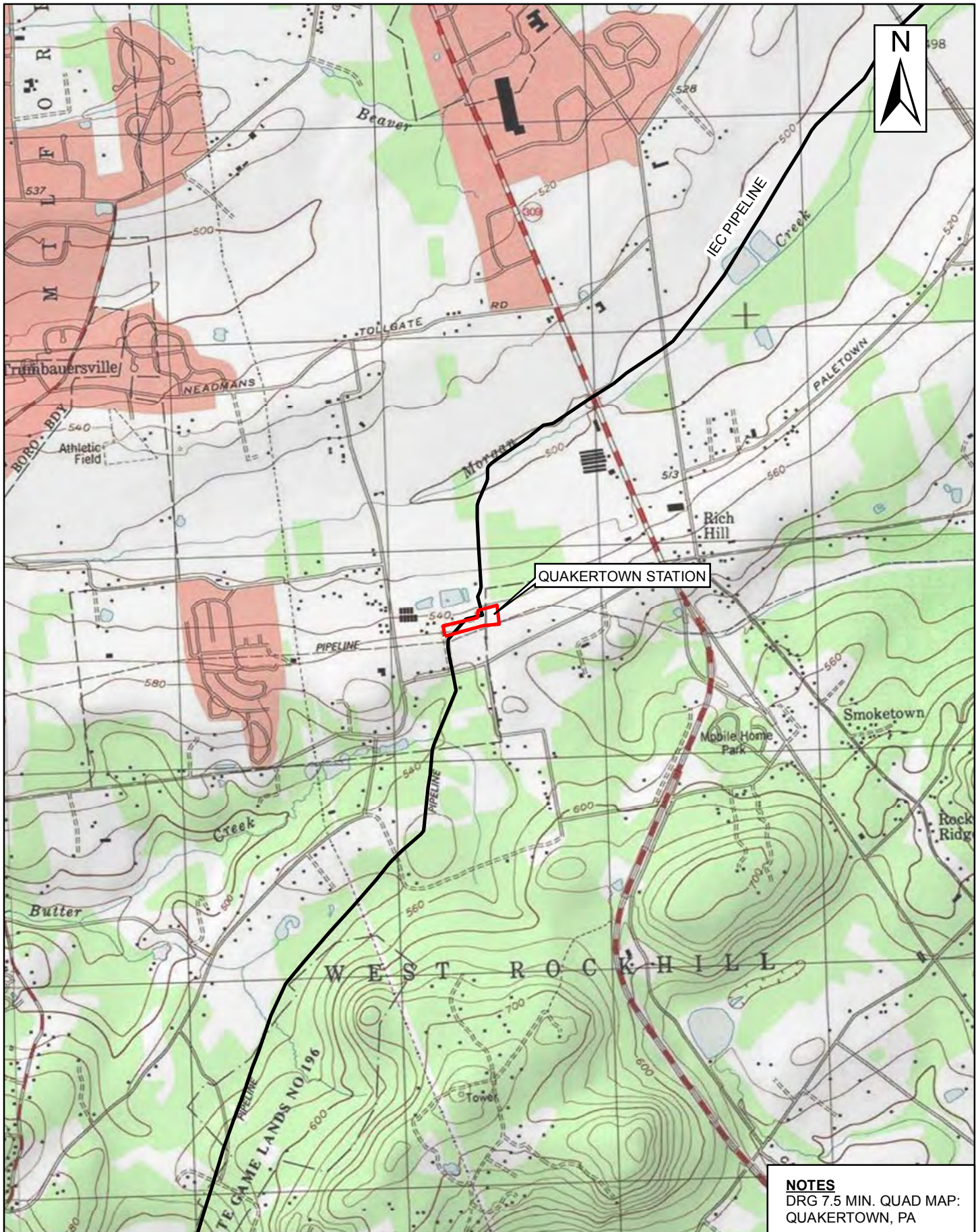
NOTES
DRG 7.5 MIN. QUAD MAP:
HELLERTOWN, PA

— HELLERTOWN LATERAL CROSSING
— EXISTING PIPELINE

N V 5

0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
HELLERTOWN LATERAL CROSSING
NORTHAMPTON COUNTY, PENNSYLVANIA



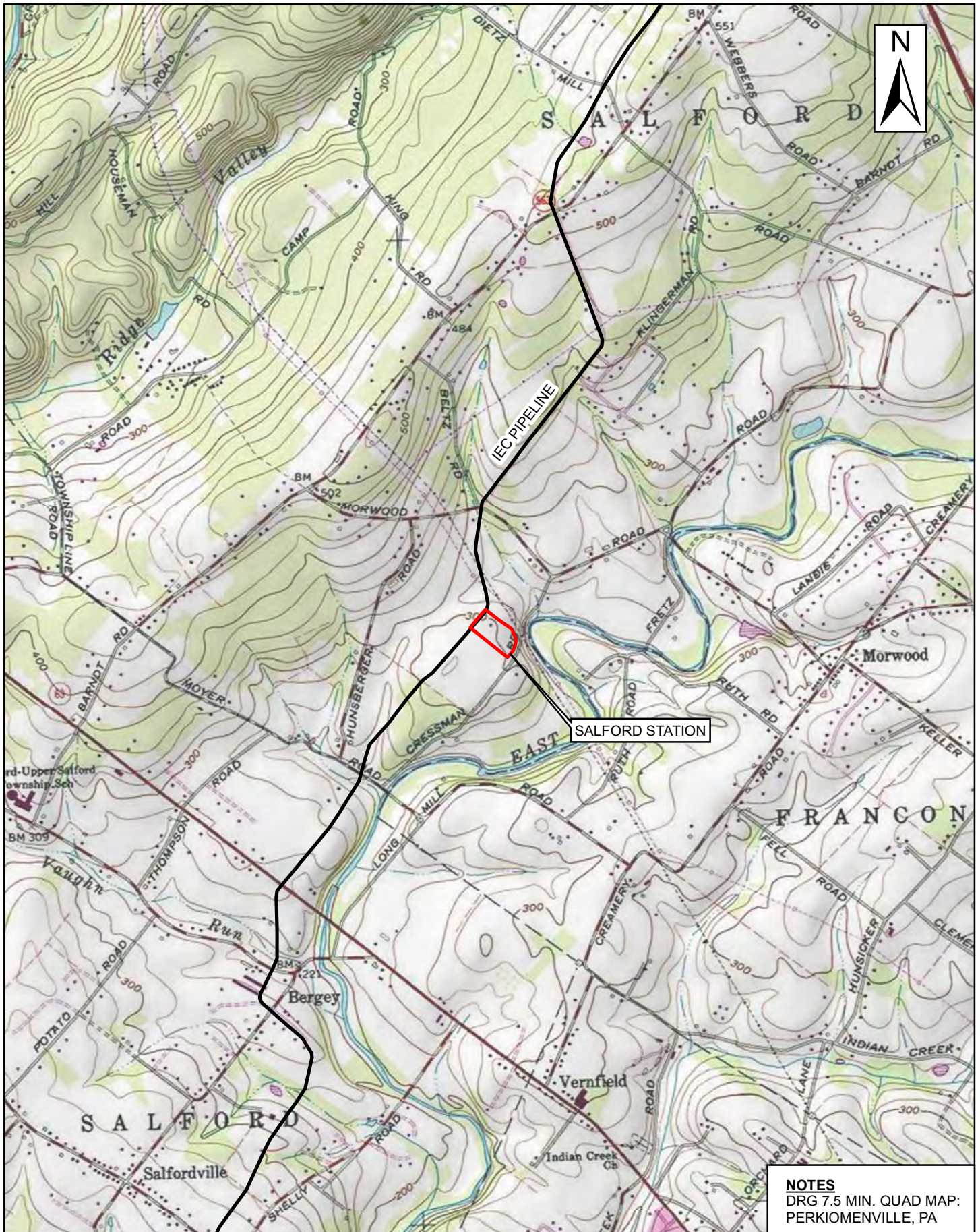
NOTES
 DRG 7.5 MIN. QUAD MAP:
 QUAKERTOWN, PA

— QUAKERTOWN STATION
 — EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

PROJECT LOCATION MAP
QUAKERTOWN STATION
BUCKS COUNTY, PENNSYLVANIA



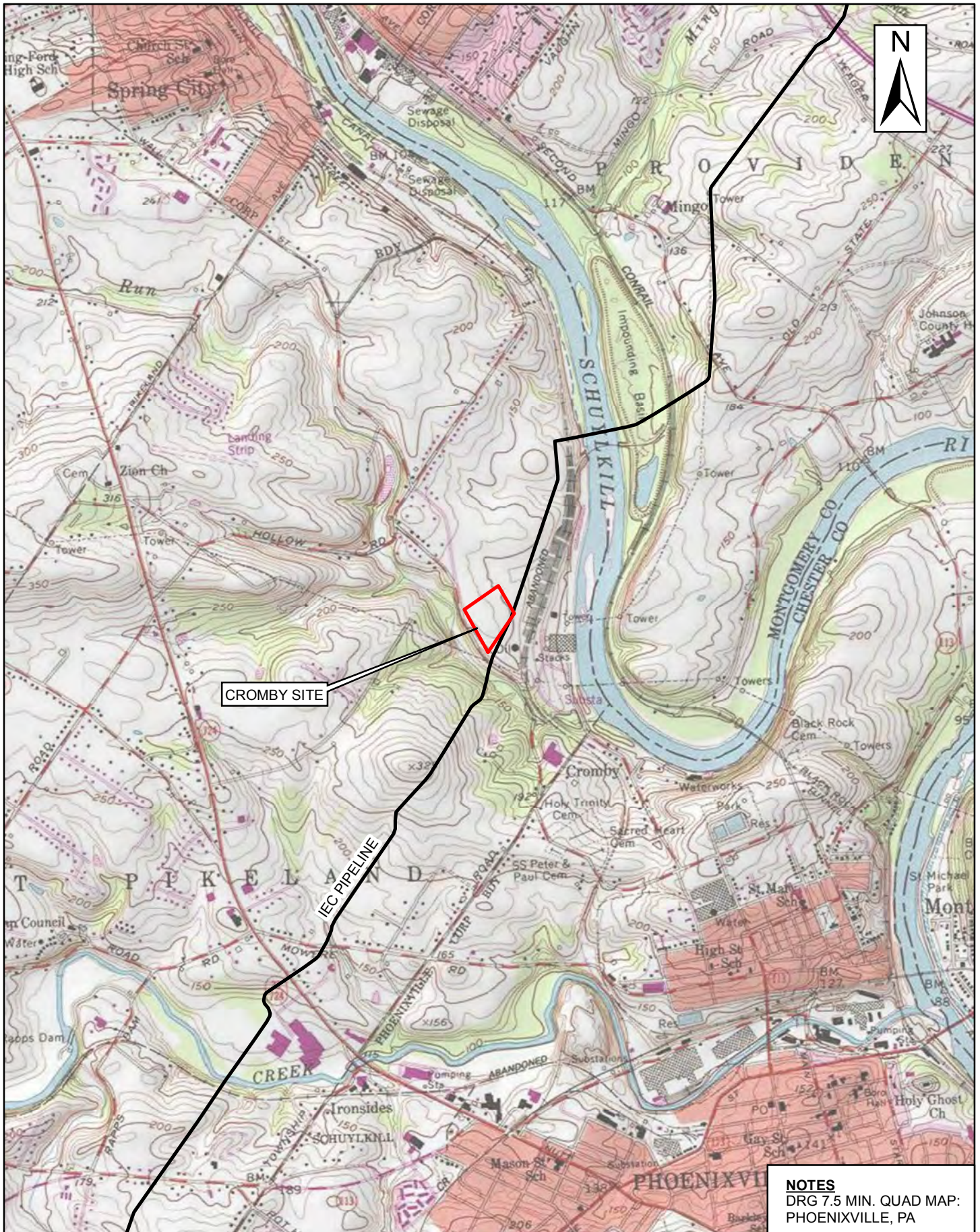
NOTES
 DRG 7.5 MIN. QUAD MAP:
 PERKIOMENVILLE, PA

— SALFORD STATION
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet



PROJECT LOCATION MAP
SALFORD STATION
MONTGOMERY COUNTY, PENNSYLVANIA



CROMBY SITE

IEC PIPELINE

NOTES
 DRG 7.5 MIN. QUAD MAP:
 PHOENIXVILLE, PA

 CROMBY SITE
 EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

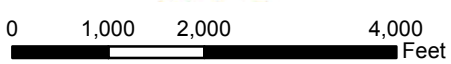
PROJECT LOCATION MAP
CROMBY SITE
CHESTER COUNTY, PENNSYLVANIA



MARCUS HOOK
INTERCONNECTS AND
LATERALS

NOTES:
DRG 7.5 MIN. QUAD MAP
MARCUS HOOK, PA

- MARCUS HOOK DELIVERY LATERAL 1
- MARCUS HOOK DELIVERY LATERAL 2
- MARCUS HOOK INTERCONNECTS
- EXISTING PIPELINE



NV5

**PROJECT LOCATION MAP
MARCUS HOOK INTERCONNECTS
AND LATERALS
DELAWARE COUNTY, PENNSYLVANIA**

Attachment C

Wetland Data

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Herb Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes _____ No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				

Remarks: (If observed, list morphological adaptations below).

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: _____

Feature Photo: Facing - N S E W NE NW SE SW





Pennsylvania Fish & Boat Commission

Division of Environmental Services

Natural Gas Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

September 5, 2017

IN REPLY REFER TO

SIR# 48287

NV5

Sara Holmes
813 N. Dupont Street
Wilmington, Delaware 19805

**RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. – LARGE PROJECT REVIEW
IEC Pipeline Modification Project
MONTGOMERY, NORTHAMPTON, CHESTER, BUCKS, AND DELAWARE Counties**

Dear Sara Holmes:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search “potential conflict” or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the PNDI database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Interstate Energy Company is evaluating improvements to their current pipeline system with seven sites throughout Pennsylvania.

**Martins Creek Terminal Site – Northampton County;
PennEast lateral and Interconnect Site – Northampton County;
Hellertown Interconnect Site – Northampton County;
Quakertown Station Site – Bucks County;
Marcus Hook Laterals and Interconnect Site – Delaware County;**

Except for occasional transient species, rare, candidate, threatened or endangered species under our jurisdiction are not known to exist in the vicinity of the project areas listed above. Therefore, no biological assessment or further consultation regarding rare species is needed with the Commission. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

Our Mission:

www.fish.state.pa.us

To protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.



January 10, 2018

Pennsylvania Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

Heather A. Smiles,
Chief Natural Gas Section

Subject: **Revised PNDI Review**

In July 2017 NV5, LLC (NV5) requested a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the Pennsylvania Fish and Boat Commission (PFBC) for the proposed Pipeline Modification Project located in eastern Pennsylvania. The PFBC responded to the request in a letter dated September 5, 2017 (**SIR #48287**).

The scope of the proposed Project, now called the Adelpia Gateway Project¹, has changed since NV5's original submittal of a request for PNDI review. The Project remains in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Under the revised scope, the following Project components are under evaluation:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested land, paved/graveled industrial-use land, pasture, and existing pipeline right-of-way;
- Skippack Interconnect Site – a new interconnect adjacent to the intersection of the existing line and a PECO-owned natural gas pipeline in Montgomery County. The Site would be located on pasture and existing pipeline right-of-way;
- Marcus Hook Laterals – two new pipeline laterals (one 0.3-mile line and one 4.4-mile line) originating at the existing Marcus Hook Terminal in Delaware County.
 - The Parkway Lateral would be an approximately 0.3-mile, 16-inch-diameter pipeline that

¹ See the November 2, 2017 press release available at <https://adelphiagateway.com/wp-content/uploads/2017/11/18-05-Adelpia-Gateway-Announcement.pdf>.

January 10, 2018

terminates at a new interconnect at an existing meter station in Claymont, New Castle County, Delaware;

- The Tilghman Lateral would be an approximately 4.4-mile, 16-inch-diameter pipeline that would terminate at a new delivery point located within the boundaries of an existing meter station in Chester, Delaware County, Pennsylvania. Adelphia would also install five additional delivery points along the Tilghman Lateral, four of which would be installed entirely within existing industrial meter station sites. The remaining delivery point would be installed on a 0.1-acre regularly maintained, grassy site in Lower Chichester. About 80% of the Tilghman Lateral would be installed using horizontal directional drill methods;
- Marcus Hook Station Site - expansion and improvements to above ground facilities at the existing Marcus Hook Terminal in Marcus Hook, Delaware County. The Site would be located entirely on existing paved/graveled industrial-use land; and
- Mainline Valve and Blowdown Assembly Sites – construction of one new mainline valve and eight new blowdown assemblies at various locations along an existing 18-inch-diameter natural gas pipeline in Delaware, Chester, and Montgomery Counties. Construction and operation of the facilities would take place along existing access roads and within the existing pipeline’s permanent, maintained right-of-way.

The current evaluation area encompasses approximately 42 acres of land, about 9 of which would be permanently affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. NV5 is requesting a revised Large Project PNDI review for resources under the jurisdiction of the PFBC for the proposed Project.

The following are enclosed to facilitate your review:

- a completed revised Project Review Form; and
- USGS 7.5-minute quadrangle maps showing the revised Project area.

The wetland data forms provided with NV5’s previous consultation letter are still valid. Since the original letter, NV5 has performed wetland and waterbody surveys at all of the revised locations except for the Tilghman Lateral (and its associated delivery points), the mainline valve site, and the blowdown assembly sites. No wetlands or waterbodies were identified at the newly surveyed sites. NV5 will provide an updated letter to the PFBC detailing its findings upon completion of the surveys.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.



January 10, 2018

Sincerely,

A handwritten signature in cursive script that reads "Sara Holmes". The signature is written in black ink on a white background.

Sara Holmes
Environmental Scientist
NV5

Attachments:

- Attachment A – Large Project PNDI Review Form
- Attachment B – USGS 7.5-minute Quadrangle Maps

NIVIS

OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

When to Use the Manual Project Submission Form

Use this form if you do *not* want to use the online Pennsylvania Conservation Explorer to submit your project of any size for environmental review. Due to system limitations and agency requirements, projects should not be submitted piecemeal. The entire project area including roads and infrastructure should be submitted as a single unit. Fill out this form and send it along with your project materials (see *What to Send to Jurisdictional Agencies*) **to all four agencies** listed at the bottom of this PNDI Project Submission Form. There is no charge for submitting a project manually; however, due to the additional work required of agency staff, online submission is more efficient.

Note: All Projects may be submitted using the Pennsylvania Conservation Explorer online tool (a \$40 fee will be charged per project). Online submission results in greater convenience and possibly faster response times.

What to Send to Jurisdictional Agencies

Send the following information to all of the agencies listed on the Project Submission Form.

Check-list of Minimum Materials to be submitted:

- ___ Completed Manual Project Submission Form
- ___ Supplemental project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- ___ Relevant portion of the USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

- ___ GIS shapefiles depicting the project extent
- ___ A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- ___ Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- ___ Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

PNDI Project Submission Form Definitions

Applicant: Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Proposed Activity: Include **all** earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished.

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities.



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Adelpia Gateway, LLC

Address: 1415 Wyckoff Rd, Wall, NJ 07719

Phone Number: 800-483-3179

Email: info@adelphiagateway.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: Adelpia Gateway Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Multiple

County: Multiple see cover letter.

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Multiple see Attachments

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 42.2 Acreage to be Impacted: 13.9

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No The project would cross 2 creeks: Marcus Hook Creek (HDD) and Stoney Creek (open-cut).
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation?
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 1.5 acres

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

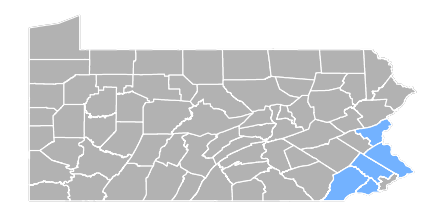
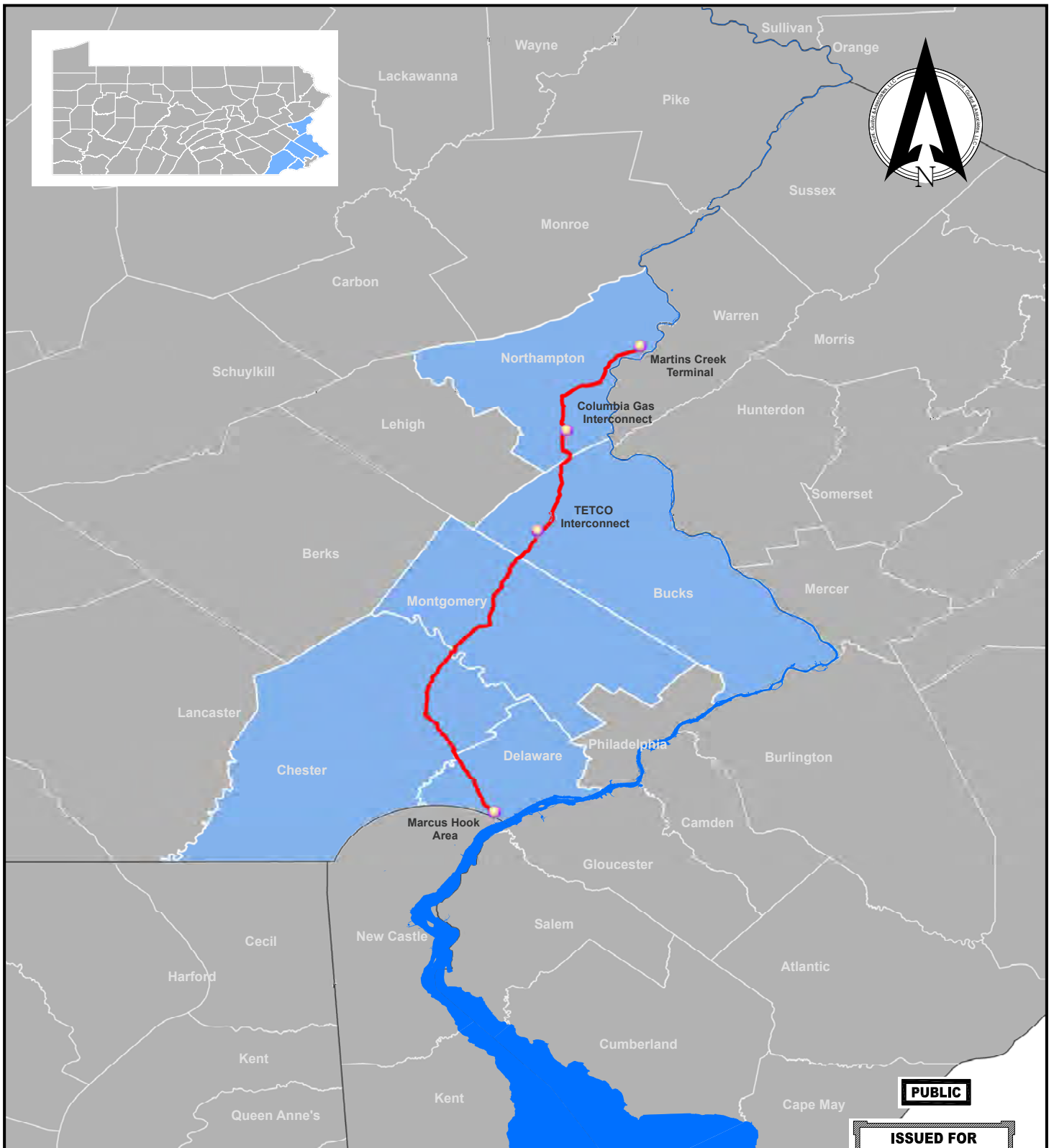
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B


USGS Quad Maps



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**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

Legend

-  Facility
-  Adelpia Gateway

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			

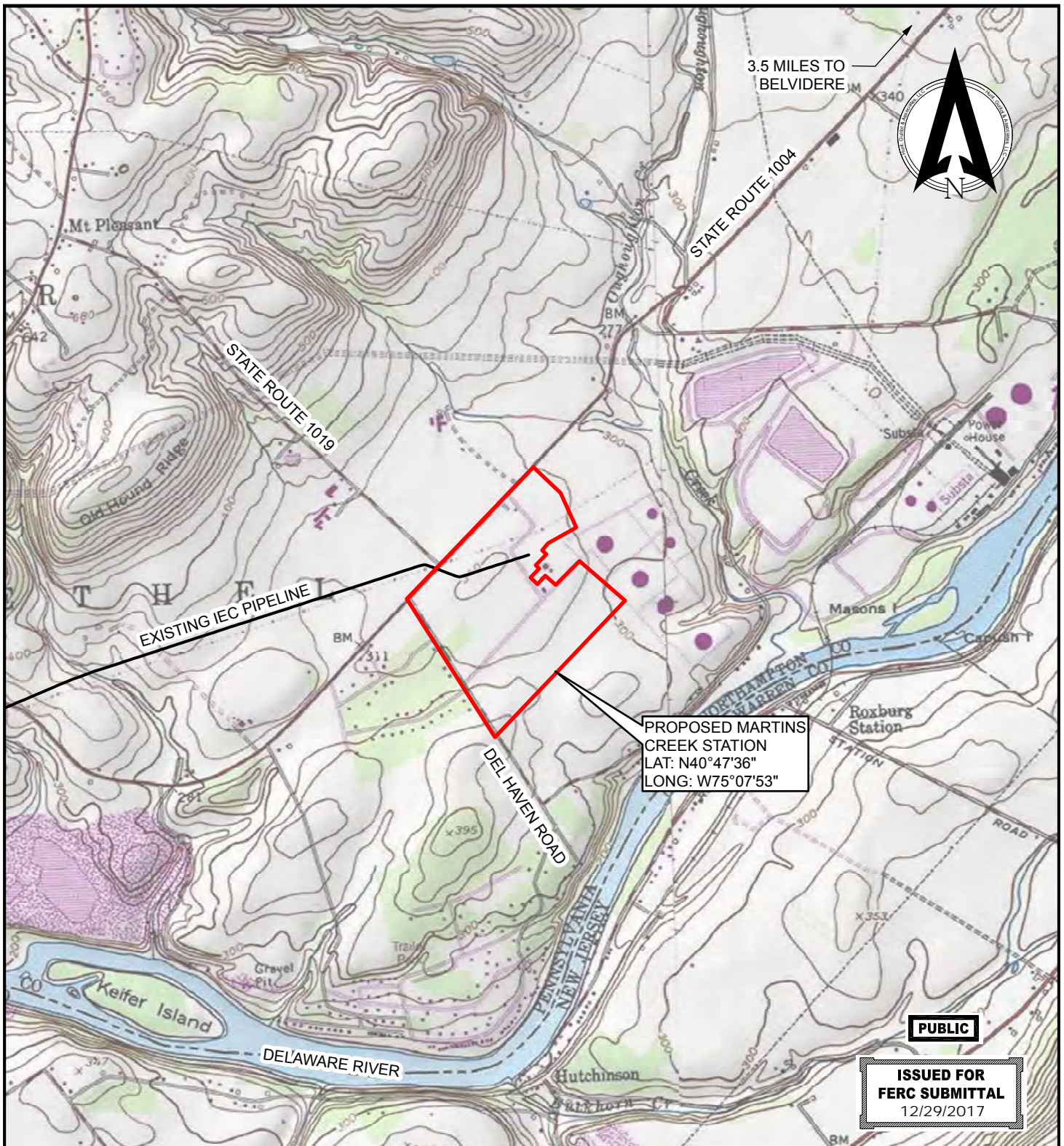


**ADELPIA GATEWAY, LLC
PROJECT VICINITY MAP
BUCKS, CHESTER, DELAWARE,
MONTGOMERY, NORTHAMPTON
COUNTIES, PENNSYLVANIA**

SCALE N.T.S.	DRAWING NUMBER 8.A17022.01-VICINITY	REV 0
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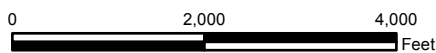
phumphrey 12/27/2017 3:27:15 PM

FIGURE 1



LEGEND

- PROPOSED MARTINS CREEK STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -o40075g2 (BANGOR, PA)
 -o40075g1 (BELVIDERE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MARTINS CREEK STATION
NORTHAMPTON COUNTY,
PENNSYLVANIA

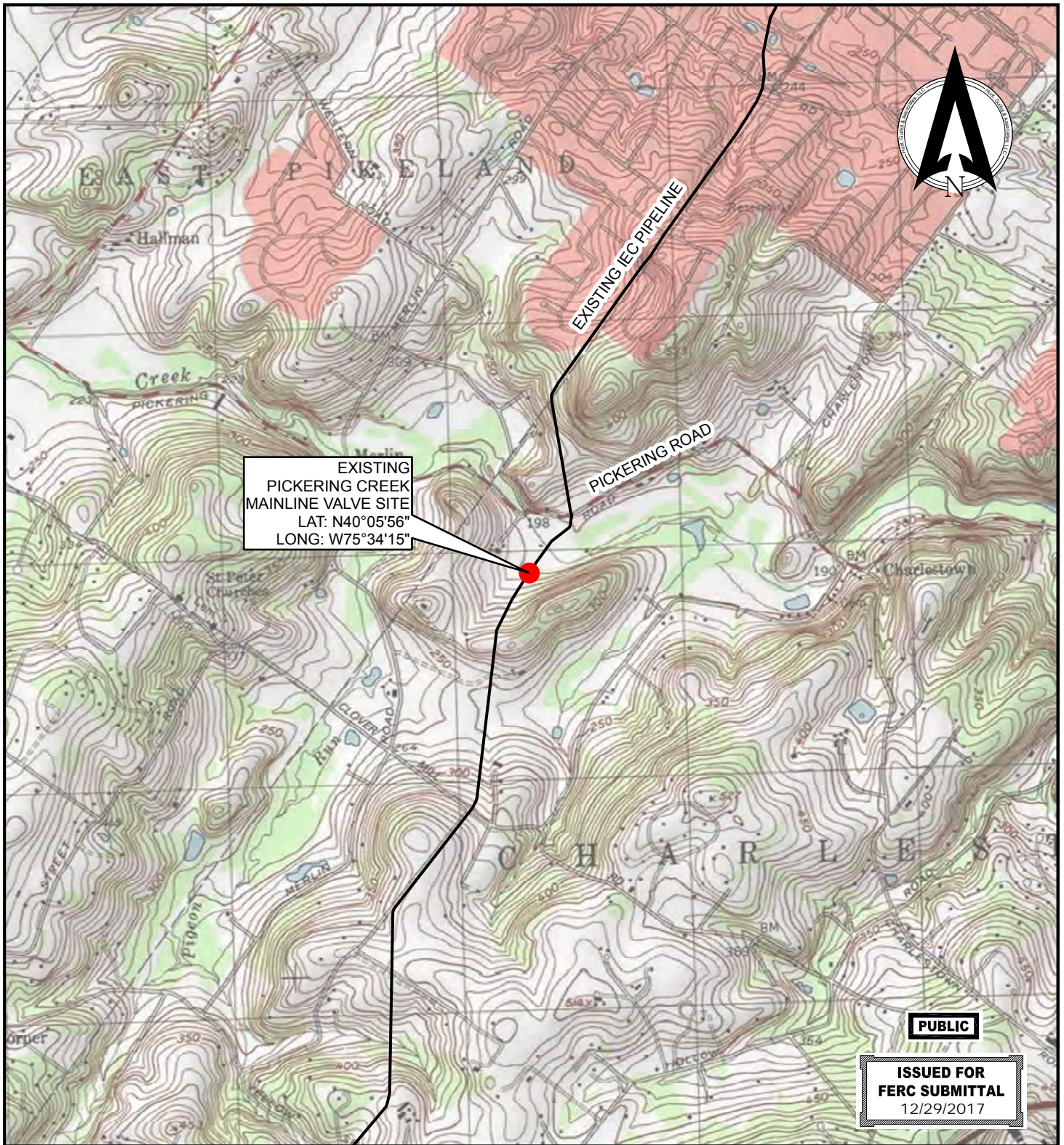
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						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



phumphrey 12/27/2017 3:47:58 PM

FIGURE 5a



EXISTING
PICKERING CREEK
MAINLINE VALVE SITE
LAT: N40°05'56"
LONG: W75°34'15"

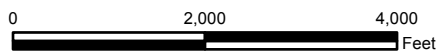


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**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075a5 (MALVERN, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

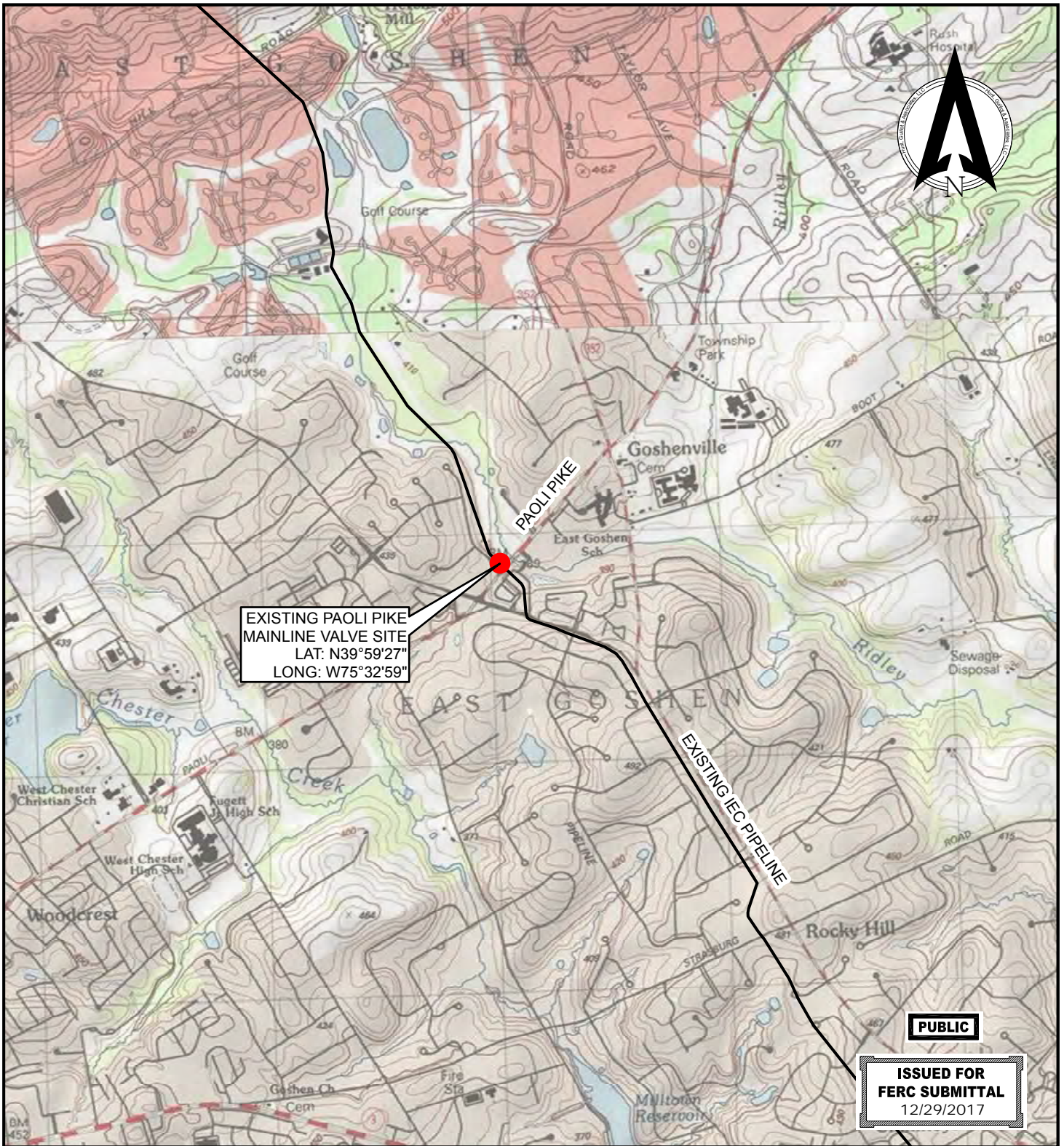


**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PICKERING CREEK
BLOWDOWN M.P. 22.98
CHESTER COUNTY,
PENNSYLVANIA**

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 22.98	0

phumphrey 12/27/2017 2:54:23 PM

FIGURE 18a



EXISTING PAOLI PIKE
MAINLINE VALVE SITE
LAT: N39°59'27"
LONG: W75°32'59"

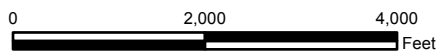


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WESTCHESTER, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PAOLI PIKE BLOWDOWN M.P. 14.46
CHESTER COUNTY,
PENNSYLVANIA**

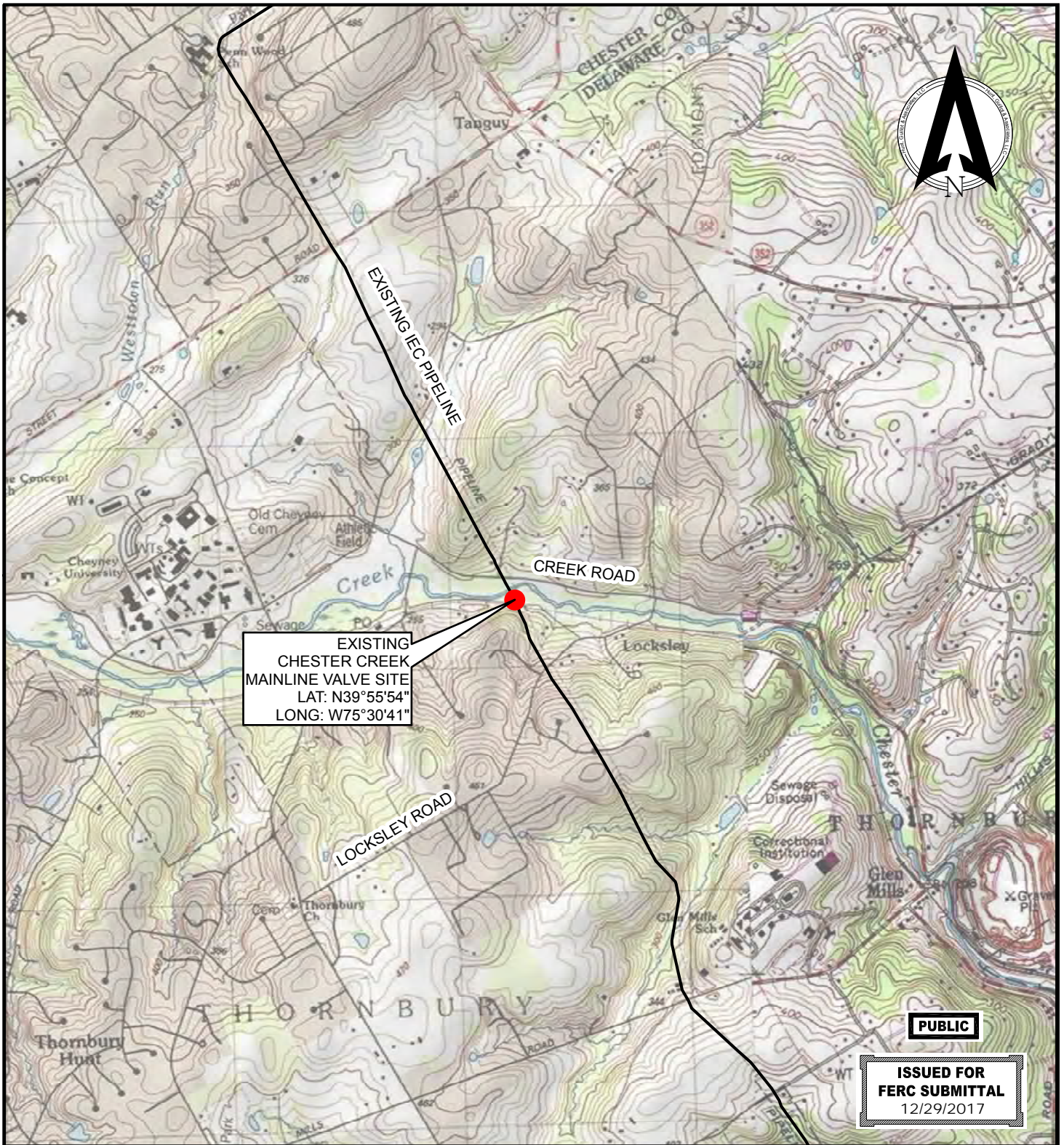


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						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 14.46	REV 0
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FIGURE 17a



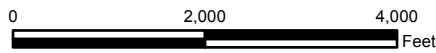
EXISTING
CHESTER CREEK
MAINLINE VALVE SITE
LAT: N39°55'54"
LONG: W75°30'41"

PUBLIC

**ISSUED FOR
FERC SUBMITTAL**
12/29/2017

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-o39075h5 (WEST CHESTER, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
CHESTER CREEK
BLOWDOWN M.P. 9.53
DELAWARE COUNTY,
PENNSYLVANIA**

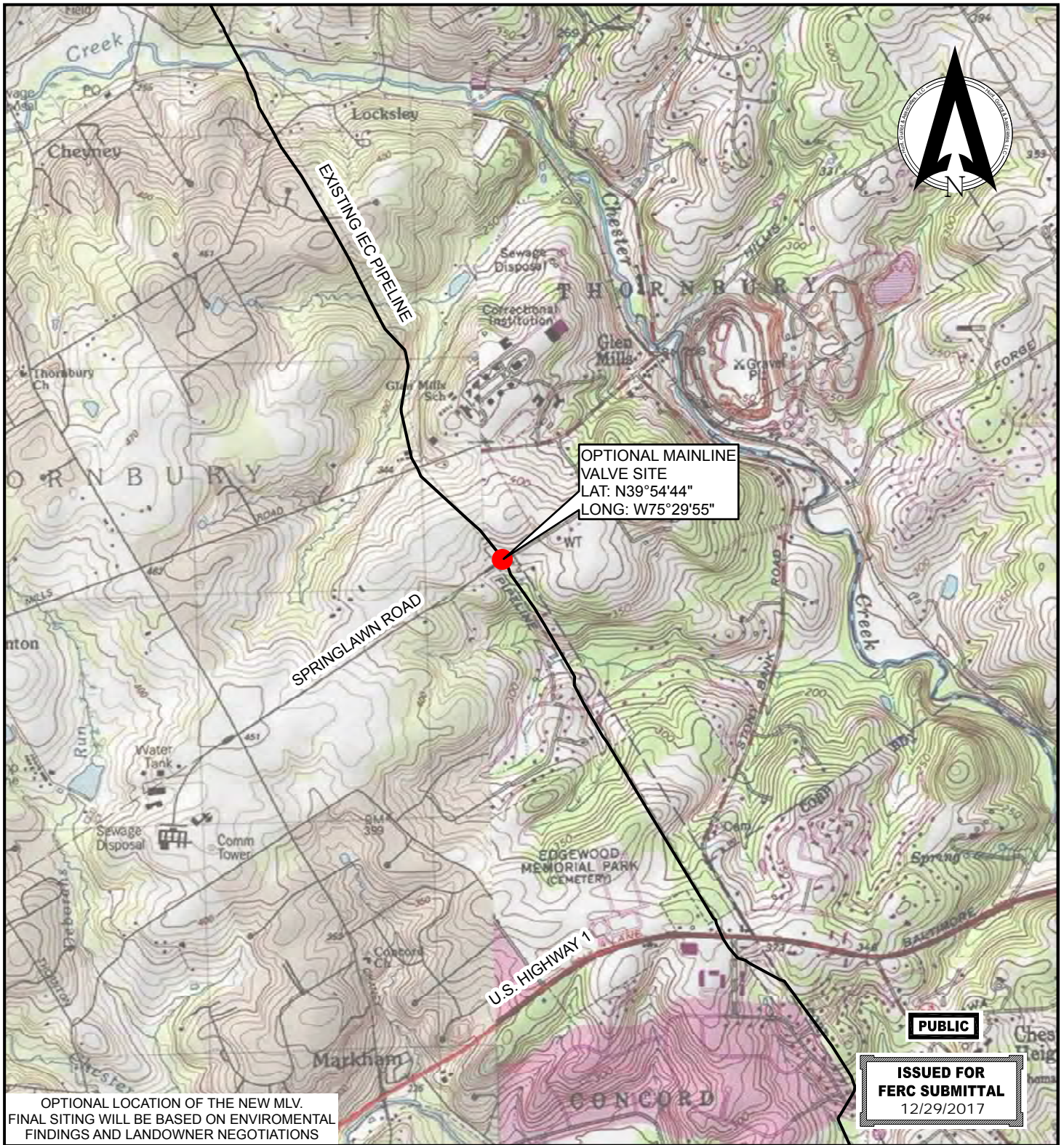
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
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DRAWN BY	MSF	12/15/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 2:48:49 PM

FIGURE 16a



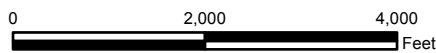
OPTIONAL LOCATION OF THE NEW MLV. FINAL SITING WILL BE BASED ON ENVIRONMENTAL FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

ISSUED FOR FERC SUBMITTAL
12/29/2017

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WEST CHESTER, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

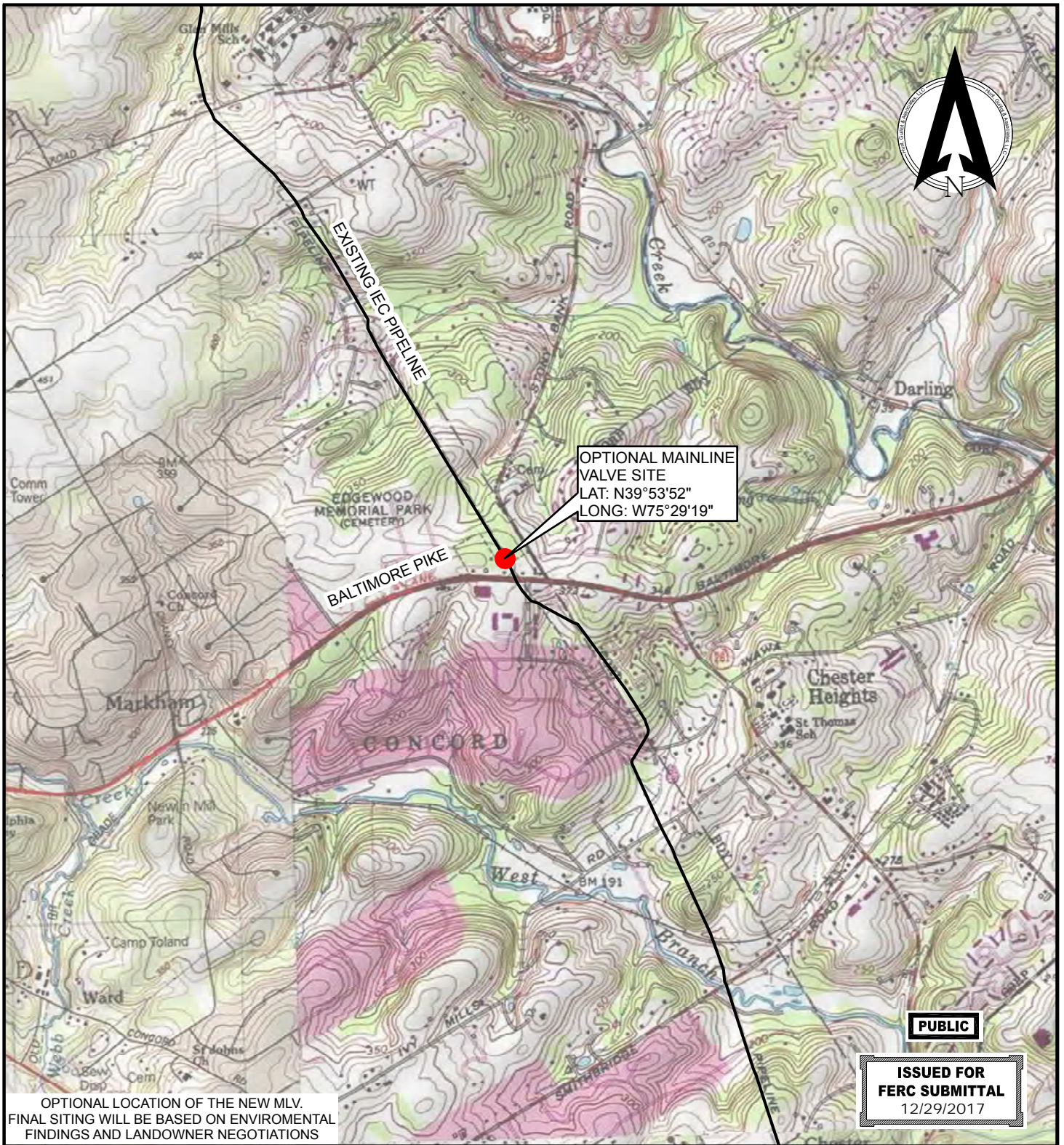


ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 2 AT M.P. 7.94
DELAWARE COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 7.94	REV 0
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phumphrey 12/27/2017 2:45:39 PM

FIGURE 15a



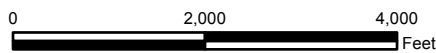
OPTIONAL LOCATION OF THE NEW MLV.
FINAL SITING WILL BE BASED ON ENVIRONMENTAL
FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h4 (MEDIA, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			

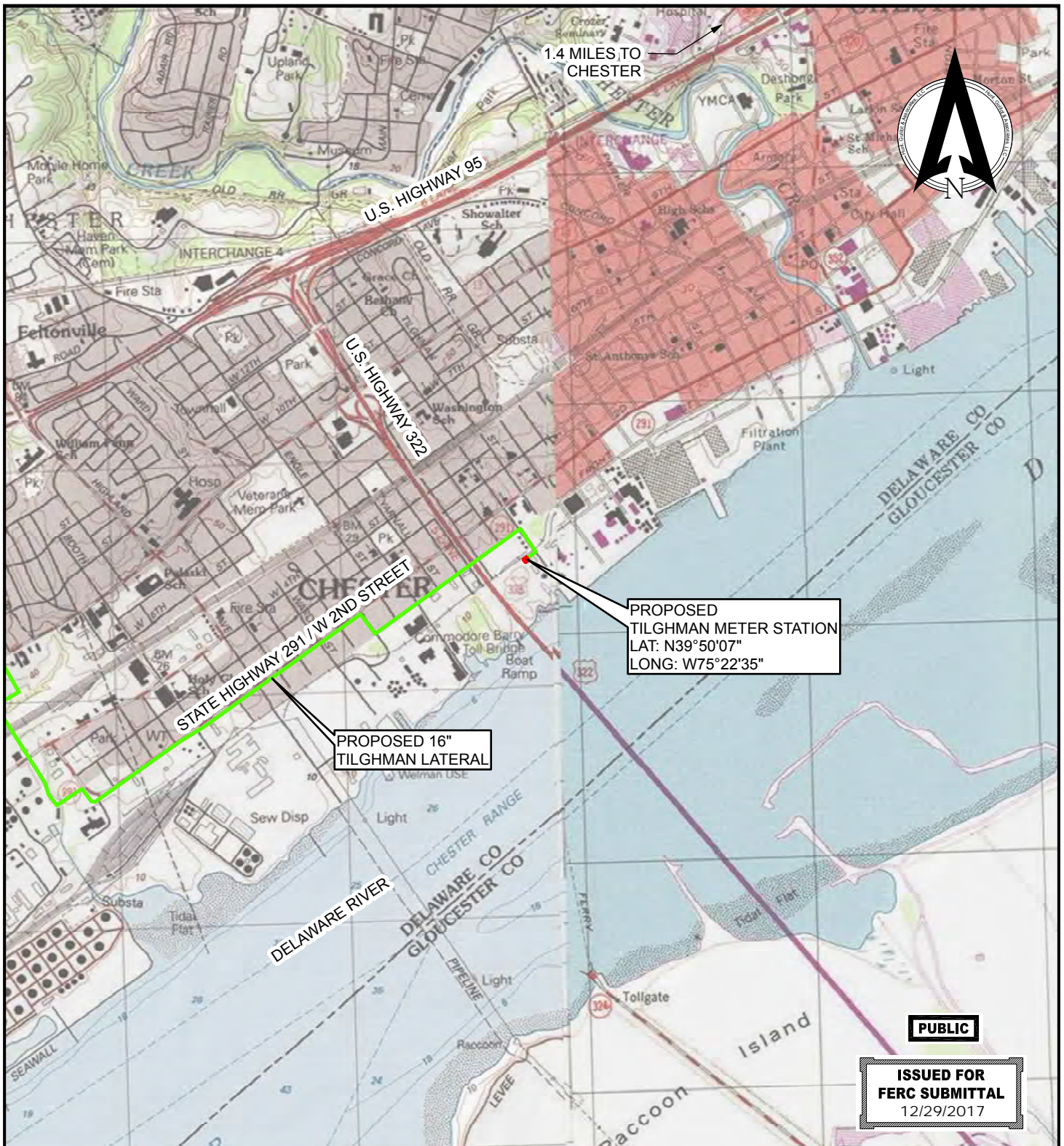


**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 1 AT M.P. 6.66
DELAWARE COUNTY,
PENNSYLVANIA**

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 6.66	REV 0
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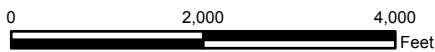
phumphrey 12/27/2017 2:41:10 PM

FIGURE 14a



LEGEND

- PROPOSED TILGHMAN METER STATION
- PROPOSED 16" TILGHMAN LATERAL



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED TILGHMAN
METER STATION
DELAWARE COUNTY,
PENNSYLVANIA

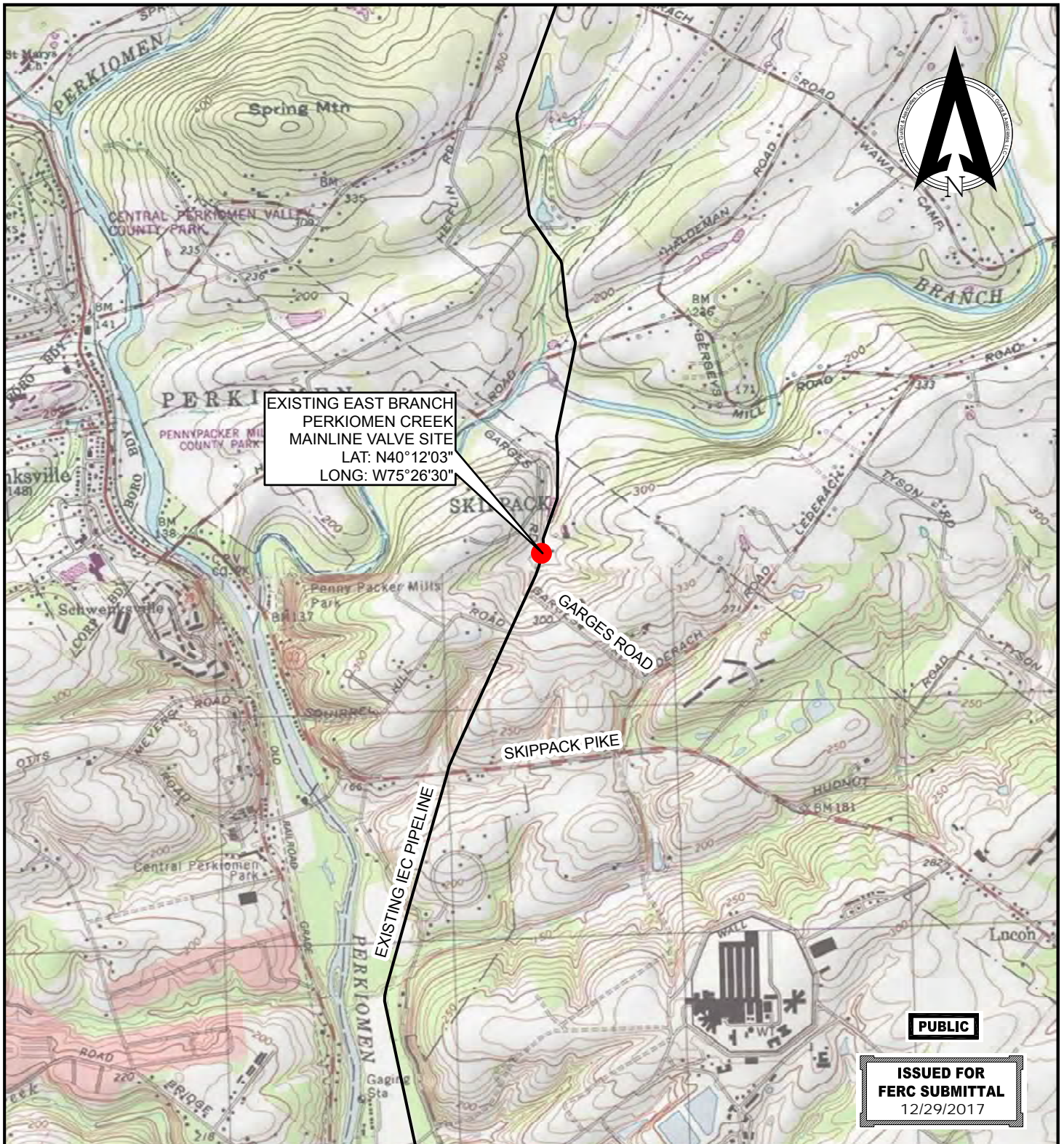
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-TILGHMAN	REV 0
---------------------	---	----------

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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



FIGURE 13a

phumphrey 12/28/2017 7:26:05 AM



EXISTING EAST BRANCH
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'03"
LONG: W75°26'30"

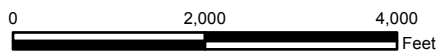


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**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075c4 (PERKIOMENVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



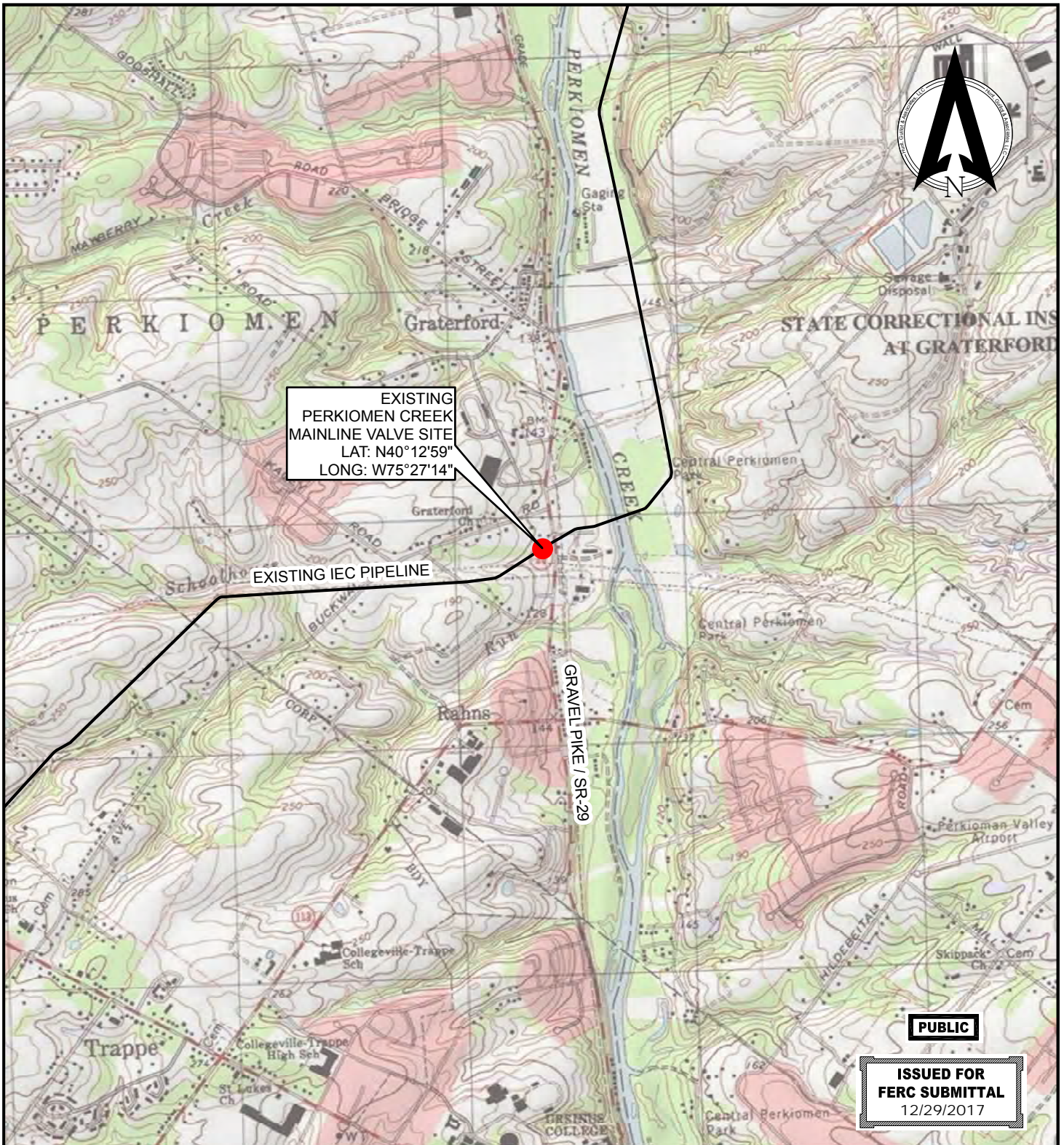
**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
EAST BRANCH PERKIOMEN CREEK
BLOWDOWN M.P. 36.68
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 36.68	REV 0
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phumphrey 12/27/2017 3:06:51 PM

FIGURE 23a



EXISTING
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'59"
LONG: W75°27'14"

EXISTING IEC PIPELINE

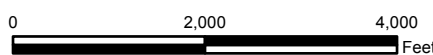


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b4 (COLLEGEVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



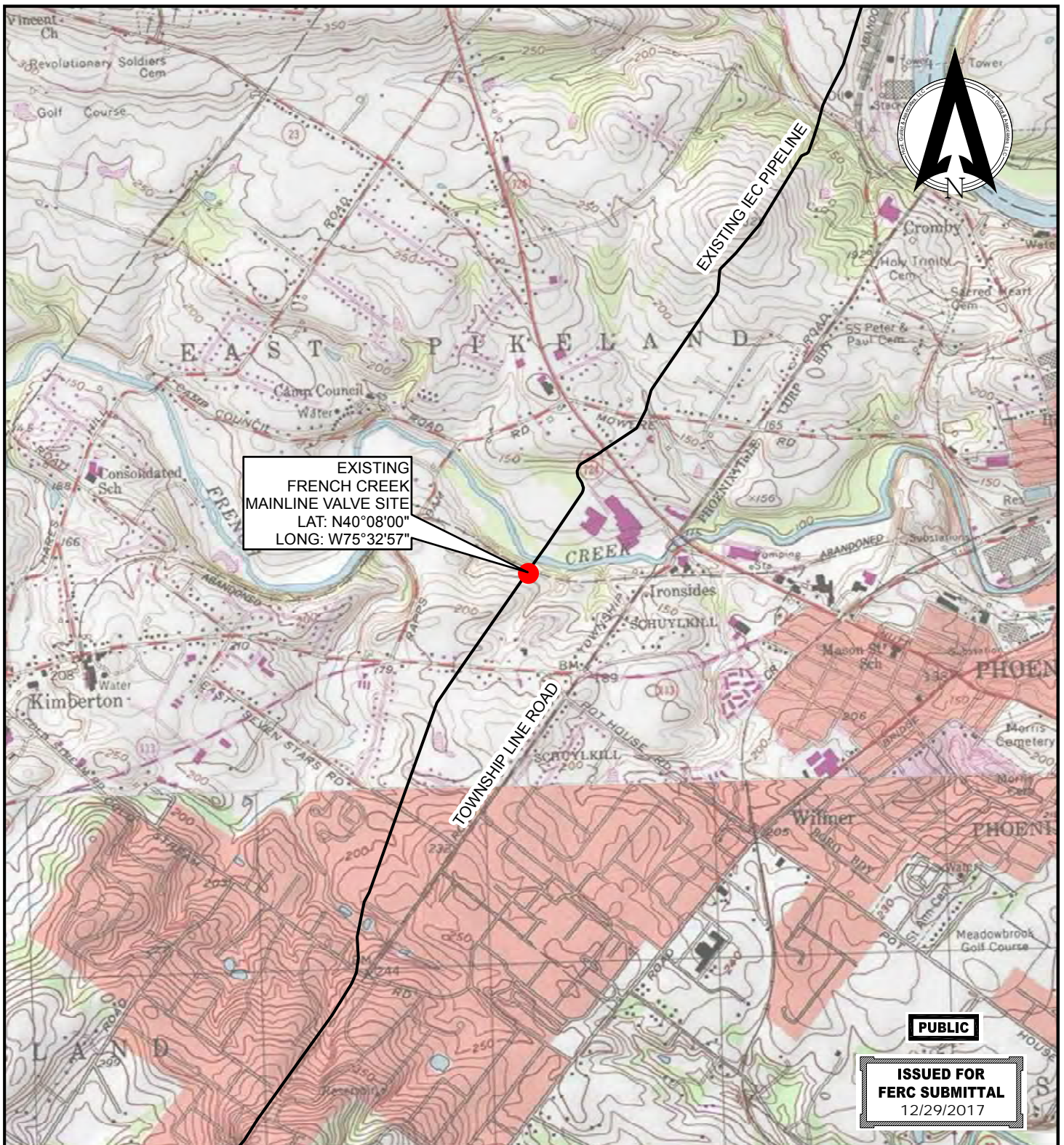
**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PERKIOMEN CREEK
BLOWDOWN M.P. 33.97
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 33.97	0

FIGURE 22a

phumphrey 12/27/2017 3:04:43 PM



EXISTING
FRENCH CREEK
MAINLINE VALVE SITE
LAT: N40°08'00"
LONG: W75°32'57"

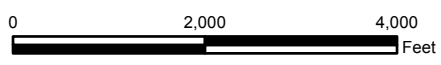


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b5 (PHOENIXVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
FRENCH CREEK
BLOWDOWN M.P. 25.74
CHESTER COUNTY,
PENNSYLVANIA**

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 25.74	0

REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

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FIGURE 19a

Adelphia Gateway, LLC

Adelphia Project

DOCKET NO. CP18-__-000

Appendix 1D-1

Agency Correspondence – Public

Appendix 1D-1

PGC Correspondence

ADELPHIA GATEWAY PROJECT





August 5, 2017

Pennsylvania Game Commission
Bureau of Wildlife Habitat Management
Department of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

Subject: **PNDI Review**

To whom it may concern,

Interstate Energy Company (IEC) is evaluating improvements to their current pipeline system located in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Specifically, IEC is evaluating the following Project components:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- PennEast Lateral and Interconnect Site - a new ~0.5-mile pipeline lateral and meter station interconnect with the proposed PennEast Pipeline in Northampton County, Pennsylvania. IEC is evaluating two route options for the laterals, both of which would cross residential, agricultural, and forested land;
- Hellertown Interconnect Site - a new interconnect adjacent to the intersection of the existing line and the proposed PennEast Pipeline in Northampton County, which would be located on existing pipeline right-of-way and agricultural land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested and agricultural land, and existing pipeline right-of-way;
- Salford Station Site - a material receiving and storage area located within and adjacent to an existing pumping/reheat station in Montgomery County, Pennsylvania, which would be sited on agricultural and industrial land, and existing electrical transmission line right-of-way;

August 5, 2017

- Cromby Site - new above ground facilities on an agricultural-use site adjacent to an existing above ground delivery interconnect and in close proximity to the retired Cromby power plant in Chester County, Pennsylvania; and
- Marcus Hook Laterals and Interconnect Site – two new pipeline laterals (one 0.3-mile line, and one 0.5-mile line) originating at the existing Marcus Hook Terminal in Delaware County, Pennsylvania and two new meter station interconnects within the boundaries of the Terminal, which would be sited entirely on industrial land and paved roadways.

The evaluation area encompasses approximately 50 acres of land; approximately 12 of which could be affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. On behalf of IEC and as their environmental consultant, NV5 is requesting a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the Pennsylvania Game Commission for the proposed Project.

The following are enclosed to facilitate your review:

- a completed Project Review Form;
- USGS 7.5-minute quadrangle maps showing the Project area; and
- wetland datasheets and photographs.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,



Sara Holmes
Environmental Scientist
NV5

Attachments:

- Attachment A – PNDI Large Project Review Form
- Attachment B – USGS 7.5-minute Quadrangle Maps
- Attachment C – Wetland and Waterbody Delineation Report

NV5

OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Interstate Energy Company

Address: 214 Shoemaker Road, Pottstown, PA

Phone Number: 610-327-5325

Email: info@ie c.energy.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: IEC Pipeline Modification Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Upper Salford Township

County: Montgomery

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name:

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 50.2

Acreeage to be Impacted: 12.0

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project? Yes No
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation? Yes. Wetland data are attached.
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 0.0

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

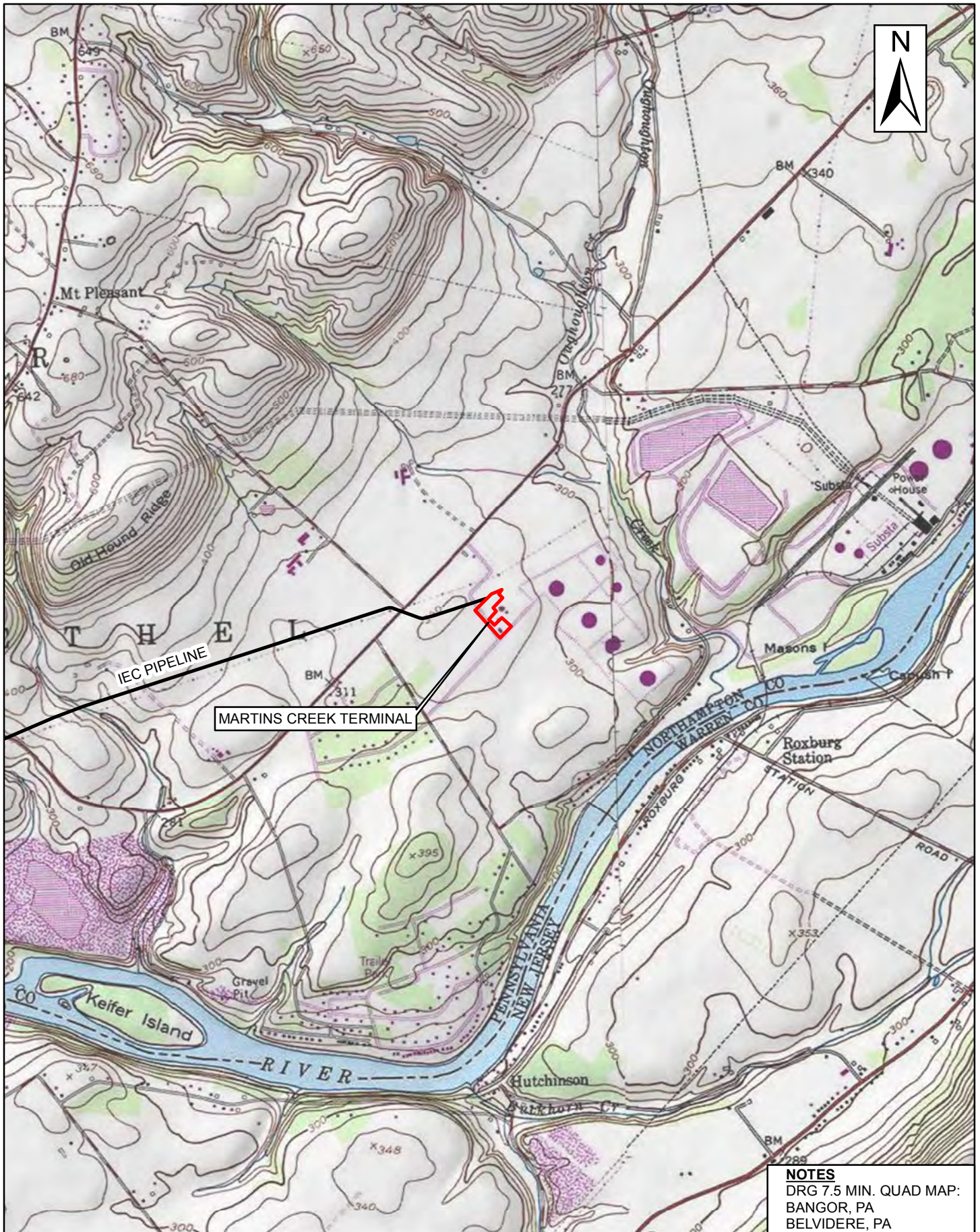
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

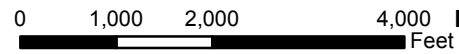
Attachment B

USGS Quad Maps

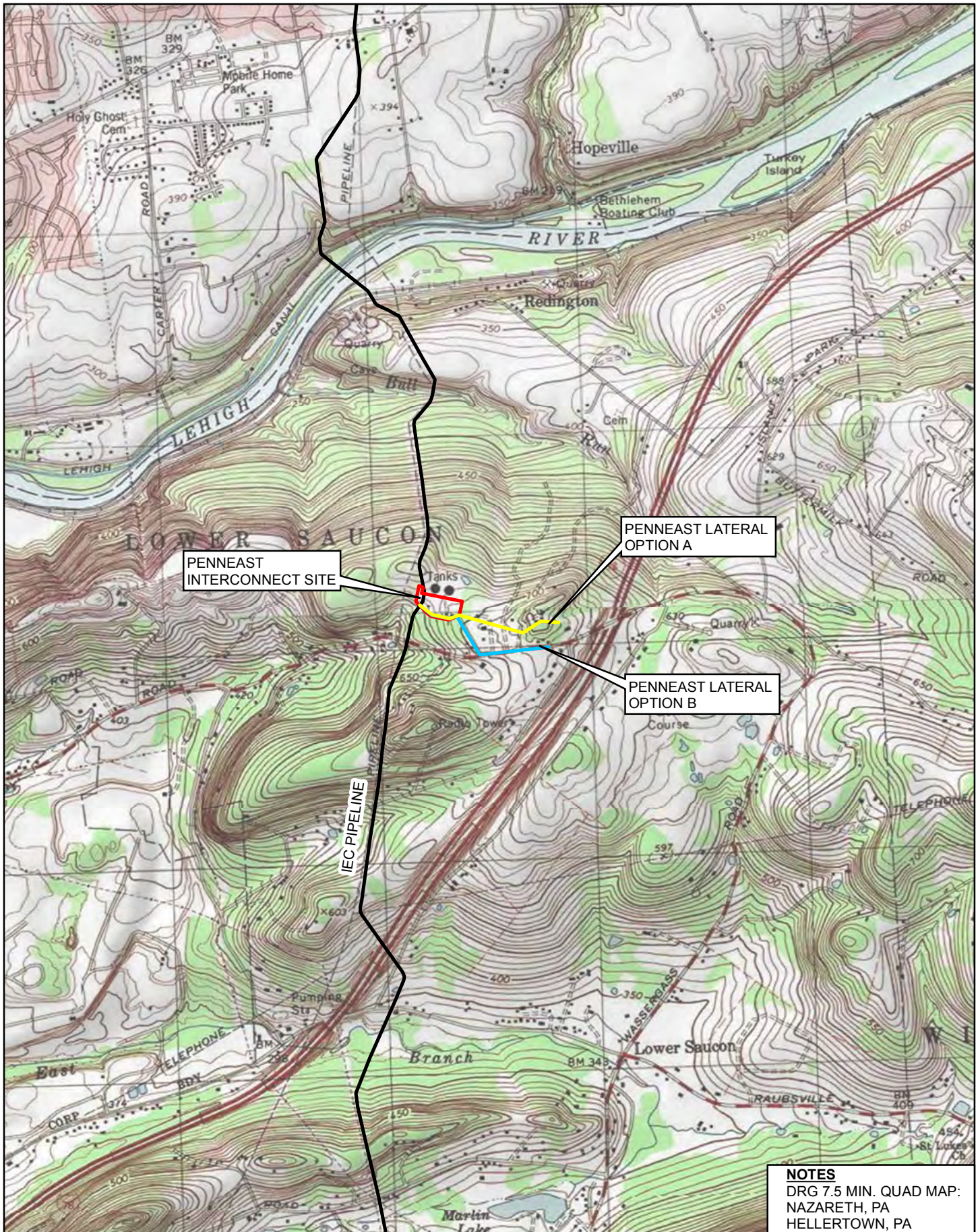


NOTES
 DRG 7.5 MIN. QUAD MAP:
 BANGOR, PA
 BELVIDERE, PA

— MARTINS CREEK TERMINAL
 — EXISTING PIPELINE



PROJECT LOCATION MAP
MARTINS CREEK TERMINAL
NORTHAMPTON COUNTY, PENNSYLVANIA



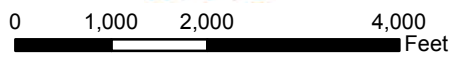
PENNEAST INTERCONNECT SITE

PENNEAST LATERAL OPTION A

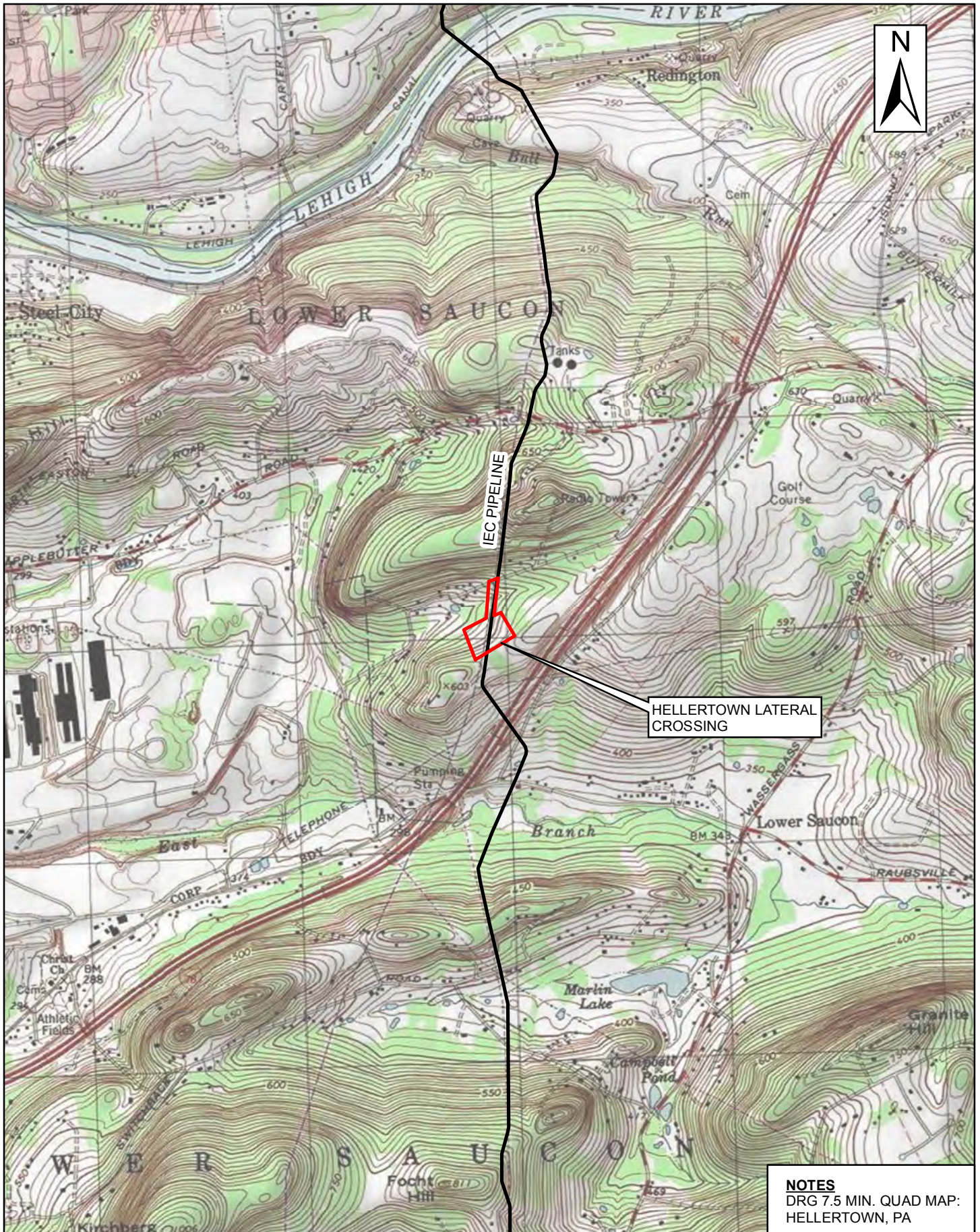
PENNEAST LATERAL OPTION B

NOTES
 DRG 7.5 MIN. QUAD MAP:
 NAZARETH, PA
 HELLERTOWN, PA

- PENNEAST LATERAL OPTION A
- PENNEAST LATERAL OPTION B
- PENNEAST INTERCONNECT SITE
- EXISTING PIPELINE



**PROJECT LOCATION MAP
 PENNEAST INTERCONNECT
 AND LATERALS
 NORTHAMPTON COUNTY, PENNSYLVANIA**



HELLERTOWN LATERAL CROSSING

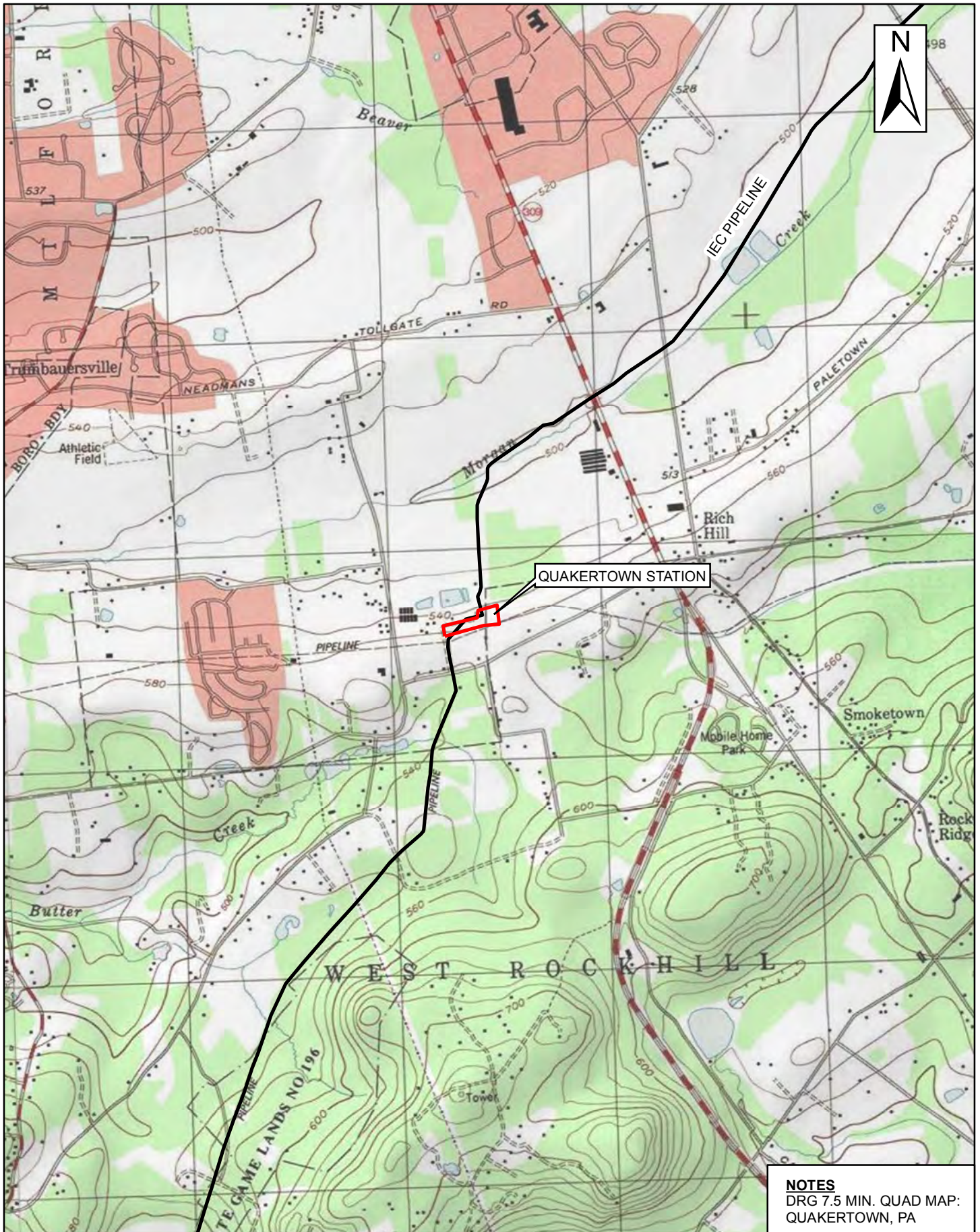
NOTES
DRG 7.5 MIN. QUAD MAP:
HELLERTOWN, PA

— HELLERTOWN LATERAL CROSSING
— EXISTING PIPELINE

N V 5

0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
HELLERTOWN LATERAL CROSSING
NORTHAMPTON COUNTY, PENNSYLVANIA



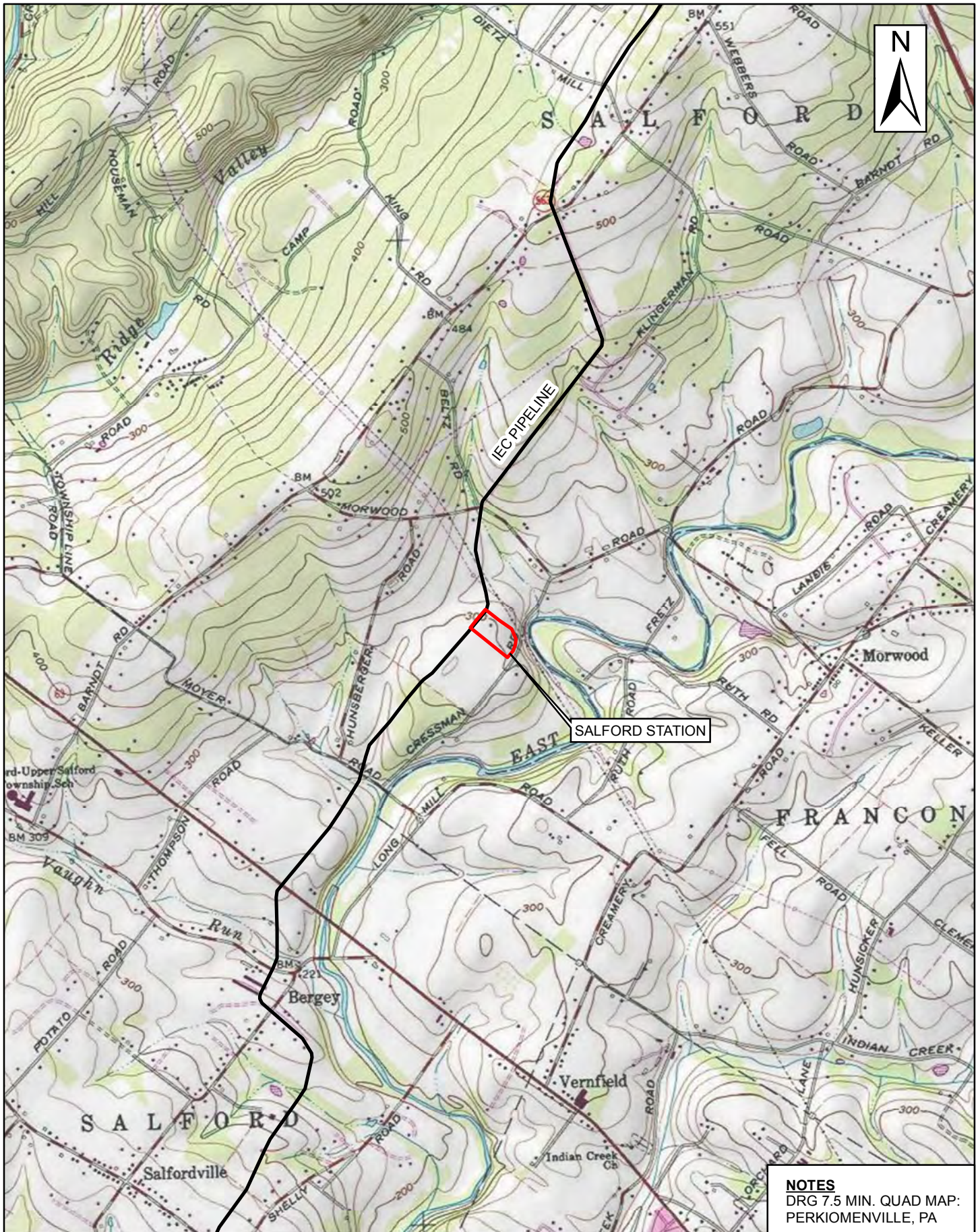
NOTES
 DRG 7.5 MIN. QUAD MAP:
 QUAKERTOWN, PA

— QUAKERTOWN STATION
 — EXISTING PIPELINE

N V 5

0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
QUAKERTOWN STATION
BUCKS COUNTY, PENNSYLVANIA



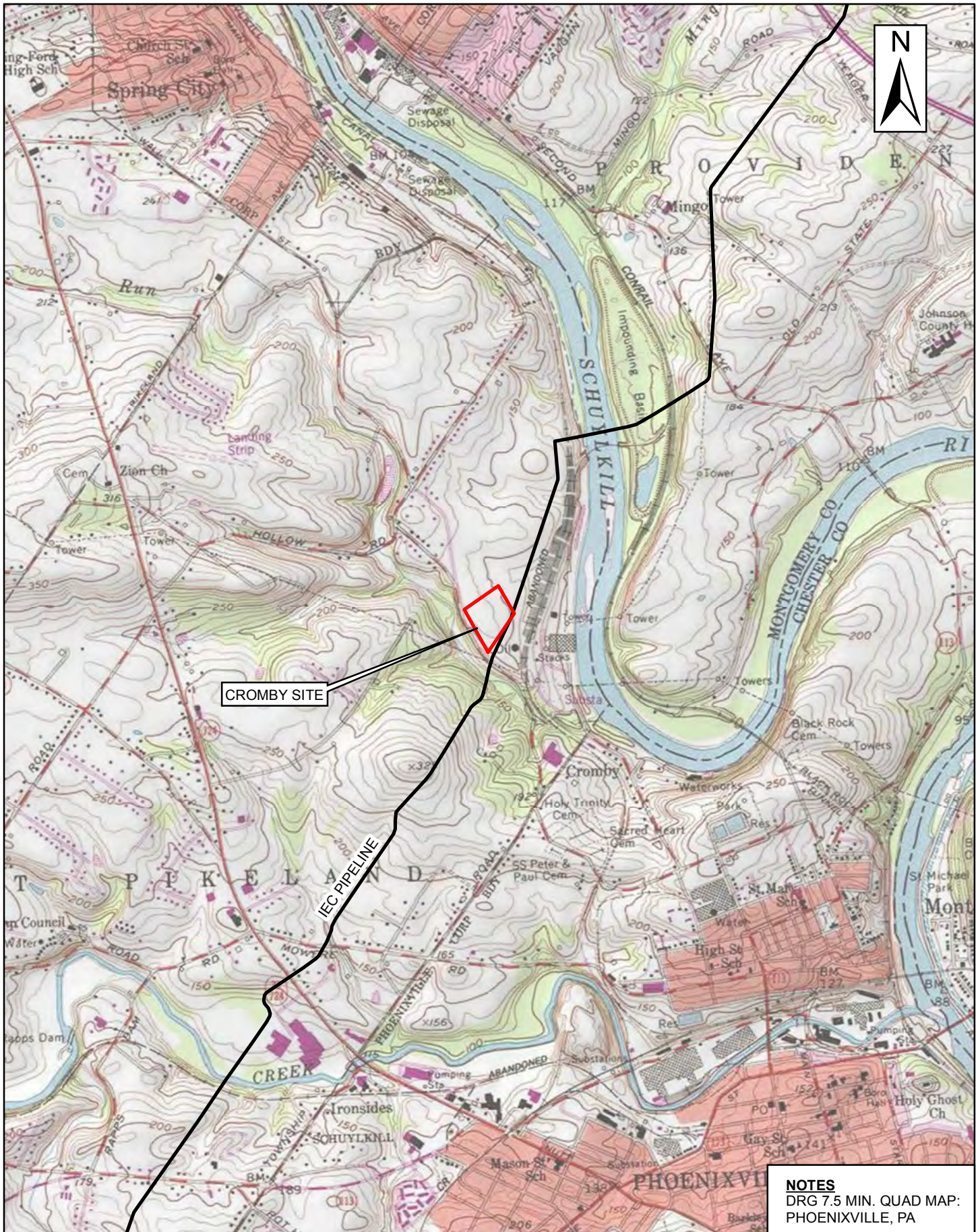
NOTES
 DRG 7.5 MIN. QUAD MAP:
 PERKIOMENVILLE, PA

— SALFORD STATION
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet



PROJECT LOCATION MAP
SALFORD STATION
MONTGOMERY COUNTY, PENNSYLVANIA



CROMBY SITE

IEC PIPELINE

NOTES
 DRG 7.5 MIN. QUAD MAP:
 PHOENIXVILLE, PA

 CROMBY SITE
 EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

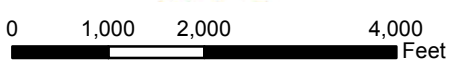
PROJECT LOCATION MAP
CROMBY SITE
CHESTER COUNTY, PENNSYLVANIA



MARCUS HOOK
INTERCONNECTS AND
LATERALS

NOTES:
DRG 7.5 MIN. QUAD MAP
MARCUS HOOK, PA

- MARCUS HOOK DELIVERY LATERAL 1
- MARCUS HOOK DELIVERY LATERAL 2
- MARCUS HOOK INTERCONNECTS
- EXISTING PIPELINE



NV5

**PROJECT LOCATION MAP
MARCUS HOOK INTERCONNECTS
AND LATERALS
DELAWARE COUNTY, PENNSYLVANIA**

Attachment C

Wetland Data

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Herb Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				

Feature Sketch: Indicate North, CL and Survey Corridor, Photo Locations

Sampling Point: _____

Feature Photo: Facing - N S E W NE NW SE SW





COMMONWEALTH OF PENNSYLVANIA PENNSYLVANIA GAME COMMISSION

2001 Elmerton Avenue
Harrisburg, PA 17110-9797

Wildlife Habitat Management
717-787-6818

September 22, 2017

PGC ID Number: 201706150601

Ms. Sara Holmes
NV5
813 North Dupont Street
Wilmington, Delaware 19805
Sara.holmes@nv5.com

Re: Interstate Energy Corporation - IEC Pipeline Modification Project
PNDI Manual Project Submission
Various Townships, Northampton, Bucks, Montgomery, Chester and Delaware Counties,
Pennsylvania

Dear Ms. Holmes,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located within the vicinity portions of the project. The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and has determined that potential impacts to the following species may be associated with portions of your project:

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	THREATENED	THREATENED
<i>Falco peregrinus</i>	Peregrine Falcon	ENDANGERED	N/A

According to the information provided, the project proponent is considering modifications to the existing pipeline system at seven locations. The components that are being considered and were provided for PNDI review are the Martin's Creek Terminal Site, PennEast Lateral and Interconnect Site, Hellertown Interconnect Site, Quakertown Station Site, Salford Station Site, Cromby Site and the Marcus Hook Lateral and Interconnect Site.

Based on the PNDI review, information submitted concerning the nature of the project, the immediate location, and our detailed resource information, the PGC has determined that no impact is likely for five of the seven locations being considered. The five locations where no impacts are

Ms. Sara Holmes

-2-

September 22, 2017

likely are the Martins Creek Terminal Site, Hellertown Interconnect Site, Quakertown Station Site, Salford Station Site, and Marcus Hook Laterals and Interconnect Site. At this time, no further coordination with the PGC will be necessary for these portions of the project.

However, the PNDI review did reveal the presence of northern long-eared bats within the vicinity of the PennEast Lateral and Interconnect Site and peregrine falcons within the vicinity of the Cromby Site. Therefore, the following measures should be implemented to avoid impacts to these species.

- Northern long-eared bats: This is a federally-listed threatened species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Northern long-eared bats from the PennEast Lateral and Interconnect Site to the U.S. Fish and Wildlife Service.
- Peregrine falcons: All project-related activities associated with the Cromby Site shall be completed between August 1 and February 14 to avoid impacts to the nesting pair. No project-related activities shall occur during nesting season, February 15 through July 31.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for two additional years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Please be sure to include the above-referenced PGC ID Number on any future correspondence with the PGC regarding this project.

Sincerely,



Olivia A. Braun
Environmental Planner
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management



January 10, 2018

Pennsylvania Game Commission
Bureau of Wildlife Habitat Management
Department of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

Ms. Olivia A. Braun
Environmental Planner
Division of Environmental Planning and Habitat Protection
Bureau of Wildlife Habitat management
Subject: **Revised PNDI Review**

Dear Ms. Braun,

In July 2017 NV5, LLC (NV5) requested a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for birds and mammals under the jurisdiction of the Pennsylvania Game Commission (PGC) for the proposed Pipeline Modification Project located in eastern Pennsylvania. The PGC responded to the request in a letter dated September 22, 2017 (**PGC ID Number: 201706150601**).

The scope of the proposed Project, now called the Adelpia Gateway Project¹, has changed since NV5's original submittal of a request for PNDI review. The Project remains in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Under the revised scope, the following Project components are under evaluation:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested land, paved/graveled industrial-use land, pasture, and existing pipeline right-of-way;
- Skippack Interconnect Site – a new interconnect adjacent to the intersection of the existing line and a PECO-owned natural gas pipeline in Montgomery County. The Site would be located on pasture and existing pipeline right-of-way;
- Marcus Hook Laterals – two new pipeline laterals (one 0.3-mile line and one 4.4-mile line)

¹ See the November 2, 2017 press release available at <https://adelphiagateway.com/wp-content/uploads/2017/11/18-05-Adelpia-Gateway-Announcement.pdf>.

January 10, 2018

originating at the existing Marcus Hook Terminal in Delaware County.

- The Parkway Lateral would be an approximately 0.3-mile, 16-inch-diameter pipeline that terminates at a new interconnect at an existing meter station in Claymont, New Castle County, Delaware;
- The Tilghman Lateral would be an approximately 4.4-mile, 16-inch-diameter pipeline that would terminate at a new delivery point located within the boundaries of an existing meter station in Chester, Delaware County, Pennsylvania. Adelphia would also install five additional delivery points along the Tilghman Lateral, four of which would be installed entirely within existing industrial meter station sites. The remaining delivery point would be installed on a 0.1-acre regularly maintained, grassy site in Lower Chichester. About 80% of the Tilghman Lateral would be installed using horizontal directional drill methods;
- Marcus Hook Station Site - expansion and improvements to above ground facilities at the existing Marcus Hook Terminal in Marcus Hook, Delaware County. The Site would be located entirely on existing paved/graveled industrial-use land; and
- Mainline Valve and Blowdown Assembly Sites – construction of one new mainline valve and eight new blowdown assemblies at various locations along an existing 18-inch-diameter natural gas pipeline in Delaware, Chester, and Montgomery Counties. Construction and operation of the facilities would take place along existing access roads and within the existing pipeline’s permanent, maintained right-of-way.

The current evaluation area encompasses approximately 42 acres of land, about 9 of which would be permanently affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. NV5 is requesting a revised Large Project PNDI review for resources under the jurisdiction of the PGC for the proposed Project.

The following are enclosed to facilitate your review:

- a completed revised Project Review Form; and
- USGS 7.5-minute quadrangle maps showing the revised Project area.

The wetland data forms provided with NV5’s previous consultation letter are still valid. Since the original letter, NV5 has performed wetland and waterbody surveys at all of the revised locations except for the Tilghman Lateral (and its associated delivery points), the mainline valve site, and the blowdown assembly sites. No wetlands or waterbodies were identified at the newly surveyed sites. NV5 will provide an updated letter to the PGC detailing its findings upon completion of the surveys.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.



January 10, 2018

Sincerely,

A handwritten signature in cursive script that reads "Sara Holmes".

Sara Holmes
Environmental Scientist
NV5

Attachments:

Attachment A – PNDI Large Project Review Form
Attachment B – USGS 7.5-minute Quadrangle Maps

NIVIS

OFFICES NATIONWIDE

CONSTRUCTION QUALITY ASSURANCE · INFRASTRUCTURE · ENERGY · PROGRAM MANAGEMENT · ENVIRONMENTAL

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

When to Use the Manual Project Submission Form

Use this form if you do *not* want to use the online Pennsylvania Conservation Explorer to submit your project of any size for environmental review. Due to system limitations and agency requirements, projects should not be submitted piecemeal. The entire project area including roads and infrastructure should be submitted as a single unit. Fill out this form and send it along with your project materials (see *What to Send to Jurisdictional Agencies*) **to all four agencies** listed at the bottom of this PNDI Project Submission Form. There is no charge for submitting a project manually; however, due to the additional work required of agency staff, online submission is more efficient.

Note: All Projects may be submitted using the Pennsylvania Conservation Explorer online tool (a \$40 fee will be charged per project). Online submission results in greater convenience and possibly faster response times.

What to Send to Jurisdictional Agencies

Send the following information to all of the agencies listed on the Project Submission Form.

Check-list of Minimum Materials to be submitted:

- Completed Manual Project Submission Form
- Supplemental project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- Relevant portion of the USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

- GIS shapefiles depicting the project extent
- A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

PNDI Project Submission Form Definitions

Applicant: Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Proposed Activity: Include **all** earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished.

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities.



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Adelpia Gateway, LLC

Address: 1415 Wyckoff Rd, Wall, NJ 07719

Phone Number: 800-483-3179

Email: info@adelphiagateway.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: Adelpia Gateway Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Multiple

County: Multiple see cover letter.

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Multiple see Attachments

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 42.2 Acreage to be Impacted: 13.9

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No The project would cross 2 creeks: Marcus Hook Creek (HDD) and Stoney Creek (open-cut).
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation?
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 1.5 acres

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

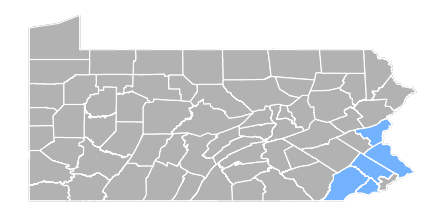
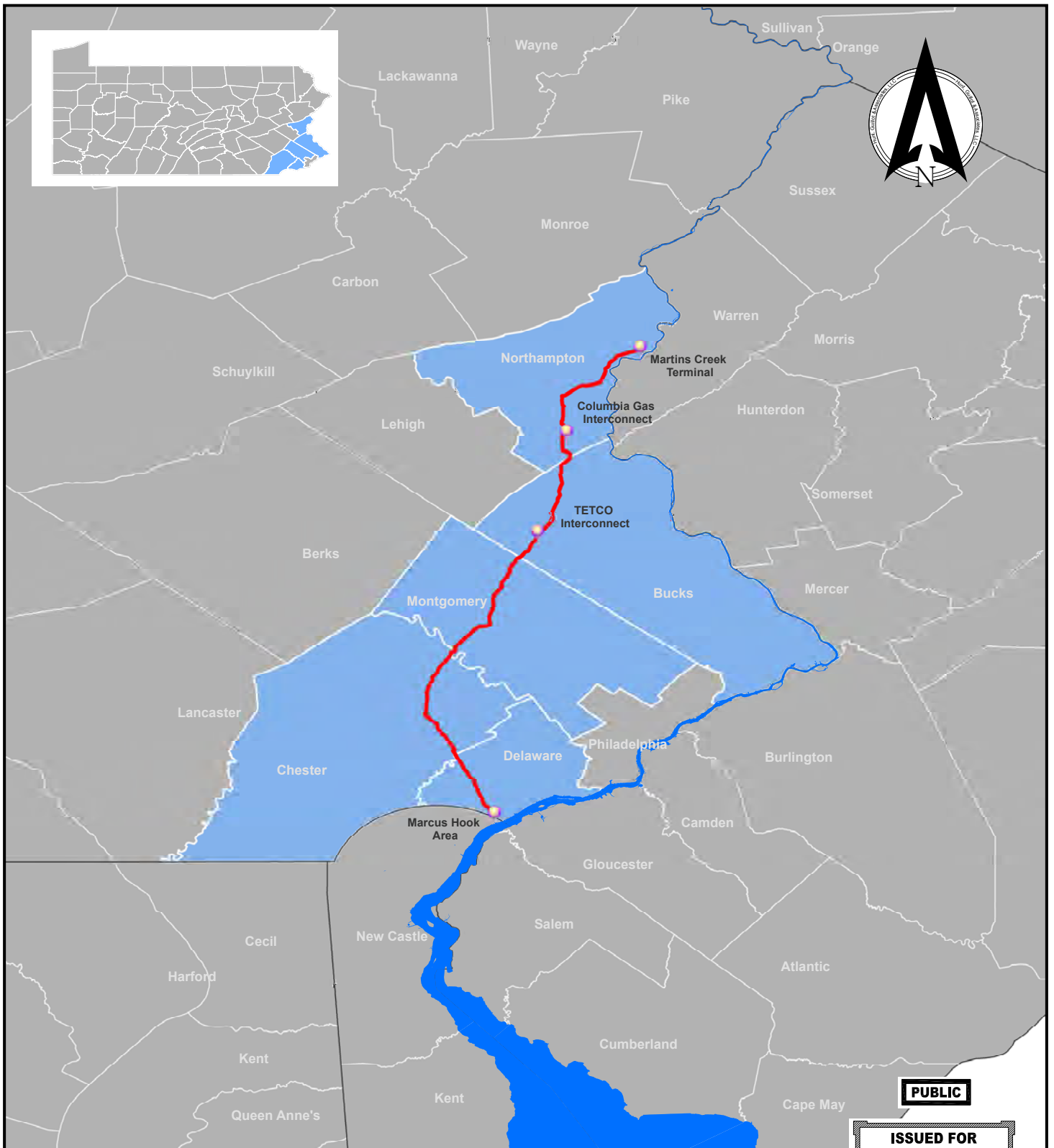
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



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12/29/2017**

Legend

-  Facility
-  Adelpia Gateway

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
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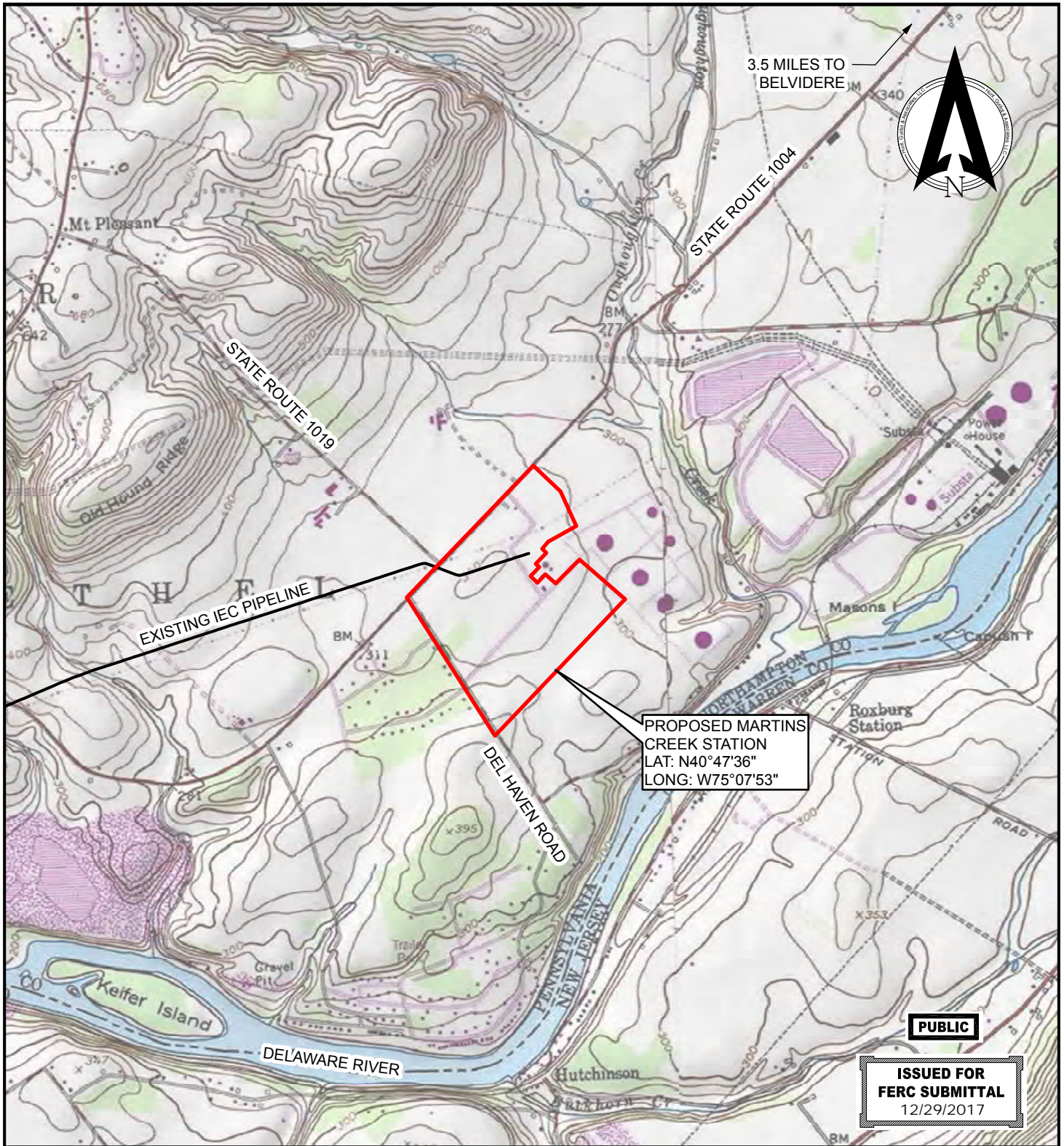


**ADELPIA GATEWAY, LLC
PROJECT VICINITY MAP
BUCKS, CHESTER, DELAWARE,
MONTGOMERY, NORTHAMPTON
COUNTIES, PENNSYLVANIA**

SCALE N.T.S.	DRAWING NUMBER 8.A17022.01-VICINITY	REV 0
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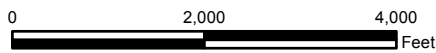
phumphrey 12/27/2017 3:27:15 PM

FIGURE 1



LEGEND

- PROPOSED MARTINS CREEK STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -o40075g2 (BANGOR, PA)
 -o40075g1 (BELVIDERE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MARTINS CREEK STATION
NORTHAMPTON COUNTY,
PENNSYLVANIA

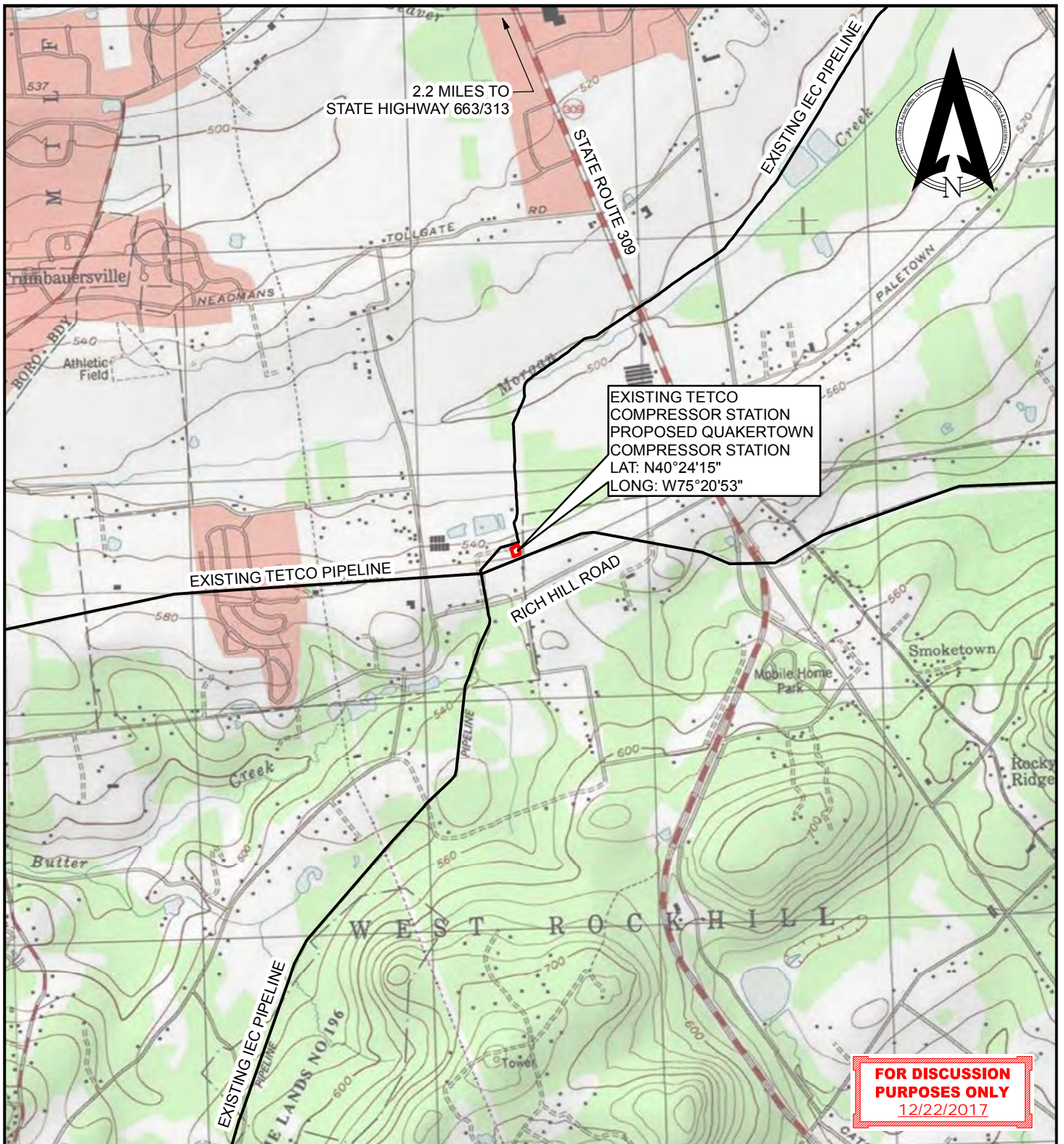
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MARTINS CREEK	REV 0
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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
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REV	DESCRIPTION	CHK	DATE	APP	DATE			



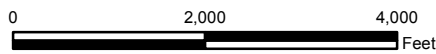
phumphrey 12/27/2017 3:47:58 PM

FIGURE 5a



LEGEND

- PROPOSED QUAKERTOWN COMPRESSOR STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
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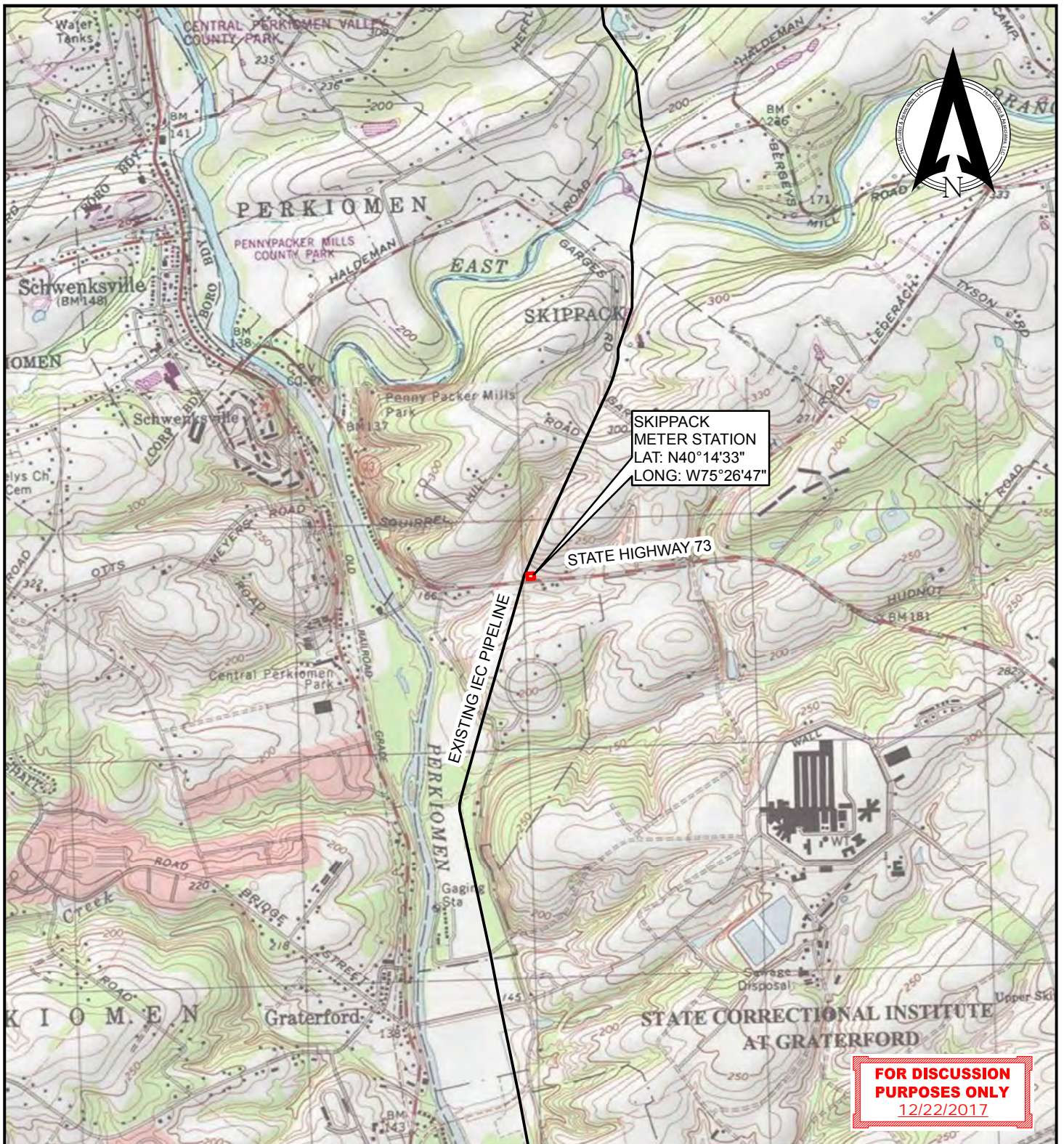
HGA HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

						DRAWN BY PLH 12/19/17 DESIGNED BY PLH 06/29/17 CHECKED BY MEH 12/21/17 APPROVED BY RCH 12/21/17 HGA JOB NO. 8.A17022.01.0 PLOT SCALE 1:1 MODEL ID 8.A17022
REV	DESCRIPTION	CHK	DATE	APP	DATE	



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED QUAKERTOWN
COMPRESSOR STATION
BUCKS COUNTY, PENNSYLVANIA

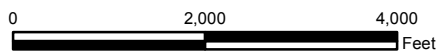
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---------------------	---	-----



**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- SKIPPACK METER STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075d3 (QUAKERTOWN, PA)

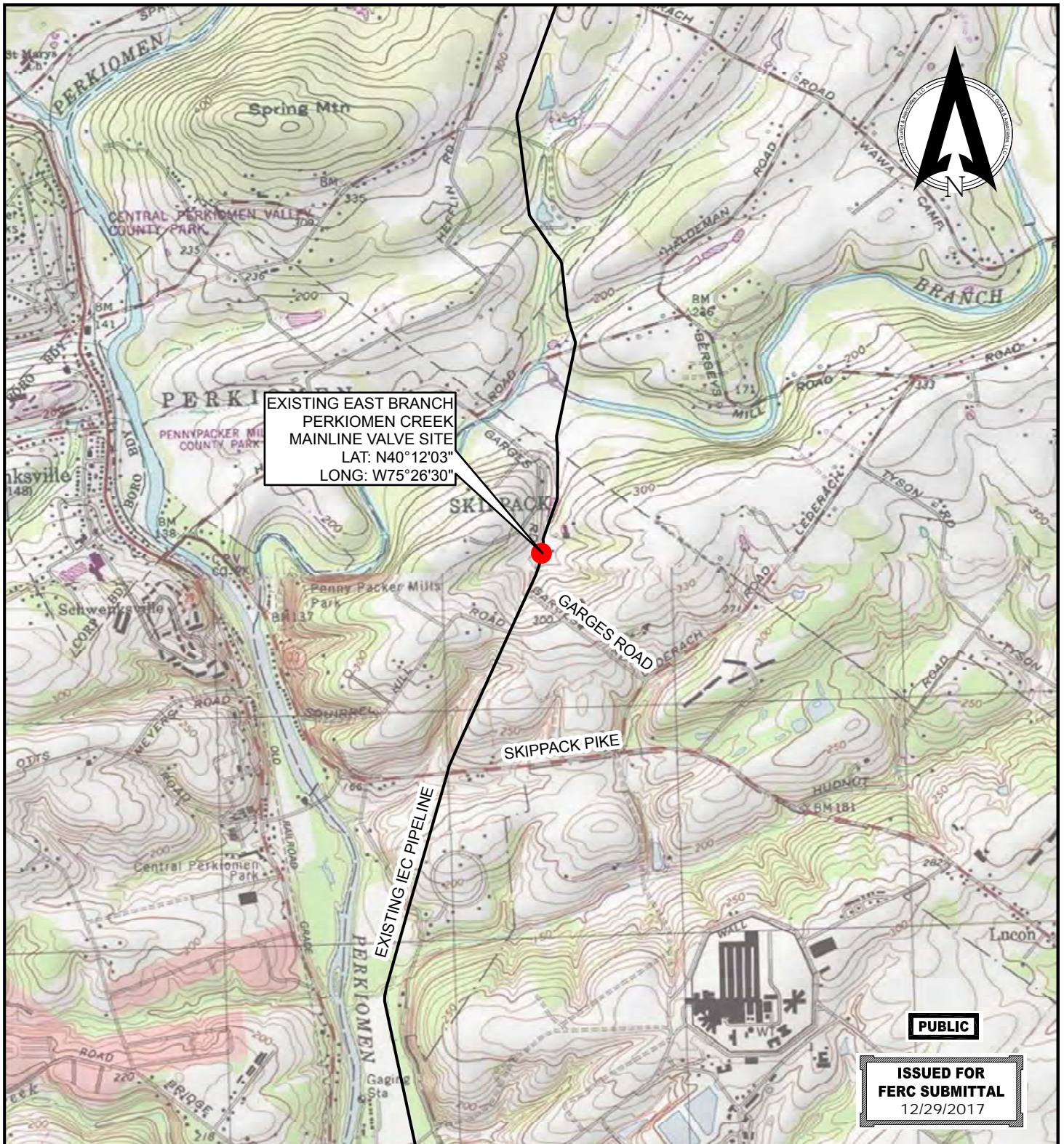
HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
SKIPPACK METER STATION
MONTGOMERY COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-SKIPPACK	REV
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EXISTING EAST BRANCH
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'03"
LONG: W75°26'30"

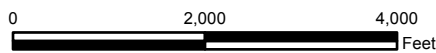


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12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075c4 (PERKIOMENVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
EAST BRANCH PERKIOMEN CREEK
BLOWDOWN M.P. 36.68
MONTGOMERY COUNTY,
PENNSYLVANIA**

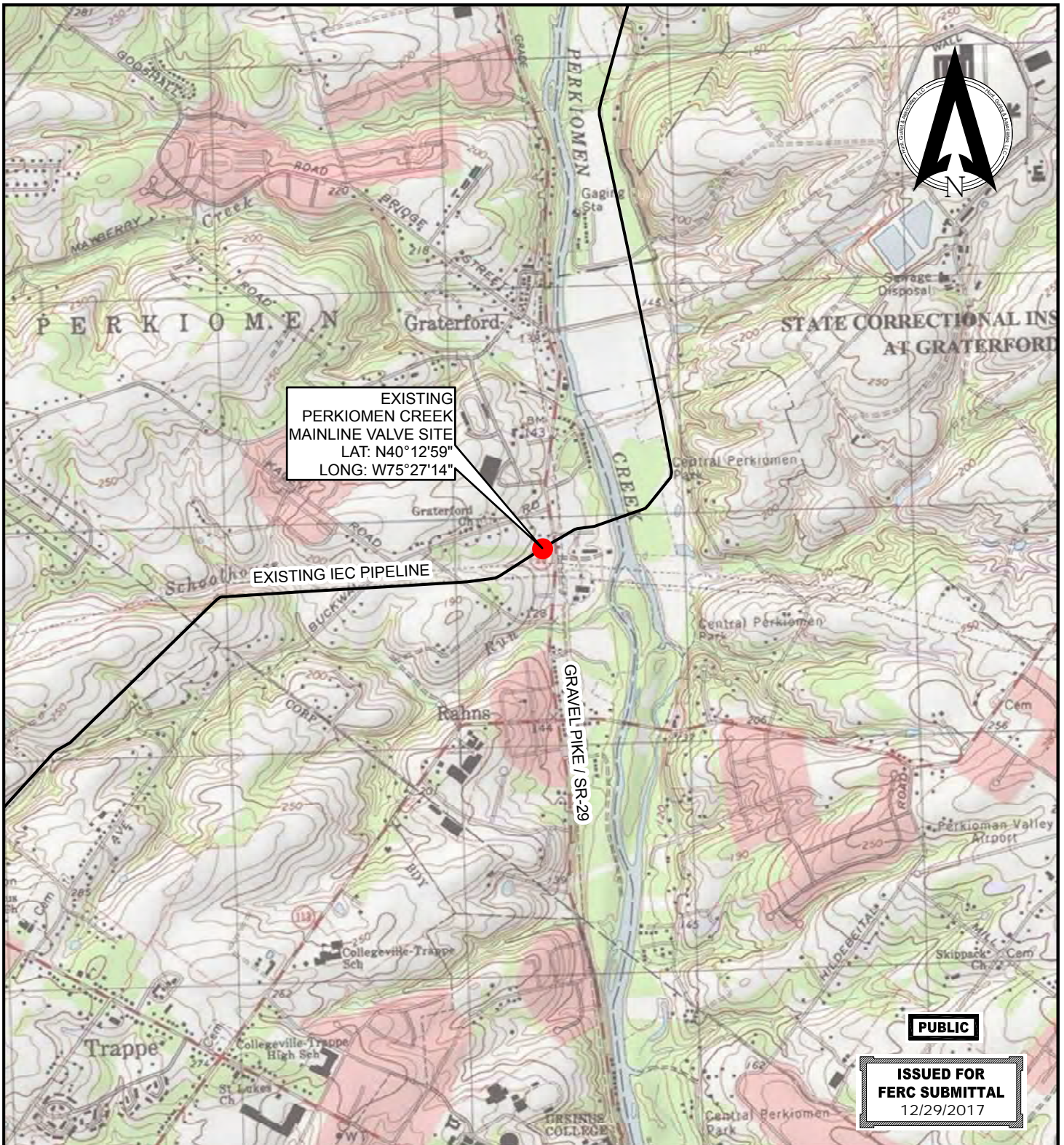
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
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DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 3:06:51 PM

FIGURE 23a



EXISTING
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'59"
LONG: W75°27'14"

EXISTING IEC PIPELINE

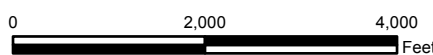


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b4 (COLLEGEVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



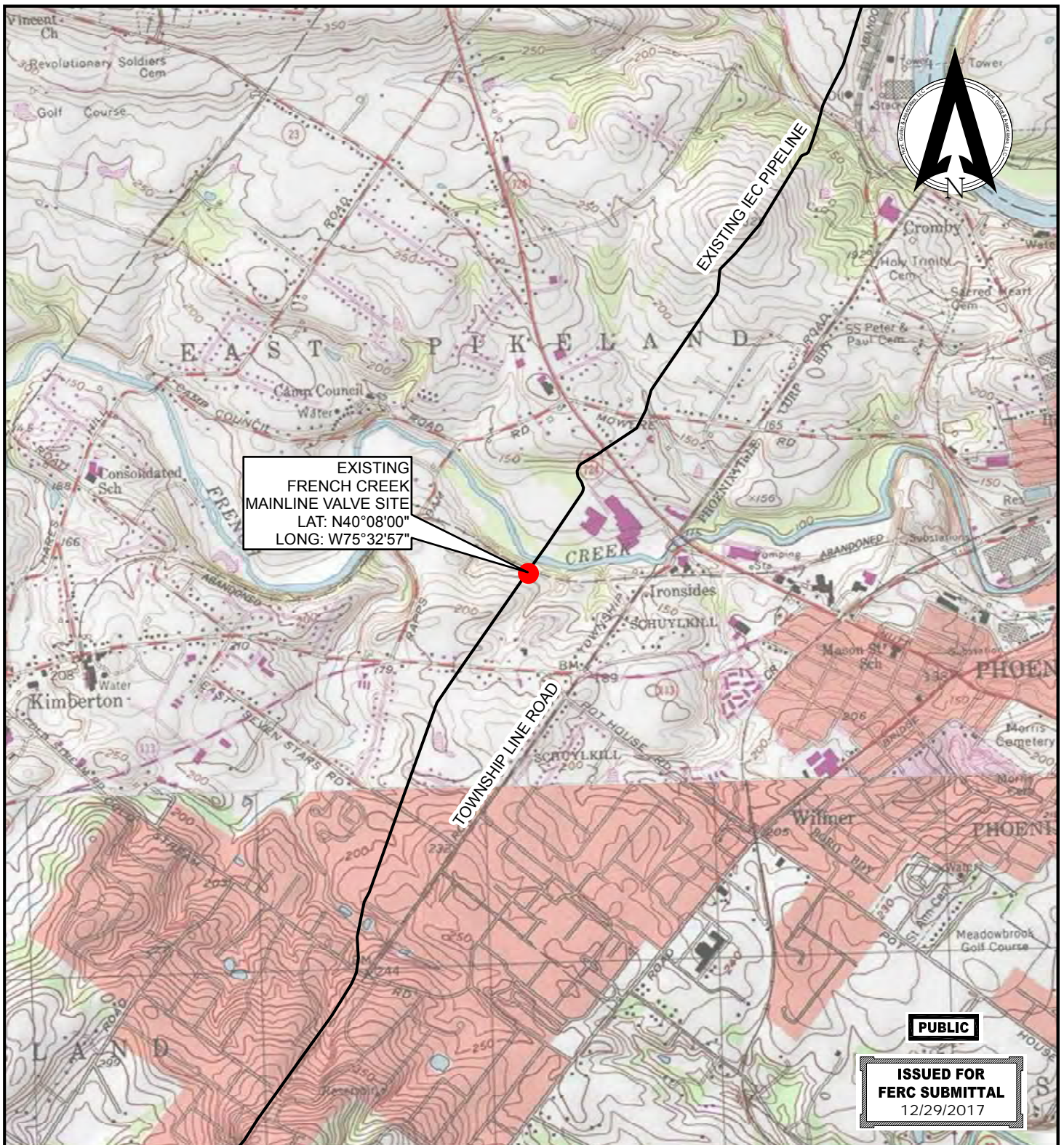
**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PERKIOMEN CREEK
BLOWDOWN M.P. 33.97
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 33.97	0

phumphrey 12/27/2017 3:04:43 PM

FIGURE 22a



EXISTING
FRENCH CREEK
MAINLINE VALVE SITE
LAT: N40°08'00"
LONG: W75°32'57"

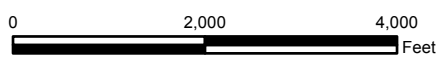


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b5 (PHOENIXVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
FRENCH CREEK
BLOWDOWN M.P. 25.74
CHESTER COUNTY,
PENNSYLVANIA**



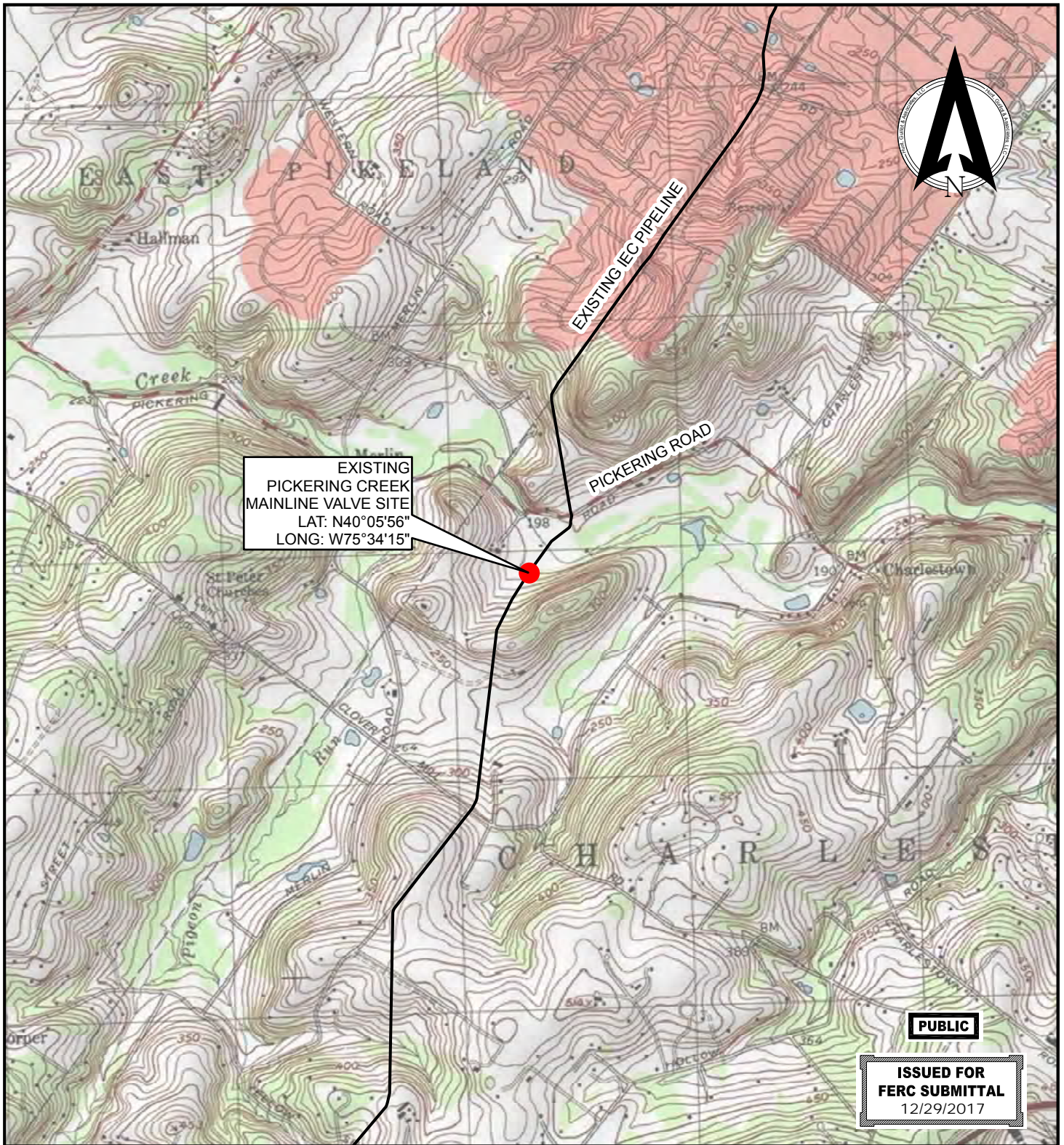
DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

REV	DESCRIPTION	CHK	DATE	APP	DATE
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 25.74	REV 0
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phumphrey 12/27/2017 2:57:40 PM

FIGURE 19a



EXISTING
PICKERING CREEK
MAINLINE VALVE SITE
LAT: N40°05'56"
LONG: W75°34'15"

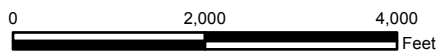


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075a5 (MALVERN, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

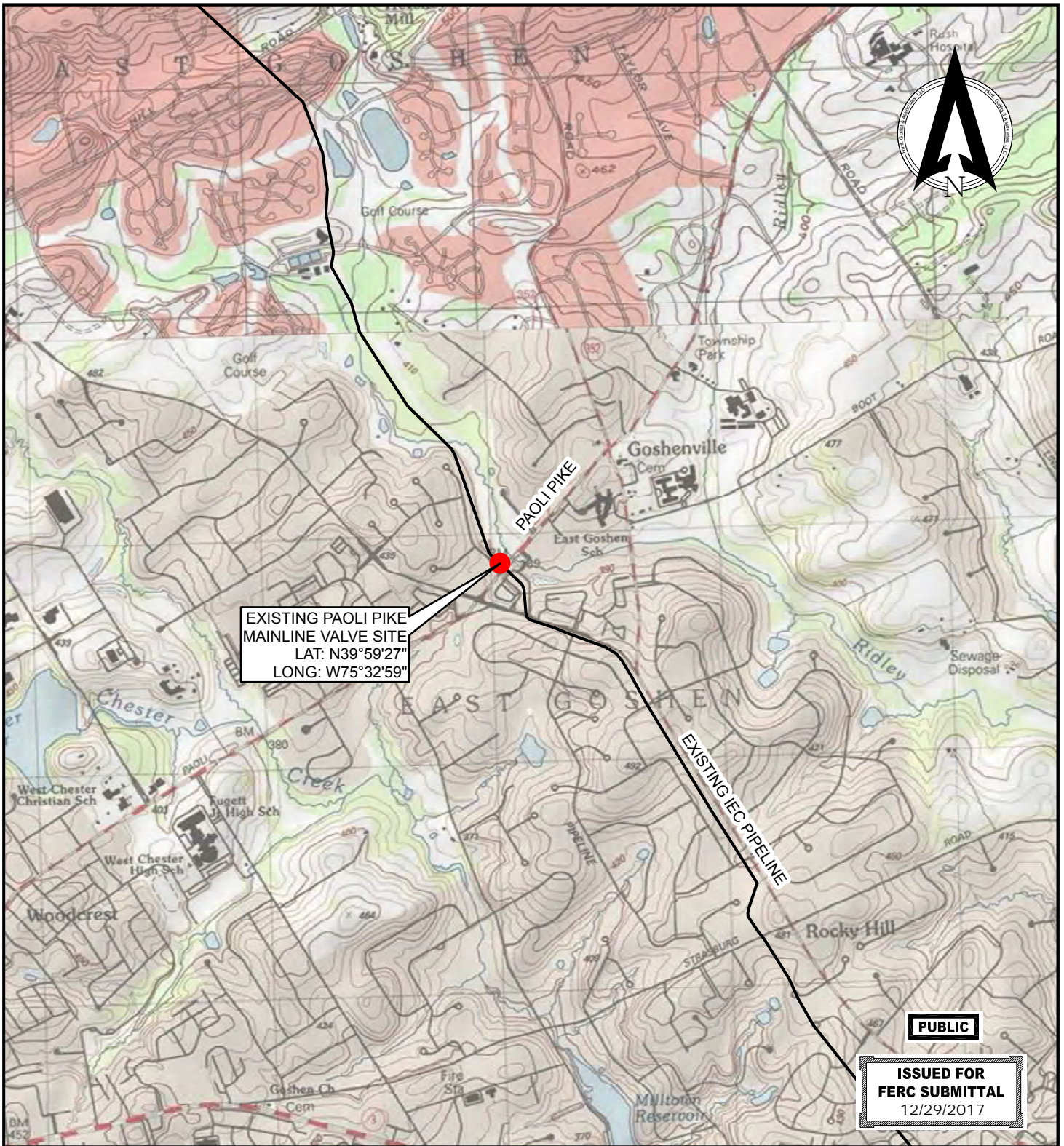


**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PICKERING CREEK
BLOWDOWN M.P. 22.98
CHESTER COUNTY,
PENNSYLVANIA**

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P.22.98	0

phumphrey 12/27/2017 2:54:23 PM

FIGURE 18a



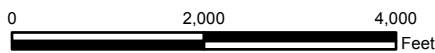
EXISTING PAOLI PIKE
MAINLINE VALVE SITE
LAT: N39°59'27"
LONG: W75°32'59"

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WESTCHESTER, PA)

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PAOLI PIKE BLOWDOWN M.P. 14.46
CHESTER COUNTY,
PENNSYLVANIA**

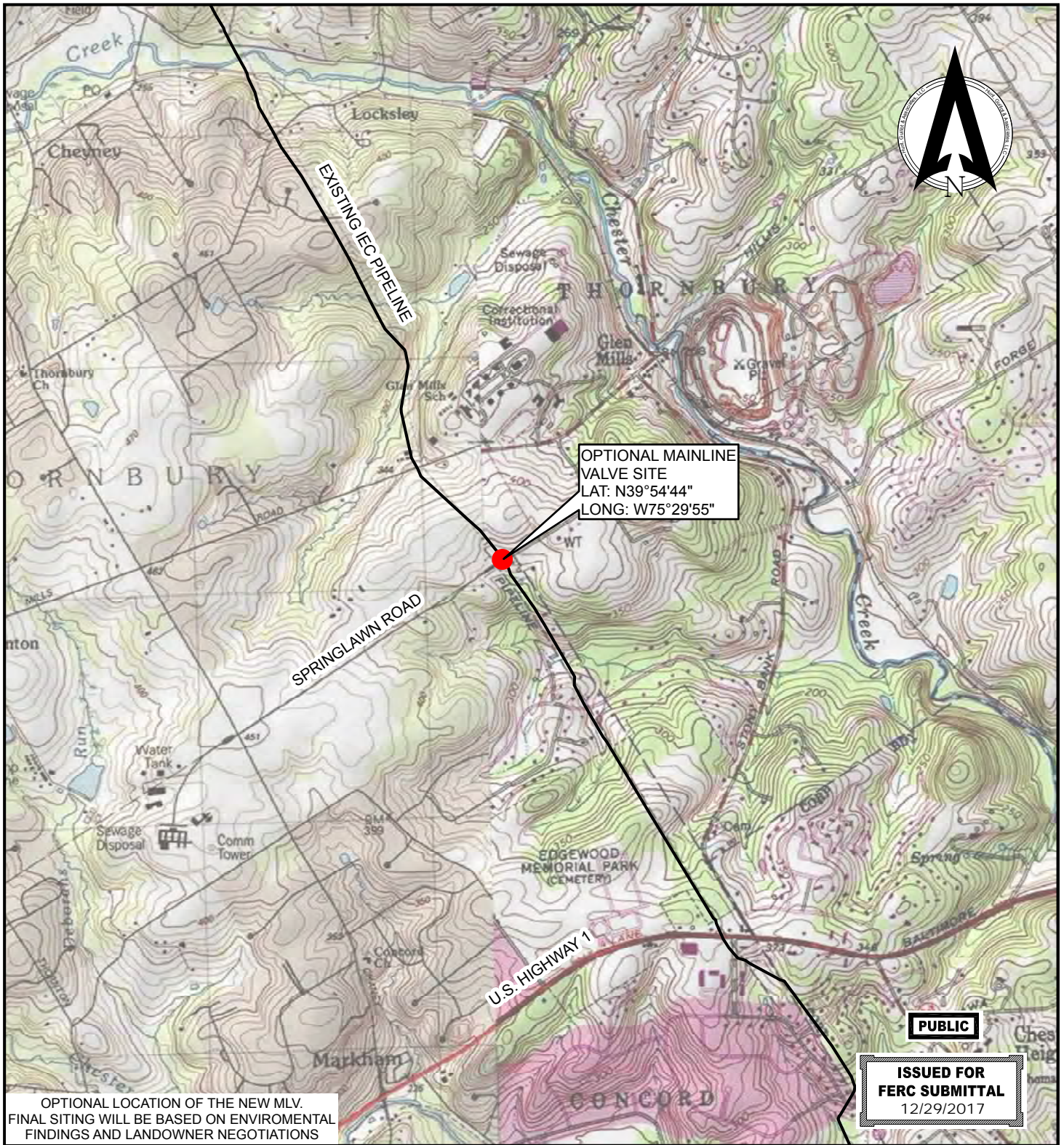


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						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 14.46	0

phumphrey 12/27/2017 2:51:50 PM

FIGURE 17a



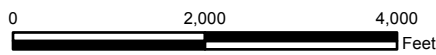
OPTIONAL LOCATION OF THE NEW MLV. FINAL SITING WILL BE BASED ON ENVIRONMENTAL FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

ISSUED FOR FERC SUBMITTAL
12/29/2017

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h5 (WEST CHESTER, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	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.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

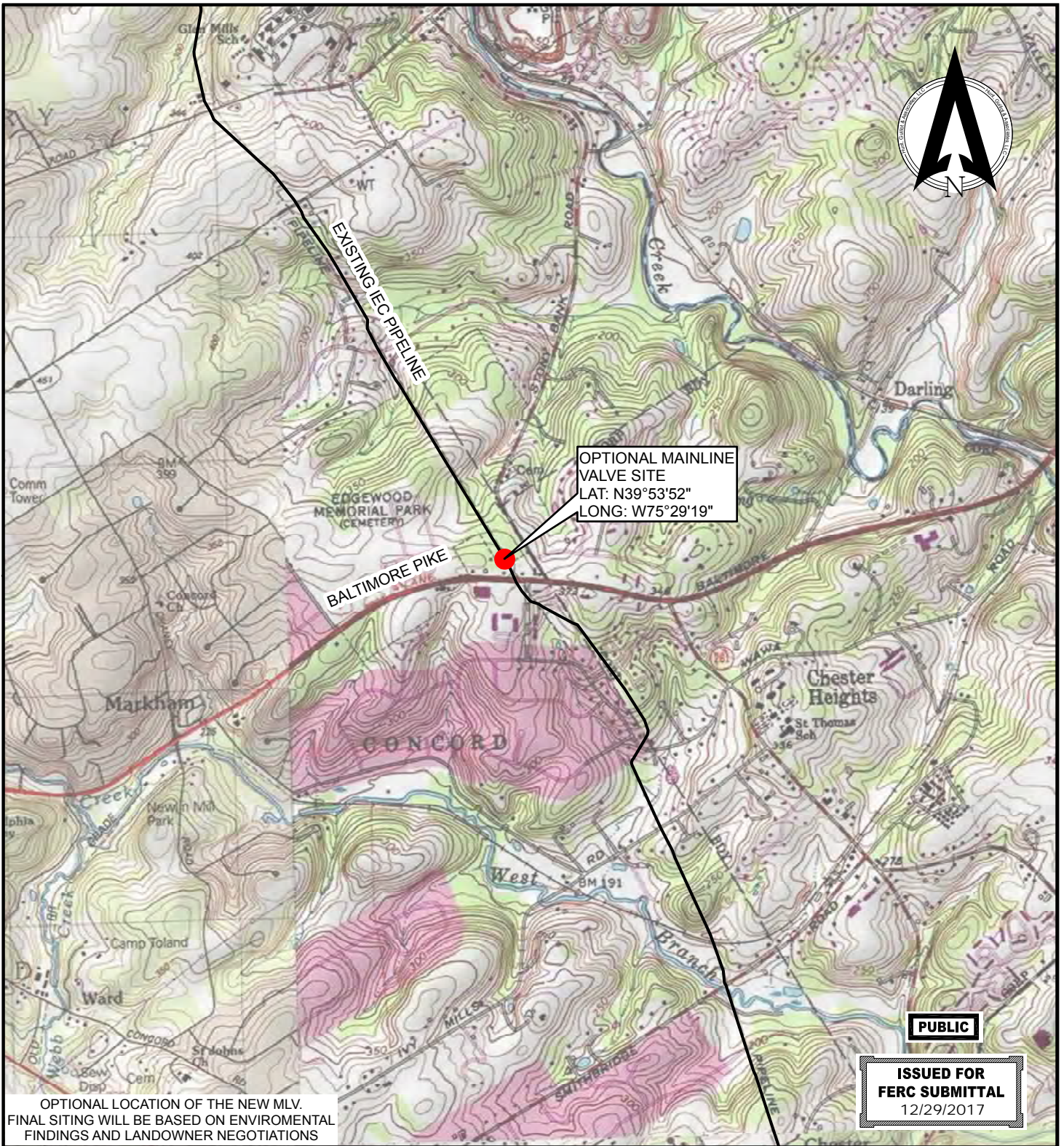


ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 2 AT M.P. 7.94
DELAWARE COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 7.94	REV 0
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phumphrey 12/27/2017 2:45:39 PM

FIGURE 15a



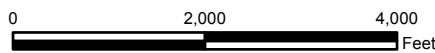
OPTIONAL LOCATION OF THE NEW MLV.
FINAL SITING WILL BE BASED ON ENVIRONMENTAL
FINDINGS AND LANDOWNER NEGOTIATIONS

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- OPTIONAL MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075h4 (MEDIA, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
NEW MLV OPTION 1 AT M.P. 6.66
DELAWARE COUNTY,
PENNSYLVANIA**

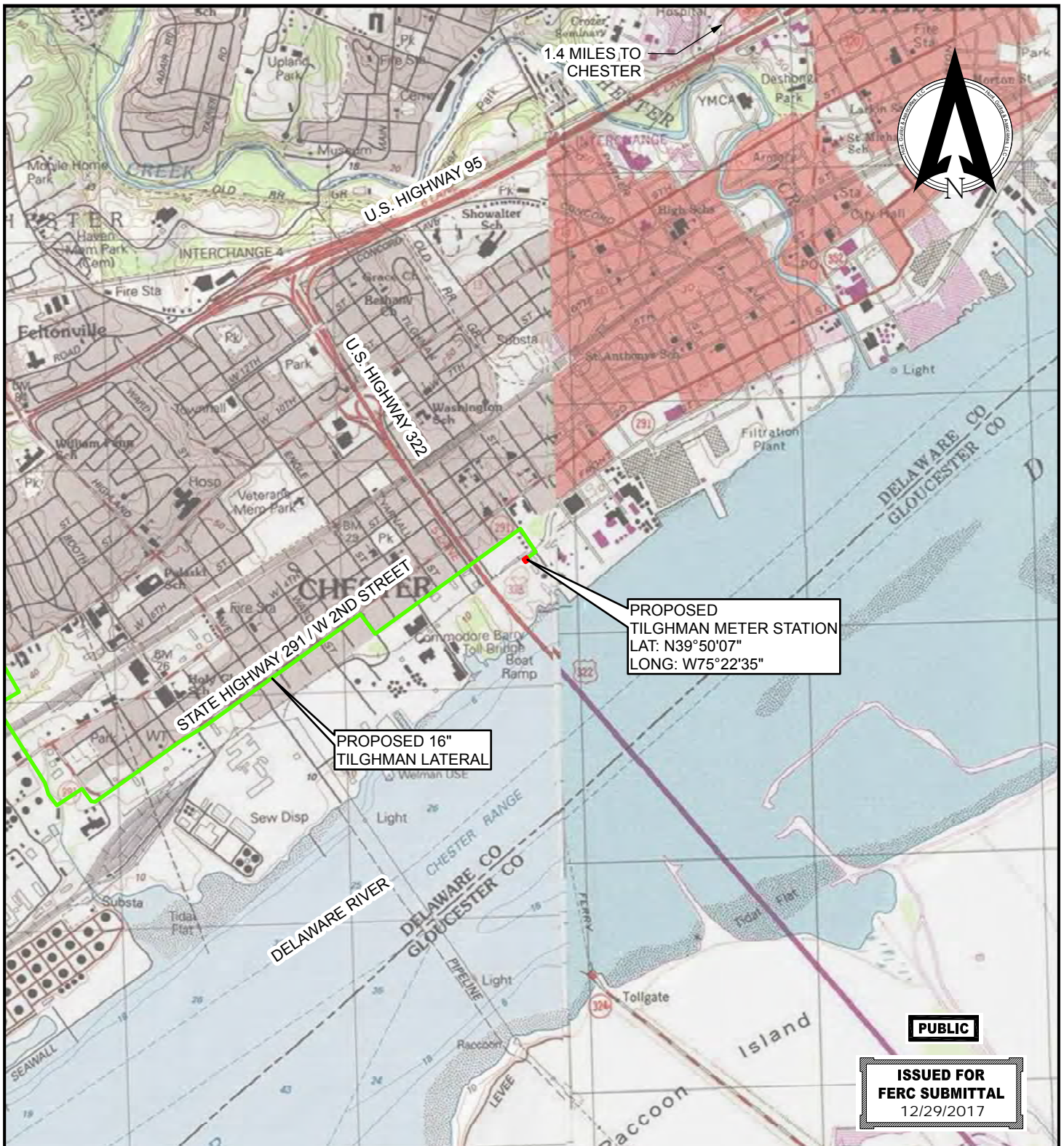


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						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 6.66	0

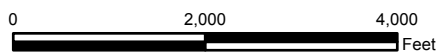
phumphrey 12/27/2017 2:41:10 PM

FIGURE 14a



LEGEND

- PROPOSED TILGHMAN METER STATION
- PROPOSED 16" TILGHMAN LATERAL



NOTES

DRG 7.5 MIN. QUAD MAP:
-039075g4 (MARCUS HOOK, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED TILGHMAN
METER STATION
DELAWARE COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-TILGHMAN	REV 0
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						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



FIGURE 13a

phumphrey 12/28/2017 7:26:05 AM

Appendix 1D-1

USFWS Correspondence

ADELPHIA GATEWAY PROJECT



August 5, 2017

U.S Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, PA 16801

Subject: **PNDI Review**

To whom it may concern,

Interstate Energy Company (IEC) is evaluating improvements to their current pipeline system located in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Specifically, IEC is evaluating the following Project components:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- PennEast Lateral and Interconnect Site - a new ~0.5-mile pipeline lateral and meter station interconnect with the proposed PennEast Pipeline in Northampton County, Pennsylvania. IEC is evaluating two route options for the laterals, both of which would cross residential, agricultural, and forested land;
- Hellertown Interconnect Site - a new interconnect adjacent to the intersection of the existing line and the proposed PennEast Pipeline in Northampton County, which would be located on existing pipeline right-of-way and agricultural land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested and agricultural land, and existing pipeline right-of-way;
- Salford Station Site - a material receiving and storage area located within and adjacent to an existing pumping/reheat station in Montgomery County, Pennsylvania, which would be sited on agricultural and industrial land, and existing electrical transmission line right-of-way;
- Cromby Site - new above ground facilities on an agricultural-use site adjacent to an existing above ground delivery interconnect and in close proximity to the retired Cromby power plant in Chester County, Pennsylvania; and

August 5, 2017

- Marcus Hook Laterals and Interconnect Site – two new pipeline laterals (one 0.3-mile line, and one 0.5-mile line) originating at the existing Marcus Hook Terminal in Delaware County, Pennsylvania and two new meter station interconnects within the Terminal boundaries, which would be sited entirely on industrial land and paved roadways.

The evaluation area encompasses approximately 50 acres of land; approximately 12 of which could be affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. On behalf of IEC and as their environmental consultant, NV5 is requesting a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service for the proposed Project.

The following are enclosed to facilitate your review:

- a completed Project Review Form;
- USGS 7.5-minute quadrangle maps showing the Project area; and
- wetland datasheets and photographs.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,



Sara Holmes
Environmental Scientist
NV5

Attachments:

- Attachment A – PNDI Large Project Review Form
- Attachment B – USGS 7.5-minute Quadrangle Maps
- Attachment C – Wetland and Waterbody Delineation Report

NV5

OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Interstate Energy Company

Address: 214 Shoemaker Road, Pottstown, PA

Phone Number: 610-327-5325

Email: info@ie c.energy.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: IEC Pipeline Modification Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Upper Salford Township

County: Montgomery

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name:

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 50.2

Acreeage to be Impacted: 12.0

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project? Yes No
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation? Yes. Wetland data are attached.
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 0.0

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Email: RA-HERITAGEREVIEW@state.pa.us

fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection

2001 Elmerton Avenue
Harrisburg, PA 17110-9797

RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823

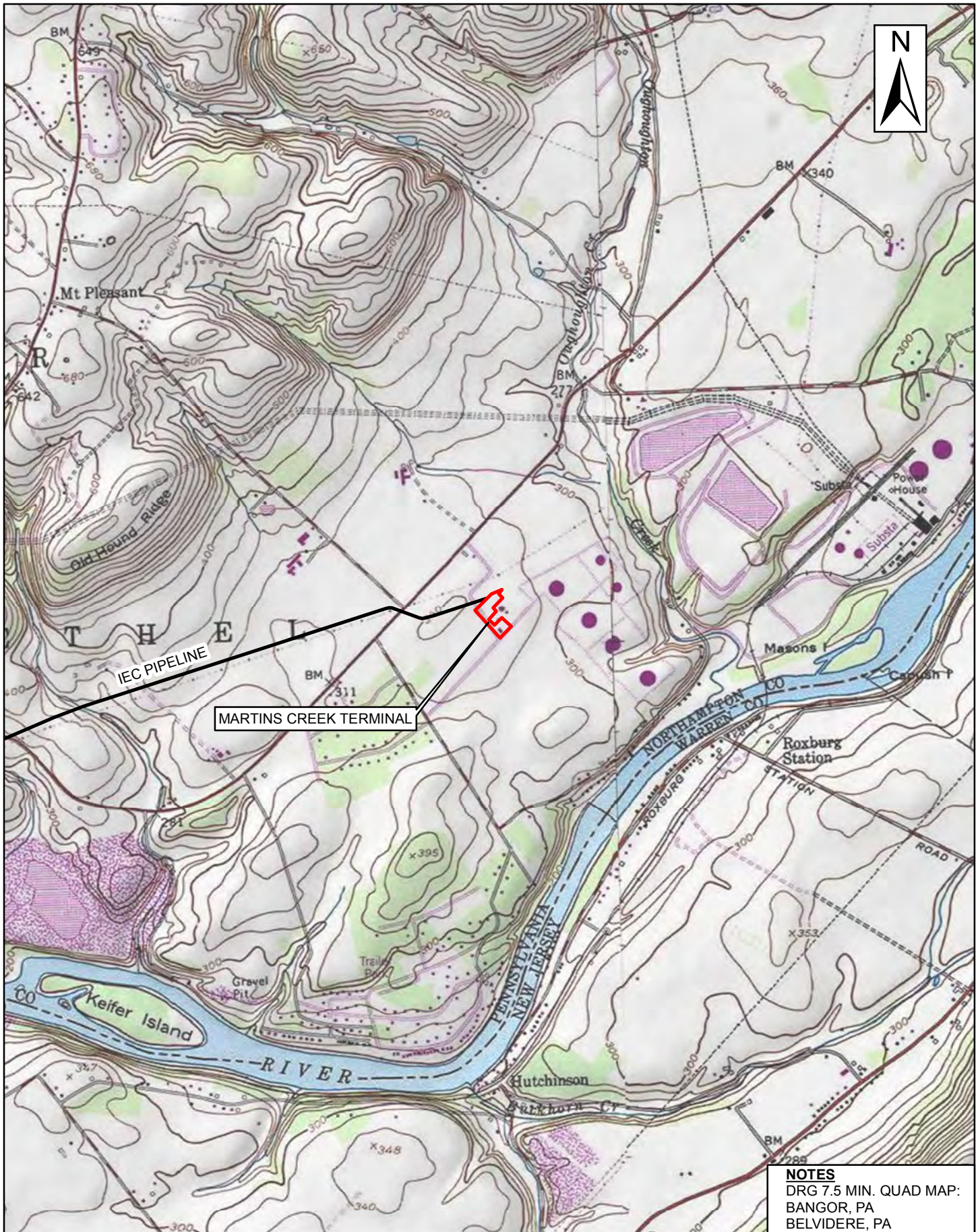
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



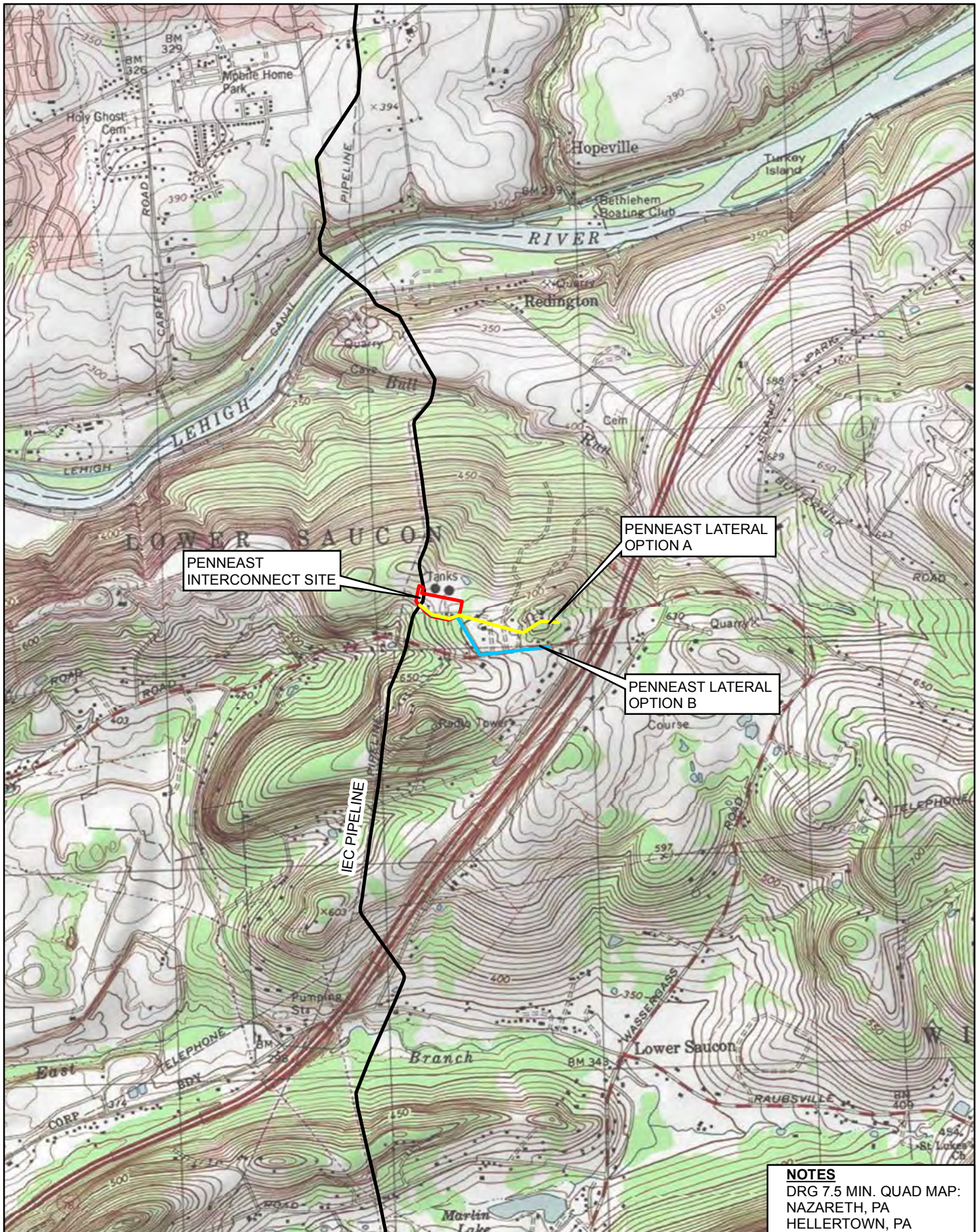
— MARTINS CREEK TERMINAL
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
MARTINS CREEK TERMINAL
NORTHAMPTON COUNTY, PENNSYLVANIA

NOTES
 DRG 7.5 MIN. QUAD MAP:
 BANGOR, PA
 BELVIDERE, PA



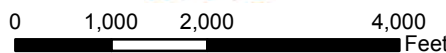
PENNEAST INTERCONNECT SITE

PENNEAST LATERAL OPTION A

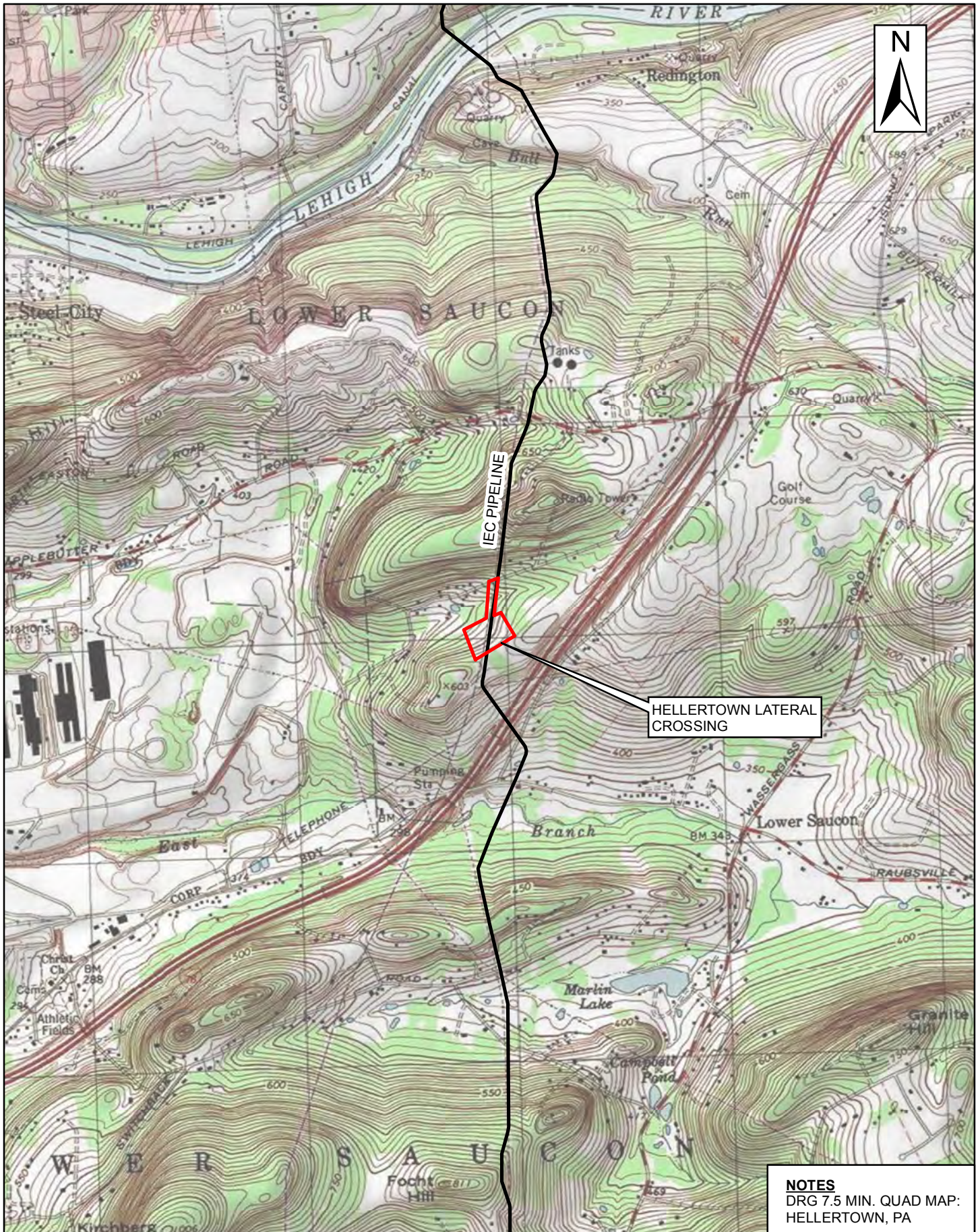
PENNEAST LATERAL OPTION B

NOTES
 DRG 7.5 MIN. QUAD MAP:
 NAZARETH, PA
 HELLERTOWN, PA

- PENNEAST LATERAL OPTION A
- PENNEAST LATERAL OPTION B
- PENNEAST INTERCONNECT SITE
- EXISTING PIPELINE



**PROJECT LOCATION MAP
 PENNEAST INTERCONNECT
 AND LATERALS
 NORTHAMPTON COUNTY, PENNSYLVANIA**



HELLERTOWN LATERAL CROSSING

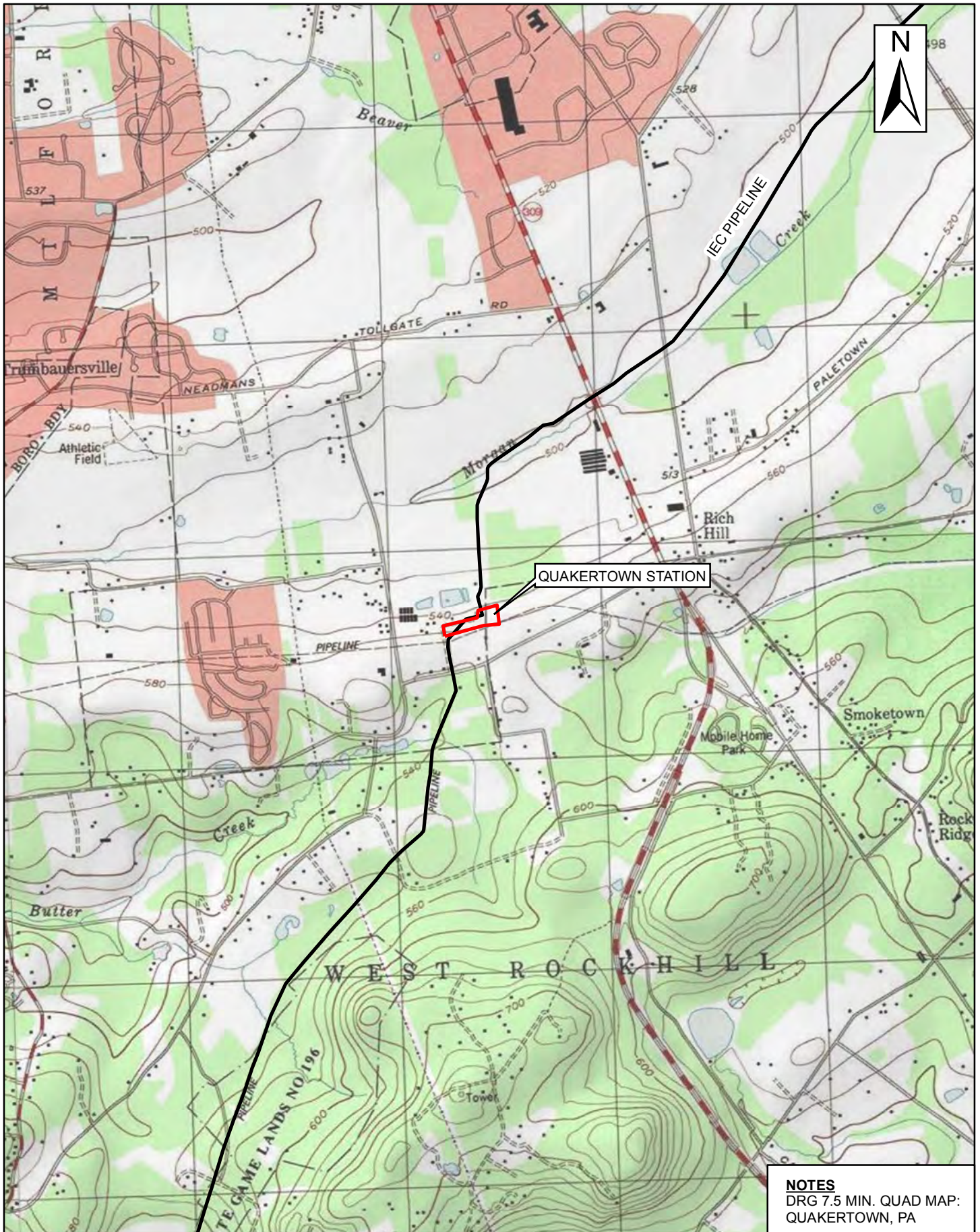
NOTES
DRG 7.5 MIN. QUAD MAP:
HELLERTOWN, PA

— HELLERTOWN LATERAL CROSSING
— EXISTING PIPELINE

N V 5

0 1,000 2,000 4,000 Feet

PROJECT LOCATION MAP
HELLERTOWN LATERAL CROSSING
NORTHAMPTON COUNTY, PENNSYLVANIA



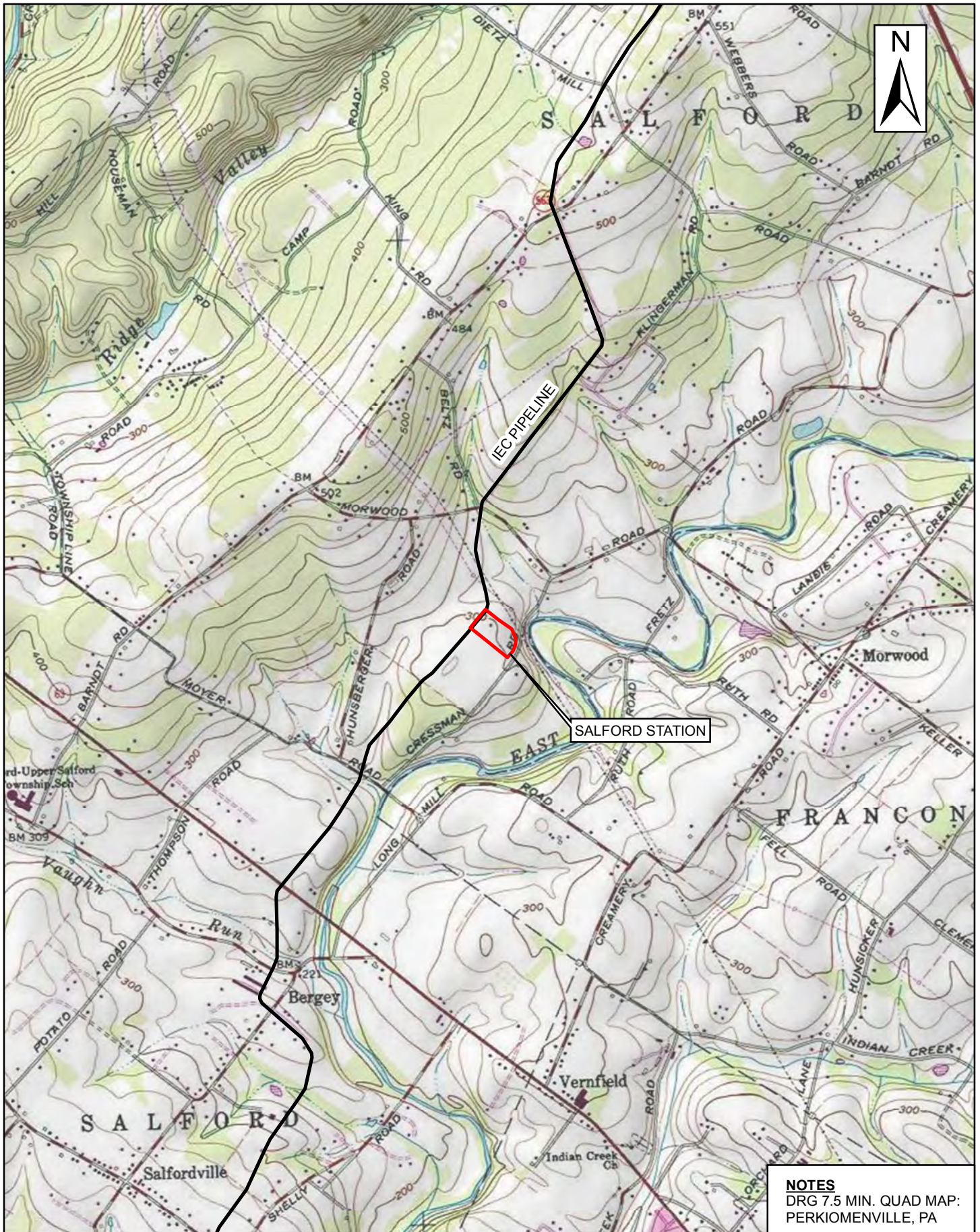
NOTES
 DRG 7.5 MIN. QUAD MAP:
 QUAKERTOWN, PA

— QUAKERTOWN STATION
 — EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

PROJECT LOCATION MAP
QUAKERTOWN STATION
BUCKS COUNTY, PENNSYLVANIA



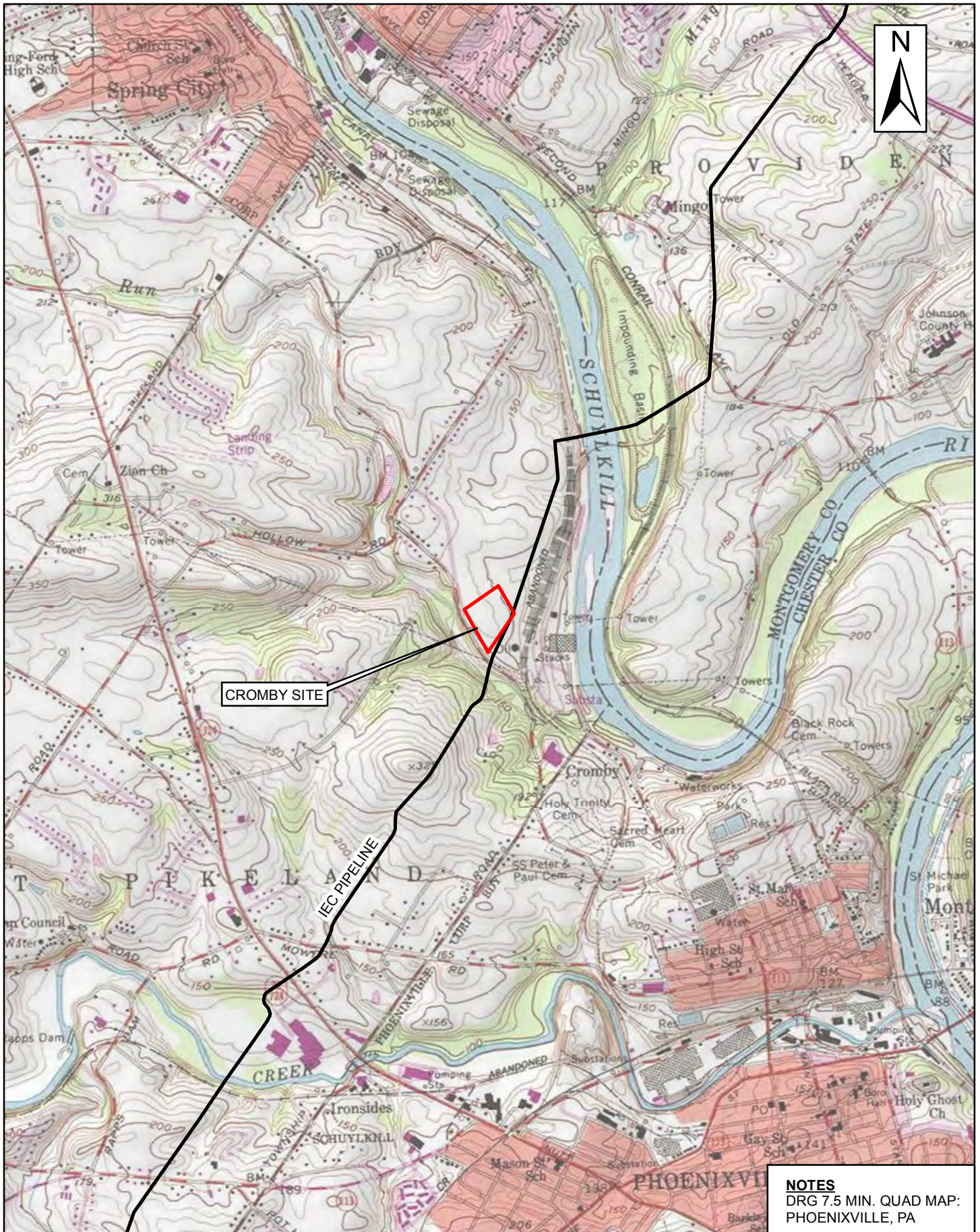
NOTES
 DRG 7.5 MIN. QUAD MAP:
 PERKIOMENVILLE, PA

— SALFORD STATION
 — EXISTING PIPELINE



0 1,000 2,000 4,000 Feet



PROJECT LOCATION MAP
SALFORD STATION
MONTGOMERY COUNTY, PENNSYLVANIA



CROMBY SITE

IEC PIPELINE

NOTES
 DRG 7.5 MIN. QUAD MAP:
 PHOENIXVILLE, PA

 CROMBY SITE
 EXISTING PIPELINE

NV5

0 1,000 2,000 4,000
 Feet

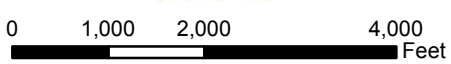
PROJECT LOCATION MAP
CROMBY SITE
CHESTER COUNTY, PENNSYLVANIA



MARCUS HOOK
INTERCONNECTS AND
LATERALS

NOTES:
DRG 7.5 MIN. QUAD MAP
MARCUS HOOK, PA

- MARCUS HOOK DELIVERY LATERAL 1
- MARCUS HOOK DELIVERY LATERAL 2
- MARCUS HOOK INTERCONNECTS
- EXISTING PIPELINE



N V 5

**PROJECT LOCATION MAP
MARCUS HOOK INTERCONNECTS
AND LATERALS
DELAWARE COUNTY, PENNSYLVANIA**

Attachment C

Wetland Data

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Herb Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes _____ No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				



January 10, 2018

U.S Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, PA 16801

Ms. Lora Z. Lattanzi,
Field Office Supervisor

Subject: **Revised PNDI Review**

In July 2017 NV5, LLC requested a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for federally listed species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) for the proposed Pipeline Modification Project located in eastern Pennsylvania. The USFWS responded to the request in a letter dated September 05, 2017 (**USFWS Project #2017-1465**).

The scope of the proposed Project, now called the Adelpia Gateway Project¹, has changed since NV5's original submittal of a request for PNDI review. The Project remains in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Under the revised scope, the following Project components are under evaluation:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested land, paved/graveled industrial-use land, pasture, and existing pipeline right-of-way;
- Skipack Interconnect Site – a new interconnect adjacent to the intersection of the existing line and a PECO-owned natural gas pipeline in Montgomery County. The Site would be located on pasture and existing pipeline right-of-way;
- Marcus Hook Laterals – two new pipeline laterals (one 0.3-mile line and one 4.4-mile line) originating at the existing Marcus Hook Terminal in Delaware County.
 - The Parkway Lateral would be an approximately 0.3-mile, 16-inch-diameter pipeline that

¹ See the November 2, 2017 press release available at <https://adelphiagateway.com/wp-content/uploads/2017/11/18-05-Adelpia-Gateway-Announcement.pdf>.

January 10, 2018

terminates at a new interconnect at an existing meter station in Claymont, New Castle County, Delaware;

- The Tilghman Lateral would be an approximately 4.4-mile, 16-inch-diameter pipeline that would terminate at a new delivery point located within the boundaries of an existing meter station in Chester, Delaware County, Pennsylvania. Adelphia would also install five additional delivery points along the Tilghman Lateral, four of which would be installed entirely within existing industrial meter station sites. The remaining delivery point would be installed on a 0.1-acre regularly maintained, grassy site in Lower Chichester. About 80% of the Tilghman Lateral would be installed using horizontal directional drill methods;
- Marcus Hook Station Site - expansion and improvements to above ground facilities at the existing Marcus Hook Terminal in Marcus Hook, Delaware County. The Site would be located entirely on existing paved/graveled industrial-use land; and
- Mainline Valve and Blowdown Assembly Sites – construction of one new mainline valve and eight new blowdown assemblies at various locations along an existing 18-inch-diameter natural gas pipeline in Delaware, Chester, and Montgomery Counties. Construction and operation of the facilities would take place along existing access roads and within the existing pipeline’s permanent, maintained right-of-way.

The current evaluation area encompasses approximately 42 acres of land, about 9 of which would be permanently affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. NV5 is requesting a revised Large Project PNDI review for resources under the jurisdiction of the USFWS for the proposed Project.

The following are enclosed to facilitate your review:

- a completed revised Project Review Form; and
- USGS 7.5-minute quadrangle maps showing the revised Project area.

The wetland data forms provided with NV5’s previous consultation letter are still valid. Since the original letter, NV5 has performed wetland and waterbody surveys at all of the revised locations except for the Tilghman Lateral (and its associated delivery points), the mainline valve site, and the blowdown assembly sites. No wetlands or waterbodies were identified at the newly surveyed sites. NV5 will provide an updated letter to the USFWS detailing its findings upon completion of the surveys.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.



January 10, 2018

Sincerely,

A handwritten signature in cursive script that reads "Sara Holmes". The signature is written in black ink on a white background.

Sara Holmes
Environmental Scientist
NV5

Attachments:

Attachment A – PNDI Large Project Review Form

Attachment B – USGS 7.5-minute Quadrangle Maps

NIVIS

OFFICES NATIONWIDE

Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

When to Use the Manual Project Submission Form

Use this form if you do *not* want to use the online Pennsylvania Conservation Explorer to submit your project of any size for environmental review. Due to system limitations and agency requirements, projects should not be submitted piecemeal. The entire project area including roads and infrastructure should be submitted as a single unit. Fill out this form and send it along with your project materials (see *What to Send to Jurisdictional Agencies*) **to all four agencies** listed at the bottom of this PNDI Project Submission Form. There is no charge for submitting a project manually; however, due to the additional work required of agency staff, online submission is more efficient.

Note: All Projects may be submitted using the Pennsylvania Conservation Explorer online tool (a \$40 fee will be charged per project). Online submission results in greater convenience and possibly faster response times.

What to Send to Jurisdictional Agencies

Send the following information to all of the agencies listed on the Project Submission Form.

Check-list of Minimum Materials to be submitted:

- ___ Completed Manual Project Submission Form
- ___ Supplemental project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- ___ Relevant portion of the USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

- ___ GIS shapefiles depicting the project extent
- ___ A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- ___ Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- ___ Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

PNDI Project Submission Form Definitions

Applicant: Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Proposed Activity: Include **all** earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished.

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities.



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Adelpia Gateway, LLC

Address: 1415 Wyckoff Rd, Wall, NJ 07719

Phone Number: 800-483-3179

Email: info@adelphiagateway.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: Adelpia Gateway Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Multiple

County: Multiple see cover letter.

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Multiple see Attachments

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 42.2 Acreage to be Impacted: 13.9

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No The project would cross 2 creeks: Marcus Hook Creek (HDD) and Stoney Creek (open-cut).
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation?
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 1.5 acres

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105

Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

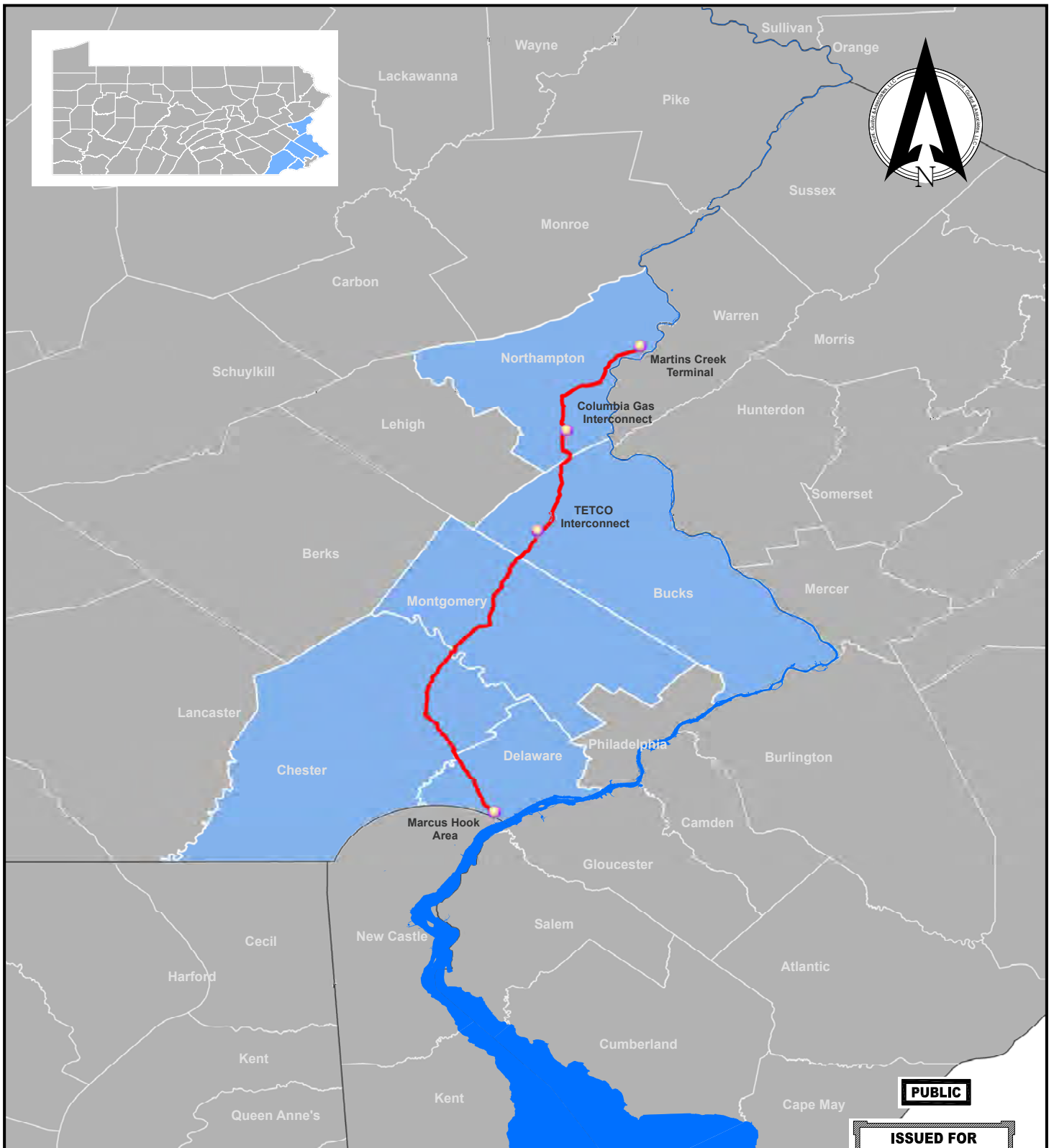
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

Legend

- Facility
- Adelpia Gateway

HGA HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			

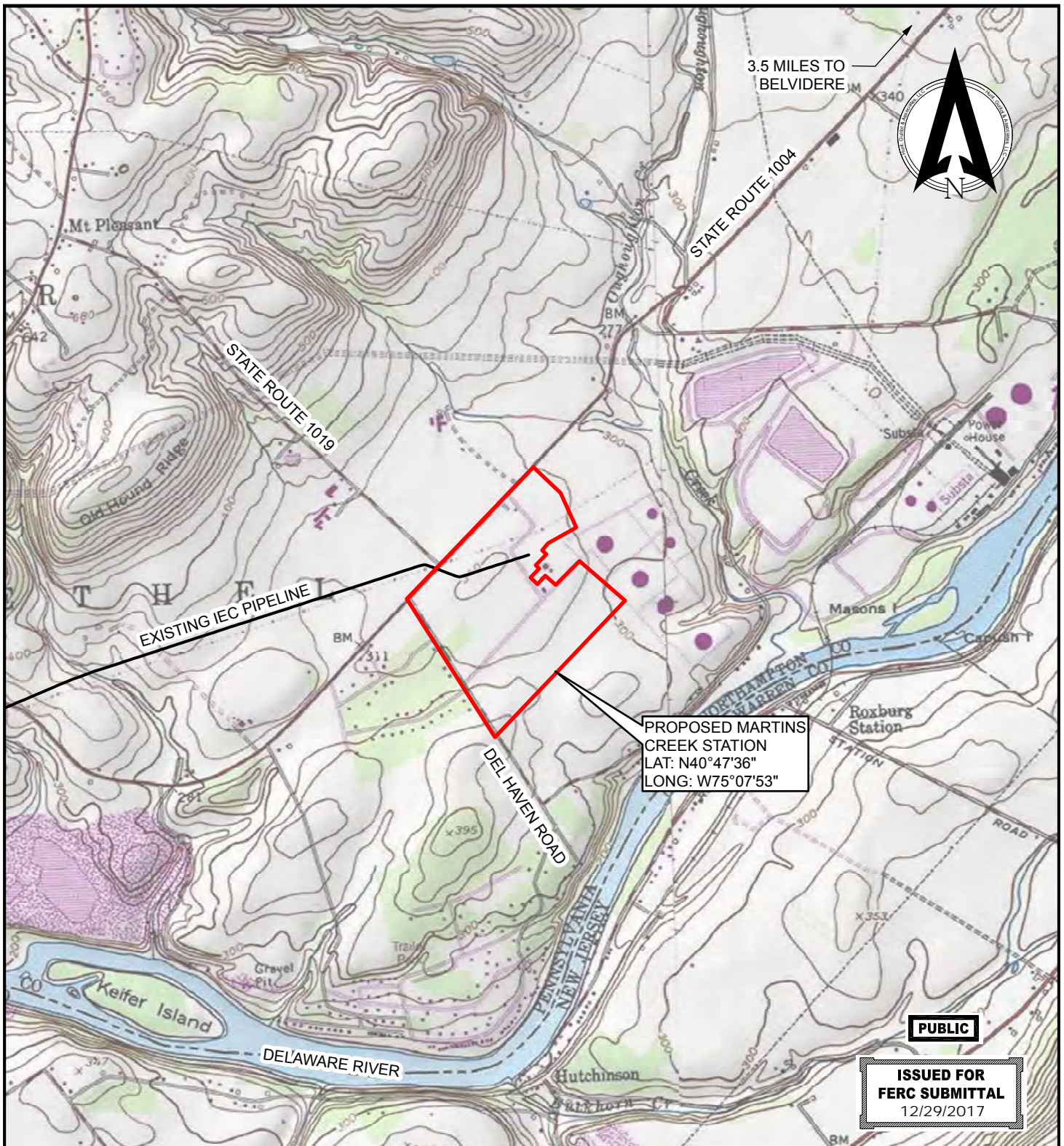


**ADELPIA GATEWAY, LLC
 PROJECT VICINITY MAP
 BUCKS, CHESTER, DELAWARE,
 MONTGOMERY, NORTHAMPTON
 COUNTIES, PENNSYLVANIA**

SCALE N.T.S.	DRAWING NUMBER 8.A17022.01-VICINITY	REV 0
------------------------	---	-----------------

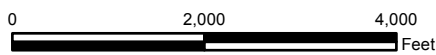
phumphrey 12/27/2017 3:27:15 PM

FIGURE 1



LEGEND

- PROPOSED MARTINS CREEK STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -o40075g2 (BANGOR, PA)
 -o40075g1 (BELVIDERE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MARTINS CREEK STATION
NORTHAMPTON COUNTY,
PENNSYLVANIA

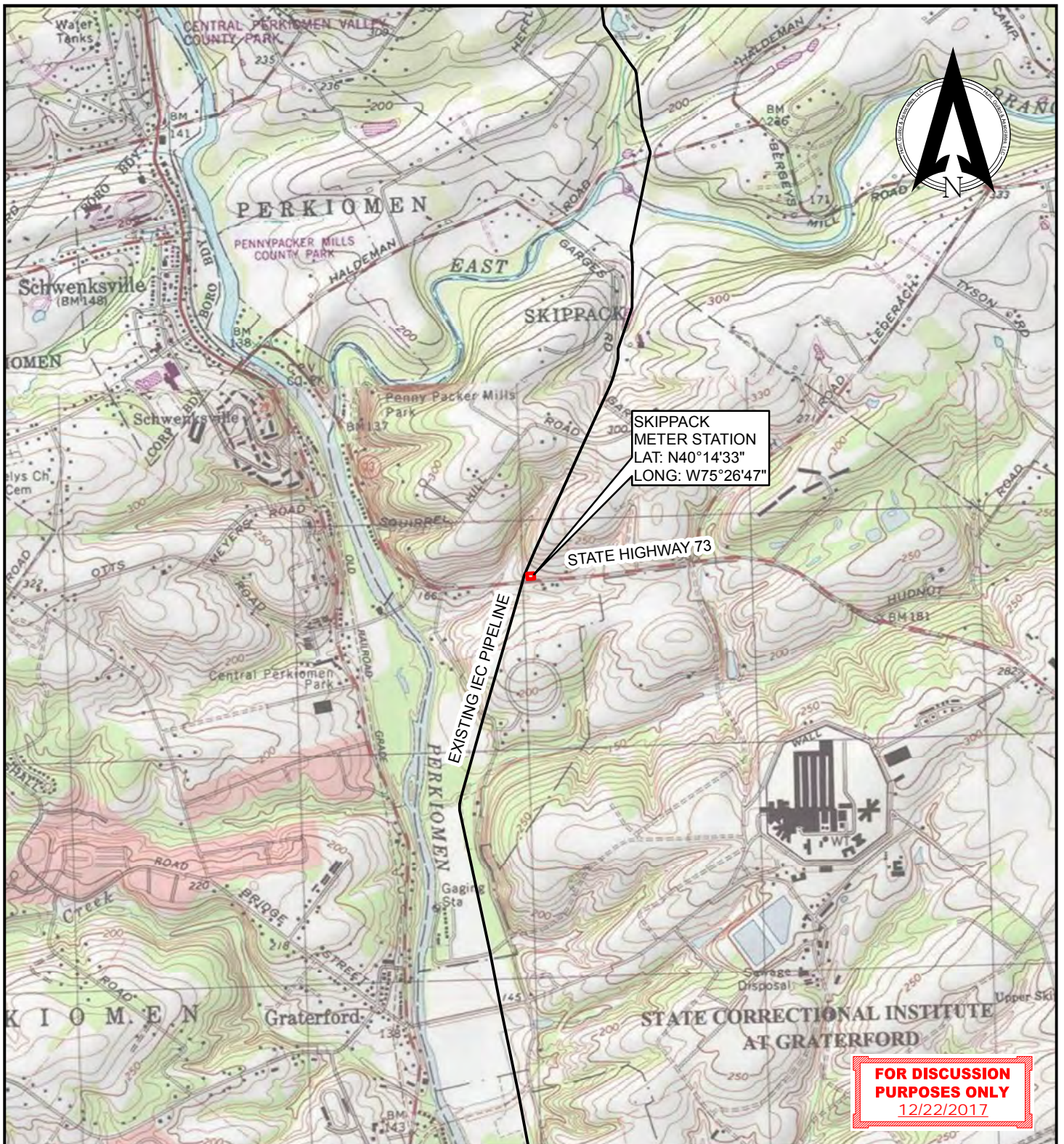
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MARTINS CREEK	REV 0
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						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



phumphrey 12/27/2017 3:47:58 PM

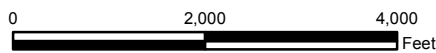
FIGURE 5a



**FOR DISCUSSION
PURPOSES ONLY**
12/22/2017

LEGEND

- SKIPPACK METER STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075d3 (QUAKERTOWN, PA)

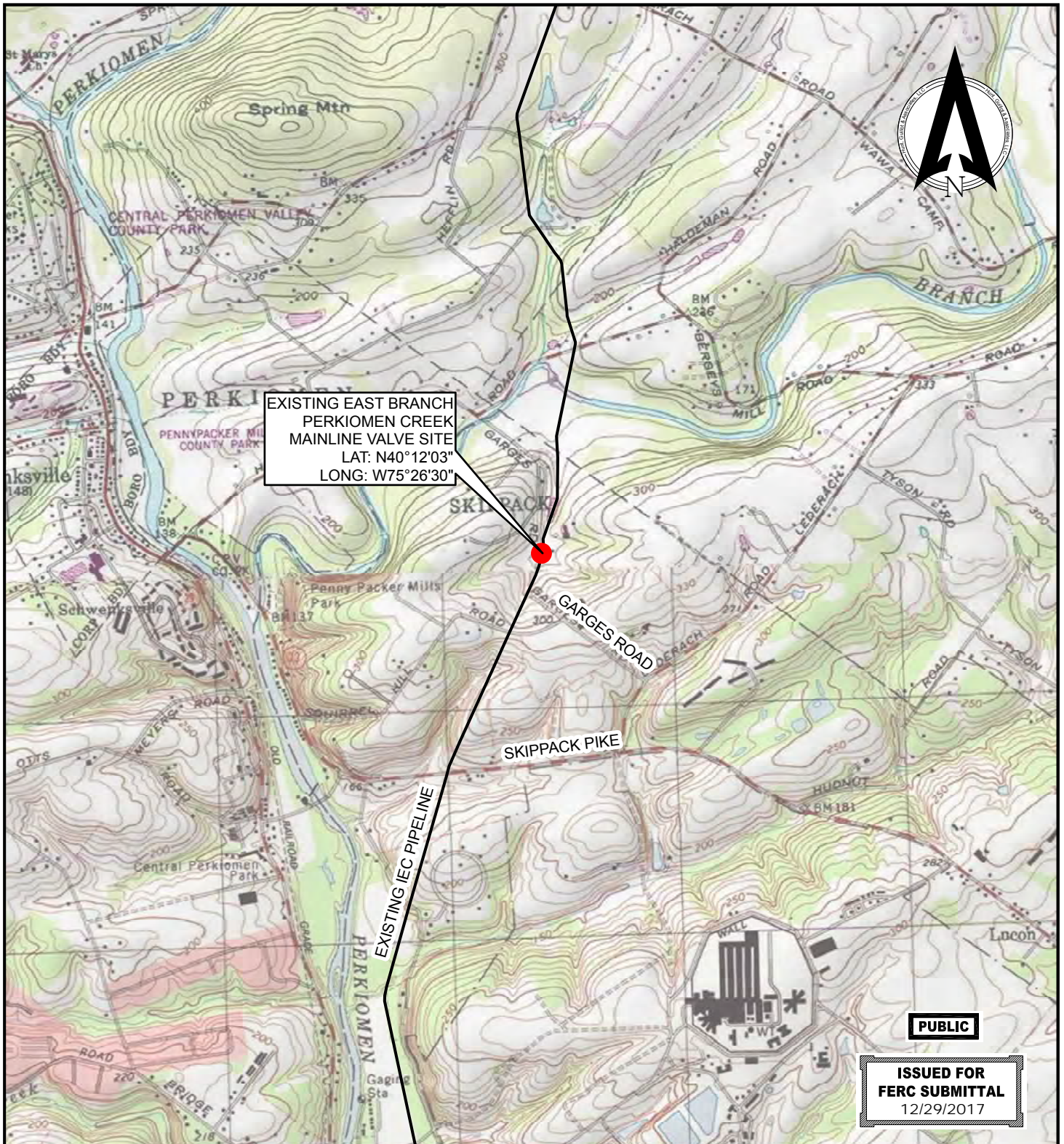
HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
SKIPPACK METER STATION
MONTGOMERY COUNTY,
PENNSYLVANIA

SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-SKIPPACK	REV
---------------------	---	-----



EXISTING EAST BRANCH PERKIOMEN CREEK MAINLINE VALVE SITE
 LAT: N40°12'03"
 LONG: W75°26'30"

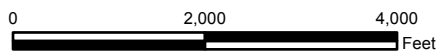


PUBLIC

ISSUED FOR FERC SUBMITTAL
 12/29/2017

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -040075c4 (PERKIOMENVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148



ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
EAST BRANCH PERKIOMEN CREEK
BLOWDOWN M.P. 36.68
MONTGOMERY COUNTY,
PENNSYLVANIA

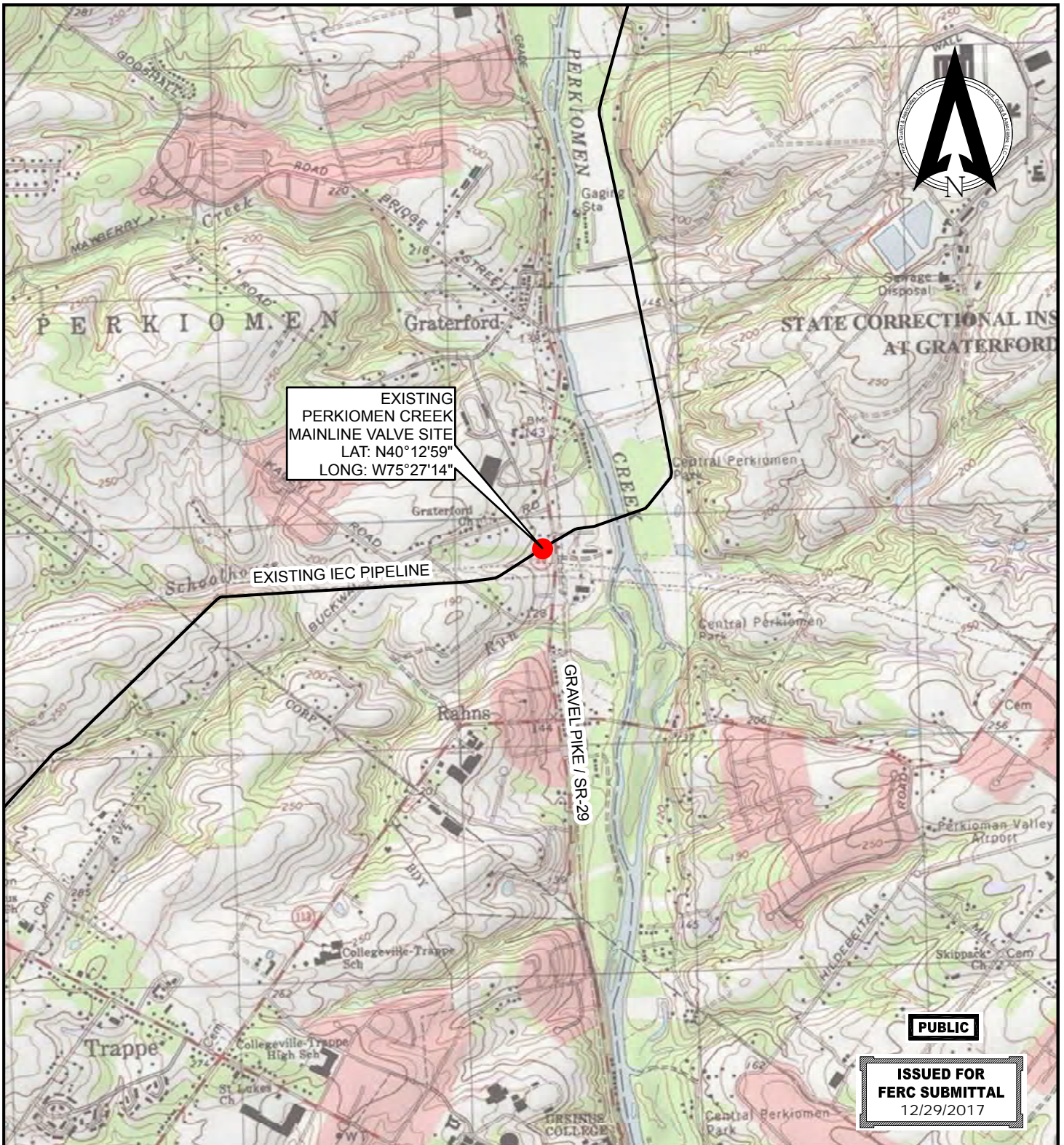
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	8.A17022

DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 3:06:51 PM

FIGURE 23a



EXISTING
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'59"
LONG: W75°27'14"

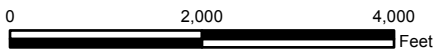
EXISTING IEC PIPELINE

PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b4 (COLLEGEVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PERKIOMEN CREEK
BLOWDOWN M.P. 33.97
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 33.97	0

phumphrey 12/27/2017 3:04:43 PM

FIGURE 22a



January 10, 2018

U.S. Department of the Interior
Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

Subject: **Migratory Bird Treaty Act Review Request for the Adelpia Gateway Project.**

To whom it may concern,

In August 2017 NV5, LLC (NV5) requested a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the United States Fish and Wildlife Service (USFWS) for the proposed Pipeline Modification Project located in eastern Pennsylvania. The USFWS responded to the request in a letter dated September 5, 2017 (**USFWS Project #2017-1465**).

The scope of the proposed Project, now called the Adelpia Gateway Project¹, has changed since NV5's original submittal of a request for PNDI review and USFWS consultation. NV5, on behalf of Adelpia Gateway, LLC, formally requests USFWS consultation regarding the Migratory Bird Treaty Act (MBTA).

The Project remains in Northampton, Bucks, Montgomery, Chester, and Delaware Counties, Pennsylvania. Under the revised scope, the following Project components are under evaluation:

- Martins Creek Terminal Site - minor modifications at the Martins Creek Terminal in Northampton County, which would take place entirely on commercial/industrial land;
- Quakertown Station Site - expansion and improvements to above ground facilities at an existing meter station near Quakertown, Bucks County, Pennsylvania, which would occur on forested land, paved/graveled industrial-use land, pasture, and existing pipeline right-of-way;
- Skippack Interconnect Site – a new interconnect adjacent to the intersection of the existing line and a PECO-owned natural gas pipeline in Montgomery County. The Site would be located on pasture and existing pipeline right-of-way;
- Marcus Hook Laterals – two new pipeline laterals (one 0.3-mile line and one 4.4-mile line) originating at the existing Marcus Hook Terminal in Delaware County.
 - The Parkway Lateral would be an approximately 0.3-mile, 16-inch-diameter pipeline that

¹ See the November 2, 2017 press release available at <https://adelphiagateway.com/wp-content/uploads/2017/11/18-05-Adelpia-Gateway-Announcement.pdf>.

terminates at a new interconnect at an existing meter station in Claymont, New Castle County, Delaware;

- The Tilghman Lateral would be an approximately 4.4-mile, 16-inch-diameter pipeline that would terminate at a new delivery point located within the boundaries of an existing meter station in Chester, Delaware County, Pennsylvania. Adelphia would also install five additional delivery points along the Tilghman Lateral, four of which would be installed entirely within existing industrial meter station sites. The remaining delivery point would be installed on a 0.1-acre regularly maintained, grassy site in Lower Chichester. About 80% of the Tilghman Lateral would be installed using horizontal directional drill methods;
- Marcus Hook Station Site - expansion and improvements to above ground facilities at the existing Marcus Hook Terminal in Marcus Hook, Delaware County. The Site would be located entirely on existing paved/graveled industrial-use land; and
- Mainline Valve and Blowdown Assembly Sites – construction of one new mainline valve and eight new blowdown assemblies at various locations along an existing 18-inch-diameter natural gas pipeline in Delaware, Chester, and Montgomery Counties. Construction and operation of the facilities would take place along existing access roads and within the existing pipeline’s permanent, maintained right-of-way.

The current evaluation area encompasses approximately 42 acres of land; about 9 of which would be permanently affected by Project activities. Construction of proposed improvements is projected to begin in 4th Quarter 2018 with the facilities phased into service between 4th Quarter 2018 and 2nd Quarter 2019. NV5 is submitting on behalf of Adelphia Gateway, LLC and this letter details how The Adelphia Gateway Project may have an effect on migratory birds potentially occurring in the Project area, proposed avoidance and impact minimization measures that would be used by Adelphia during construction of the Project, and requests USFWS consultation regarding these measures in order to comply with the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Action.

In order to minimize impacts on migratory birds Adelphia has designed the Adelphia Gateway Project to avoid migratory bird habit to the extent possible. The majority of the Adelphia Project would be sited on industrial, residential, and open land types. Approximately 1.5 acres of forested land would be temporarily affected along the Project, of which 0.5 acre would be permanently affected. The forested areas that would be affected are located in industrialized and densely populated residential areas and consist of fragmented discontinuous habitat. The Project would temporarily affect 6.3 acres of open land, of which 0.9 acre would be permanently affected. Work at the remaining facilities including the Marcus Hook Station Site, Martins Creek Station, and Parkway Lateral would be sited within developed land (residential or industrial). Only 0.1 acre of agricultural land would be affected along the MLV sites, and this area would be returned to pre-construction conditions upon Project completion.



OFFICES NATIONWIDE

The Marcus Hook Compressor Station Site and a portion of the Parkview Lateral would be located within the Delaware Coastal Zone Important Bird Area. The Delaware Coastal Zone Important Bird Areas that would be crossed by the Adelpia Project are largely developed industrial and residential areas. Portions of the proposed Tilghman Lateral and the Quakertown Compressor Station would also be located within the Pennsylvania Natural Heritage Program Natural Heritage Core Habitat and Supporting Landscape Areas. This designation is not associated with any protection or regulation but is used for planning purposes. No other significant wildlife habitats were identified through consultation with the Delaware Department of Natural Resources and Environmental Control, the Pennsylvania Department of Conservation and Natural Resources, the Pennsylvania Fish and Boat Commission, and the Pennsylvania Game Commission. Consultation with these agencies is ongoing.

The Adelpia Project would be located within the NABCI Bird Conservation Regions 30 (New England/Mid-Atlantic Coast) and 28 (Appalachian Mountains). Attachment C of these letter contains a list of the Birds of Conservation Concern that could potentially occur in the Adelpia Project area.

Adelpia would adhere to the measures provided the FERC Plan and Procedures during construction and operation the Project, including avoiding routine vegetation maintenance (e.g., clearing or mowing) within the permanent right-of-way during migratory bird nesting season (April 15th to August 1st). Vegetated areas that would not be converted to industrial use would be restored as closely as possible to preexisting conditions and would be revegetated according to the FERC Plan and Procedures. Adelpia would provide environmental training for all onsite contractors and employees in order to inform workers of the MBTA and help prevent the accidental take of migratory birds during construction of the Project.

The following items are enclosed to facilitate your review:

- a completed revised Project Review Form;
- revised USGS 7.5-minute quadrangle maps showing the Project area; and
- a list of Birds of Conservation Concern potentially within the Project area.

If you have any questions or require additional information, please contact me at (727) 565-9895 or via e-mail at sara.holmes@nv5.com.

Sincerely,



Sara Holmes
Environmental Scientist
NV5



Attachment A

PNDI Review Form



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

When to Use the Manual Project Submission Form

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Note: All Projects may be submitted using the Pennsylvania Conservation Explorer online tool (a \$40 fee will be charged per project). Online submission results in greater convenience and possibly faster response times.

What to Send to Jurisdictional Agencies

Send the following information to all of the agencies listed on the Project Submission Form.

Check-list of Minimum Materials to be submitted:

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The inclusion of the following information may expedite the review process.

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- Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

PNDI Project Submission Form Definitions

Applicant: Person that owns the property or is proposing the project or activity

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Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities.



Pennsylvania Natural Diversity Inventory

MANUAL PROJECT SUBMISSION FORM

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Adelpia Gateway, LLC

Address: 1415 Wyckoff Rd, Wall, NJ 07719

Phone Number: 800-483-3179

Email: info@adelphiagateway.com

Contact Person Information - if different from applicant

Name: Sara Holmes (NV5)

Address: 813 N. Dupont St., Wilmington, DE 19805

Phone Number: 727-565-9895

Email: sara.holmes@nv5.com

Project Information

Project Name: Adelpia Gateway Project

Project Reference Point: Latitude: 40°19'4.92"N Longitude: 75°24'43.90"W Datum: WGS84

Municipality: Multiple

County: Multiple see cover letter.

Attach a portion of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Multiple see Attachments

Provide GIS shapefiles showing the project boundary (strongly recommended)

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions) See cover letter.

Total Acres of Property: 42.2 Acreage to be Impacted: 13.9

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes N
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
Yes No The project would cross 2 creeks: Marcus Hook Creek (HDD) and Stoney Creek (open-cut).
3. Are wetlands located in or within 300 feet of the project area? Yes If No, is this the result of a wetland delineation?
4. How many acres of tree removal, tree cutting or forest clearing will be necessary to implement all aspects of this project? 1.5 acres

Dept. of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
Email: RA-HERITAGEREVIEW@state.pa.us
fax: 717-772-0271

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
RA-PGC_PNDI@pa.gov

PA Fish and Boat Commission

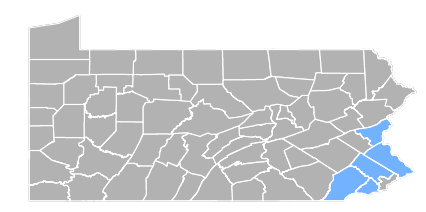
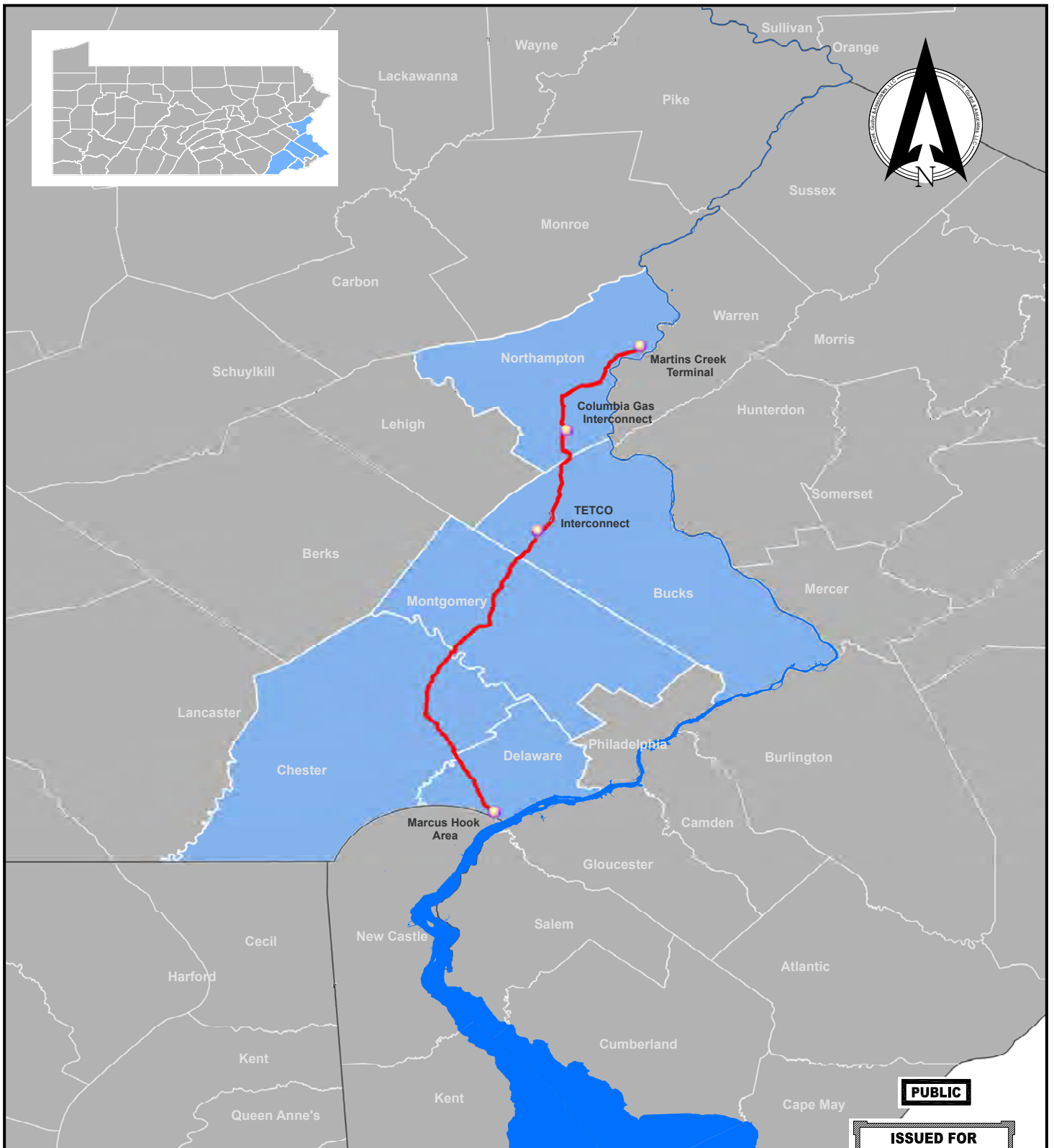
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

US Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
no faxes please

Attachment B

USGS Quad Maps



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**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

Legend

-  Facility
-  Adelpia Gateway

HGA HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	PLH	12/19/17
						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	MODEL ID	8.A17022	
REV	DESCRIPTION	CHK	DATE	APP	DATE			

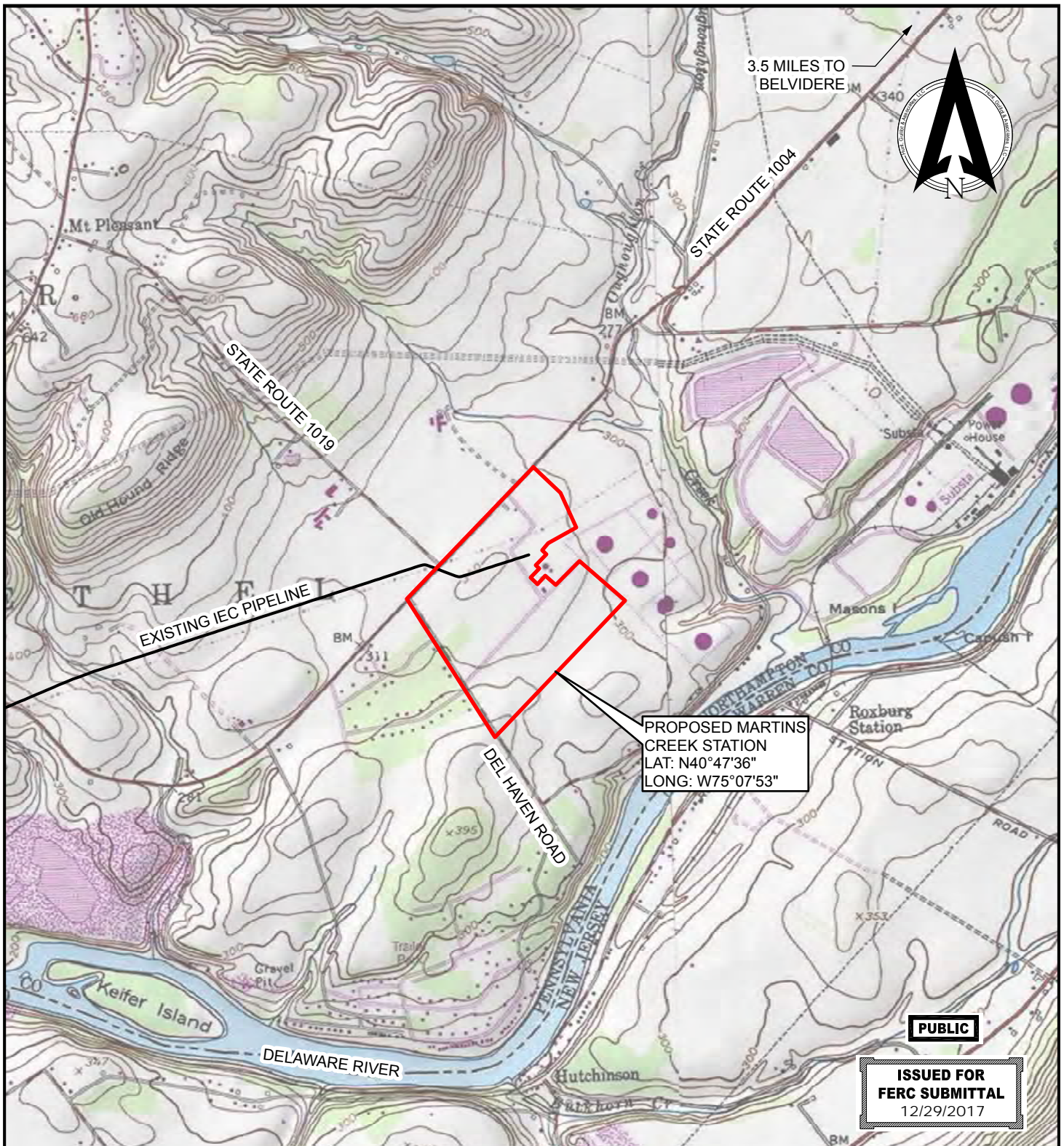


**ADELPIA GATEWAY, LLC
PROJECT VICINITY MAP
BUCKS, CHESTER, DELAWARE,
MONTGOMERY, NORTHAMPTON
COUNTIES, PENNSYLVANIA**

SCALE N.T.S.	DRAWING NUMBER 8.A17022.01-VICINITY	REV 0
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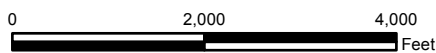
phumphrey 12/27/2017 3:27:15 PM

FIGURE 1



LEGEND

- PROPOSED MARTINS CREEK STATION
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
 -o40075g2 (BANGOR, PA)
 -o40075g1 (BELVIDERE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
 ONE METROPLEX DRIVE, SUITE 100
 BIRMINGHAM, AL 35209
 PHONE: 205-970-4977
 FIRM # PA 4004148

ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PROPOSED MARTINS CREEK STATION
NORTHAMPTON COUNTY,
PENNSYLVANIA

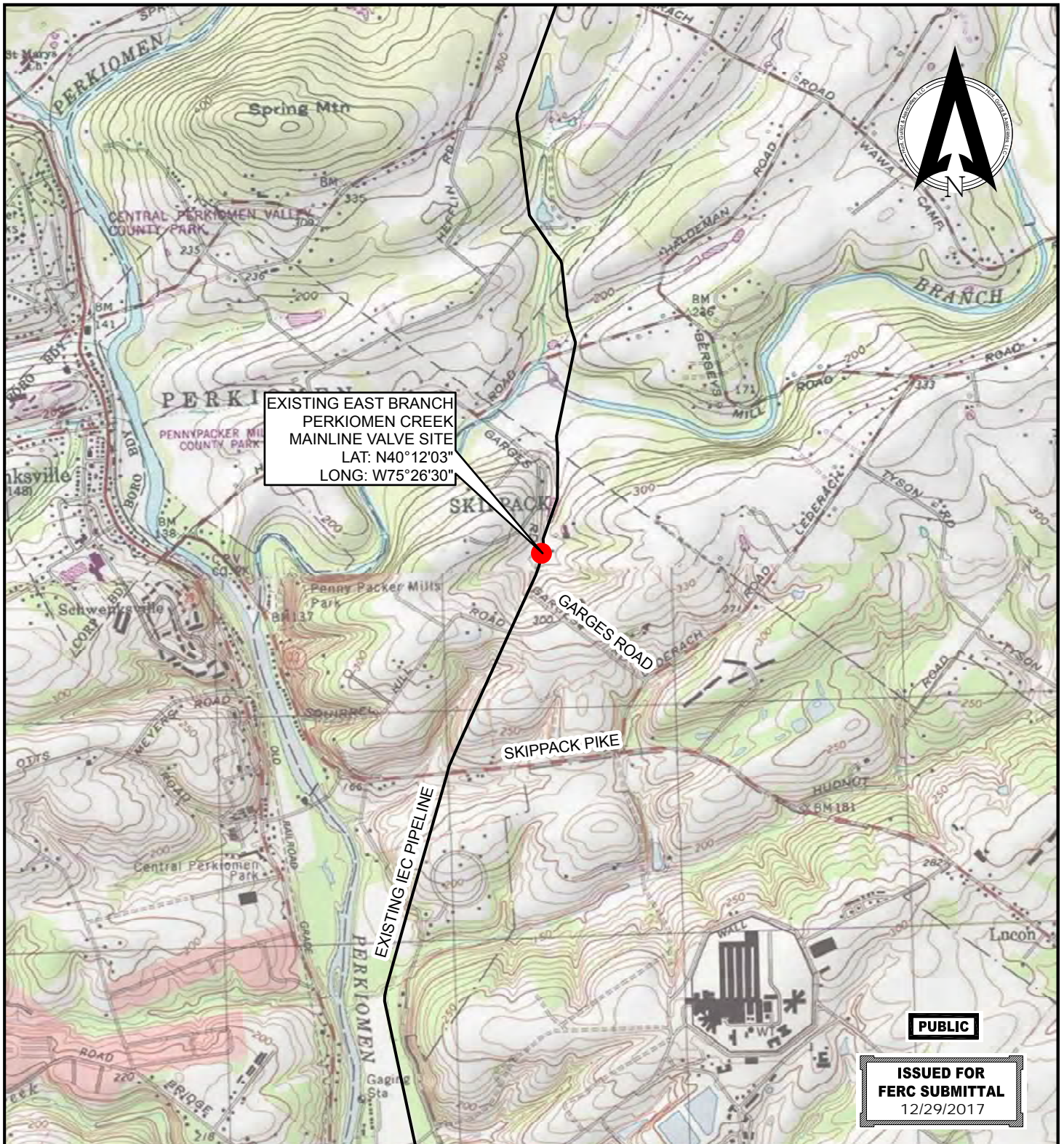
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MARTINS CREEK	REV 0
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						DESIGNED BY	PLH	06/29/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



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FIGURE 5a



EXISTING EAST BRANCH
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'03"
LONG: W75°26'30"

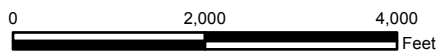


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**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075c4 (PERKIOMENVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
EAST BRANCH PERKIOMEN CREEK
BLOWDOWN M.P. 36.68
MONTGOMERY COUNTY,
PENNSYLVANIA**

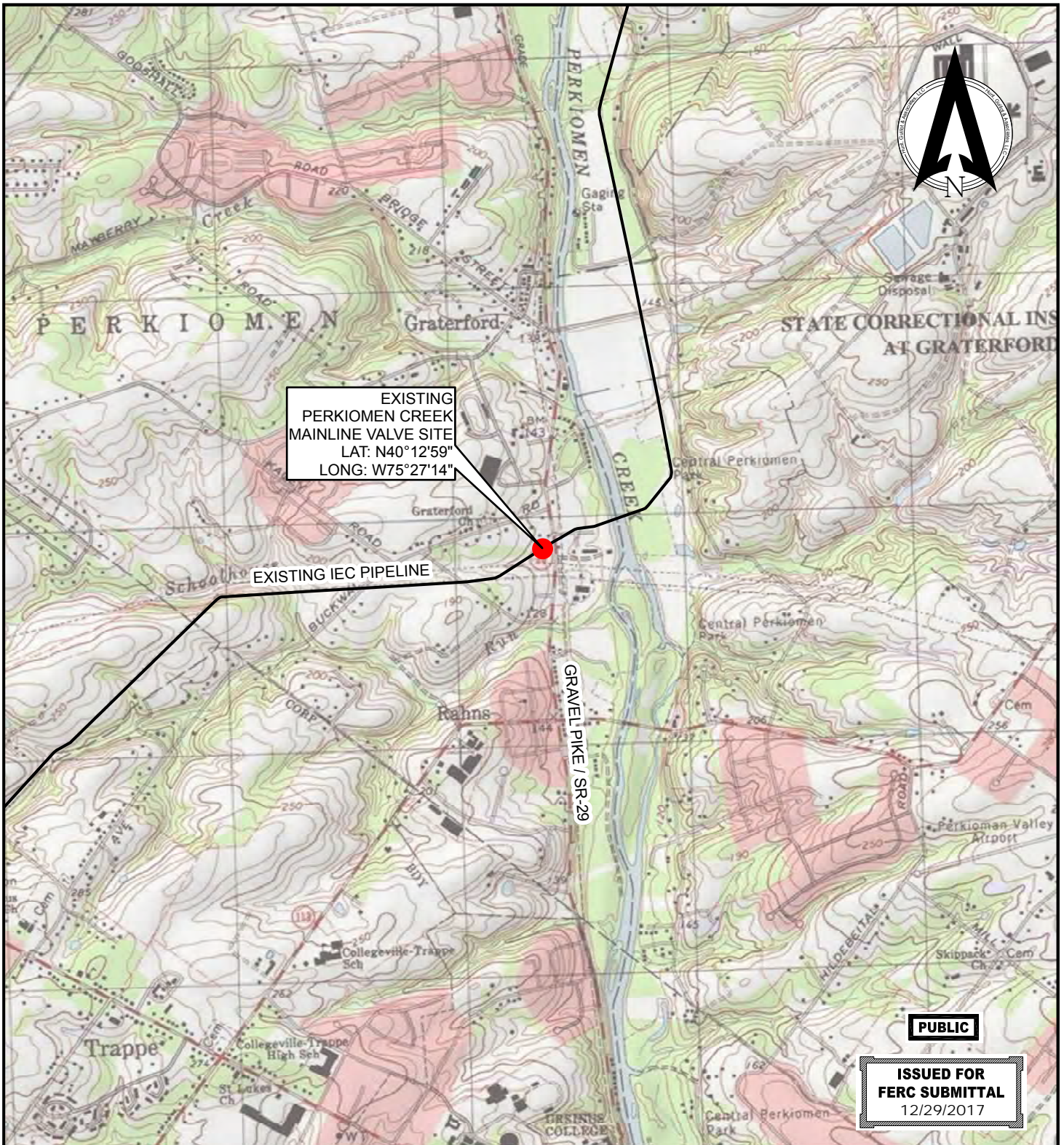
SCALE 1" = 2000'	DRAWING NUMBER 8.A17022.01-QUAD-MLV-M.P. 36.68	REV 0
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REV	DESCRIPTION	CHK	DATE	APP	DATE	MODEL ID
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017	8.A17022

DRAWN BY	MSF	12/18/17
DESIGNED BY	PLH	12/15/17
CHECKED BY	MEH	12/21/17
APPROVED BY	RCH	12/21/17
HGA JOB NO.	8.A17022.01.0	
PLOT SCALE	1:1	
MODEL ID	8.A17022	

phumphrey 12/27/2017 3:06:51 PM

FIGURE 23a



EXISTING
PERKIOMEN CREEK
MAINLINE VALVE SITE
LAT: N40°12'59"
LONG: W75°27'14"

EXISTING IEC PIPELINE

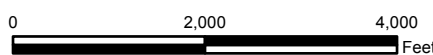


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b4 (COLLEGEVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148



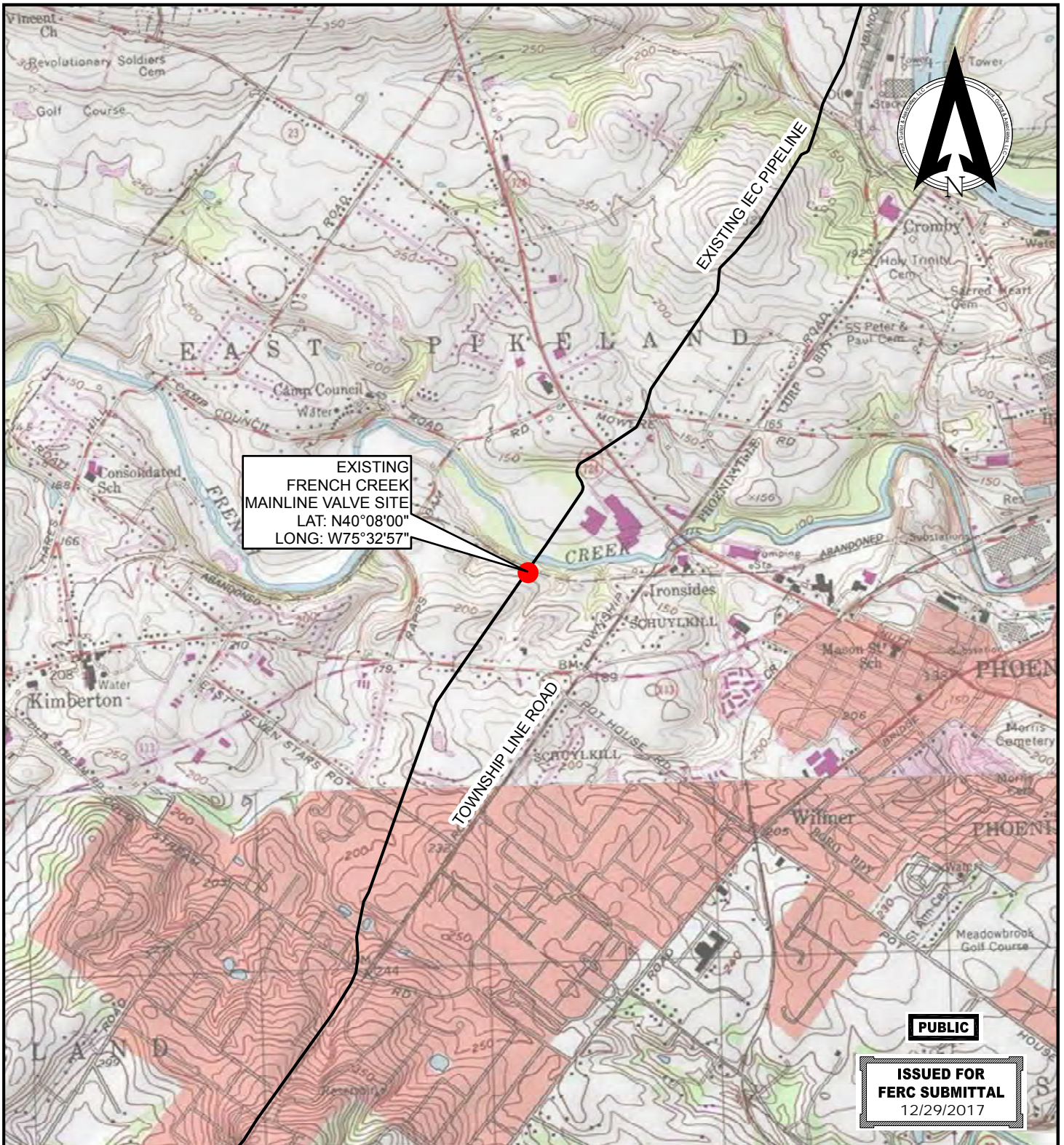
**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
PERKIOMEN CREEK
BLOWDOWN M.P. 33.97
MONTGOMERY COUNTY,
PENNSYLVANIA**

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 33.97	0

FIGURE 22a

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EXISTING
FRENCH CREEK
MAINLINE VALVE SITE
LAT: N40°08'00"
LONG: W75°32'57"

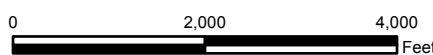


PUBLIC

**ISSUED FOR
FERC SUBMITTAL
12/29/2017**

LEGEND

- EXISTING MAINLINE VALVE SITE
- EXISTING PIPELINE



NOTES

DRG 7.5 MIN. QUAD MAP:
-040075b5 (PHOENIXVILLE, PA)



HUNT, GUILLOT & ASSOCIATES, LLC
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, AL 35209
PHONE: 205-970-4977
FIRM # PA 4004148

						DRAWN BY	MSF	12/18/17
						DESIGNED BY	PLH	12/15/17
						CHECKED BY	MEH	12/21/17
						APPROVED BY	RCH	12/21/17
						HGA JOB NO.	8.A17022.01.0	
						PLOT SCALE	1:1	
						MODEL ID	8.A17022	
0	ISSUED FOR FERC	MEH	12/29/2017	RCH	12/29/2017			
REV	DESCRIPTION	CHK	DATE	APP	DATE			



**ADELPHIA GATEWAY, LLC
PROJECT LOCATION MAP
FRENCH CREEK
BLOWDOWN M.P. 25.74
CHESTER COUNTY,
PENNSYLVANIA**

SCALE	DRAWING NUMBER	REV
1" = 2000'	8.A17022.01-QUAD-MLV-M.P. 25.74	0

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FIGURE 19a



Attachment C

Bird Lists

Birds of Conservation Concern Potentially Occurring in the Adelpia Project Area		
Species	Note	Bird Conservation Region (BCR)
American Bittern	N/A	BCR 30
American Oystercatcher	N/A	BCR 30
Audubon's Shearwater	nb	BCR 30
Bachman's Sparrow	N/A	BCR 29
Bald Eagle	b	BCR 30, 28, 29
Bewick's Wren	N/A	BCR 28, 29
Black Rail	N/A	BCR 30, 29
Black Skimmer	N/A	BCR 30
Black-capped Chickadee	N/A	BCR 28
Blue-winged Warbler	N/A	BCR 30, 29, 28
Brown-headed Nuthatch	N/A	BCR 30, 29
Buff-breasted Sandpiper	nb	BCR 30
Canada Warbler	N/A	BCR 28
Cerulean Warbler	N/A	BCR 30, 29, 28
Golden-winged Warbler	N/A	BCR 30, 28, 29
Greater Shearwater	nb	BCR 30
Gull-billed Tern	N/A	BCR 30
Henslow's Sparrow	N/A	BCR 30, 29, 28
Horned Grebe	nb	BCR 30
Hudsonian Godwit	nb	BCR 30
Kentucky Warbler	N/A	BCR 30, 29, 28
Least Bittern	N/A	BCR 30
Least Tern	c	BCR 30
Lesser yellowlegs	nb	BCR 30
Loggerhead Shrike	N/A	BCR 30, 29, 28
Louisiana Waterthrush	N/A	BCR 28
Marbled Godwith	nb	BCR 30
Nelson's Sharp-tailed Sparrow	N/A	BCR 30
Northern Saw-whet Owl	N/A	BCR 28
Olive-sided Flycatcher	N/A	BCR 28
Peregrine Falcon	b	BCR 30, 29, 28
Pied-billed Grebe	nb	BCR 30

Prairie Warbler	N/A	BCR 30, 29, 28
Purple Sandpiper	nb	BCR 30
Red Crossbill	N/A	BCR 28
Red Knot (rufa ssp.)	a, nb	BCR 30
Red-headed Woodpecker	N/A	BCR 30, 28, 29
Red-throated Loon	nb	BCR 30
Rusty Blackbird	nb	BCR 30, 29, 28
Saltmarsh Sharp-tailed Sparrow	N/A	BCR 30
Seaside Sparrow	c	BCR 30
Sedge Wren	N/A	BCR 30, 29, 28
Semipalmated Sandpiper (Eastern)	nb	BCR 30
Short-billed Dowitcher	nb	BCR 30
Short-eared Owl	nb	BCR 30, 29
Snowy Egret	N/A	BCR 30
Solitary Sandpiper	nb	BCR 30
Swainson's Warbler	N/A	BCR 28, 29
Upland Sandpiper	N/A	BCR 30, 28
Whimbrel	nb	BCR 30
Whip-poor-will	N/A	BCR 30, 29, 28
Wilson's Plover	N/A	BCR 30
Wood Thrush	N/A	BCR 30, 29, 28
Worm-eating Warbler	N/A	BCR 30, 28
Yellow-bellied Sapsucker	N/A	BCR 28
Source: USFWS, 2008 a - ESA candidate, b - ESA delisted, c - non-listed subspecies or population of Threatened or Endangered species, d - MBTA protection uncertain or lacking, nb - non-breeding in this BCR, N/A - Not Applicable.		



OFFICES NATIONWIDE

Adelphia Gateway, LLC
Adelphia Project

DOCKET NO. CP18-__-000

Appendix 3A

Phase I Bog Turtle Survey Report

Appendix 3A

PHASE I BOG TURTLE REPORTS

ADELPHIA GATEWAY PROJECT

December 2017

Quakertown Compressor Station Site Phase I Bog Turtle Survey Report

INTRODUCTION

On December 13 2017, biologists Scott Angus of NV5 performed a Phase I Bog Turtle Habitat Survey on lands where access was granted for the Quakertown Compressor Station Site in a rural portion of Quakertown, Bucks County, Pennsylvania for a proposed Adelpia Gateway Project (Project). Mr. Angus, is a USFWS Recognized Qualified Bog Turtle Surveyor in Pennsylvania and the northeast. Wetlands within and adjacent to the proposed project were evaluated in accordance with methodologies outlined in the US Fish and Wildlife Service's (USFWS) "Bog Turtle (*Glyptemys {Clemmys} muhlenbergii*) Northern Population Recovery Plan (May 2001, rev. March 2006)."

PURPOSE OF STUDY

The bog turtle's northern population has been listed as threatened by the USFWS under the Endangered Species Act (ESA) of 1973. USFWS guidelines require that surveys for bog turtle habitat (Phase I Bog Turtle Habitat Survey) be performed to determine if potential bog turtle habitat occurs in the vicinity of or within a proposed project limit, in a region where bog turtle habitat is known to be present. If potential bog turtle habitat is present then the USFWS may require additional studies including a visual bog turtle survey (Phase II Survey).

SURVEY METHODOLOGY

Analysis of aerial photography, the Buck County soil survey and SSURGO/NRCS mapping, and an onsite field survey were used to survey for potential bog turtle habitat. The field survey was conducted on foot and the entire property was searched. Wherever possible, inspections of adjacent property were performed from the periphery of the subject property. Copies of the Bog Turtle Habitat Field Data Sheet and photographs are attached as Attachments B and C, respectively.

BOG TURTLE RANGE AND HABITAT

Bog turtles occur discontinuously in western, central and southern New York, adjacent Connecticut and Massachusetts, New Jersey, Pennsylvania, northern Delaware and Maryland. A disjunct southern population occurs in southwestern Virginia, eastern Tennessee and western North Carolina (Conant 1975). The southern population is listed as threatened under the ESA as well due to similar appearance to the northern population; however, due to much less development and other anthropogenic stressors the southern population is stable and doing well.

In Pennsylvania, extant bog turtle populations are known from 15 counties including: Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill, and York. Populations have been extirpated from Philadelphia County and historic records occur for Mercer and Crawford Counties in western Pennsylvania.

The two most important characteristics of bog turtle are groundwater hydrology and soft, mucky substrates. Although open canopy wetlands with emergent vegetation are an important component of bog turtle habitats, recent radio telemetry and mark and recapture studies have demonstrated that a significant number of individual bog turtles spend considerable amounts of time outside this type of habitat. Generally, habitat for bog turtles include sunlit marshy meadows and fens; mucky forested and/or shrubby wetlands with areas of open canopy containing hummocky topography and emergent vegetation; mucky, groundwater fed cow pastures; cattail marshes and other emergent vegetated wetlands (USFWS 2001). Other characteristics of bog turtle habitat include clear, shallow, slow-moving rivulets or brooks (Conant 1975; Behler and King 1979; Ernst et al. 1994), subterranean tunnels and areas with root systems of shrubs and trees containing gentle persistent water flow and/or soft substrates.

In the herbaceous stratum general vegetative species that occur in bog turtle habitats can include but are not limited to: cattails (*Typha latifolia*, *T. angustifolia*), tussock sedge (*Carex stricta*), other sedge species (*Carex* spp., *Cyperus* spp., *Dulichium* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), spikerushes (*Eleocharis* spp.), spotted jewelweed (*Impatiens capensis*), skunk cabbage (*Symplocarpus foetidus*), both tearthumbs (*Polygonum sagittatum*, *P. arifolium*), rice cut-grass (*Leersia oryzoides*), sphagnum mosses (*Sphagnum* spp.) and other open canopy wetland species (Cromartie, et al. 1982). The scrub/shrub stratum usually contains Poison Sumac (*Toxicodendron vernix*), alders (*Alnus* spp.), willows (*Salix* spp.) dogwoods (*Cornus* spp.), sweetgale (*Myrica gale*), maleberry (*Lyonia ligustrina*), winterberry (*Ilex verticillata*) and stunted red maple (*Acer rubrum*) and Eastern red cedar (*Juniperus virginiana*). Common tree species often associated with bog turtle habitats include: E. red cedar, red maple, black and green ash (*Fraxinus nigra*, *F. pensylvanica*).

SITE DESCRIPTION

The site is located off Rich Hill Road in a rural section of Quakertown, Bucks County Pennsylvania west of Route 309. This portion of Pennsylvania is within the Piedmont Physiographic Province characterized by rolling lowlands, shallow valleys and isolated hills and underlined with mainly red shale, siltstone and sandstone; along with some limited areas of conglomerate and diabase bedrock (PA DCNR Open/Data website). A Project location map is provided as Attachment A.

The Quakertown site can be described as part of a large shallow valley within the floodplain of the Morgan Creek. The main Land Use within the surrounding area is agricultural and rural residential, however; only a short distance from the heavy commercial corridor of Route 309 within the developed portion of Quakertown.

One wetland area (Wetland WA) and three man-made ponds were identified on or adjacent to the site during wetland delineation for the project conducted in June and December 2017. Most of the wetlands associated with the site are on the northern portion of the site and comprised of a palustrine forested freshwater wetland (PFO). Upland early successional and agricultural fields are located on the southern portion of the site and although physical access to this part of the site was limited, via Google Earth it can be surmised that these upland areas continue offsite to the south to Rich Hill Road.

The remainder of the site includes a gravel access driveway, an existing compressor station serving an existing underground utility Right-of-Way (ROW) that bisects the site. In the general location of the existing compressor station, some upland early successional shrubs and small trees have established around the chain-link exclusion fence. The existing ROW cuts a 50 foot wide swath through the PFO and is maintained as early successional, dominated by herbaceous vegetation. A commercial drilling company, not associated with this project, is an inholding adjacent and downslope to the site and is served by the same existing gravel driveway. An existing single family residence and is also served by the gravel access driveway is adjacent to the site on the west.

Wetland WA

Wetland WA was walked entirely by foot on 12/13/17 and is comprised of a broad, nearly flat, palustrine forested freshwater wetland (PFO). Wetland WA is located almost entirely within the floodplain of the Morgan Creek and dominated by typical floodplain tree species such as, Pin Oak, Bur Oak, Swamp White Oak and Red Maple. The understory is sparsely vegetated with patches of Stout Woodreed being the only dominant herbaceous species. Wetland WA does not receive hydrology from groundwater and contains no mucky soils. The hydrology of Wetland WA appears to be derived from flooding of the Morgan Creek and surface water flow gathering in areas of depressions where the soil is too dense for permeability. The aforementioned utility ROW bisects the PFO and is maintained in early succession with herbaceous vegetation dominating the 50 foot wide linear opening. A disturbed area associated with the drilling company inholding contains a dense stand of *Phragmites*. There was no mucky soils or groundwater in this disturbed area.

The three onsite ponds mentioned in the site description are associated with Wetland WA and are located near the highest elevation of the wetland. At the time of the survey these ponds did not contain any aquatic or hydrophytic vegetation on the banks and should be classified as open waters. From the ponds, the wetland gently descends to the Morgan Creek. The wetland continues offsite across the Morgan Creek and was viewed peripherally, because not only is it offsite, but also the Morgan Creek was too deep to cross. Portions of the wetlands across the creek visually appear to be very similar to the wetlands onsite and other sections of the wetland appear to be flat, floodplain dominated by frequently flooded Reed Canarygrass. Generally, in the Piedmont Physiographic Province of Pennsylvania bog turtles do not occur in these types of habitats.

Overall, Wetland WA does not meet the three criteria of known bog turtle habitat. Even within the utility ROW where the vegetation is maintained in early succession, the soils are dense and nearly impermeable. Hydrology within the ROW and all of Wetland WA is not derived from groundwater. There were no soft, mucky substrates found anywhere within Wetland WA. Based upon the absence of all three bog turtle habitat criteria, Wetland WA is not classified as potential bog turtle habitat.

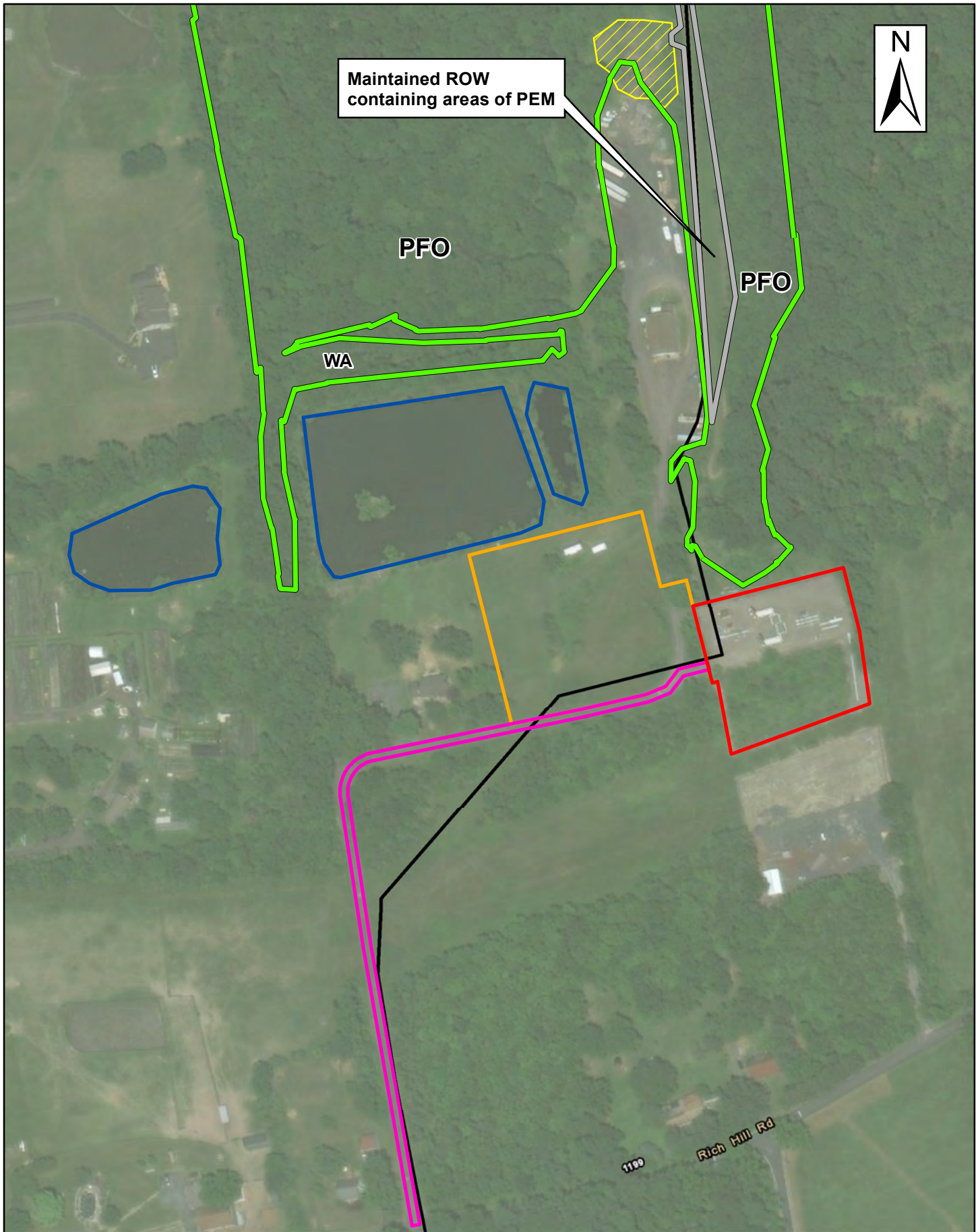
CONCLUSION

During a December 13, 2017 field survey a large single wetland (Wetland WA) was investigated for the presence of potential bog turtle habitat. Wetland WA was nearly all forested wetland, except for a 50 foot wide maintained utility ROW. There were no suitable soft mucky soils or groundwater hydrology located within Wetland WA.

Some of the adjacent properties were not able to be accessed at the time of this field survey. These properties will be investigated when access is granted. Therefore, this Phase 1 Bog Turtle Habitat Survey is limited to Wetland WA only. If other wetlands are identified in future visits they will be assessed at that time and a report of findings will be generated. However, based upon the field survey of Wetland WA, it is anticipated that there will be no direct or indirect impacts to bog turtles or potential bog turtle habitat as a result of this project within this wetland.

Attachment 1

Location Map



Wetlands	Quakertown Existing Access Road		ADELPHIA GATEWAY PROJECT PHASE I BOG TURTLE SURVEY MAP QUAKERTOWN STATION SITE BUCKS COUNTY, PENNSYLVANIA
Phragmites	Quakertown Temporary Workspace		
Waterbodies	EXISTING PIPELINE	0 100 200 400 Feet	
Quakertown Station Site	PFO - Forested Wetland PEM - Herbaceous Wetland		

Attachment 2

Field Datasheets

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form¹

(revised 06/01/2006)

Quakertown Site

Project/Property Name: _____

Project type: _____

Applicant/Landowner Name: _____

County: Bucks Quad: Quakertown Township/Municipality: QuakertownPNDI # _____ Potential conflict with USFWS species? . Y N**ACTION AREA²**Action area size: 1 acre Does the Phase 1 survey include all wetlands in the action area? Y N³WETLAND ID: WA PHOTOS TAKEN: Yes No WETLAND SIZE: _____ acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

 < 0.1 acre 0.1-0.5 acre > 0.5 to < 1 acre 1-2 acres 2-4 acres 5+ acres 10+ acresWETLAND LOCATION: Lat 40.406369° Long -75.348026°(approximate center of wetland) GPS Datum (check one): NAD 27 NAD 83 WGS 84**SURVEY CONDITIONS & LIMITATIONS**Date of survey: 12/13/17 Time In: 0800 Time Out: 1400Last precipitation: < 24 hours 1-7 days > 1 week unknown Drought conditions? Y N UnknownHow much of this wetland is located *off-site* (i.e., outside the property boundaries or right-of-way)?

- none of it – the entire wetland is within the property boundaries (skip next 2 questions)
 some of it – _____ acres or 50 % of the wetland appears to be located off-site

If part of this wetland continues *off-site*, how much of the *off-site portion* was surveyed (on foot)?

- none of it all of it part of it (50 % or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (e.g., from the subject property or from a public road)?

- all of it part of it (at least enough acres) none of it

Are there any wetlands located off-site and close enough to be affected by this project? Y N UnknownIf yes, *could* they be potential bog turtle habitat? Y N Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Mostly the forested floodplain of the Morgan Creek, agricultural fields, ponds, utility ROW/pump station and 1 residence.

WETLAND CHARACTERISTICSWetland type(s) present and % cover: PEM 5 PSS 5 PFO 80 POW 10 Y N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe
A few man-made ponds are adjacent to the wetlands which historically altered the hydrology. Y N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe
An existing underground utility ROW is maintained as herbaceous cover.

Project Name Adelphia Gateway Project _____ **Wetland WA (con't)**

Hydrology

- Y N Springs or seeps visible or likely? Watercress present? Yes No
- Y N Spring houses in or adjacent to wetland?
- Y N Saturated soils present? If yes, year-round? Likely Unlikely Unknown
- Y N Water visible on surface? Check all that apply: small puddles/depressions (____" deep)
- rivulets (____" deep) larger pools/ponds (____" deep)
- Y N Evidence of flooding? If yes, describe indicators The Morgan Creek floods part of the wetland based upon: moss trim-lines, backwater channels, soil deposits, drift lines, standing water.

Soils Mapping Unit (optional): _____ RWA Rowland Silt Loam 0-3% slopes
 Field observations confirm mapped type? YES NO Unknown

Soils – PEM Portion of Wetland			
<i>Mucky</i> ⁴ ? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	How much of it (PEM) is mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: _____ to _____"	Most of the mucky part(s) of the wetland can be probed ⁵ : <input type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"
<i>Non-mucky</i> ⁶ ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	How much of it (PEM) is non-mucky ? <input type="checkbox"/> <10% <input checked="" type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input checked="" type="checkbox"/> >70%		

Soils – PSS and PFO Portions of Wetland None			
<i>Mucky</i> ⁴ ? <input type="checkbox"/> YES <input type="checkbox"/> NO	How much of it is mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: _____ to _____"	Most of the mucky part(s) of the wetland can be probed ⁵ : <input type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- sedges rushes skunk cabbage cattail sweet flag jewelweed sphagnum moss
 - sensitive fern rice cutgrass tearthumb reed canary grass *Phragmites* purple loosestrife
 - alder dogwood red maple willow poison sumac multiflora rose Quercus palustris
- Additional dominant species: Q. bicolor, Q. macrocarpa, Cinna arundinacea

Herptiles

Were any bog turtles observed? YES⁷ NO If yes, how many? _____
 Other herptiles observed previously observed: Green frog observed during June 2017 site visit.

Additional Comments/Observations: (use additional sheets if necessary)

The soils within this wetland are heavy dense soils that hold water during inundation, and do not do not appear to receive groundwater saturation.

INVESTIGATOR'S OPINION

- YES NO UNSURE The hydrology criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The soils criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The vegetation criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Scott Angus

Investigator's Name (print) _____ Investigator's Signature _____ Date 12/13/17

Contact info: _____

ENDNOTES – Bog Turtle Habitat Evaluation Form

- 1 Non-agency field form, to be used by consultants with training and expertise in Phase 1 bog turtle surveys.
- 2 The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is included in the action area.
- 3 The Phase 1 survey should include all wetlands in the action area. Contact the USFWS if you have questions about the extent of the action area for a particular project.
- 4 Soils are considered “mucky” if one can probe them to a depth of ≥ 3 ".
- 5 Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a wooden broom handle).
- 6 Soils are considered “non-mucky” if one can probe them to a depth of < 3 ".
- 7 Report observations of bog turtles to the USFWS and PFBC within 48 hours.
- 8 See “BOG TURTLE HABITAT CRITERIA” (below)

BOG TURTLE HABITAT CRITERIA

Compare your Phase 1 survey observations to the habitat criteria below.

Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present. In some cases, the source of a wetland’s hydrology is difficult to determine because springs and seeps are not visible. However, the *influence* of springs and seeps will be apparent (*e.g.*, presence of saturated soils year-round).

Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species’ range, the soft substrate consists of scattered pockets of peat instead of muck. In the areas of the wetland where saturated soils are present, you will be able to probe them to a depth of at least 3 inches, but pockets of 5 to 12 inches are likely to be present. During drought conditions, the extent and depth of mucky soils may be dramatically reduced over non-drought conditions, with soft, saturated soils being limited to areas near springs or seeps.

Suitable vegetation. Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum* spp.), jewelweeds (*Impatiens* spp.), arrowheads (*Sagittaria* spp.), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum* spp.), other sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) or purple loosestrife (*Lythrum salicaria*). Common scrub-shrub species include alder (*Alnus* spp.), red maple (*Acer rubrum*), willow (*Salix* spp.), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

Attachment 3

Site Photographs



Photo A – Wetland WA adjacent to the north of the Quakertown Station Site.



Photo B – Wetland WA north of Photo A within the Morgan Creek Floodplain east of the ROW.



Photo C – Depicting floodplain forested wetland west of the ROW within Wetland WA.



Photo D – Some backwater areas of the Morgan Creek west of the ROW within Wetland WA.



Photo E – View west of the Morgan Creek west of the ROW.



Photo F – View east of the Morgan Creek west of the ROW.



Photo G – View north within the maintained ROW including the flooded Morgan Creek.



Photo H – View north of the maintained ROW approximately 150' south of Photo G.



Photo I – View south of the emergent wetland within the maintained utility ROW.



Photo J – View east from the ROW (near Photo I) of the floodplain forest within Wetland WA.



Photo K – View west of part of the disturbed Phragmites area adjacent to the utility ROW.



Photo L – View northwest of the largest pond associated with the site. The other two ponds are similar.

Skippack Meter Station Site Phase I Bog Turtle Report

INTRODUCTION

On December 14, 2017, biologist Scott Angus of NV5 performed a Phase I Bog Turtle Habitat Survey on the Skippack Site in a rural portion of Skippack, Montgomery County, Pennsylvania for the proposed Adelpia Gateway Project. Mr. Angus, is a USFWS Recognized Qualified Bog Turtle Surveyor in Pennsylvania and the northeast. Wetlands identified in proximity to the proposed Project property were evaluated in accordance with methodologies outlined in the US Fish and Wildlife Service's (USFWS) "Bog Turtle (*Glyptemys {Clemmys} muhlenbergii*) Northern Population Recovery Plan (May 2001, rev. March 2006)."

PURPOSE OF STUDY

The bog turtle's northern population has been listed as threatened by the USFWS under the Endangered Species Act (ESA) of 1973. USFWS guidelines require that surveys for bog turtle habitat (Phase I Bog Turtle Habitat Survey) be performed to determine if potential bog turtle habitat occurs in the vicinity of or within a proposed project limit, in a region where bog turtle habitat is known to be present. If potential bog turtle habitat is present then the USFWS may require additional studies including a visual bog turtle survey (Phase II Survey).

SURVEY METHODOLOGY

Analysis of aerial photography, the Montgomery County soil survey and SSURGO/NRCS mapping, and an onsite field survey were used to survey for potential bog turtle habitat. The field survey was conducted on foot and the entire property was searched. Wherever possible, inspections of adjacent property were performed from the periphery of the subject property. Copies of the Bog Turtle Habitat Field Data Sheets are attached.

BOG TURTLE RANGE AND HABITAT

Bog turtles occur discontinuously in western, central and southern New York, adjacent Connecticut and Massachusetts, New Jersey, Pennsylvania, northern Delaware and Maryland. A disjunct southern population occurs in southwestern Virginia, eastern Tennessee and western North Carolina (Conant 1975). The southern population is listed as threatened under the ESA as well due to similar appearance to the northern population; however, due to much less development and other anthropogenic stressors the southern population is stable and doing well.

In Pennsylvania, extant bog turtle populations are known from 15 counties including: Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill, and York. Populations have been extirpated from Philadelphia County and historic records occur for Mercer and Crawford Counties in western Pennsylvania.

The two most important characteristics of bog turtle are groundwater hydrology and soft, mucky substrates. Although open canopy wetlands with emergent vegetation are an important component of bog turtle habitats, recent radio telemetry and mark and recapture studies have demonstrated that a significant number of individual bog turtles spend considerable amounts of time outside this type of habitat. Generally, habitat for bog turtles include sunlit marshy meadows and fens; mucky forested and/or shrubby wetlands with areas of open canopy containing hummocky topography and emergent vegetation; mucky, groundwater fed cow pastures; cattail marshes and other emergent vegetated wetlands (USFWS 2001). Other characteristics of bog turtle habitat include clear, shallow, slow-moving rivulets or brooks (Conant 1975; Behler and King 1979; Ernst et al. 1994), subterranean tunnels and areas with root systems of shrubs and trees containing gentle persistent water flow and/or soft substrates.

In the herbaceous stratum general vegetative species that occur in bog turtle habitats can include but are not limited to: cattails (*Typha latifolia*, *T. angustifolia*), tussock sedge (*Carex stricta*), other sedge species (*Carex* spp., *Cyperus* spp., *Dulichium* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), spikerushes (*Eleocharis* spp.), spotted jewelweed (*Impatiens capensis*), skunk cabbage (*Symplocarpus foetidus*), both tearthumbs (*Polygonum sagittatum*, *P. arifolium*), rice cut-grass (*Leersia oryzoides*), sphagnum mosses (*Sphagnum* spp.) and other open canopy wetland species (Cromartie, et al. 1982). The scrub/shrub stratum usually contains Poison Sumac (*Toxicodendron vernix*), alders (*Alnus* spp.), willows (*Salix* spp.) dogwoods (*Cornus* spp.), sweetgale (*Myrica gale*), maleberry (*Lyonia ligustrina*), winterberry (*Ilex verticillata*) and stunted red maple (*Acer rubrum*) and Eastern red cedar (*Juniperus virginiana*). Common tree species often associated with bog turtle habitats include: E. red cedar, red maple, black and green ash (*Fraxinus nigra*, *F. pensylvanica*).

SITE DESCRIPTION

The site is located off Route 73/Skipack Pike in a rural section of Skipack, Montgomery County Pennsylvania. This portion of Pennsylvania is within the Piedmont Physiographic Province characterized by rolling lowlands, shallow valleys and isolated hills and underlined with mainly red shale, siltstone and sandstone; along with some limited areas of conglomerate and diabase bedrock (PA DCNR Open/Data website).

The Skipack site can be described as upland rolling hills. The main land use within the surrounding area is horse pasture, agricultural and rural residential, however; currently a mulch storage and landscape machinery storage area is located on a relatively small section of the site.

Two wetland areas (Wetlands WA and WB) were identified on the site during wetland delineations for the project conducted the same day (December 14, 2017). The wetlands associated with the site are small and Wetland WB is within a man-made drainage feature. Rolling upland early successional and agricultural fields are located on the north side of Route 73 along with the mulch/landscaping operation. This side of the road is the favored location of the proposed activities. On the south side of Route 73 a horse boarding/pasture operation is located, including infrastructure such as, fencing, gates, water troughs, gravel parking areas, drainage features, etc. The wetlands are depicted in Attachment A.

Wetland WA

Wetland WA was walked entirely by foot on 12/14/17. A light snow had fallen overnight, however; this did not impede the ability to assess the site. and is comprised of a broad, nearly flat, palustrine forested freshwater wetland (PFO). Wetland WA is located almost entirely within the floodplain of the Morgan Creek and dominated by typical floodplain tree species such as, Pin Oak, Bur Oak, Swamp White Oak and Red Maple. The understory is sparsely vegetated with patches of Stout Woodreed being the only dominant herbaceous species. Wetland WA does not receive hydrology from groundwater and contains no mucky soils. The hydrology of Wetland WA appears to be derived from flooding of the Morgan Creek and surface water flow gathering in areas of depressions where the soil is too dense for permeability. The aforementioned utility ROW bisects the PFO and is maintained in early succession with herbaceous vegetation dominating the 50 foot wide linear opening.

The three onsite ponds mentioned in the site description are associated with Wetland WA and are located near the highest elevation of the wetland. At the time of the survey these ponds did not contain any aquatic or exhibit hydrophytic vegetation on the banks and should be classified as open waters. From the ponds, the wetland gently descends to the Morgan Creek. The wetland continues offsite across the Morgan Creek and was viewed peripherally, because not only is it offsite, but also the Morgan Creek was too deep to cross. Portions of the wetlands across the creek visually appear to be very similar to the wetlands onsite and other sections of the wetland appear to be flat, floodplain dominated by frequently flooded Reed Canarygrass. Generally, in the Piedmont Physiographic Province of Pennsylvania bog turtles do not occur in these types of habitats.

Overall, Wetland WA does not meet the three criteria of known bog turtle habitat. Even within the utility ROW where the vegetation is maintained in early succession, the soils are dense and nearly impermeable. Hydrology within the ROW and all of Wetland WA is not derived from groundwater. There were no soft, mucky substrates found anywhere within Wetland WA. Based upon the absence of all three bog turtle habitat criteria, Wetland WA is not classified as potential bog turtle habitat.

Wetland WB

Wetland WB was walked entirely by foot on 12/14/17 and is a small (approximately 0.01 acres) man-made drainage feature, which due to siltation has become vegetated as a palustrine emergent freshwater wetland (PEM) with sections of open water. Wetland WB is located in a "crease" in the topography with a slight slope on the north and a more significant slope to the south. It appears that this "wetland" is isolated and is likely an oddly made drainage swale. Wetland WB is dominated by two invasive species, *Microstegium* and Reed Canarygrass. The banks of Wetland B is dominated by *Microstegium* and woody shrub species including, Multiflora Rose and Wineberry, Wetland WB does not receive hydrology from groundwater, the hydrology is from the a pipe, which is assumed to be draining from a pond that is approximately 300 feet to the east. Directly below the pipe outfall, there is a silty muddy, mucky area. This area extends about 20 feet into the wetland in a semi-circle with the pipe being the center point. This silty, muddy, mucky area is a result of silt draining to the wetland and settling there. Mucky soils were not found

elsewhere in Wetland WB and as you move west within Wetland B, it becomes more of an open water swale.

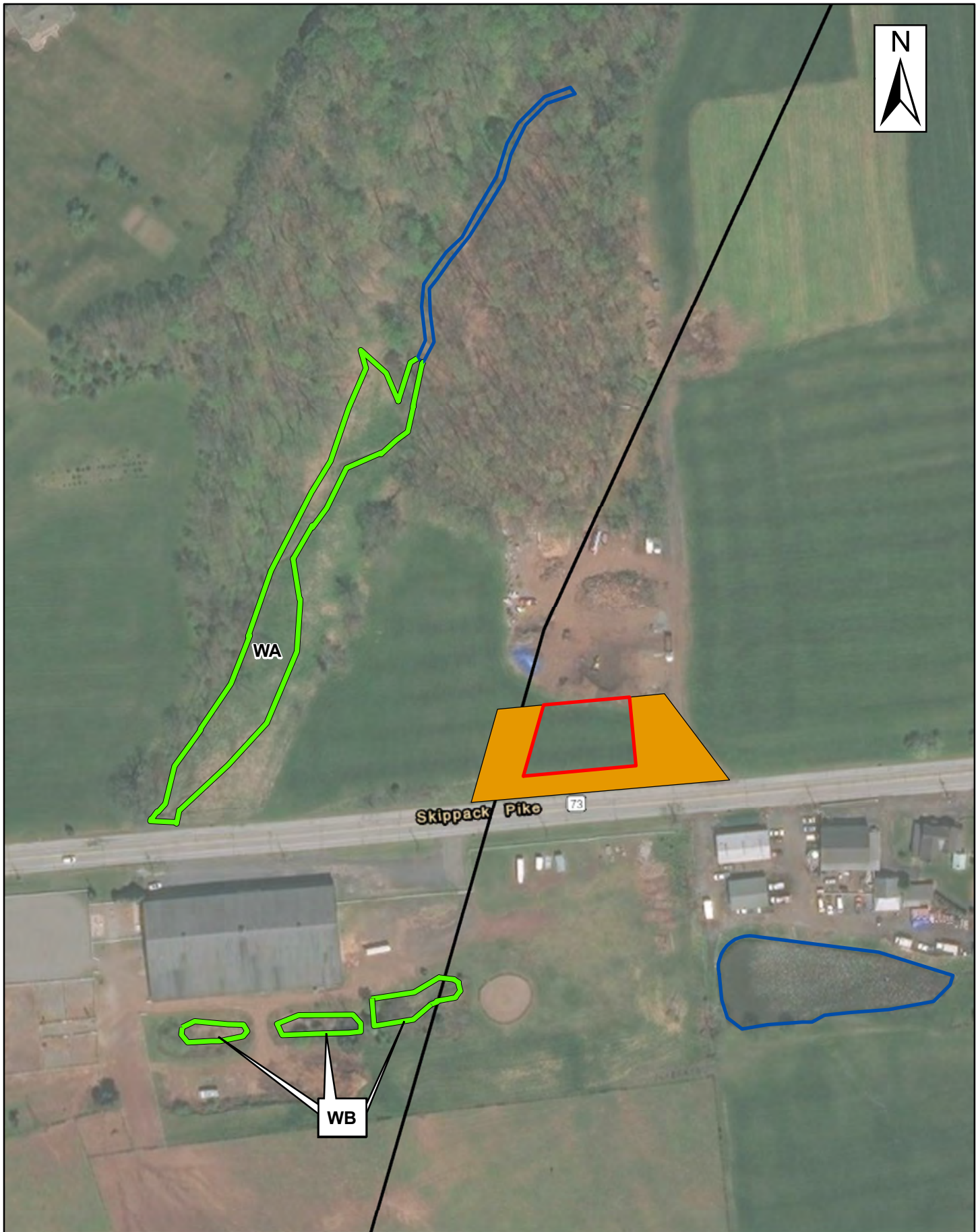
Overall, Wetland WB does not meet the criteria of known bog turtle habitat. It is the Qualified Bog Turtle Surveyor's opinion that although the substrates are soft and muddy/mucky, this criteria is reached in an uncharacteristic way for bog turtle habitat and is a result of man-made siltation and not saturation from groundwater. The wetland vegetation is herbaceous although it is dominated by two invasive species. It is understood that the presence or dominance of invasive species does not exclude wetlands from meeting the criteria of herbaceous vegetation, however; usually wetlands containing bog turtles and invasive species contain strong indicators of the other two criteria. Conversely, the two other criteria are absent or derived from man-made disturbance and thus would not be classified as "strong" criteria. Based upon the field survey, Wetland WB is not classified as potential bog turtle habitat. Field datasheets for the wetlands evaluated are presented in Attachment 2. Attachment 3 has photographs taken at the sites.






CONCLUSION

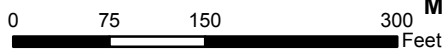
During a December 14, 2017 field survey two wetlands in proximity to the Project were investigated, WA and WB. Both wetlands exhibited one of the three criteria of potential bog turtle habitat; emergent vegetation. However, although Wetland WB superficially met the substrate criteria, this soft substrate area in the wetland is small and produced by anthropogenic influences. Wetland WB is a man-made drainage feature as a result of piped water apparently from a pond. Based upon these field surveys, it is anticipated that there will be no direct or indirect impact to bog turtles or potential bog turtle habitats within Wetlands WA or WB as a result of the project as proposed.

Attachment 1

Location Map



-  Wetlands
-  Waterbodies
-  Skippack Interconnect
-  Skippack Interconnect Temporary Workspace
-  EXISTING PIPELINE



**ADELPHIA GATEWAY PROJECT
PHASE I BOG TURTLE SURVEY MAP
SKIPPAK INTERCONNECT
MONTGOMERY COUNTY, PENNSYLVANIA**

Attachment 2

Field Datasheets

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form¹
(revised 06/01/2006)

Project/Property Name: Adelphia Skippack Site

Project type: _____

Applicant/Landowner Name: _____

County: Montgomery Quad: Phoenixville Township/Municipality: Skippack

PNDI # _____ Potential conflict with USFWS species? Y N

ACTION AREA²

Action area size: 1 acre Does the Phase 1 survey include all wetlands in the action area? Y N³

WETLAND ID: WA PHOTOS TAKEN: Yes No WETLAND SIZE: 0.12 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

< 0.1 acre 0.1-0.5 acre > 0.5 to < 1 acre 1-2 acres 2-4 acres 5+ acres 10+ acres

WETLAND LOCATION: Lat 40.242294° Long -75.448026°
(approximate center of wetland) GPS Datum (check one): NAD 27 NAD 83 WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 12/14/17 Time In: 0730 Time Out: 1200

Last precipitation: < 24 hours 1-7 days > 1 week unknown Drought conditions? Y N Unknown

How much of this wetland is located *off-site* (i.e., outside the property boundaries or right-of-way)?

- none of it – the entire wetland is within the property boundaries (skip next 2 questions)
 some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

- none of it all of it part of it (_____ % or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (e.g., from the subject property or from a public road)?

- all of it part of it (at least _____ acres) none of it

Are there any wetlands located off-site and close enough to be affected by this project? Y N Unknown

If yes, *could* they be potential bog turtle habitat? Y N Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Horse pasture, uplands, rolling hills, mulch/hardscaping storage area, corn field, fallow field

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: PEM 100% PSS _____ PFO _____ POW _____

Y N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe

Y N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Project Name Adelphia Skippack Site

Wetland WA (con't)

Hydrology

- Y N Springs or seeps visible or likely? Watercress present? Yes No
- Y N Spring houses in or adjacent to wetland?
- Y N Saturated soils present? If yes, year-round? Likely Unlikely Unknown
- Y N Water visible on surface? Check all that apply: small puddles/depressions (___" deep)
- Y N rivulets (___" deep) larger pools/ponds (___" deep)
- Y N Evidence of flooding? If yes, describe indicators flow marks, drift deposits

Soils Mapping Unit (optional): BwA Buckingham silt loam 0-3% slopes

Field observations confirm mapped type? YES NO Unknown

Soils – PEM Portion of Wetland			
<i>Mucky</i> ⁴ ? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	How much of it (PEM) is mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: _____ to _____"	Most of the mucky part(s) of the wetland can be probed ⁵ : <input type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"
<i>Non-mucky</i> ⁶ ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	How much of it (PEM) is non-mucky ? <input type="checkbox"/> <10% <input checked="" type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input checked="" type="checkbox"/> >70%		

Soils – PSS and PFO Portions of Wetland No PSS or PFO			
<i>Mucky</i> ⁴ ? <input type="checkbox"/> YES <input type="checkbox"/> NO	How much of it is mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: _____ to _____"	Most of the mucky part(s) of the wetland can be probed ⁵ : <input type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- sedges rushes skunk cabbage cattail sweet flag jewelweed sphagnum moss
 - sensitive fern rice cutgrass tearthumb reed canary grass *Phragmites* purple loosestrife
 - alder dogwood red maple willow poison sumac multiflora rose Polygonum perfoliatum
- Additional dominant species: Setaria pumila

Herptiles

Were any bog turtles observed? YES⁷ NO If yes, how many? _____

Other herptiles observed previously observed: none

Additional Comments/Observations: (use additional sheets if necessary)

This wetland appears to be formed from an intermittent stream upslope that when it periodically floods and when the floodwaters meet the road embankment, deposits hydric soils and remains wet long enough to form a wetland. However; this is not a bog turtle wetland even though the vegetation criterion is met.

INVESTIGATOR'S OPINION

- YES NO UNSURE The hydrology criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The soils criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The vegetation criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Scott Angus
Investigator's Name (print)

Investigator's Signature

12/14/17
Date

Contact info: _____

ENDNOTES – Bog Turtle Habitat Evaluation Form

- 1 Non-agency field form, to be used by consultants with training and expertise in Phase 1 bog turtle surveys.
- 2 The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is included in the action area.
- 3 The Phase 1 survey should include all wetlands in the action area. Contact the USFWS if you have questions about the extent of the action area for a particular project.
- 4 Soils are considered “mucky” if one can probe them to a depth of ≥ 3 ".
- 5 Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a wooden broom handle).
- 6 Soils are considered “non-mucky” if one can probe them to a depth of < 3 ".
- 7 Report observations of bog turtles to the USFWS and PFBC within 48 hours.
- 8 See “BOG TURTLE HABITAT CRITERIA” (below)

BOG TURTLE HABITAT CRITERIA

Compare your Phase 1 survey observations to the habitat criteria below.

Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present. In some cases, the source of a wetland’s hydrology is difficult to determine because springs and seeps are not visible. However, the *influence* of springs and seeps will be apparent (*e.g.*, presence of saturated soils year-round).

Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species’ range, the soft substrate consists of scattered pockets of peat instead of muck. In the areas of the wetland where saturated soils are present, you will be able to probe them to a depth of at least 3 inches, but pockets of 5 to 12 inches are likely to be present. During drought conditions, the extent and depth of mucky soils may be dramatically reduced over non-drought conditions, with soft, saturated soils being limited to areas near springs or seeps.

Suitable vegetation. Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum* spp.), jewelweeds (*Impatiens* spp.), arrowheads (*Sagittaria* spp.), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum* spp.), other sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) or purple loosestrife (*Lythrum salicaria*). Common scrub-shrub species include alder (*Alnus* spp.), red maple (*Acer rubrum*), willow (*Salix* spp.), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

USFWS / PFBC Bog Turtle Habitat Evaluation Field Form¹
(revised 06/01/2006)

Project/Property Name: Adelphia Skippack Site

Project type: _____

Applicant/Landowner Name: _____

County: Montgomery Quad: Phoenixville Township/Municipality: SkippackPNDI # _____ Potential conflict with USFWS species? Y N**ACTION AREA²**Action area size: 1 acre Does the Phase 1 survey include all wetlands in the action area? Y N³WETLAND ID: WB PHOTOS TAKEN: Yes No WETLAND SIZE: 0.1 acres

Wetland size estimation – If actual acreage is not known at time of investigation, check one:

 < 0.1 acre 0.1-0.5 acre > 0.5 to < 1 acre 1-2 acres 2-4 acres 5+ acres 10+ acresWETLAND LOCATION: Lat 40.241495° Long -75.447294°(approximate center of wetland) GPS Datum (check one): NAD 27 NAD 83 WGS 84**SURVEY CONDITIONS & LIMITATIONS**Date of survey: 12/14/17 Time In: 0730 Time Out: 1200Last precipitation: < 24 hours 1-7 days > 1 week unknown Drought conditions? Y N UnknownHow much of this wetland is located *off-site* (i.e., outside the property boundaries or right-of-way)?

- none of it – the entire wetland is within the property boundaries (skip next 2 questions)
 some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?

- none of it all of it part of it (_____ % or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (e.g., from the subject property or from a public road)?

- all of it part of it (at least _____ acres) none of it

Are there any wetlands located off-site and close enough to be affected by this project? Y N UnknownIf yes, *could* they be potential bog turtle habitat? Y N Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):

Horse pasture, uplands, rolling hills**WETLAND CHARACTERISTICS**Wetland type(s) present and % cover: PEM 90% PSS _____ PFO _____ POW 10% Y N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe
This wetland is a man-made and originates from an outfall (pipe) from an existing pond. Y N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe

Project Name Adelphia Skippack SiteWetland WB (con't)**Hydrology**

- Y N Springs or seeps visible or likely? Watercress present? Yes No
- Y N Spring houses in or adjacent to wetland?
- Y N Saturated soils present? If yes, year-round? Likely Unlikely Unknown
- Y N Water visible on surface? Check all that apply: small puddles/depressions (3" deep)
- rivulets (" deep) larger pools/ponds (12" deep)
- Y N Evidence of flooding? If yes, describe indicators _____

Soils Mapping Unit (optional): BwA Buckingham silt loam 0-3% slopesField observations confirm mapped type? YES NO Unknown

Soils – PEM Portion of Wetland			
<i>Mucky</i> ⁴ ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	How much of it (PEM) is mucky ? <input checked="" type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: <u>3</u> to <u>5</u> "	Most of the mucky part(s) of the wetland can be probed ⁵ : <input checked="" type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"
<i>Non-mucky</i> ⁶ ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	How much of it (PEM) is non-mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input checked="" type="checkbox"/> >70%	The muck comes from silt deposited at scour of outfall. Not typical substrate of known bog turtle habitat.	

Soils – PSS and PFO Portions of Wetland <u>None</u>			
<i>Mucky</i> ⁴ ? <input type="checkbox"/> YES <input type="checkbox"/> NO	How much of it is mucky ? <input type="checkbox"/> <10% <input type="checkbox"/> 10-29% <input type="checkbox"/> 30-49% <input type="checkbox"/> 50-70% <input type="checkbox"/> >70%	Mucky soils range in depth from: _____ to _____"	Most of the mucky part(s) of the wetland can be probed ⁵ : <input type="checkbox"/> 3-5" <input type="checkbox"/> 6-8" <input type="checkbox"/> 9-11" <input type="checkbox"/> ≥12"

Wetland Vegetation (characterize the wetland as a whole)

Check (X) if present (≥ 5% areal coverage), and also circle if dominant (≥ 20% coverage).

- sedges rushes skunk cabbage cattail sweet flag jewelweed sphagnum moss
- sensitive fern rice cutgrass tearthumb reed canary grass *Phragmites* purple loosestrife
- alder dogwood red maple willow poison sumac multiflora rose Microstegium vimineum
- Additional dominant species: Polygonum perfoliatum

HerptilesWere any bog turtles observed? YES⁷ NO If yes, how many? _____Other herptiles observed previously observed: None**Additional Comments/Observations:** (use additional sheets if necessary)

Although superficially this wetland meets the vegetative and muck criteria, it is not bog turtle habitat. The hydrology is derived from a pipe that originates from a man-made pond. Soft substrates at this location is silt deposited from the pipe, and not typical "bog turtle muck."

INVESTIGATOR'S OPINION

- YES NO UNSURE The hydrology criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The soils criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE The vegetation criterion⁸ for bog turtle habitat is met.
- YES NO UNSURE This wetland is potential bog turtle habitat.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Scott Angus

Investigator's Name (print)

Investigator's Signature

12/14/17

Date

Contact info: _____

ENDNOTES – Bog Turtle Habitat Evaluation Form

- 1 Non-agency field form, to be used by consultants with training and expertise in Phase 1 bog turtle surveys.
- 2 The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is included in the action area.
- 3 The Phase 1 survey should include all wetlands in the action area. Contact the USFWS if you have questions about the extent of the action area for a particular project.
- 4 Soils are considered “mucky” if one can probe them to a depth of ≥ 3 ".
- 5 Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a wooden broom handle).
- 6 Soils are considered “non-mucky” if one can probe them to a depth of < 3 ".
- 7 Report observations of bog turtles to the USFWS and PFBC within 48 hours.
- 8 See “BOG TURTLE HABITAT CRITERIA” (below)

BOG TURTLE HABITAT CRITERIA

Compare your Phase 1 survey observations to the habitat criteria below.

Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present. In some cases, the source of a wetland’s hydrology is difficult to determine because springs and seeps are not visible. However, the *influence* of springs and seeps will be apparent (*e.g.*, presence of saturated soils year-round).

Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species’ range, the soft substrate consists of scattered pockets of peat instead of muck. In the areas of the wetland where saturated soils are present, you will be able to probe them to a depth of at least 3 inches, but pockets of 5 to 12 inches are likely to be present. During drought conditions, the extent and depth of mucky soils may be dramatically reduced over non-drought conditions, with soft, saturated soils being limited to areas near springs or seeps.

Suitable vegetation. Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum* spp.), jewelweeds (*Impatiens* spp.), arrowheads (*Sagittaria* spp.), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum* spp.), other sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) or purple loosestrife (*Lythrum salicaria*). Common scrub-shrub species include alder (*Alnus* spp.), red maple (*Acer rubrum*), willow (*Salix* spp.), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

Attachment 3

Site Photographs



Photo A – View west from uplands towards Wetland WA.



Photo B – View south of Wetland WA Route 73 is in the background.



Photo C – View north along the slope to the east of Wetland WA.



Photo D – View east upslope from Wetland WA.



Photo E – View northeast of the mulch/landscaping operation adjacent to the proposed work.



Photo F – View north of an upland agricultural field east of the mulch/landscaping operation.



Photo G – View southwest of the location of the proposed work.



Photo H – View west along Route 73 looking towards Wetland WA.



Photo I – View west of the silted in area of Wetland WB. Note open water in background.



Photo J – View southwest of Wetland WB where it becomes more open water/ponded with wet edge..



Photo K – View east of upland pasture east of Wetland WB. The pond is near the three trees ahead.



Photo L – View east of the pond that it is assumed that the pipe that feeds Wetland WB originates.

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