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PennEast Pipeline Company, LLC
One Meridian Boulevard, Suite 2C01
Wyomissing, PA 19610

July 31, 2015

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

Re: PennEast Pipeline Company, LLC, Docket No. PF15-1-000
Draft Resource Reports 1, 8, 9 and 10 and Appendices A, F, L and P

Dear Ms. Bose:

On October 10, 2014, the Director of the Office of Energy Projects issued a letter in the above-referenced docket approving the request of PennEast Pipeline Company, LLC ("PennEast") to commence the Federal Energy Regulatory Commission's ("Commission") Pre-filing Review Process of its proposed PennEast Pipeline Project ("Project"). PennEast herewith submits draft Resource Reports 1, 8, 9 and 10, as well as draft Appendices A, F, L and P.

Appendix F contains private citizens' privileged contact information and is therefore submitted as privileged and confidential with each page marked "Contains Privileged Information – Do Not Release." Privileged information should be treated as confidential and is for Commission Staff use only and not to be released to the public.[1] Questions pertaining to confidential information may be submitted to:

Frank Markle
Senior Counsel
PennEast Pipeline Company, LLC
One Meridian Boulevard
Suite 2C01
Wyomissing, PA 19610
Telephone: 610-373-7999, ext. 183
Facsimile: 610-992-3258

[1] 18 C.F.R. § 388.112(b) (2015).

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Should you have any questions concerning this request, please contact me at (610) 406-4322.

Sincerely,

/s/ Anthony C. Cox
Anthony C. Cox
PennEast Pipeline Company, LLC,
By its Project Manager
UGI Energy Services, LLC

cc: Medha Kochhar (FERC)

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PennEast Pipeline Project

REVISED DRAFT
FERC Section 7(c) Application
Resource Reports 1, 8, 9 and 10

FERC Docket No. PF15-1-000

Volume II-A

"PUBLIC"

July 2015

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PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

RESOURCE REPORT 1

General Project Description

FERC Docket No. PF15-1-000

Revised Draft

July 2015

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Resource Report 1 – General Project Description
FERC Environmental Checklist

PART 380-APPENDIX A MINIMUM FILING REQUIREMENTS FOR ENVIRONMENTAL REPORTS	COMPANY COMPLIANCE OR INAPPLICABILITY OF REQUIREMENT
☐ Provide a detailed description and location map of the Project facilities. (§380.12(c) (1))	Sections 1.2, 1.2.1, 1.2.2 and 1.2.3; Figure 1.2-1a
☐ Describe any non-jurisdictional facilities that would be built in association with the Project. (§380.12(c) (2))	Section 1.10; Figure 1.2-1a
☐ Provide current original U.S. Geological Survey (USGS) 7.5-minute series topographic maps with mile posts showing the Project facilities. (§380.12(c) (3)).	Appendix A
☐ Provide aerial images or photographs or alignment sheets based on these sources with mile posts showing the Project facilities. (§380.12(c) (3)).	Figure 1.2-1a and Appendix C
☐ Provide plot/site plans of compressor stations showing the location of the nearest noise-sensitive areas (NSA) within 1 mile. (§380.12(c) (3,4)).	Appendix B
☐ Describe construction and restoration methods. (§380.12(c) (6)).	Section 1.5, Appendix E and Resource Report 2
☐ Identify the permits required for construction across surface waters. (§380.12(c) (9)).	Section 1.7 and Table 1.7-1
☐ Provide the names and addresses of all affected landowners and certify that all affected landowners would be notified as required in §157.6(d). (§§380.12(a)(4) and (c) (10)).	Section 1.8 and Appendix F
Additional Information Often Missing and Resulting in Data Requests	
☐ Describe all authorizations required to complete the proposed action and the status of applications for such authorizations.	Section 1.7
☐ Provide Plot/site plans of all other aboveground facilities that are not completely within the right-of-way.	Provided
☐ 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. See Resource Report 8.	Provided
☐ Summarize the total acreage of land affected by construction and operation of the project.	Table 1.3-4
☐ If Resource Report 5, Socioeconomics is not provided, provide the start and end dates of construction, the number of pipeline spreads that would be used, and the workforce per spread.	Provided
☐ Send two (2) additional copies of topographic maps and aerial images/photographs directly to the environmental staff of the Office of Energy Projects (OEP).	Provided

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INVENTORY OF SELECTED DELAWARE RIVER BASIN WATER RESOURCES FEATURES	COMPANY COMPLIANCE OR ENVIRONEMTAL REPORT LOCATION
☐ Total Project length	Section 1.2
☐ Total area of disturbance	Section 1.3
☐ Temporary area of disturbance and additional temporary workspace (ATWS)	Section 1.3
☐ Permanent area disturbance	Section 1.3
☐ Pipe yard areas	Section 1.3
☐ Access road areas	Section 1.3
☐ Average width of temporary and permanent disturbance	Section 1.3
☐ Average width of final new rights of way (with or without co-location)	Section 1.3
☐ Ratio of average width of new rights of way to average outside pipe diameter	Section 1.3
☐ Length of co-locations	Section 1.3
☐ Project length in the DRBC SPW watersheds	Section 1.2 and Resource Report 2
☐ Total area of disturbance in DRBC SPW watersheds	Section 1.3
☐ Temporary area of disturbance and ATWS in DRBC SPW watersheds	Section 1.3
☐ Permanent area of disturbance in DRBC SPW watersheds	Section 1.3
☐ Pipe yard areas in DRBC SPW watersheds	Section 1.3
☐ Access road area in DRBC SPW watersheds	Section 1.3

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Appendix A USGS Topographic Maps

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Appendix D USFWS Wetland Inventory Maps

Appendix E Erosion and Sedimentation Control Plan (E&SCP)

Appendix F Names and Addresses of Affected Landowners and Stakeholders

Appendix G Agency and Stakeholder Correspondence

Appendix H Spill Prevention, Control, and Countermeasure (SPCC) Plan and Unanticipated Discovery of Contaminated Soils Standard Operating Procedures (SOP)

Appendix I Wetland Delineation Reports

Appendix J Cultural Resource Survey Reports

Appendix K Unanticipated Discoveries Plan

Appendix L Air and Noise Appendices

Appendix M Economic Impact Report and Analysis: PennEast Pipeline Project Economic Impact Analysis

Appendix N Energy Market Savings Report and Analysis

Appendix O Geotechnical Overview Report

Appendix P Reroute Analysis Tables and Figures

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Master List of Acronyms and Abbreviations

AC	alternating current
ACHP	Advisory Council on Historic Preservation
Algonquin	Algonquin Gas Transmission, LLC
AMSL	above mean sea level
APE	area of potential effect
API	American Petroleum Institute
AQCR	Air Quality Control Regions
ASME	American Society of Mechanical Engineers
ATWS	additional temporary workspace
BACT	best available control technology
BAT	best available technology
BGS	below ground surface
BMP	best management practice
BREC	Bedford Rural Electric Cooperative
BTGS	Bureau of Topographic and Geologic Survey
CAA	Clean Air Act of 1970
CEII	Critical Energy Infrastructure Information
Census	U.S. Census Bureau
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2eq}	carbon dioxide equivalents
CPG	Columbia Pipeline Group
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CWF	coldwater fishes
dB	decibel
dBA	A-weighting filter decibel
DIL	dynamic insertion loss
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day

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E&SCP	Erosion and Sedimentation Control Plan
EA	Environmental assessment
E/C	equipment/component
ECP	environmental construction plan
EFH	essential fish habitat
EGM	environmental gas monitor
EI	Environmental inspector
EIS	Environmental impact statement
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
ERNS	Emergency Response Notification Site
ESA	Endangered Species Act
ESCGP	Erosion and Sediment Control General Permit
ESD	emergency shutdown
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
FERC	Federal Energy Regulatory Commission
FMV	fair market value
ft	feet/foot
g/hp-hr	grams per horsepower-hour
GHG	Greenhouse gas
GP	General Permit
gpm	gallons per minute
HAP	hazardous air pollutant
HDD	horizontal directional drill
hp	horsepower
HUC	hydrologic unit code
HVAC	heating, venting, and air conditioning
Hz	Hertz
IMP	integrity management program
kW	kilowatts
L10	Sound level exceeded 10 percent of the measurement period
L90	Sound level exceeded 90 percent of the measurement period
LAER	lowest achievable emission rate
L_{dn}	Day-night sound level

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L_{eq}	Equivalent sound level
lbs	pounds
LNG	liquefied natural gas
Lp	sound pressure level
Lw	sound power level
Lxx	Sound level where xx is percentile of time sound level exceeded
µg/m3	microgram per cubic meter
M&R	metering and regulating
MACT	maximum achievable control technology
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
Memorandum	Memorandum of Understanding on Natural Gas Transportation Facilities
MMDth/d	million dekatherms per day
MF	migratory fishes
mg/l	milligrams per liter
MLV	mainline valve
MMBtu/hr	one million British thermal units per hour
MOA	Memorandum of Agreement
MP	mile post
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NDE	non-destructive examination
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NFRAP	No Further Remedial Action Plan
NGA	Natural Gas Act
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NNSR	non-attainment new source review
NOI	Notice of Intent to Prepare an Environmental Impact Statement
NO_2	nitrogen dioxide
NO_x	nitrogen oxide compounds
NPDES	National Pollutant Discharge Elimination System

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NPL	National Priorities Listed
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	new source performance standards
NSR	new source review
NTU	nephelometric turbidity units
NWI	National Wetland Inventory
NWSRS	National Wild and Scenic Rivers System
O&M	operation and maintenance
O_3	ozone
O.B.	octave-band
OBL	obligate
OD	outside diameter
OEP	Office of Energy Projects
O&M	Operations & Maintenance
OPP	over pressure protection
OSD	Official Soil Series Description
OTR	Northeast Ozone Transport Region
PA	Pennsylvania
DCNR	Pennsylvania Department of Conservation of Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PADOT	Pennsylvania Department of Transportation
PANHP	Pennsylvania National Heritage Program
PAR	permanent access road
Pb	lead
pcf	pound-force per cubic foot
PCPI	per capita personal income
PCR	power control room
PEM	palustrine emergent marsh
PennEast	PennEast Pipeline Company, LLC
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PGC	Pennsylvania Game Commission
PHMC BHP	Pennsylvania Historical and Museum Commission Bureau for Historic Preservation
PHMSA	Pipeline and Hazardous Materials Safety Administration

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Plan	FERC Upland Erosion Control, Revegetation, and Maintenance Plan
PM	particulate matter
$PM_{2.5}$	particulate matter sized 2.5 microns and smaller
PM_{10}	particulate matter sized 10 microns and smaller
ppb	parts-per-billion
PPC	Preparedness, Prevention, and Contingency Plan
ppm	parts-per-million
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	PennEast Pipeline Project
PSD	prevention of significant deterioration
PSE&G	Public Service Electric and Gas
psi	pounds per square inch
psig	pounds per square inch gauge
PSS	palustrine scrub-shrub
PTE	potential-to-emit
PWL	sound power level
RACT	reasonably available control technology
RCRA	Resource Conservation and Recovery Act
RFD	Request for Determination of Requirement for Plan Approval/ Operating Permit
RICE	Reciprocating Internal Combustion Engines
ROW	right-of-way
Secretary	Secretary of the Commission
sf	service factor
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SPL	sound pressure level
SR	State Route
SSA	Sole Source Aquifer
SSURGO	Soil Survey Geographic Database
STP	shovel test pit
SWL	solid waste landfill
T&E	threatened and endangered
TAR	temporary access road
Texas Eastern	Texas Eastern Transmission, LP

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THPO	Tribal Historic Preservation Officers
TMDL	total maximum daily load
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company LLC
Tcf	Trillion Cubic Feet
TSF	trout stocking fishery
UPL	upland
UPS	uninterruptible power supply
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USDOC	U.S. Department of Commerce
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VDC	volts direct current
VFD	variable frequency drive
VOC	volatile organic compound
WSS	Web Soil Survey
WWF	warmwater fisheries

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1.0 GENERAL PROJECT DESCRIPTION

PennEast Pipeline Company, LLC (PennEast) will be seeking authorization from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act for the construction and operation of the PennEast Pipeline Project (PennEast Project or Project) to be located in Pennsylvania and New Jersey. PennEast designed its Project to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production region in eastern Pennsylvania to growing natural gas markets in eastern and southeastern Pennsylvania, New Jersey and surrounding states.

This Environmental Report (ER) has been prepared in accordance with FERC Order Nos. 603, et seq., which govern the filing of the ER portion of applications for Certificates of Public Convenience and Necessity, authorizing the construction and operation of facilities to provide service under Section 7 of the NGA.

The PennEast Project application (Application) and associated ER will be organized into four volumes, in compliance with FERC's document control requirements for Public, Critical Energy Infrastructure Information (CEII), and Privileged and Confidential classes of information. The ER along with the CEII and confidential Application exhibits will be contained in Volumes II-IV and outlined below. The Application text and related public exhibits will be included as Volume I.

Public – Volume I

- Application
- Public Exhibits, Except F-1 (A, B, C, D, F, H, J, K, L, M, N, P, Z-1)
- Volume II-A
- Resource Reports 1-12
- Volume II-B
- Appendices A, C, D, E, G1, G2, H, I, K, and L

Privileged and Confidential – Volume III

- Appendix F – Landowner and Stakeholder Lists
- Appendix J – Cultural Resource Survey Reports

Exhibit I – CEII – Volume IV

- Appendix B - Plot Plans
- Appendix L (excerpts)
- Exhibits G, G-I, and G-II

Resource Report 1 includes the purpose and need for the Project, the locations and descriptions of proposed facilities, and the expected land requirements associated with construction and operation of the Project. In addition, this Resource Report contains information regarding the proposed construction and right-of-way (ROW) restoration procedures, operation and maintenance (O&M) practices, the permits and approvals required to construct and operate the Project, landowner notification information, any potential plans for future expansion or abandonment of the proposed facilities, proposed non-jurisdictional facilities, and a cumulative impacts analysis.

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1.1 Purpose and Need

PennEast proposes to construct, install and operate the Project facilities to provide approximately 1.0 MMDth/d of year-round transportation service from northern Pennsylvania to markets in eastern and southeastern Pennsylvania, New Jersey and surrounding states.

The Project is designed to provide a long-term solution to bring the lowest cost natural gas available in the country produced in the Marcellus Shale region in eastern Pennsylvania to homes and businesses in New Jersey, Pennsylvania and adjacent states. The Project facilities include a 36-inch diameter, 113.8-mile mainline pipeline, extending from Luzerne County, Pennsylvania, to Mercer County, New Jersey. The Project will extend from various receipt point interconnections in the eastern Marcellus region, including interconnections with Transcontinental Gas Pipe Line Company, LLC (Transco) and gathering systems operated by Williams Partners L.P., Energy Transfer Partners, L.P. (formerly Regency Energy Partners, LP), and UGI Energy Services, LLC, all in Luzerne County, Pennsylvania, to various delivery point interconnections in the heart of major northeastern natural gas-consuming markets, including interconnections with UGI Central Penn Gas, Inc. (Blue Mountain) in Carbon County, Pennsylvania, UGI Utilities, Inc. and Columbia Pipeline Group (CPG) in Northampton County, Pennsylvania, and Elizabethtown Gas, NRG REMA, LLC, Texas Eastern Transmission, LP (Texas Eastern) and Algonquin Gas Transmission, LLC (Algonquin), all in Hunterdon County, New Jersey. The terminus of the proposed PennEast system will be located at a delivery point with Transco in Mercer County, New Jersey.

The Project was developed in response to market demands in New Jersey and Pennsylvania, and interest from shippers that require transportation capacity to accommodate increased demand and greater reliability of natural gas in the region. The Project will include a new pipeline and aboveground facilities that will provide a new source of natural gas supply from the Marcellus Shale producing region to New Jersey, Pennsylvania and surrounding states enhancing the region's supply diversity. The Project is designed to provide a new pipeline to serve markets in the region with firm, reliable access to the Marcellus supplies versus the traditional, more costly Gulf regional supplies and pipeline pathways. An additional supply of natural gas to the region will provide a benefit to consumers, utilities and electric generators by providing enhanced competition among suppliers and pipeline transportation providers. The Project will satisfy the needs of shippers seeking (i) additional supply flexibility, diversity and reliability; (ii) liquid points for trading in locally produced gas from Marcellus & Utica Shale; (iii) direct access to premium markets in the northeast and mid-Atlantic regions; (iv) the ability to capture pricing differentials between the various interconnected market pipelines; (iv) enhanced natural gas transportation system reliability to the region with modern, state-of-the art facilities and (v) firm access to currently the most affordable long-lived dry gas reserves. The Project will provide shippers additional opportunities to buy and sell supplies and to transport natural gas to where it is needed and valued most. The Project also offers shippers a reliable, short-haul transportation option for direct access to Marcellus Shale natural gas supplies absent several risks associated with long-haul pipelines originating and traversing other regions of the country.

PennEast held an Open Season for the Project from August 11, 2014, to August 29, 2014, and has executed long–term, binding precedent agreements with 12 shippers for approximately 99 percent of the firm transportation capacity to be created by the Project. A complete list of these shippers is identified in Table 1.1-1. As such, the Project is fully consistent with the Commission's Statement of Policy on the Certification of New Interstate Natural Gas Pipeline Facilities. PennEast continues to negotiate with other potential shippers, the combination of which could fully subscribe the capacity of the proposed Project facilities. Notably, a majority of the Project shippers are regional electricity generators and local natural gas distribution companies.

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Table 1.1-1
PennEast Customers and Transportation Capacity Subscribed to the Project

Shipper	Transportation Contract Quantity (Dth/Day)
New Jersey Natural Gas Company	180,000
PSEG Power LLC	125,000
Texas Eastern Transmission	125,000
South Jersey Gas Company	105,000
Consolidated Edison Company	100,000
Pivotal Utility Holdings, Inc. (d/b/a Elizabethtown Gas)	100,000
UGI Energy Services, LLC	100,000
Cabot Oil & Gas Corporation	50,000
Talen Energy Marketing, LLC	50,000
Enerplus Resources (USA) Corporation	30,000
Warren Resources, Inc.	15,000
NRG REMA LLC	10,000
Total	**990,000**

As is demonstrated by the make-up of the Project shippers, the PennEast Project is primarily driven by the demand markets. Several of the Project shippers have provided PennEast with information regarding their rationale for committing to Project capacity so that PennEast could provide that information in this Resource Report 1. PennEast provides this information below:

New Jersey Natural Gas

Following Superstorm Sandy, New Jersey Natural Gas undertook a comprehensive initiative to increase the reliability of its distribution system. As a result, New Jersey Natural Gas intends to receive natural gas from additional supply points to eliminate single points of failure. PennEast will provide stable, low-cost natural gas that will provide supply and pipeline diversity to New Jersey Natural Gas for Monmouth and Ocean counties. PennEast also provides an opportunity for New Jersey Natural Gas to restructure its gas supply portfolio.

Pivotal Utility Holdings, Inc. (d/b/a Elizabethtown Gas)

Elizabethtown Gas (ETG) has both a current need and a long-term planning need for new capacity in New Jersey. The PennEast Project provides a unique option to economically increase the reliability of firm pipeline transportation in a market area where the availability of new pipeline and peak shaving capacity is constrained. More direct-connected interstate supply options allows for less reliance on the continued addition of supplemental on-system peak shaving facilities or the use of third-party, delivered peaking supplies to meet growing firm customer demand. Additionally, service from PennEast will increase ETG's system reliability. Existing interstate natural gas pipelines to the northwest portion of Elizabethtown's territory are fully subscribed and recent expansions have been costly. PennEast will deliver to the northwestern portion of ETG's system thereby significantly reducing, if not eliminating, the need to rely on third parties for bundled, city-gate delivered supplies.

ETG has subscribed to service from PennEast to increase supply diversification for ETG's current customers, and to provide capacity from new sources to serve the immediate and long-term growth in

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ETG's service territory. Service from PennEast will provide an important new source of firm gas supply that can also help ETG extend service to more communities as significant opportunities develop. In an effort to extend gas service to more customers, over the next three years, ETG intends to work with local municipal and county officials, local and state economic development authorities, community leaders and the New Jersey Board of Public Utilities to find affordable solutions that will allow ETG to extend additional service within communities near the PennEast Project.

PSEG Power LLC

PSEG as the largest utility in New Jersey, and one of the largest buyers of Marcellus Shale supplies in the northeast, intends to utilize the supplies of gas from the proposed PennEast Project to displace more expensive supplies of gas from the Gulf of Mexico. PSEG has utilized supply from the shale region over the last several years to lower retail gas rates to its residential gas customers resulting in these customers having the lowest retail rates in New Jersey. The PennEast Project will provide additional lower cost, reliable supplies from Pennsylvania that will support these lower rates. In addition, the PennEast Project will be utilized to meet the needs of the PSEG gas-fired generation fleet during times of the year when the capacity is surplus to the residential customer. Finally, the physical layout of the PennEast Project, with direct connections to Transco and Texas Eastern in New Jersey, will provide additional operational flexibility for the PSEG distribution system allowing multiple downstream deliveries based on need and economics.

South Jersey Gas Company

The PennEast Project will provide a new natural gas supply from a stable low cost source displacing supplies which have been subject to extreme price volatility. This became very apparent during the 2013-14 and 2014-15 winter seasons when the Northeast market experienced unprecedented price spikes. Unparalleled high commodity costs were ultimately passed on to consumers. The PennEast Project looks to leverage South Jersey Gas Company's (South Jersey) close proximity to Marcellus production and create a lower, more stable price environment which will benefit all South Jersey customers.

South Jersey's capacity portfolio is uniquely positioned to take advantage of the Project because the Company currently has interstate pipeline capacity with a receipt point very close to the terminus of the PennEast Project. These conditions will allow for the displacement of supplies that could be very expensive with much lower, secure supply prices. Acquisition of PennEast capacity will allow South Jersey to restructure its capacity portfolio to further lower overall costs to its Basic Gas Supply Service customers. PennEast will also provide additional operational flexibility and reliability for South Jersey by connecting South Jersey's distribution system to an additional upstream pipeline. The available capacity will provide lower commodity costs, which will feed new load into the South Jersey distribution system, including several natural gas-fired power plants. The project also falls completely in line with the goals of New Jersey's Energy Master Plan.

Texas Eastern Transmission, LP

The PennEast Project provides Texas Eastern with direct access to the eastern Marcellus, which allows Texas Eastern to increase supply diversity and optionality for its shippers and for markets that it serves in the region.

UGI Energy Services, LLC

UGI Energy Services is one of the largest gas marketers in the Mid-Atlantic and serves a significant number of industrial and commercial customers on 33 different LDCs. The PennEast Project will provide UGI Energy Services with greater access to the gas production region of the Marcellus Shale, which will be used to support service and provide more competitive costs to retail customers.

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As described further in Resource Report 10, PennEast evaluated using existing interstate pipelines in the area as alternatives to the PennEast Project; however, such pipelines would not have the ability to satisfy the purpose and need of the PennEast Project and otherwise would not provide suitable alternatives for the Project.

A review of the Annual Energy Outlook 2014 (Energy Information Administration [EIA] 2014) reference case indicates that natural gas consumption will rise from 25.6 trillion cubic feet (Tcf) in 2012 to 31.6 Tcf in 2040.

The pipeline capacity that PennEast will create will not simply provide additional supply to the nearby markets; it will provide new supply sources as well. The winter of 2013-14 demonstrated that there were significant constraints in the natural gas supply system created by a combination of increased demand from residential, commercial and industrial conversions; cold weather affecting traditional demand; and new natural-gas fired power generation. While natural gas prices have steeply declined over the last several years, critical links between supply and demand, particularly on days where demand is highest, led to unprecedented spikes in the cost of natural gas and electricity for the market region as illustrated in Figure 1.1-1. Figure 1.1-2 highlights the high price increases experienced during the 2013-2014 winter. While the extreme pricing events of the 2013-2014 winter were not as significant in the 2014-2015 winter for a number of external factors, (such as lower oil prices, relative timing of the colder weather during the winter, etc.) the sustained difference between natural gas prices in the northeast Pennsylvania production region and the market regions served by the Project were significant and lasted longer. This is shown in Figure 1.1-3. The blue line represents basis pricing in the production region relative to Henry Hub, and the red line shows basis pricing in the market region. The green line shows the difference, or the opportunity for savings for consumers if the inexpensive supply could be efficiently accessed. The line of best fit demonstrates the trend of increasing opportunity for savings. It should be noted that some of the external factors, such as lower oil prices, represent temporary conditions that, if reversed, could have a devastating impact on energy supply to the markets served by the Project.

The lack of a new pipeline with access to supply sources in Pennsylvania will continue to create dramatic seasonal price fluctuations in New Jersey and Pennsylvania with higher gas and electric rates and an increased potential for energy shortages during peak demand, resulting in threats to business continuity, public safety and national security. Failure to add critical new infrastructure will also prevent these markets from fully realizing the economic benefit of lower-cost energy supply. Continued increases in demand for natural gas across all market sectors, particularly for natural gas-fired power generation and transportation, will further exacerbate this problem or otherwise not be met if new infrastructure is not constructed. Higher energy prices reduce disposable income for residents, decrease competitiveness for businesses and increase taxes. Accordingly, the Project is designed to bring the lowest cost natural gas available in the country to homes and businesses and to provide low-cost fuel to power generation that supplies New Jersey, Pennsylvania and surrounding states well beyond the Project footprint. Figures 1.1-4 and 1.1-5 illustrate the growing importance of natural gas fired generation expected on the electric system between 2012 and 2040 that will significantly contribute to an increased demand for natural gas. Figure 1.1-6 shows the PJM capacity fuel mix as of December 1, 2014. Further, the proposed Project will help to spur economic growth in New Jersey, Pennsylvania and surrounding states by providing an abundant supply of low-cost energy, making the region more competitive.

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Figure 1.1-1
Historic Regional Power and Natural Gas Prices

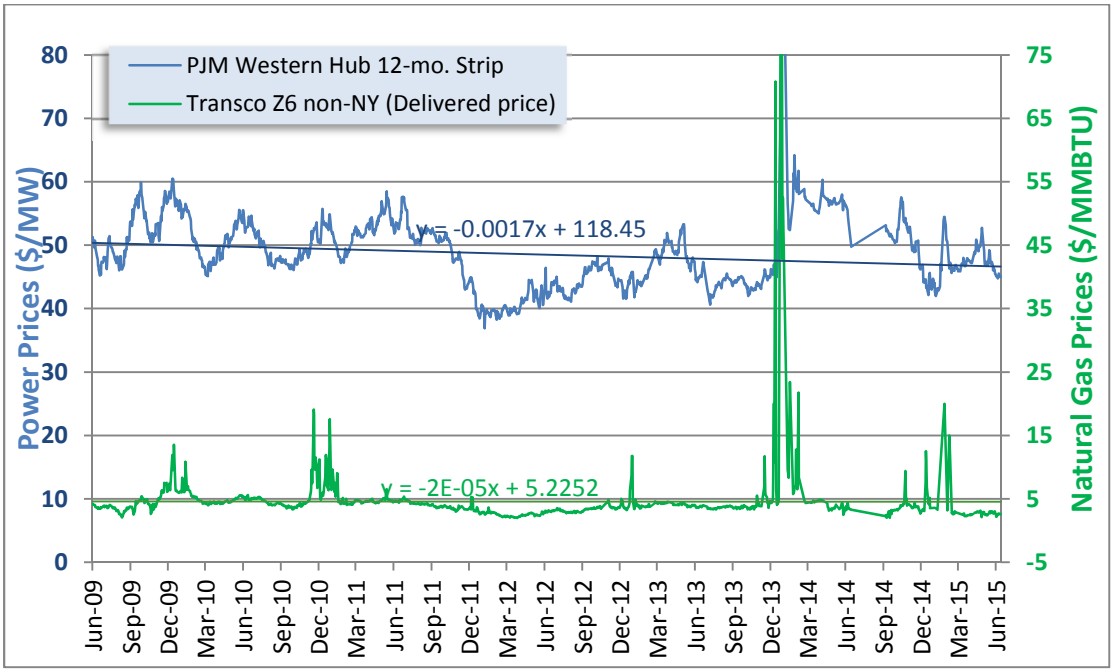

Figure 1.1-2
Regional Power and Natural Gas Prices – November 2013 through October 2014

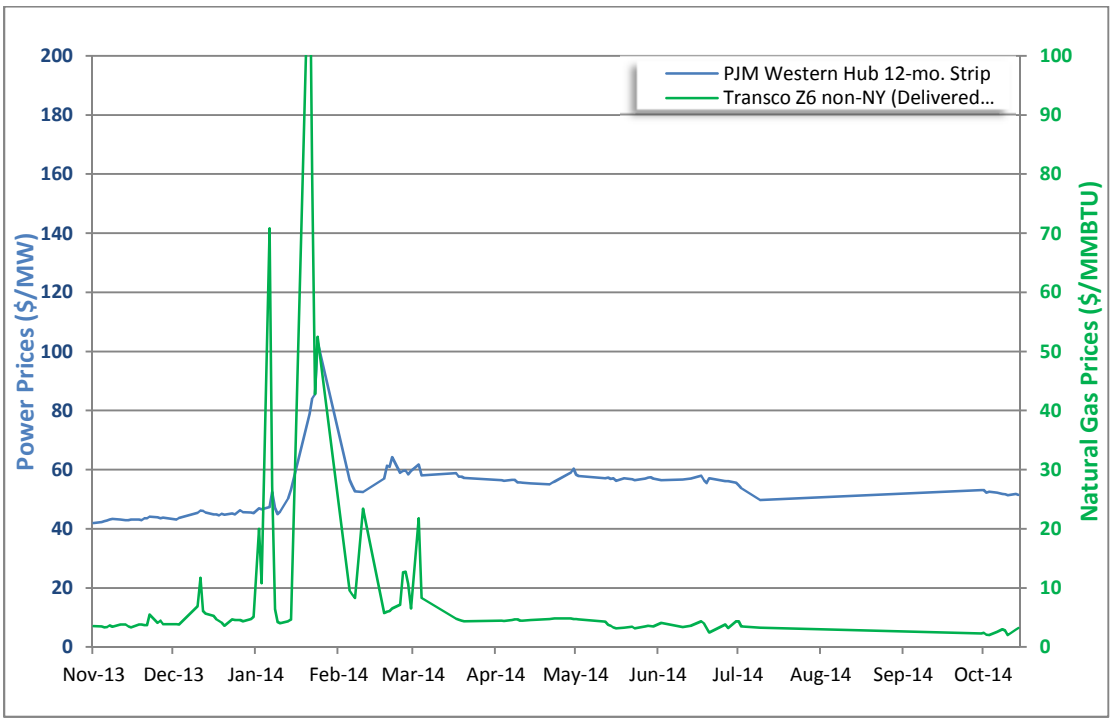

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Figure 1.1-3
Production Region vs. Market Region Natural Gas Pricing in Winter 2014-2015

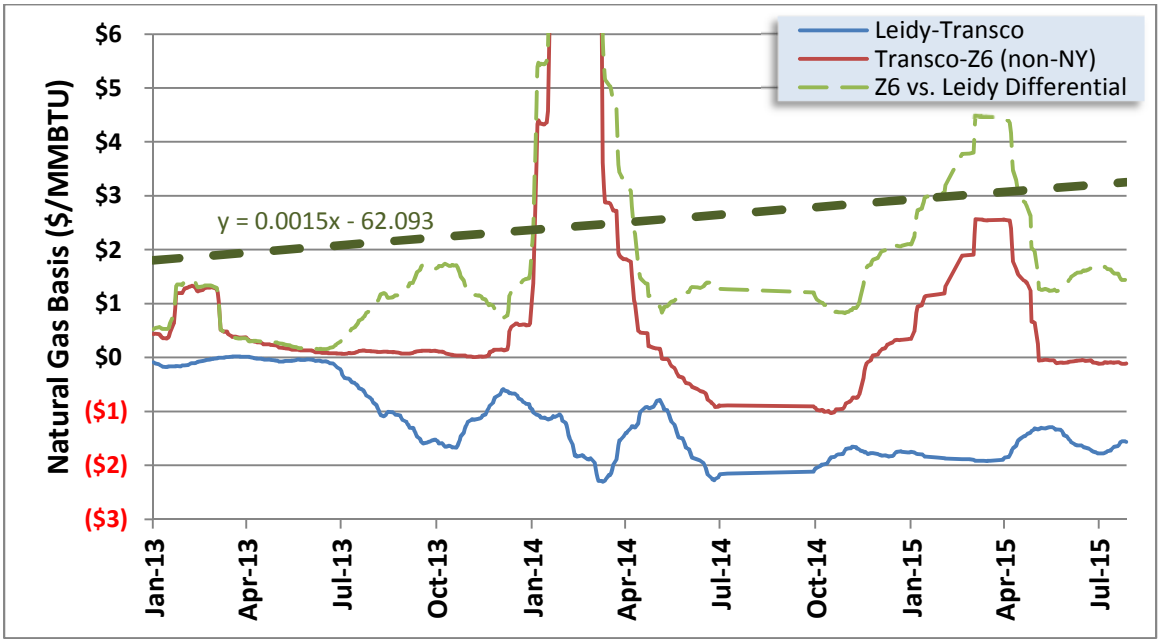


Figure 1.1-4[a]
Capacity Additions by Fuel – 2012-2020

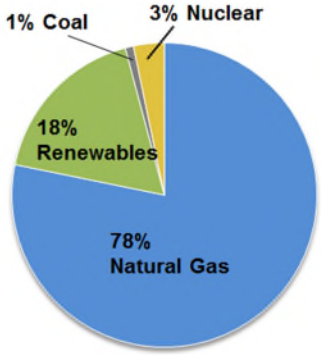
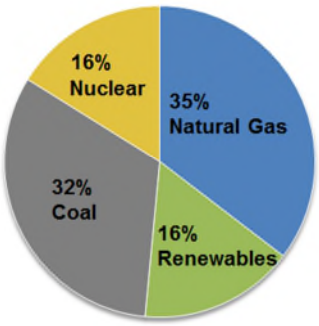


Figure 1.1-**5**[a]
Projected Capacity Fuel Mix – By 2020



[a] Energy Information Administration Annual Energy Outlook 2014

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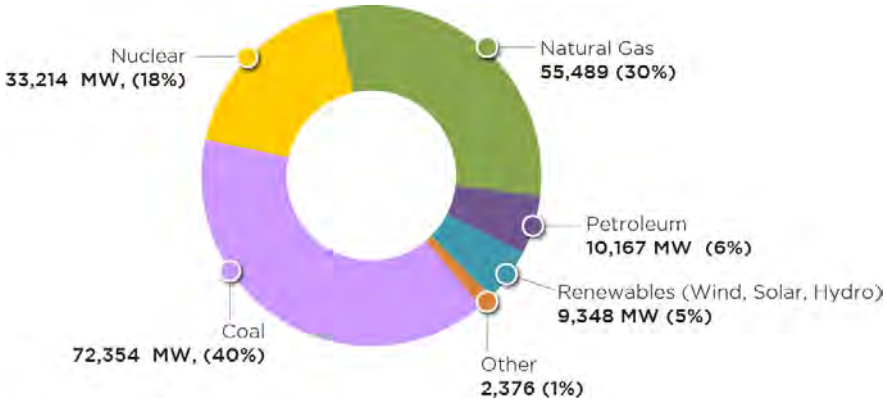
Figure 1.1-6
PJM Capacity Fuel Mix – December 1, 2014



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1.2 PennEast Location and Description of Facilities

The Project will entail the construction of approximately 113.8 miles of 36-inch diameter pipeline from Luzerne County, Pennsylvania, to Mercer County, New Jersey. The Hellertown Lateral, an approximately 2.1 mile lateral of 24-inch diameter pipe, will be constructed in Northampton County, Pennsylvania. This lateral will serve as an Interconnect with CPG and UGI Utilities, Inc. The Gilbert Lateral, an approximately 0.3-mile lateral of 12-inch diameter pipe, will extend from the mainline in Holland Township in Hunterdon County, New Jersey, to the Gilbert Electric Generating Station where it will interconnect with NRG REMA, LLC, and Elizabethtown Gas. The Lambertville Lateral, an approximately 1.4 mile lateral of 36-inch diameter pipe, will be constructed in Hunterdon County, New Jersey. This lateral will serve as an Interconnect with Algonquin and Texas Eastern. The associated aboveground infrastructure for PennEast will consist of interconnect meter stations, mainline block valves, and a single compressor station and their appurtenant facilities and equipment.

1.2.1 Pipeline Facilities

The Project's pipeline facilities are identified by segment and include the PennEast mainline route pipeline, the 24-inch Hellertown lateral, the 12-inch Gilbert Lateral, and the 36-inch Lambertville Lateral. These pipeline facilities are summarized on Table 1.2-1, which provides the proposed Project's pipeline installations, pipeline diameter, approximate length, MP, and type of activity. Table 1.2-2 provides the proposed Project's mainline installations by municipality while Table 1.2-3 provides the proposed Project's mainline installations by river basin. Figure 1.2-1 shows the regional location of the Project. Appendix A, presents U.S. Geological Survey (USGS) topographic quadrangle maps depicting the locations of the proposed pipeline facilities. Appendices B and C contain plot plans and aerial alignment sheets, respectively, of the proposed pipeline and associated facilities.

- The PennEast pipeline will be an approximately 113.8-mile long new pipeline starting in Luzerne County, Pennsylvania, and extending to Mercer County, New Jersey. Pennsylvania counties traversed include Luzerne, Carbon, Northampton, and Bucks. The Project traverses Hunterdon and Mercer counties in the New Jersey portion.
- The 24-inch Hellertown Lateral will be an approximately 2.1-mile new pipeline in Northampton County, Pennsylvania.
- The 12-inch Gilbert Lateral will be an approximately 0.3-mile new pipeline in Hunterdon County, New Jersey.
- The 36-inch Lambertville Lateral will be an approximately 1.4-mile new pipeline in Hunterdon County, New Jersey.

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Table 1.2-1
Pipeline Facilities

Facility	Pipeline Diameter and Type	Approx. Length* (miles)	Begin MP	End MP*	State	County	River Basin
PennEast Mainline Route Pipeline	36-inch new pipeline	113.8	0.0	113.8	PA, NJ	Luzerne, Carbon, Northampton, Bucks, Hunterdon, Mercer	Upper Susquehanna, Upper Delaware, Lower Hudson
Hellertown 24-inch Lateral	24-inch new pipeline	2.1	71.5	HL-2.1	PA	Northampton	Upper Delaware
Gilbert 12-inch Lateral	12-inch new pipeline	0.3	79.1	GL-0.3	NJ	Hunterdon	Upper Delaware
Lambertville 36-inch Lateral	36-inch new pipeline	1.4	100.5	LL-1.4	NJ	Hunterdon	Upper Delaware

*Mileposts shown are based on alignment sheet information

Table 1.2-2
Mainline Pipeline by Municipality

Township	Approximate Mileage	Begin MP	End MP	County	State
Dallas Township	1.3	0.0	1.3	Luzerne	PA
Kingston Township	2.9	1.3	4.2	Luzerne	PA
West Wyoming Borough	1.8	4.2	6.0	Luzerne	PA
Wyoming Borough	1.1	6.0	7.1	Luzerne	PA
Jenkins Township	1.9	7.1	11.0	Luzerne	PA
Plains Township	2.6	8.1	12.6	Luzerne	PA
Laflin Borough	1.1	9.1	10.2	Luzerne	PA
Bear Creek Township	10.4	12.6	23.0	Luzerne	PA
Kidder Township	10.1	23.0	33.1	Carbon	PA
Penn Forest Township	7.6	33.1	40.6	Carbon	PA
Towamensing Township	6.4	40.6	47.0	Carbon	PA
Lower Towamensing Township	4.1	47.0	51.1	Carbon	PA
Lehigh Township	2.4	51.1	53.5	Northampton	PA
Moore Township	6.9	53.5	60.3	Northampton	PA
East Allen Township	0.8	60.3	61.2	Northampton	PA

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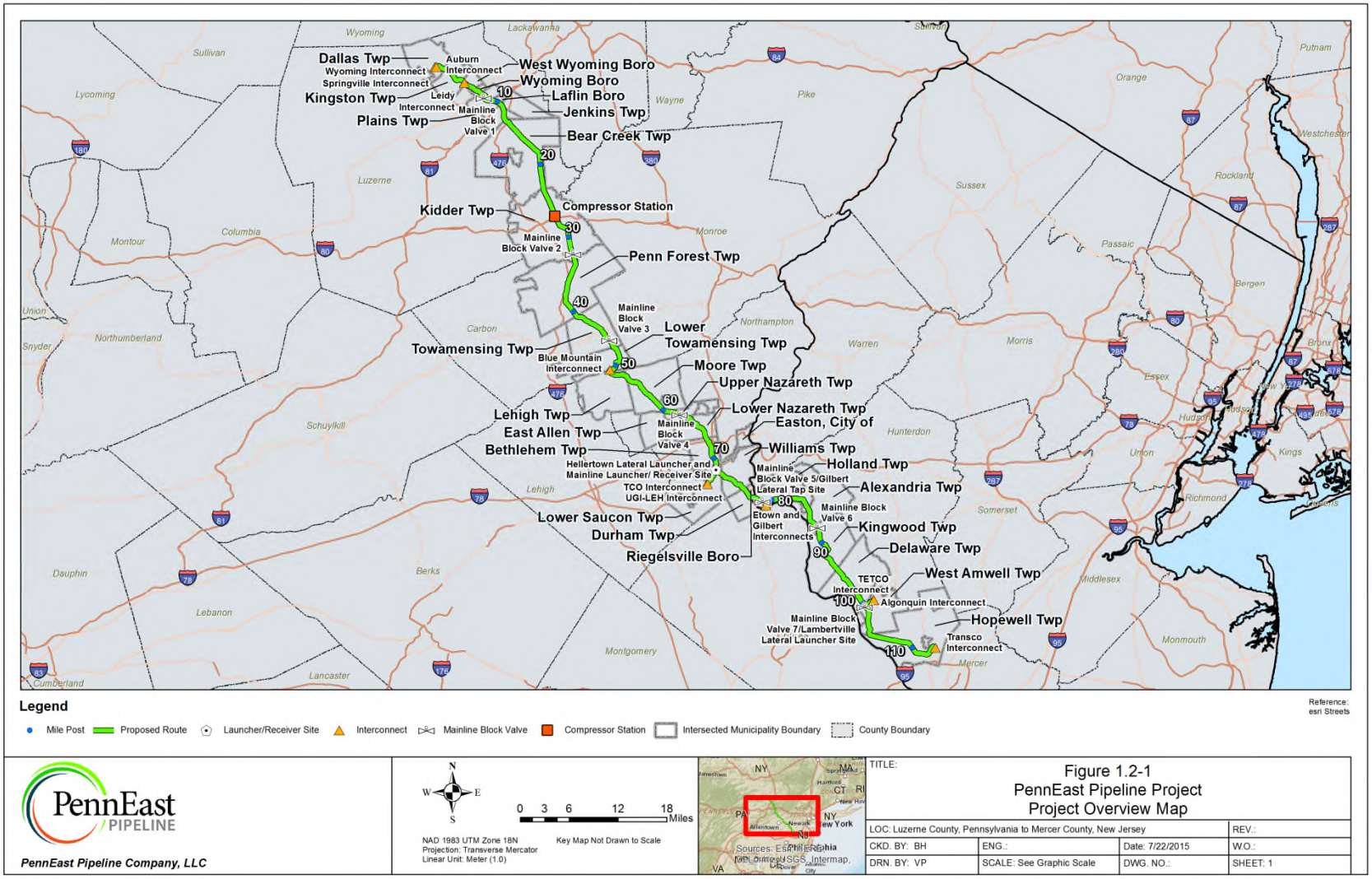
Township	Approximate Mileage	Begin MP	End MP	County	State
Upper Nazareth Township	2.8	61.2	63.9	Northampton	PA
Lower Nazareth Township	3.2	63.9	67.1	Northampton	PA
Bethlehem Township	3.7	67.1	70.8	Northampton	PA
Easton City	0.1	70.8	70.9	Northampton	PA
Lower Saucon Township	1.4	70.9	72.3	Northampton	PA
Williams Township	3.5	72.3	75.7	Northampton	PA
Durham Township	1.5	75.7	77.5	Bucks	PA
Riegelsville Borough	0.2	76.5	76.7	Bucks	PA
Holland Township	7.9	77.5	85.5	Hunterdon	NJ
Alexandria Township	2.1	85.5	87.5	Hunterdon	NJ
Kingwood Township	6.7	87.5	94.3	Hunterdon	NJ
Delaware Township	5.8	94.3	100.1	Hunterdon	NJ
West Amwell Township	4.1	100.1	104.2	Hunterdon	NJ
Hopewell Township	9.6	104.2	113.8	Mercer	NJ

Table 1.2-3
Mainline Pipeline by River Basin

River Basin	MP Range	Approximate Mileage
Upper Susquehanna	0.0 – 14.4	14.4
Upper Delaware	14.4 – 111.8	97.3
Lower Hudson	111.8 – 113.8	2.1

Figure 1.2-1 Project Overview Map



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1.2.2 Aboveground Facilities

The PennEast Project will make use of a single compressor station that will serve the entire line, providing sufficient throughput with an aggregate of approximately 39,660 ISO hp of compression. PennEast has identified a proposed compressor site at approximate milepost 26.7 in Kidder Township, Carbon County, Pennsylvania. The latitude/longitude location coordinates for the facility locations are listed in Table 1.2-4 below.

1.2.2.1 Compressor Station

The Compressor Station will be a new facility. PennEast has identified a proposed location on an approximately 66-acre site in Carbon County, Pennsylvania for the single compressor station. The proposed compressor station location is on undeveloped, forested land. The proposed facility components at the Compressor Station include three gas turbine-driven Mars 90 units rated at 13,220 hp each under ISO conditions (39,660 total ISO hp).

1.2.2.2 Other Facilities

Various associated aboveground facilities including interconnects, launchers, receivers, and mainline block valves also will be constructed to support the pipeline system. Table 1.2-4 provides a list of the associated facilities.

Table 1.2-4
Aboveground Facilities

Facility/ Location	Type	New/ Modified	MP*	State	Municipality	County	Coordinates
PennEast Mainline	**UPPER SUSQUEHANNA RIVER BASIN**						
	Wyoming Interconnect (Energy Transfer Partners, L.P.)	New	0.0	PA	Dallas Twp	Luzerne	N 41° 20' 45.3" W 75° 56' 44.8"
	Springville Interconnect (Williams Partners LP)	New	0.2	PA	Dallas Twp	Luzerne	N 41° 20' 45.3" W 75° 56' 32"
	Auburn (UGI Energy Services, LLC) and Leidy Interconnects (Transcontinental Gas Pipe Line Company, LLC)	New	4.6	PA	West Wyoming Borough	Luzerne	N 41° 19' 5.9" W 75° 52' 34.4"
	Mainline Block Valve 1	New	8.2	PA	Plains Twp	Luzerne	N 41° 17' 28.1" W 75° 49' 49.6"
	UPPER DELAWARE RIVER BASIN						
	Compressor Station	New	26.7	PA	Kidder Twp	Carbon	N41° 4' 53.0" W75° 39' 44.9"
	Mainline Block Valve 2	New	32.2	PA	Kidder Twp	Carbon	N 41° 0' 56.2" W 75° 37' 2.8"
	Mainline Block Valve 3	New	46.0	PA	Towamensing Twp	Carbon	N 40° 51' 41.8" W 75° 31' 52.4"
	Blue Mountain Interconnect (UGI Central Penn Gas, Inc.)	New	50.9	PA	Lower Towamensing Twp	Carbon	N 40° 48' 33.6" W 75° 31' 43.4"
	Mainline Block Valve 4	New	62.2	PA	Upper Nazareth Twp	Northampton	N 40° 43' 49.5" W 75° 21' 58.6"

Facility/ Location	Type	New/ Modified	MP*	State	Municipality	County	Coordinates
	Hellertown Lateral Launcher and Mainline Launcher/ Receiver Site	New	71.5	PA	Lower Saucon Twp	Northampton	N40° 37' 58.6" W75° 16' 45.7"
	Mainline Block Valve 5/Gilbert Lateral Tap Site	New	78.8	NJ	Holland Twp	Hunterdon	N 40° 34' 35.3" W 75° 10' 17.6"
	Mainline Block Valve 6	New	88.0	NJ	Kingwood Twp	Hunterdon	N 40° 31' 50.1" W 75° 2' 37.8"
	Mainline Block Valve 7/Lambertville Lateral Launcher Site	New	100.5	NJ	West Amwell Twp	Hunterdon	N 40° 23' 18.7" W 74° 56' 0.7"
	LOWER HUDSON RIVER BASIN						
	Transco Interconnect (Transcontinental Gas Pipe Line Company, LLC)	New	113.8	NJ	Hopewell Twp	Mercer	N 40° 18' 57.2" W 74° 46' 8.5"
	UPPER DELAWARE RIVER BASIN						
PennEast Hellertown Lateral	TCO (Columbia Pipeline Group) and UGI-LEH (UGI Utilities, Inc.) Interconnects	New	HL-2.1	PA	Lower Saucon Twp	Northampton	N 40° 36' 29.4" W 75° 18' 0.2"
PennEast Gilbert Lateral	Etown (Elizabethtown Gas) and Gilbert (NRG REMA LLC Gilbert Generating Station) Interconnects	New	GL-0.3	NJ	Holland Twp	Hunterdon	N 40° 34' 12.6" W 75° 9' 47.7"
PennEast Lambertville Lateral	Algonquin (Algonquin Gas Transmission, LLC) and TETCO (Texas Eastern Transmission, LP) Interconnects	New	LL-1.4	NJ	West Amwell Twp	Hunterdon	N 40° 24' 1.8" W 74° 54' 42.5"

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1.2.3 Location Maps, Detailed Site Maps, and Plot and Site Maps

Volumes II-B and IV of this filing provide the referenced appendices. As previously noted, Appendix A includes USGS topographic quadrangles depicting the proposed facilities. Appendix B (Volume IV) contains plot plans for the aboveground facilities associated with the Project. Appendix C provides the latest available Ortho Rectified aerial photographs, updated June 2015, of the facility locations. Aerial photography for the entire PennEast Project was acquired in March 2015. Appendix D provides figures depicting USGS topographic quadrangles with U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) data layers for the Project area.

1.3 Land Requirements

1.3.1 Pipeline Facilities

The PennEast Project requires a 50-foot permanent ROW and, on average, an approximately 50-foot temporary construction workspace for a nominal 100-foot-wide construction corridor. This corridor width is based on construction conditions of similar projects in the Northeast U.S. From the center of the ditch, the spoil side of the construction ROW is proposed to be 35 feet. This footprint will serve as the primary spoil storage area. Thus, the working side of the construction ROW will typically be 65 feet wide from the center of the ditch and will serve to accommodate trench excavation, bank sloping, topsoil segregation and safe equipment mobilization. Agricultural areas where full topsoil segregation of 12 inches deep will require an additional 25 feet, the construction corridor will be a total of 125 feet wide. During project review, conditions evaluated include topography, soils, bedrock, boulders, wetlands, and waterbodies, as well as proximity to existing roads, railroads, residences. PennEast has considered these noted conditions along with machinery requirements needed for safe pipeline and support facility installation. As additional field surveys, landowner negotiations, agency consultations and engineering are performed, PennEast will evaluate whether additional workspace is necessary to maintain safe practices and the integrity of pliable land in specific locations and, as necessary, additional workspace would extend beyond the nominal 100-foot wide corridor. Conversely, PennEast will assess environmental conditions and evaluate the need to contract workspaces below the nominal 100-foot corridor in certain environmentally sensitive areas such as wetlands. The current workspace requirements are included on the aerial alignment sheets in Appendix C and the estimated land requirements for pipeline construction and operation and maintenance (O&M) needs are presented in Table 1.3-1, below. During the design phase of the Project, any additional staging areas and work spaces not identified at this time will be included as part of the Project study area in agency consultations, environmental permitting and resource surveys as appropriate .

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Table 1.3-1
Land Requirements for Pipeline Facilities

Facility[1]	Approximate Length/ No. of Sites	Temporary Workspace for Construction (acres)	Additional Temporary Workspace for Construction (acres)	Permanent Easement for Construction and Operation (acres)	Total Workspace for Construction (acres)
PennEast Mailine Route Pipeline	113.8(mi)/1	615.7	432.8	765.2	1,813.7
Hellertown 24-inch Lateral	2.1(mi)/1	4.4	8.4	41.8	54.6
Gilbert 12-inch Lateral	0.3(mi)/1	1.4	1.7	11.8	14.9
Lambertville 36-inch Lateral	1.4(mi)/1	39.9	4.0	13.9	57.8
Total Pipeline	117.6(mi)/4	661.5	446.8	832.6	1,941.0
Access Roads[3]	32.2(mi)/115	109.3	0.0	7.9	117.2
Pipeyards	462.9(acres)/8	0.0	462.9	0.0	462.9

1 This table does not specify valves and launcher/receivers that will be constructed on the pipeline segments since the land requirements for these facilities are within the land requirements for the pipeline segments.

2 Only includes existing permanent 50 foot ROW within limits of construction.

3 Estimated Temporary Workspace for Construction includes access roads (new and existing).

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Table 1.3-2
Land Requirements for Pipeline Facilities by River Basin

River Basin	Approximate Length/No. of Sites	Temporary Workspace for Construction (acres)	Additional Temporary Workspace for Construction (acres)	Permanent Easement for Construction and Operation (acres)		Total Workspace for Construction (acres)
				Existing[2]	New	
Pipeline[1]						
Upper Susquehanna	14.4(mi)/1	81.3	118.7	0.0	93.7	293.8
Upper Delaware	101.3(mi)/4	568.6	321.3	0.0	724.8	293.8
Lower Hudson	2.1(mi)/1	11.6	6.8	0.0	14.1	32.6
Access Roads[3]						
Upper Susquehanna	10.0(mi)/33	30.8	0.0	3.4	2.3	36.5
Upper Delaware	22.2(mi)/82	78.5	0.0	1.5	0.7	80.7
Lower Hudson	-	0.0	0.0	0.0	0.0	0.0
Pipeyards						
Upper Susquehanna	196.6(acres)/1	0.0	196.6	0.0	0.0	0.0
Upper Delaware	266.2(acres)/7	0.0	266.2	0.0	0.0	0.0
Lower Hudson	-	0.0	0.0	0.0	0.0	0.0
Total Project						
Upper Susquehanna	-	112.1	315.4	3.4	96.0	330.3
Upper Delaware	-	647.1	587.5	1.5	725.5	374.5
Lower Hudson	-	11.6	6.8	0.0	14.1	32.6

1 This table does not specify valves and launcher/receivers that will be constructed on the pipeline segments since the land requirements for these facilities are within the land requirements for the pipeline segments.
2 Only includes existing permanent 50 foot ROW within limits of construction.
3 Estimated Temporary Workspace for Construction includes access roads (new and existing).

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Table 1.3-3
Pipeline ROW Co-Location

Co-Location Facility	Milepost Range	Mileage Co-Located
Pennsylvania		
PennEast Mainline Route Pipeline	10.5 - 68.3	26.8
Hellertown 24-inch Lateral	HL-1.7 - 2.1	0.4
Pennsylvania Total: 27.2 miles/35%		
New Jersey		
PennEast Mainline Route Pipeline	80.3 - 112.6	15.1
Gilbert 12-inch Lateral	GL-0.0 - 0.3	0.3
Lambertville 36-inch Lateral	LL-1.0 - 1.4	0.5
New Jersey Total: 15.9 miles/39%		
Total Project: 43.1 miles/36%		
The totals shown in this table may not equal the sum of addends due to rounding.		

1.3.1.1 New Pipeline ROW

Typical construction and operation ROW widths for new pipeline along the PennEast Pipeline, the 24-inch diameter Hellertown Lateral, the 12-inch diameter Gilbert Lateral, and the 36-inch diameter Lambertville Lateral are shown in Figure 1 in the E&SCP (Appendix E). As noted, the typical construction ROW will be 100 feet wide consisting of new 50-foot permanent easement plus an average temporary workspace of 50 feet. The average width of temporary and permanent disturbance for the entire project will be 99 feet, and the ratio of the average width of new ROW to the average outside pipe diameter will be 50:3, or 16.7 feet of ROW per foot of pipe diameter.

Where practicable, the construction ROW has been co-located and sited adjacent to, or in proximity, to existing ROWs (pipeline or electric power). Where necessary, the new ROW has been sited away from existing ROWs when there is an unacceptable risk, such as a combination of steep vertical and horizontal slope areas as well as building encroachment on the existing ROW. Land requirements for constructed temporary workspace is included as part of the pipeline assessment.

1.3.1.2 Access Roads

To the extent practicable, existing public and private road crossings will be used as the primary means to access the ROW. Additional access points are necessary beyond those available by use of existing public roads. Preliminarily, PennEast has identified 115 access roads for use during construction of the Project. These access roads include a total length of approximately 32.23 miles. These access roads include use of 101 existing roads and construction or enhancement of 14 new/existing access roads. Table 1.3-3 lists all proposed roads by pipeline segment. The following access roads are identified by County:

- 32 Access Roads – Luzerne County, Pennsylvania
- 18 Access Roads – Carbon County, Pennsylvania
- 30 Access Roads – Northampton County, Pennsylvania

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- 2 Access Roads – Bucks County, Pennsylvania
- 23 Access Roads – Hunterdon County, New Jersey
- 10 Access Roads – Mercer County, New Jersey

Improved access roads will likely require maintenance activities that may include tree branch clearing, gravel placement, minor grading, and/or access path widening. Moreover, there will be the need to establish temporary staging areas along several access roads. Such areas will serve as places for temporary vehicle parking and/or staging of minor supplies (e.g., hay bales for erosion control activities). Any additional land work spaces not identified at this time included as part of the Project study area in agency consultations, environmental permitting and resource surveys as appropriate.

Table 1.3-4 includes the total land use impacts resulting from the proposed access roads including the staging areas. Temporary access roads (TARs) for construction will be restored in accordance with landowner agreements. Landowner permission will be obtained for all proposed permanent access roads (PARs).

1.3.1.3 Pipeyards and Wareyards

The number and location of five pipeyards is currently under consideration for the Project. Table 1.3-5 lists the pipeyards, location, current land use and modification, if any, and size. Total land requirements for these temporary and other associated facilities are presented on Table 1.3-1.

Table 1.3-4
Access Roads for the Project

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-001	0.0	Luzerne	1,401	Existing	30	Matted	Yes	1,367	Permanent	Wyoming Interconnect access
AR-002	0.5	Luzerne	1,691	Existing	30	Paved	No	-	Permanent	Springville Interconnect access
AR-003	4.5	Luzerne	1,211	Partially existing	30	Paved, field, and forest	Yes	85	Permanent	Leidy, Auburn Interconnect access
AR-004	5.4	Luzerne	907	Existing	30	Paved	No	-	Temporary	Clearing crew access for light traffic
AR-005	6.4	Luzerne	438	Existing	30	Paved	No	-	Temporary	light vehicle access prior to clearing and construction
AR-006	6.5	Luzerne	229	Existing	30	Gravel and dirt road	Yes	225	Temporary	Access for light and major equipment for construction between Route 11 and the Susquehanna River
AR-007	7.3	Luzerne	874	Partially existing	30	Paved and dirt road	Yes	800	Temporary	Access to south side of Susquehanna River crossing
AR-008	8.1	Luzerne	507	Partially existing	30	Paved and forest	Yes	125	Temporary	Access for major equipment North of Lakewood Drive
AR-009	8.1	Luzerne	141	New	30	Grass and trees	Yes	248	Temporary	Access around guard rails on N Main street

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-011	8.5	Luzerne	236	Existing	30	Gravel	No	-	Temporary	Access for light equipment to support construction to the north up to North Main Street
AR-012	8.6	Luzerne	234	Partially existing	30	Gravel and dirt road	Yes	234	Temporary	Access for light equipment to support construction to the north and south while avoiding steep terrain
AR-013	8.8	Luzerne	292	Existing	30	Gravel	No	-	Temporary	Access for heavy construction equipment
AR-014	9.1	Luzerne	562	Partially existing	30	Gravel and forest	Yes	243	Temporary	Access for light and major equipment for construction north of the existing quarry
AR-015	9.1	Luzerne	5,067	Existing	30	Gravel	No	-	Temporary	Access to ROW for materials and major equipment. Access to west side of Union Street HDD.
AR-016	9.1	Luzerne	328	Existing	30	Paved	No	-	Temporary	Access for light and major equipment from the south for construction through the existing quarry

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-017A	9.2	Luzerne	157	Existing	30	Paved and gravel	No	-	Temporary	Access for light and major equipment from the south for construction through the existing quarry to the east
AR-017B	9.3	Luzerne	1,037	Existing	30	Paved and gravel	No	-	Temporary	Access for light and major equipment from the south for construction to the west up to the railroad crossing
AR-018A	9.5	Luzerne	948	Existing	30	Gravel	No	-	Temporary	Access for light and major equipment from the south for construction to the east up to the railroad crossing
AR-018B	9.5	Luzerne	229	Existing	30	Gravel	No	-	Temporary	Access for light and major equipment from the north for construction to the west to support the stream crossing and Main Street crossing
AR-021A	10.2	Luzerne	2,414	Existing	30	Gravel	No	-	Temporary	Access for light and major equipment from the north for construction to the east and support for the Main Street road crossing

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-021B	10.4	Luzerne	256	Existing	30	Gravel	No	-	Temporary	Access for light and major equipment from the south for construction of the crossing of highway 81 and route 315
AR-022	10.6	Luzerne	6,195	Partially existing	30	Gravel and forest	Yes	196	Temporary	Access to south side of Hwy 315 and Interstate 81 HDD
AR-023	10.8	Luzerne	1,407	Partially existing	30	Gravel and jeep trail	Yes	1,407	Temporary	Access for light equipment from the south for construction to the east and access to ATWS and to support the I-81 road crossing from the east
AR-024A	11.3	Luzerne	3,711	Partially existing	30	Gravel and forest	Yes	196	Temporary	Access to south side of Hwy 315 and Interstate 81 HDD
AR-024B	11.3	Luzerne	1,846	Partially existing	30	Forest and jeep trail	Yes	1,846	Temporary	Access for light equipment from the south for construction to the east
AR-025	12.9	Luzerne	1,994	Existing	30	Gravel	No	-	Temporary	Clearing crew access for light traffic

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-028	13.0	Luzerne	1,172	Partially existing	30	Paved and Grass	Yes	812	Temporary	Access for light and major equipment from the east for construction of the crossing of highway 476 while avoiding a major wetland
AR-029	13.3	Luzerne	2,525	Existing	30	Gravel and jeep trail	Yes	2,563	Temporary	Access to south side of Interstate 476 crossing
AR-030	14.4	Luzerne	10,994	Existing	30	Gravel	No	-	Temporary	Access to ROW in remote area. Will minimize clearing.
AR-031	16.6	Luzerne	14,122	Partially existing	30	Forest and jeep trail	Yes	14,038	Temporary	Access to ROW in remote area. Will minimize impact to and crossing of parallel creek.
AR-032	20.4	Luzerne	3,405	Existing	30	Gravel	No	-	Temporary	Access to ROW and clearing in remote area.
AR-033	21.8	Luzerne	11,862	Existing	30	Gravel and dirt road	No	-	Temporary	Access to ROW in remote area. Access to north side of Lehigh River crossing
AR-034	25.0	Carbon	9,027	Partially existing	30	Paved, gravel, and forest	Yes	2,343	Temporary	Access to ROW in remote area. Access to south side of Lehigh River crossing

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-035	26.9	Carbon	6,171	Existing	30	Gravel	No	-	Temporary	Access to south side of Interstate 80 crossing
AR-036	28.8	Carbon	3,322	Partially existing	30	Paved and gravel	No	-	Temporary	Access to ROW south of large wetland complex
AR-037	31.9	Carbon	444	Existing	30	Paved and Gravel	Yes	49	Temporary	Access to Spread 2 Preferred Contractor Yard
AR-038	32.7	Carbon	3,265	Existing	30	Paved and gravel	No	-	Temporary	Access to ROW north of Mud Run during pre-clearing activities, i.e. survey
AR-039	34.5	Carbon	41	Existing	30	Gravel	No	-	Temporary	Construction access across adjacent line from Balsam Drive
AR-040	35.6	Carbon	1,192	Partially existing	30	Paved and Grass	Yes	524	Temporary	Access for light and major equipment from the northfor construction to the south
AR-041	37.1	Carbon	984	Partially existing	30	Gravel and forest	Yes	984	Temporary	Access for light and major equipment from the south for construction to the north and construction through the wetland

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-042	37.2	Carbon	2,739	Partially existing	30	Gravel and forest	Yes	103	Temporary	Access for light and major equipment from the south for construction to the south and construction through the wetland
AR-043	42.5	Carbon	110	Existing	30	Gravel	No	-	Temporary	Construction access
AR-044	44.5	Carbon	249	Partially existing	30	Gravel and forest	Yes	249	Temporary	Access for light and major equipment from the east for HDD construction support
AR-045	44.8	Carbon	145	Existing	30	Paved	No	-	Temporary	Access to west side of creek crossing at Sei Pike Ln
AR-046	45.0	Carbon	270	Partially existing	30	Grass	Yes	270	Temporary	Access for light and major equipment for construction to the east and through the wetland to the south
AR-047	46.6	Carbon	1,194	Existing	30	Gravel	No	-	Temporary	Access to ROW in remote area
AR-048	48.1	Carbon	188	New	30	Grass	Yes	289	Temporary	Access around guard rails to south side of Little Gap Rd crossing
AR-049	48.6	Carbon	2,658	Existing	30	Gravel and dirt road	Yes	2,798	Temporary	Access to ROW in a steep area

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-050	49.6	Carbon	53	Existing	30	Paved	No	-	Temporary	Access for light and major equipment from the north for construction to the east and west
AR-051	51.0	Carbon	1,024	Existing	30	Paved	No	-	Permanent	Access for light and major equipment from the west for construction to the north and south and for the blue mountain interconnect
AR-052	52.5	Northampton	1,175	Partially existing	30	Paved and forest	Yes	494	Temporary	Access for light and major equipment from the south for construction to the east and west
AR-053	53.9	Northampton	950	Partially existing	30	Paved and grass	Yes	151	Temporary	Access for light and major equipment from the east for construction to the north and south
AR-054	55.9	Northampton	120	Partially existing	30	Gravel	Yes	49	Temporary	Access for light and major equipment from the east for construction to the north to support crossing Mountain view drive and multiple stream crossings

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-055	60.2	Northampton	751	Existing	30	Paved	No	-	Temporary	Access to ROW that minimizes impact to Monocacy Creek
AR-056	60.4	Northampton	1,762	Existing	30	Paved and dirt road	Yes	1,156	Temporary	Access for light and major equipment from the south for construction to the east and west to support crossing Monocacy Drive and North Walnut Street
AR-057	62.8	Northampton	1,436	Existing	30	Paved and gravel	No	-	Temporary	Access to south side of railroad crossing
AR-058	63.4	Northampton	1,480	Existing	30	Gravel and dirt road	No	-	Temporary	Access for light and major equipment from the south for construction to the east and west
AR-059	64.0	Northampton	528	Partially existing	30	Paved and Grass	Yes	53	Temporary	Access for light and major equipment from the east for construction to the north and south and to access the proposed ATWS

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-060	64.2	Northampton	1,062	Existing	30	Paved and Grass	Yes	390	Temporary	Access for light and major equipment from the west for construction to the north and south and to support crossing route 946
AR-061	64.3	Northampton	179	Existing	30	Paved	No	-	Temporary	Access for light and major equipment for construction to the east and south and to support crossing route 946
AR-062	65.0	Northampton	189	Partially existing	30	Gravel and Grass	Yes	148	Temporary	Access for light and major equipment from the south for construction to the north and to support crossing route 191
AR-063	66.5	Northampton	1,111	Existing	30	Paved	No	-	Temporary	Access for light and major equipment from the south for construction to the north
AR-064	66.6	Northampton	34	Existing	30	Paved	No	-	Temporary	Access for light and major equipment from the south for construction to support crossing Hecktown Road

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-065A	67.0	Northampton	1,251	Partially existing	30	Gravel and dirt road	Yes	458	Temporary	Access for light and major equipment from the west for construction to the north
AR-065B	67.1	Northampton	447	Partially existing	30	Gravel and dirt road	Yes	447	Temporary	Access for light and major equipment from the west for construction of Lehigh valley Thruway and construction to the south
AR-066	67.9	Northampton	538	Existing	30	Paved	No	-	Temporary	Access for light and major equipment to support crossing Green pond Road and construction to the south
AR-067	68.4	Northampton	21	Partially existing	30	Grass	Yes	21	Temporary	Access for light and major equipment to support crossing Route 33 and construction to the south
AR-068	68.8	Northampton	230	Existing	30	Paved	No	-	Temporary	Access for light and heavy equipment to support crossing Route 2020 and construction to the north

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-069	69.6	Northampton	452	Existing	30	Paved	No	-	Temporary	Access to North side of and berm crossing. Access for light and heavy equipment to support access ATWS and support construction through the existing shopping mall parking lots
AR-070	69.8	Northampton	953	Existing	30	Paved	No	-	Temporary	Access for light and heavy equipment to support access ATWS and support construction through the existing shopping mall parking lots
AR-071	70.4	Northampton	1,966	Partially existing	30	Paved and Dirt Path	Yes	1,765	Temporary	Access for light and heavy equipment to support access from staging area and support construction to the south
AR-072A	71.2	Northampton	1,978	Partially existing	30	Gravel and grass	Yes	1,978	Temporary	Access for light and heavy equipment to support access for the Lehigh River crossing and construction to the south

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-072B	71.5	Northampton	44	Existing	30	Gravel	Yes	44	Permanent	Access for light and heavy equipment to support access for the Hellertown Lateral launcher and receiver site
AR-073	71.9	Northampton	329	Partially existing	30	Paved and Grass	Yes	199	Temporary	Access for light and heavy equipment to support construction of the Lower Saucon Road crossing and wetland and stream crossing to the south
AR-074	72.1	Northampton	423	Partially existing	30	Grass	Yes	314	Temporary	Access for light and heavy equipment to support construction of the wetland and stream crossing to the north as well as construction to the south
AR-075	72.8	Northampton	113	New	30	Grass and trees	Yes	112	Temporary	Access for light and heavy equipment to support construction of the large wetland crossing to the north as well as construction to the east

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-076	73.2	Northampton	337	Existing	30	Gravel	No	-	Temporary	Access for light and heavy equipment to support construction of the wetland crossing to the east as well as construction to the east and west
AR-077	73.8	Northampton	1,079	Partially Existing	30	Paved and forest	Yes	533	Permanent	TCO Interconnect access. Access for light and heavy equipment to support construction of the Hexenkopf Road crossing from the west as well as construction to the east
AR-078	74.7	Northampton	524	Existing	30	Dirt path	Yes	524	Temporary	Access for light and heavy equipment to support construction of the Durham Road crossing from the east as well as construction to the west

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-079	76.3	Bucks	2,649	Existing	30	Paved and gravel	No	-	Temporary	Access for light and heavy equipment to support construction of the Delaware Road crossing from the west as well as construction to the west
AR-080	77.2	Bucks	1,145	New	30	Paved and field	Yes	1,046	Temporary	Access for light and heavy equipment to support construction of the Delaware River HDD to the east as well as construction to the west
AR-081	77.8	Hunterdon	294	Existing	30	Paved	No	-	Temporary	Access to east side of Delaware River HDD
AR-082	80.3	Hunterdon	1,022	Partially existing	30	Paved and forest	Yes	199	Temporary	Access for light and heavy equipment to support construction to the east and west
AR-083	81.1	Hunterdon	1,895	Existing	30	Paved and gravel	No	-	Temporary	Access for light and heavy equipment to support construction of the Spring Garden Road crossing from the west as well as construction to the west

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-084	82.0	Hunterdon	1,379	Existing	30	Paved	No	-	Temporary	Access to West side of St Hwy519/Wetland HDD
AR-085	82.3	Hunterdon	911	New	30	Grass	Yes	967	Temporary	Access to East side of St Hwy519/Wetland HDD and access to west side of creek crossing
AR-086	82.7	Hunterdon	1,481	Existing	30	Paved and gravel	No	-	Temporary	Access ROW that minimizes impact to tributary to Hakihokake Creek
AR-087A	84.0	Hunterdon	30	Existing	30	Gravel	No	-	Temporary	Access for light and heavy equipment to support construction of the Milford Mt Pleasant Road crossing from the south as well as construction to the south
AR-087B	84.3	Hunterdon	1,094	Existing	30	Gravel	No	-	Temporary	Access for light and heavy equipment to support construction of the Milford Mt Pleasant Road crossing from the south as well as construction to the south

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-088	85.0	Hunterdon	2,028	Existing	30	Dirt path	No	-	Temporary	Access to ROW in remote area
AR-089	85.9	Hunterdon	893	Existing	30	Dirt path	No	-	Temporary	Access to ROW that minimizes impact to tributary to Harihokake Creek
AR-090	86.2	Hunterdon	2,448	Partially existing	30	Paved and Grass	Yes	409	Temporary	Access for light and heavy equipment to support construction to the north and south
AR-091	86.7	Hunterdon	1,559	Existing	30	Gravel	No	-	Temporary	Access to ROW that minimizes impact to Harihokake
AR-092	89.4	Hunterdon	1,441	Partially existing	30	Gravel and dirt road	Yes	532	Temporary	Access to ROW in remote area
AR-093	92.0	Hunterdon	401	New	30	Grass and trees	Yes	401	Temporary	Access for light and heavy equipment to support construction of the Barbertown Point Breeze Road crossing from the south as well as construction to the south

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-094	95.2	Hunterdon	258	Existing	30	Paved	No	-	Temporary	Access for light and heavy equipment to support construction of the Sanford Road crossing from the north as well as construction to the north
AR-096	96.1	Hunterdon	892	Existing	30	Paved	No	-	Temporary	Access for light and heavy equipment to support construction of the Rosemont Ringoes Road crossing from the west as well as construction to the west
AR-097	99.7	Hunterdon	1,724	Existing	30	Paved and Grass	Yes	1,000	Temporary	Access to ROW in remote area
AR-098	100.3	Hunterdon	339	New	30	Grass	Yes	339	Temporary	Access for light and heavy equipment to support construction of the Route 202 Road crossing and multiple foreign line crossings from the west as well as construction to the west

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-099	100.5	Hunterdon	973	New	30	Grass and trees	Yes	973	Permanent	Access for light and heavy equipment to support construction of the mainline block valve and the tie in to the Lambertville Lateral launcher and receiver site as well as construction to the east and west
AR-100	104.2	Hunterdon	140	New	30	Grass	Yes	140	Temporary	Access for light and heavy equipment to support construction to the east and west
AR-101	107.0	Mercer	851	Existing	30	Paved	No	-	Temporary	Access for light and heavy equipment to support construction to the east and west
AR-102	107.8	Mercer	1,312	Existing	30	Grass	Yes	1,312	Temporary	Access for light and heavy equipment to support construction to the east and west
AR-103A	109.2	Mercer	180	Existing	30	Gravel and grass	Yes	180	Temporary	Access for light and heavy equipment to support construction to the west
AR-103B	109.3	Mercer	1,970	Existing	30	Grass	Yes	649	Temporary	Access for light and heavy equipment to support construction to the east

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-104	109.6	Mercer	863	Existing	30	Dirt path	Yes	720	Temporary	Access for light and heavy equipment to support construction of the Pennington Titusville Road crossing from the south as well as construction to the south
AR-105A	110.4	Mercer	601	Partially existing	30	Paved and grass	Yes	525	Temporary	Access to North side of Hopewell Township HDD.
AR-105B	110.4	Mercer	1,397	Partially existing	30	Paved and grass	Yes	525	Temporary	Access to North side of Hopewell Township HDD.
AR-106	110.9	Mercer	601	New	30	Grass	Yes	601	Temporary	Southbound Access for light and heavy equipment to support construction of the Scotch Road crossing from the west as well as construction to the west

Road No.	MP	County	Length	New/ Existing	Width	Condition	Improvement Needed	Improvement Distance	Temporary/ Permanent	Justification
AR-107	110.9	Mercer	328	Partially existing	30	Gravel and grass	Yes	229	Temporary	Northbound Access for light and heavy equipment to support construction of the Scotch Road crossing from the east as well as construction to the east
AR-108	111.3	Mercer	165	New	30	Grass	Yes	165	Temporary	Access for light and heavy equipment to support construction of the North Road crossing from the west as well as construction to the west
AR-201	2.1	Northampton	7	New	30	Grass	Yes	291	Permanent	Access to TCO and UGI-LEH interconnect sites
AR-301	0.4	Hunterdon	644	Partially existing	30	Paved and grass	Yes	40	Permanent	Access to Etown interconnect and Gilbert Station
AR-401	1.0	Hunterdon	2,058	New	30	Grass	Yes	2,058	Permanent	Access for light and heavy equipment to support construction of the Lambertville Lateral
AR-402	1.4	Hunterdon	1,295	New	30	Paved and grass	Yes	1,094	Permanent	Algonquin and TETCO Interconnect access

Table 1.3-5
Proposed Pipeyards in Pennsylvania and New Jersey

Facility Name	Municipality / County	Coordinates		Land use	Proposed Modification	Acreage
Mohawk Real Estate Development Corporation	Upper Nazareth Twp/ Northampton	40° 43' 41.675" N	75° 21' 44.255" W	Agriculture	TBD	20.42
Walck	Kidder Twp/Carbon	41° 1' 14.301" N	75° 37' 13.036" W	Residential, Forest/Woodland	TBD	1.39
Diehl	Kidder Twp/Carbon	41° 1' 10.134" N	75° 37' 15.660" W	Open Land, Forest/Woodland	TBD	14.45
St Luke's Hospital - Anderson Campus	Bethlehem Twp/Northampton	40° 39' 9.940" N	75° 16' 59.626" W	Open Land	TBD	40.63
Mathews	Kingwood Twp/Hunterdon	40° 27' 29.161" N	75° 0' 30.788" W	Agriculture, Forest/Woodland	TBD	74.48
Walters	West Amwell Twp/Hunterdon	40° 22' 53.355" N	74° 55' 30.114" W	Agriculture, Forest/Woodland	TBD	22.14
David C Popple Irrevocable Trust	Plains Twp-Laflin Boro/Luzerne	41° 16' 59.537" N	75° 49' 8.346" W	Open Land, Forest/Woodland	TBD	196.64
Pennsylvania International (Nazerth Speedway)	Lower Nazareth Twp/Northampton	40° 43' 39.730" N	75° 19' 10.974" W	Commercial/Industrial/Open Land	TBD	92.72

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1.3.2 Aboveground Facilities

Aboveground facilities associated with the Project will include one new compressor station. The proposed compressor station location is presently undeveloped land and will require full site preparation. Table 1.3-6 summarizes the land requirements for construction and operation of the aboveground facilities associated with the Project. Appendix B (Volume IV) provides preliminary site-specific plot plans for aboveground facilities proposed by PennEast.

Table 1.3-6
Land Requirements for Aboveground Facilities

Facility	Temporary Disturbed Acreage for Construction (acres)	Permanently Disturbed Acreage on ROW	Permanently Disturbed Acreage off ROW	Total Permanently Disturbed Area (acres)
Upper Susquehanna River Basin				
Wyoming Interconnect	0.00	1.17	0.50	1.67
Springville Interconnect	0.00	1.83	1.13	2.96
Auburn and Leidy Interconnects	0.89	3.18	0.00	3.18
Mainline Block Valve 1	0.00	0.06	0.00	0.06
Total River Basin	**0.89**	**6.23**	**1.63**	**7.86**
Upper Delaware River Basin				
Compressor Station	0.00	9.85	0.00	9.85
Mainline Block Valve 2	0.00	0.06	0.00	0.06
Mainline Block Valve 3	0.00	0.06	0.00	0.06
Blue Mountain Interconnect	0.10	0.00	0.13	0.13
Mainline Block Valve 4	0.00	0.06	0.00	0.06
Hellertown Lateral Launcher and Mainline Launcher/ Reciever Site	1.03	1.19	0.53	1.72
Mainline Block Valve 5/Gilbert Lateral Tap Site	0.00	0.18	0.09	0.27
Mainline Block Valve 6	0.00	0.06	0.00	0.06
Mainline Block Valve 7/Lambertville Lateral Launcher Site	0.15	0.17	0.09	0.26
TCO and UGI-LEH Interconnects	0.30	4.76	0.00	4.76
Etown and Gilbert Interconnects	0.33	1.18	0.70	1.88

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Facility	Temporary Disturbed Acreage for Construction (acres)	Permanently Disturbed Acreage on ROW	Permanently Disturbed Acreage off ROW	Total Permanently Disturbed Area (acres)
Algonquin and TETCO Interconnects	1.28	5.12	0.00	5.12
Total River Basin	**3.20**	**22.69**	**1.54**	**24.22**
Lower Hudson River Basin				
Transco Interconnect	0.00	1.37	0.00	1.37
Total River Basin	**0.00**	**1.37**	**0.00**	**1.37**
Total Project	**4.08**	**30.30**	**3.17**	**33.46**

*Mainline valve sites will not have separate easements from the pipeline
**Mainline valve acreage based on 50 x 50 operational workspace.
***The totals shown in this table may not equal the sum of addends due to rounding.

1.4 Cumulative Impacts

A cumulative impact analysis is being conducted to identify and describe the potential effects attributable to the proposed PennEast Project. The cumulative impact analysis was developed in accordance with the National Environmental Policy Act (NEPA) and addresses the Council on Environmental Quality (CEQ) guidelines (CEQ, 1979) based on recent court rulings. CEQ's regulations define cumulative impacts as the incremental effect of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR, Section 1508.7). Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects may be significant.

Existing baseline conditions within the proposed Project area are a result of past actions. PennEast has identified four general categories of actions that could potentially contribute to cumulative impacts when considered with the proposed Project. These include: 1) natural gas development (natural gas wells, pipeline gathering systems and interstate pipelines); 2) electric generation and transmission projects; 3) transportation projects; and 4) residential and commercial development projects. These development projects have substantially altered the natural environment in the proposed Project area and wider region. When added to other past, present and future actions, the proposed Project may result in cumulative impacts that affect such resources as groundwater, water use for consumption, surface water, vegetation, wildlife (including federally and state protected species), cultural resources, socioeconomics, geology, soils, land use, air quality and noise.

This analysis serves to identify and describe the cumulative impact that could potentially result from the incremental impact of the Project when added to the impacts of other past, present and reasonably foreseeable future actions. The selection of a time period and geographic boundaries for the cumulative impacts analysis is based on the natural boundaries of resources of concern (henceforth referred to as the region of influence [ROI]) and the period of time that the proposed Project's impacts may persist. PennEast understands that the ROI varies with the resource affected and cumulative impacts can extend beyond certain terrestrial boundaries. Therefore, to develop a robust and relevant data study, the ROI for the PennEast Project's cumulative impact analysis includes:

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- minor projects, including natural gas wells, residential development, small commercial development and small transportation projects, within 0.25 mile of the centerline;
- major projects, including large commercial, industrial, transportation and energy development projects, within 10-miles of the centerline when discussing land use, recreation, aesthetics and socioeconomics;
- major projects within U.S. Geological Survey (USGS) National Hydrography Datasets (NHD) 10 Hydrologic Unit Code (HUC)-Watersheds or subbasin areas crossed by the proposed Project (see RR2);
- and projects with the potential to result in longer term impacts on air quality (e.g., natural gas pipeline compressor stations) located within an Air Quality Control Region (AQCR) crossed by the proposed projects.

The selection of a 0.25-mile buffer for minor projects is based upon FERC Environmental Assessments and Environmental Impact Assessments, such as the Constitution Pipeline and Wright Interconnect projects (FERC Docket Nos.: CP13-499-000; CP13-502-000; and PF12-9-000).

In order to develop a thorough and comprehensive data analysis for decision-making purposes, a practical delineation of the spatial and temporal boundaries was selected to more precisely define the cumulative impact analysis scope. The cumulative impacts analysis includes projects that meet one or more of the criteria listed in Table 1.4-2. In terms of the selected spatial and temporal boundaries, the resource category ROIs vary. For inclusion in the analysis, a project must impact a resource category potentially affected by the proposed Project within a defined resource ROI. For some resource categories, the ROI can be large due to factors such as the dispersal of air pollutants, while for other resources ROI will be small in size due to the limited spatial scope of the impact, such as with noise impacts. The time period in which other projects could potentially contribute to cumulative impacts associated with the proposed Project area was based on whether the resource category impacts are short-term, long-term, or permanent. Most of the direct impacts associated with the PennEast Project will occur during the construction phase. However, there are some long-term operational impacts that would result from the Project, such as the operation of the compressor station. For other, similar projects where the impacts are long-term or permanent, the temporal range was extended to include their impact contributions. Table 1.4-1 identifies the Cumulative Impact Assessment Area (CIAA) for each of the resource categories the proposed Project will contribute direct and indirect impacts to. In general, regulatory guidance documents from CEQ, USEPA and FERC, along with recent published FERC EISs for similar pipeline projects, were used to select the appropriate CIAA for each resource category.

Table 1.4-1
Cumulative Impact Assessment Area for the Project

Resource	CIAA Boundary
RR 2: Groundwater	Watershed boundary Hydrologic Unit Code ("HUC") 10
RR 2: Water Use and Quality	Watershed boundary HUC 10
RR 3: Fish, Wildlife	Watershed boundary HUC 10
RR 3: Vegetation	Watershed boundary HUC 10
RR 4: Cultural Resources	0.25 mile
RR 5: Socioeconomics	County
RR 6: Geological Resources	0.25 mile
RR 7: Soils	0.25 mile or Watershed boundary HUC 10
RR 8: Land Use, Recreation, and Aesthetics	Watershed HUC 10 or 10 miles
RR 9: Air Quality	Air Quality Control Regions ("AQCR")

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Resource	CIAA Boundary
RR 9: Noise	1 mile
RR 10: Alternatives	N/A
RR 11: Reliability and Safety	N/A
RR 12: PCB Contamination	N/A
RR 13: Engineering and Design Material	N/A

PennEast is consulting with municipalities and county planning agencies affected by the Project to identify past, present and reasonably foreseeable future minor or major projects in the vicinity of the proposed Project that may contribute to cumulative impacts. The cumulative impacts assessment will also be based on information about projects obtained from resources such as planning commissions and county and municipal departments, available transportation improvement plans, meeting minutes and communications with county staff, input provided at Project Open Houses, and industry sources. The discussions and research include requests for information on projects that are presently on-going, and/or are planned and/or approved for implementation. The list of projects identified to date that may be considered in the context of the cumulative impacts analysis is provided in Table 1.4-2 below.

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Table 1.4-2
Projects Potentially Contributing to Cumulative Impacts Analysis

Project	Location (Address, Township, County, State)	Description	Permit Number	Closest Mile Post[a]	Approx. Distance to Project (Miles, Direction)	Approx. Permanent Impact Area (acres)	Current Status and Schedule	Watershed [b]	Air Quality Control Region (AQCR) [c]
Marcellus Shale Development									
Wells [d]									
None									
Pipeline Gathering Systems [e, f]									
Auburn Line Extension Operated by UGI Energy Services	Wyoming and Luzerne Counties, PA	27.4-mile, 20-inch diameter pipeline and compressor station capable of delivering approximately 200,000 dth/d	Erosion and Sediment Control GP2 Permit No. ESX131310001(1), E4029-003, E6629-0153	0.0 to 4.4	0.2 miles, East	166.1	In-service (2013)	Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Springville Gathering Pipeline Operated by Williams	Susquehanna, Wyoming and Luzerne Counties, PA	33.5-mile, 24-inch Springville pipeline transports natural gas from Williams' gathering system to its Transco interstate gas transmission system	Not Available	0.0 to 0.5	Parallels ROW, West to Northeast	203.0	In-service (2012)	Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Wyoming Gathering Pipeline Operated by PVC	Wyoming and Luzerne Counties, PA	750 million cubic feet per day (MMcfd) capacity system, 30 miles in length, 24-inches in diameter. Connects with the Transco interstate pipeline system	Erosion and Sediment Control GP2 Permit No. E6629-003 (Wyoming) and E4029-002 (Luzerne)	0.0	<0.25 mile, Northwest	181.8	In-service (2012)	Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Interstate Natural Gas Pipeline Projects [e]									
Marc II Pipeline Project Operated by CNYOG	Sullivan, Wyoming and Luzerne Counties, PA	Proposed 30-mile, 30-inch pipeline connecting the CNYOG MARC I Pipeline with the proposed PennEast Pipeline, a new interconnect on Transco's Leidy Line, and Transco's proposed Atlantic Sunrise Expansion Project in Luzerne County, PA	Not Yet in FERC Pre-Filling	0.0	Connects to PennEast Receipt Point	181.8	Currently proposed. Target in-service date of late 2017	Upper Susquehanna	Northeast Pennsylvania-Upper Delaware Valley Interstate Air Quality Control Region.
Garden State Expansion Project Operated by Williams	Burlington County, NJ	Provide up to 180,000 dth/d of natural gas. The project will include the installation of a new compressor station, meter and regulating station on land located in Burlington County, NJ. No expansion of the pipeline is required.	FERC Docket No. CP15-89-000	113.85	Connects to PennEast Delivery Point	23.2	Start of construction proposed for early 2016	Millstone	Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware)
Franklin Loop (Leidy Southeast Expansion) Operated by Transco	Tobyhanna and Buck Townships, Luzerne County, PA	11.5 mile, 42-inch pipeline expansion project to connect to Transco Pipeline	FERC Docket No. CP13-551-000	21.0-32.0	1.5 miles, East	69.7	Under Construction	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region

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Project	Location (Address, Township, County, State)	Description	Permit Number	Closest Mile Post[a]	Approx. Distance to Project (Miles, Direction)	Approx. Permanent Impact Area (acres)	Current Status and Schedule	Watershed [b]	Air Quality Control Region (AQCR) [c]
Skillman Loop (Leidy Southeast Expansion) Operated by Transco	Princeton and Montgomery Townships, Mercer County, NJ	6.3 mile, 42-inch expansion project to connect to Transco Pipeline	FERC Docket No. CP13-551-000	113.85	5.7 miles, Northeast	37.6	Under Construction	Millstone	Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware)
Atlantic Sunrise Pipeline Project Operated by Transco	Susquehanna, Wayne, Wyoming, Luzerne, Columbia, Northumberland, Schuylkill, Lebanon, Lancaster, Clinton, Lycoming, Lackawanna, PA; Prince William, VA; Howard, MD; NC; SCs	190 miles of pipeline, 2.5 miles of pipeline replacement, two new compressor stations, and other facility additions or modifications In PA, MD, VA, NC, and SC	FERC Docket No. PF14-8-000	0.0	2.0 miles, Northwest	1078.8	Currently proposed. Target in-service date of Summer 2017.	Bowman Creek, Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region and Northwest Pennsylvania-Youngstown Interstate
Northeast Supply Link (NSL) Project, Stanton Loop Operated by Transco	Hunterdon, NJ	6.6 miles of 42-inch pipeline loop	FERC Docket No. CP12-30-000	84.0	7.0 miles, Northeast	40.0	In-service (2013)	South Branch Raritan	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Other Projects									
Electric Generation And Transmission									
Susquehanna-Roseland Project Operated by PPL Electric Utilities	Luzerne, Lackawanna, Wayne, Pike and Monroe Counties, Pennsylvania	500 kV transmission line that will run 101-miles in Pennsylvania	Not Available	4.5	Intersects Alignment, Southwest to Northeast	Not Available	In-service (May 2015)	Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Northeast Pocono Reliability Project Operated by PPL Electric Utilities and Public Service Electric & Gas Company	Lackawanna, Monroe, Wayne, Pike and Luzerne Counties, Pennsylvania	Constructing three new electrical substations, 57 miles of new 230 kV power lines, and various shorter segments of 69 kV lines. Rebuild one 20 mile long kV line.	TBD	15.8-18.6	Parallels ROW, Northwest to Southeast	TBD	Proposed for completion in fall 2017	Upper Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Transportation									
Interstate 81	Plains Township, Luzerne County, PA	Replacement of four bridges, two over Jumper Road and two over Sunset Road	Not Available	10.5	0.1–1.7 miles, Southwest	Not Available	Under Construction	Upper Susquehanna	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
US 209 Interchange Road	Franklin and Towamensing Townships, Carbon County, PA	Highway restoration project. Mill and fill 8.43 miles and repair various drainages.	Not Available	44.4	Intersects Alignment, West to East	Not Available	Preliminary Engineering Phase. Estimated project state date of early 2016.	Aquashicola Creek, Pohopoco Creek	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Freemansburg Ave Interchange	Bethlehem Township, Northampton County, PA	Roadway reconstruction and bridge rehabilitation of SR 2018 structure	Not Available	70.0	0.1 mile, West	Not Available	Proposed in 2015	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
NJ Route 31 Expansion	Throughout Raritan Township and Flemington Borough, Hunterdon County, NJ	Build parkway system and expand street networking to Route 31 throughout Raritan Township and Flemington Borough	Not Available	96.9	7.4 miles, Northeast	Not Available	Ongoing	South Branch Raritan	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region

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Project	Location (Address, Township, County, State)	Description	Permit Number	Closest Mile Post[a]	Approx. Distance to Project (Miles, Direction)	Approx. Permanent Impact Area (acres)	Current Status and Schedule	Watershed [b]	Air Quality Control Region (AQCR) [c]
Commercial/Residential Development									
Combined Heat and Power (CHP) Plant at Blue Mountain	Intersection of PA Turnpike and PA-903, Palmerton, Carbon County, PA	Combined Heat And Power Plant By Tuthill Corporation, Funded By Pennsylvania Energy Development Authority (PEDA)	Not Available	47.1	4.5 miles, Southwest	Not Available	Not Available	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Blue Ridge Real Estate Properties	Multiple Resort Residential and Commercial Properties, Carbon County, PA	Real estate company specializing in resort residential communities in the Pocono Mountains; properties include Jack Frost National Golf Course	Not Available	24.4-30.5	0.1 mile, East	5,696 acres	Not Available	Upper Lehigh, Middle Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Sterling Crossing Subdivision	Hanoverville Road in Lower Nazareth Township, Northampton County, PA	Forty-one lot residential subdivision. Per zoning officer, Laurie Sesse.	Not Available	64.1	3.2 miles, Southwest	Not Available	Not Available	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Saratoga Farms Subdivision	Nazareth Bethlehem Pike in Lower Nazareth Township, Northampton County, PA	Fifty-five lot residential subdivision. Per zoning officer, Laurie Sesse	Not Available	66.2	0.7 miles, West	Not Available	Not Available	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Trio Fields Subdivision	Gremar Road in Lower Nazareth Township, Northampton County, PA	Three hundred and seventy-four lots residential subdivision. Per zoning officer, Laurie Sesse	Not Available	61.8– 64.7	0.1 miles, Southwest	89.8 acres	Not Available	Lower Lehigh	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Subdivision	Intersection of Green Pond Road and Farmersville Road in Bethlehem Township, Northampton County, PA	Traditions of America, proposes to build a 265-home subdivision. An area known locally as Green Pond Marsh is located in the northwestern part of the project site. Per FERC comment provided by PADEP Northeast Regional Office.	Not Available	68.0	0.5 miles, West	119 acre	Not Available	Bushkill Creek-Delaware River	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Huntington Knolls, LLC Housing Development	West of Route 519 and south of the Fox Hill development in Holland Township, Hunterdon County, NJ	Twenty nine buildings with age-restricted housing units as well as assisted-living units. Per FERC comment provided by Philip Giebel	Not Available	79.7-82.5	0.1 miles, North	87 acres	Not Available	Lower Delaware	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region
Ewing Town Center Redevelopment Project	Parkway Avenue, Ewing Township, Mercer County, NJ	Plan to redevelop closed general motors facility with 1000 housing units and 115,000 square feet of retail/commercial space	Not Available	113.8	6 miles, Southwest	128 acres	Not Available	Lower Delaware	Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware)

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Project	Location (Address, Township, County, State)	Description	Permit Number	Closest Mile Post[a]	Approx. Distance to Project (Miles, Direction)	Approx. Permanent Impact Area (acres)	Current Status and Schedule	Watershed [b]	Air Quality Control Region (AQCR) [c]

[a] Includes past (e.g. in-service within past 5 years), present or reasonably foreseeable future projects located within 0.25 miles of the Project centerline for minor projects and within 10 miles for major projects

[b] Watersheds listed are National Hydrography Datasets (NHD) 10 Hydrologic Unit Code (HUC)-Watersheds that are crossed by the Project

[c] AQCR = Air Quality Control Region (Title 40: Protection of Environment Part 81, Subpart B - Designation of Air Quality Control Regions)

[d] Wells permitted in counties within 0.25 miles of the proposed Project ROW in Pennsylvania. No well information available for New Jersey.

[e] Assumes a 50-foot permanent ROW width

[f] eFACTS search conducted for Erosion And Sediment Control GP-2 permits in Pennsylvania between 01/01/2012 and 06/19/2015. No gathering system information was found for New Jersey.

Sources: USGS 2015a; PADEP 2015 (a) (b); 40 CFR 81.13; 40 CFR 81.15; 40CFR 81.55; UGI Energy Services 2014; Williams 2015 (a) (b); First Energy 2015; PPL Electric Utilities 2008; PPL Electric Utilities 2014; PPL Electric Utilities 2015; Pennsylvania Wind Working Group 2006; ACORE 2014; PennDOT 2015; Clean Air Council 2015; NJDOT 2015; FERC 2014(a); Delaware River Keeper 2015; Jersey Central Power & Light 2015.; Crestwood Midstream Partners LP 2014; Crestwood Midstream Partners LP 2015; New Jersey Natural Gas 2015; Blue Ridge Real Estate Company 2015; Carbon Chamber and Economic Development 2014; Mercer County Planning Division 2012; Mercer County Planning Division 2015;

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1.4.1 Natural Gas Production

1.4.1.1 Wells

The U.S. Geological Survey (USGS) conducted a recent analysis of Marcellus Shale natural gas extraction in Pennsylvania and found that development creates "potentially serious patterns of disturbance on the landscape" (USGS 2012). The combined effects of natural gas well development create landscape changes due to earth disturbance for construction of roads, drilling pads, and installation of gathering lines. Changes in land use and land cover affect the ability of ecosystems to provide essential ecological goods and services, and can result in increased erosion, sedimentation and habitat fragmentation. During the natural gas production process, large volumes of water are pumped into shale under high pressure to shatter the formation facilitating release of the gas (SRBC 2013). On average, between 4 and 5 million gallons of water are used during the drilling and development phase of each natural gas production well.

A desktop study was conducted to identify all existing, planned or inactive natural gas wells within 0.25 miles of the proposed PennEast Pipeline. The majority of active natural gas production wells are located in northern, central and southwest Pennsylvania. The proposed Project will be sited in eastern Pennsylvania away from the majority of these active wells. In fact, the Pennsylvania Department of Environmental Protection (PADEP) did not issue any natural gas production well drilling permits within 10 miles of the Project centerline between January 1, 2012 and June 17, 2015 (PADEP 2015(a)). This includes Wyoming, Lackawanna, Luzerne, Carbon, Monroe, Northampton, Lehigh, and Bucks Counties in Pennsylvania. In New Jersey, natural gas production wells are extremely limited due to little natural gas drilling potential and legislative restrictions (EIA 2013). As a result, during the same time frame, no natural gas production well drilling permits were authorized within 10-miles of the Project in New Jersey, including Warren, Hunterdon, Somerset, Middlesex, and Mercer Counties. Assuming well drilling continues during and after construction of the Project, the location and extent of anticipated drilling is unknown; however, it could be reasonably assumed that an increase in drilling activity would be unlikely in the Project area due to the limiting factors described above.

A desktop analysis indicated that there are no natural gas wells permitted for extraction within 0.25 miles of the proposed Project in Pennsylvania (PADEP 2015(a)). Similarly, no past, present or reasonably foreseeable future natural gas production wells were found within 0.25-miles of the Project in New Jersey. As a result, PennEast does not anticipate that construction and operation of natural gas wells would result in cumulative impacts in the region at this time.

1.4.1.2 Pipeline Gathering Systems

The vast majority of natural gas in the U.S. gets to markets through pipelines. Pipeline gathering systems are an important aspect of natural gas transportation infrastructure as they move the gas from each production well to a larger transport line. The gas is then either transported to another transport line (also known as a “mid-stream” line) or directly to market (Johnson et al. 2011). Land impacts associated with construction, operation and maintenance of these facilities are similar to those associated with interstate natural gas transmission projects. However, gathering lines are generally smaller in diameter and shorter in length than interstate transport projects; and thus, the footprint and impact areas associated with their construction is generally narrower. In the Marcellus Shale region, gathering lines generally range from 6 to 24 inches in diameter and may require a cleared ROW of 30 to 150 feet wide (Johnson et al. 2011).

During a desktop analysis, three gathering pipeline systems were identified that are either proposed, under construction or have been completed within the past five years, and are within 10 miles of the

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proposed Project. This includes the completed Auburn Line Extension; the completed Springville pipeline; and the completed Wyoming pipeline. All identified pipeline gathering systems are located in Pennsylvania. No proposed, under construction or completed pipeline gathering systems were found within 10 miles of the proposed Project in New Jersey.

Located approximately 0.2 miles east of MP 0.0 to MP 4.4 in Wyoming and Luzerne Counties, the completed Auburn Line Extension project has been in-service since late 2013 (Auburn Pipeline 2014). The 27.4-mile, 20-inch diameter pipeline is capable of delivering approximately 200,000 Dth/ d and currently connects UGI's Auburn system with the Transcontinental Gas Pipeline (Transco) in the south. The Auburn Line Extension project intersects one of the same watersheds (Upper Susquehanna) as the proposed PennEast Project.

In January 2012, Williams Partners, LP (Williams) put the Springville natural gas gathering pipeline into service (Williams 2011). The 33.5-mile, 24-inch Springville pipeline transports natural gas from Williams' gathering system in Susquehanna County, PA, to its Transco interstate gas transmission system in Luzerne County, PA. The proposed PennEast Project would share an existing ROW within the Springville pipeline between PennEast's MP 0.0 to MP 0.5 in Luzerne County, PA. In addition, the projects would intersect one of the same watersheds (Upper Susquehanna).

PVR Partners, L.P. (PVR) completed its Wyoming natural gas gathering pipeline project in October 2012 (PR Newswire 2012). The pipeline is 30 miles in length, 24-inches in diameter and spans across the northern Wyoming County southward to connect with the Transco interstate pipeline system in Luzerne County, PA. The 750 MMcfd capacity system provides midstream services to producers operationally active in the Marcellus Shale region. The Wyoming pipeline is less than 0.25-mile from the proposed PennEast Project's MP 0.0 and located within one of the same watersheds (Upper Susquehanna).

All identified natural gas gathering pipeline systems are in the Northeast Pennsylvania-Upper Delaware Valley Interstate Air Quality Control Region.

1.4.1.3 Interstate Natural Gas Pipeline Projects

Within 10-miles of the proposed Project, there are 6 interstate natural gas pipelines projects that are either proposed, currently under construction or have been completed within the past 5 years. These projects consist of the proposed Marc-II Pipeline Project; the proposed Garden State Expansion Project; portions of the ongoing Leidy Southeast Expansion Project; the proposed Atlantic Sunrise Project, and the completed Northeast Supply Link Project. A description of these projects can be found in Table 1.4-2, and additional details regarding each project can be obtained via the eLibrary docket search function at www.ferc.gov by utilizing the above given FERC docket numbers. As of July 2015, the Marc-II Pipeline Project had not entered into the pre-filing process with the FERC; and therefore, a docket number has not yet been assigned for this project.

Central New York Oil & Gas Company LLC (CNYOG) successfully concluded a non-binding open season to solicit interest for the MARC-II pipeline project in October 2014 (Crestwood Midstream Partners LP 2014). The MARC-II pipeline would be a new 30-mile, 30-inch pipeline designed to provide 1 Bcf per day of firm transportation from existing receipt points on the CNYOG system for delivery to interconnects with the proposed PennEast pipeline, a new interconnect on Transco's Leidy Line, and Transco's proposed Atlantic Sunrise Expansion Project in Luzerne County, PA. The MARC-II pipeline would provide additional market access for gas received from multiple receipt points into the existing CYNOG system. The MARC-II pipeline would connect with the proposed PennEast pipeline's receipt point at MP 0.0 in Luzerne County, PA. The MARC-II project would intersect one of the same watersheds (Upper-Susquehanna) as the proposed PennEast Project.

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Williams is proposing the Garden State Expansion project, which would expand the Transco interstate natural gas pipeline to provide additional service to New Jersey Natural Gas Company (Williams 2015(b)). The project has been designed to provide up to 180,000 Dth/d. The project would include the installation of a new compressor station and meter and regulating station in Burlington County, NJ. No expansion of Williams' existing Transco pipeline would be required. The project has a target in-service date of November 2016 for Phase 1 of the project and a target in-service date of August 2017 for Phase 2. The Garden State Expansion Project would connect to PennEast's proposed delivery point at the Williams Transco Station 205 in Mercer County, New Jersey. The Garden State Expansion project would be located within the same watershed as the proposed PennEast Project (Millstone).

Transco is proposing the Leidy Southeast project to expand its existing pipeline system capacity to provide firm transportation service for an additional 525,000 Dth/d from the existing Grugan Interconnect on Transco's Leidy Line in Clinton County, PA, and the existing MARC-I Interconnect in Lycoming County, PA, to various delivery points on Transco's Mainline (Transco 2014). In addition, the Leidy Project will add a total of 71,900 hp at four compressor stations. As part of the project Transco proposes to construct and operate a total of approximately 29.97 miles of new 42-inch-diameter pipeline loop. Specifically, Transco proposes to construct the following facilities within 10 miles of the proposed PennEast Project:

- Franklin Loop consists of approximately 11.47 miles of pipeline loop between Leidy Line "D" MP 57.51 in Monroe County and MP 69.95 in Luzerne County, Pennsylvania. The Franklin Loop is approximately 1.5 miles east of PennEast's proposed MP 21.0 to MP 32.0 and is within one of the same watersheds (Lower Lehigh);

- Skillman Loop includes approximately 6.31 miles of pipeline loop between Caldwell "D" Loop Pipeline MP 1776.79 in Mercer County and MP 1783.00 in Somerset County, NJ. The Skillman Loop is approximately 5.7 miles northeast from MP 113.85 of the proposed PennEast Project and is within one of the same watersheds (Millstone).

Transco is proposing the Atlantic Sunrise Project to provide 1,700,002 Dth per day of capacity from northern Pennsylvania to Alabama (FERC 2014(a)). Proposed facilities include (i) 57.3 miles of 30-inch diameter pipeline and 125.2 miles of 42-inch diameter pipeline in PA; (ii) two new compressor stations totaling 70,000 hp in PA; (iii) the addition of 62,000 hp at three existing compressor stations in PA and MD; and (iv) modification of its existing system to enable north-to-south flow. Transco anticipates construction to begin in June 2016. The project would be approximately 2.0 miles northwest of the proposed PennEast starting point and within one of the same watersheds (Upper Susquehanna).

Transco is currently operating the Northeast Supply Link project providing an additional 250,000 Dth/d of firm incremental transportation service from various receipt points on Transco's Leidy Line in PA to various delivery points along Transco's Mainline and Leidy systems in PA, NJ, and NY. Facilities include approximately 12 miles of 42-inch diameter pipeline looping extension, 27 miles of pipeline updates, 0.4-miles of pipeline replacement, construction of a new compressor station, and modification of various aboveground facilities. Facilities were placed into service in late 2013. The Northeast Supply Link project is 7 miles northeast of the proposed PennEast Project's MP 84.0.

All identified interstate natural gas pipeline projects are, or would be, within the Northeast Pennsylvania-Upper Delaware Valley Interstate Air Quality Control Region, the Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware), and/or the Northwest Pennsylvania-Youngstown Interstate.

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1.4.2 Other Projects

1.4.2.1 Electric Generation and Transmission

There are two electric generation and transmission projects located within 10 miles of PennEast's proposed ROW that are either proposed, under construction or have been completed within the past 5 years. Both electric generation and transmission projects are intersected by the proposed PennEast Project, which includes the Susquehanna-Roseland Project and the Northeast Pocono Reliability Project.

PPL Electric Utilities energized the Pennsylvania portion of the Susquehanna-Roseland transmission line on May 11, 2015 (PPL Electric Utilities 2008). The project consists of a new 500-kilovolt power line that runs 101-miles north from Berwick, PA to Hawley and southeast to Bushkill, where it crosses the Delaware River. The proposed PennEast Pipeline would cross the Susquehanna-Roseland transmission line corridor at MP 4.5. The Susquehanna-Roseland Project is within one of the same watersheds as the proposed PennEast Project (Upper Susquehanna).

As part of the Northeast/Pocono Reliability Project, PPL Electric Utilities is in the process of building approximately 57 miles of new 230-kV power line, three electrical substations, and several short segments of 69 kV line in Lackawanna, Monroe, Wayne, Pike and Luzerne Counties, PA (PPL Electric Utilities 2014). Also as part of this project, PPL Electric Utilities will be rebuilding an existing 20 mile long, 69-kilovolt line that runs from the Peckville area in Lackawanna County to Honesdale, Wayne County, PA. The project is anticipated to be completed in fall 2017. One segment of the Northeast/Pocono Reliability project, the Jenkins to West Pocono Route, Alternate A, starts at the PPL Electric Utilities Jenkins Substation in Plains Township and parallels an existing transmission line ROW that the proposed PennEast pipeline would follow from MP 15.8 to MP 18.6. Both the proposed PennEast Project and the Northeast/Pocono Reliability Project intersect the same watershed (Upper Lehigh).

Both identified electric generation and transmission projects are, or would be, within the Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region.

1.4.2.2 Transportation

The Pennsylvania Department of Transportation (PennDOT) and the New Jersey Department of Transportation (NJDOT) have numerous projects either proposed and/or currently under construction. As discussed in Section 1.4, minor transportation projects were evaluated within 0.25 mile of the proposed Project and major transportation projects were evaluated within 10-miles of the proposed Project. The scope of the majority of these projects includes replacement of existing structures, such as bridges and roadways, or highway restoration projects. Four transportation projects were identified, including:

- PennDOT's Interstate 81 project in Plains Township, Luzerne County, PA consisting of the replacement of four bridges, two over Jumper Road and two over Sunset Road. The project is located 0.1 to 1.7 miles to the southwest of MP 10.5 in the Upper Susquehanna watershed. This transportation project is currently under construction.

- PennDOT's US 209 Interchange Road project is located in Franklin and Towamensing Townships in Carbon County, PA within two of the same watersheds as the proposed PennEast Project (Pohopoco Creek and Aquashicola Creek). Highway restoration will consist of mill and fill of 8.4 miles of roadway and repair of various drainages. US 209 intersects the proposed PennEast Project at MP 44.4. This project is currently in the preliminary engineering phase with an estimated project state date of early 2016.

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- PennDOT's Freemansburg Avenue Interchange project is located in Bethlehem Township in Northampton County, PA. The project will entail roadway reconstruction and bridge rehabilitation. The proposed project would be 0.1 mile from the proposed PennEast Project and within one of the same watershed (Lower Lehigh).

- NJDOT's Route 31 Expansion project is located through Raritan Township and Flemington Borough in Hunterdon County, NJ. The project involves construction of a new parkway system and expansion of street networking to Route 31 throughout Raritan Township and Flemington Borough. The transportation expansion project will be located 7.4 miles to the northwest of the proposed PennEast Project.

The anticipated completion date of these projects is unknown; however, based on available information, each project could overlap temporally with the proposed PennEast Project. All identified transportation projects are, or would be, within the Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region.

1.4.2.3 Commercial/Residential Development

The analysis determined that there are 8 commercial and/or residential development projects located within the ROI. Summaries of these projects are included below.

- Blue Mountain was awarded a $500,000 grant from Pennsylvania Energy Development Authority (PEDA) in 2014 in support of The Tuthill Corporation's project to build a combined heat and power (CHP) plant, also known as a cogeneration plant, at Blue Mountain (Northeast Pennsylvania Business Journal 2014). The project will be located approximately 4.5 miles southwest of PennEast's proposed MP 47.1. The current status and schedule for the cogeneration facility is not available, but the plant would be located in the same watershed as the PennEast Project (Lower Lehigh).

- Blue Ridge Real Estate Properties consists of multiple resort residential and commercial properties in Carbon County, PA that would be intersected by PennEast's Project in Kidder Township. The Blue Ridge Real Estate Properties consists of resort residential communities in the Pocono Mountains, including properties such as the Jack Frost National Golf Course. Blue Ridge Real Estate Properties is located 0.1 mile east of the proposed Project and within two of the same watersheds (Upper Lehigh and Middle Lehigh).

- Sterling Crossing Subdivision is a proposed forty-one (41) lot residential subdivision located approximately 3.2 miles southwest of the proposed MP 64.1. The subdivision would be located within the Lower Lehigh watershed, which is also intersected by the proposed PennEast Project.

- The Saratoga Farms Subdivision is a proposed fifty-five (55) lot residential subdivision approximately 0.7 mile west of the proposed MP 66.2. The subdivision would be within the Lower Lehigh watershed, which is also intersected by the proposed PennEast Project.

- Trio Fields Subdivision consists of a proposed three hundred and seventy-four (374) lot residential subdivision approximately 0.1 mile southwest of proposed MP 61.8 to MP 64.7. The subdivision would consist of 89.8 acres and be within one of the same watersheds as the proposed Project (Lower Lehigh).

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- A subdivision is currently proposed by Traditions of America at the intersection of Green Pond Road and Farmersville Road in Bethlehem Township, Northampton County, PA. Traditions of America proposes to build a two hundred and sixty-five (265) subdivision over the span of 119 acres. The proposed subdivision is approximately 0.5 mile west of the proposed PennEast Project and located within the same watershed as the proposed PennEast Project (Bushkill Creek - Delaware River).

- Huntington Knolls, LLC Housing Development is proposed for construction west of Route 519 and south of the Fox Hill Development in Holland Township, Hunterdon County, NJ. The proposed project includes building twenty nine (29) buildings with age-restricted housing units, as well as assisted-living units. The proposed housing development would be located 0.1 mile north of the proposed PennEast Project in the same watershed (Lower Delaware).

- The Ewing Town Center Redevelopment Project located at Parkway Avenue in Ewing Township, Mercer County, NJ entails the redevelopment of a closed General Motors facility with 1,000 housing units and 115,000 square feet of retail/commercial space. The proposed project would encompass 128 acres and be located 6 miles southwest of proposed MP 113.8. The redevelopment project would be located within the same watershed as the proposed PennEast Project (Lower Delaware).

All identified commercial/residential projects are, or would be, within the Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region and/or the Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware).

1.4.3 Potential Cumulative Impacts

Cumulative effects result from spatial (geographic) and temporal (time) crowding of environmental disturbances. Considering baseline conditions, PennEast is evaluating potential cumulative impacts of the proposed Project as they pertain to geology and soils; groundwater, surface water, and wetlands; vegetation; wildlife; fisheries and aquatic resources; land use, recreation, special interest areas, and visual resources; socioeconomics; cultural resources; and air quality and noise. As described above, the proliferation of development has already substantially altered the natural environment in the proposed Project area and wider region. PennEast's cumulative impact analysis takes into account these past (i.e. completed in past 5 years), present and reasonably foreseeable projects located within the ROI as defined in Section 1.4 above.

The following analysis discusses the potential cumulative impacts associated with the general development of natural gas infrastructure (i.e. wells, gathering pipelines and interstate pipelines), electric generation and transmission lines, transportation projects, and residential and commercial development.

1.4.3.1 Geology and Soils

PennEast does not anticipate a cumulative adverse impact on geological or soil resources from implementation of the proposed Project in combination with other known planned developments.

As described in Resource Report 6, temporary disturbances to geological resources are not expected as necessary precautions will be implemented. Unforeseen impacts from events such as landslides, subsidence, flash flooding, or soil liquefaction should be avoided due to the results of the various studies being conducted. In addition, unforeseen impacts should be minimized by the use of proper

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construction techniques, including proper monitoring by qualified and trained environmental inspectors.

Taking into account all past, present, and likely future impacts, the cumulative impacts to geological resources are expected to be minimal. Reasonably foreseeable future actions associated with the Project include operation and maintenance activities. These activities will be undertaken with the same care, precautions, and research as the proposed Project and will thus have a low likelihood of affecting geological resources.

Similarly, as discussed in Resource Report 7, any impacts to soils from the Project will generally be localized and temporary. PennEast is working with state agencies as well as advocacy groups to formulate a comprehensive Agricultural Impact Minimization Plan to be implemented during construction. The plan will outline agriculture-specific construction methods and BMP's as well as restoration methods and monitoring to ensure that crop yields are not significantly impacted as a result of construction of the Project. In addition, PennEast will minimize impacts to soils through consistent implementation of the E&SCP (Appendix E) to avoid topsoil mixing, compaction and erosion. Operation and maintenance activities constitute reasonably foreseeable future actions, and any impacts associated with these activities, although direct, should be temporary.

1.4.3.2 Water Resources

To date, PennEast has not identified a cumulative adverse impact from the implementation of the Project that in combination with other known planned development would be deleterious to water resources. As discussed in Resource Report 2, the Project prioritizes the avoidance and/or minimization of impacts to water resources. Temporary impacts to water resources during construction activities, including unavoidable trench excavation through wetlands and waterbodies and minimal fluctuations in local water tables that may occur during trench dewatering would be minimized through the implementation of erosion and sedimentation control best management practices as outlined in the E&SCP (Appendix E).

No permanent impacts to water resources are associated with the Project; however, permanent conversion of PFO wetlands to PSS or PEM wetlands is anticipated to establish a new ROW. These conversions are being minimized to the extent practicable. The realistic, reasonable extent of future impacts resulting from this Project would predominantly focus on facility operation and maintenance activities. Such activities would be conducted in a manner similar to the construction period (i.e., avoid and minimize disturbances) and would thereby limit any temporary water resource impacts.

1.4.3.3 Vegetation

As discussed in Resource Reports 3, the Project has been designed to avoid or minimize impacts to vegetation resources wherever possible. Plans will accommodate general and site-specific protective measures for any sensitive vegetation habitat identified during the course of the Project. In addition, no direct impacts to federally-listed or state-listed plant species or critical habitat are anticipated at this time. PennEast will use construction procedures to minimize sedimentation, turbidity, and other impacts that may temporarily affect stream vegetation. PennEast will continue to work with agencies, landowners, and soil conservation authorities so that construction and mitigation procedures are compatible with both site-specific and regional environmental protection objectives.

Cumulative adverse impacts on vegetation resources from the implementation of the Project with other known planned developments is not anticipated. Minor permanent impacts to vegetation associated with the Project would be associated with the establishment of new ROW. However, portions of the Project have been co-located within, or parallel to, existing, previously disturbed, and maintained ROWs to the extent possible. By locating portions of the Project outside of significant

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habitats and adjacent to existing ROWs, impacts to vegetation are expected to be minimized during construction, operations and maintenance activities.

1.4.3.4 Wildlife

The Project has been designed to avoid or minimize impacts to wildlife resources wherever possible (see Resource Report 3). Construction disturbances will likely cause the temporary displacement of wildlife from the construction workspace and adjacent areas. Plans will accommodate general and site-specific protective measures for any sensitive wildlife habitat and species identified during the course of the Project. Seasonal timing to account for reproductive and migratory patterns will be coordinated with state and Federal agencies. PennEast will use construction procedures to minimize sedimentation, turbidity, and other impacts that may temporarily affect stream wildlife and habitat. PennEast will continue to work with agencies, landowners, and soil conservation authorities so that construction and mitigation procedures are compatible with both site-specific and regional environmental protection objectives. After construction, wildlife is expected to return to post-construction habitats.

Cumulative adverse impact on wildlife resources from the implementation of the Project with other known planned developments is not anticipated. Minor permanent impacts to wildlife associated with the Project would be associated with the establishment of new ROW. However, as stated in the section above, the Project will be co-located with existing, previously disturbed, and maintained ROWs to the greatest extent practicable. By locating these new easement portions outside of significant habitats and adjacent to existing maintained ROWs, operation and maintenance impacts to wildlife is expected to be minimized.

1.4.3.5 Fisheries and Aquatic Resources

As discussed in Resource Report 3, the Project has been designed to avoid or minimize impacts to fisheries and aquatic resources wherever possible. Temporary impacts to fisheries may occur at proposed stream crossings throughout the Project. Stream crossing methods will be determined by individual stream conditions during final engineering design. The E&SCP (Appendix E) will be followed for both standard and special construction as well as operation techniques at stream crossings. Impacts on fishery resources crossed by the proposed Project will be minimized by adhering to the waterbody crossing measures in the E&SCP and summarized in Resource Report 2. The procedures outlined in the E&SCP will minimize introduction of water pollutants into waterbodies and minimize impacts on aquatic resources.

Cumulative adverse impacts on fishery resources are not anticipated. However, minor permanent impacts to fisheries associated with the Project would be associated with the establishment of new ROW. As the Project will be co-located with existing, previously disturbed, and maintained ROWs, operation and maintenance impacts to fisheries is expected to be minimized. Impacts from construction-related sedimentation and turbidity will be limited to short-term, temporary disturbances by following the procedures. Once construction is complete, streambeds and banks will be restored to pre-construction conditions to the fullest extent possible, thus minimizing long-term impacts on fisheries. No long-term impacts are anticipated after restoration of stream bottoms and regrowth of stream bank and aquatic vegetation. Operation and routine maintenance of the pipeline and pertinent facilities will not affect fishery resources within the proposed Project area.

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1.4.3.6 Special Status Species

[*PennEast is in the process of evaluating potential cumulative impacts of the proposed Project as they pertain to special status species. Additional information will be included in PennEast's application anticipated to be filed in September 2015*].

1.4.3.7 Land Use, Recreation, Special Interest Areas, and Visual Resources

As detailed in Resource Report 8, the projected cumulative impacts on land use, recreation, special interest areas and visual resources are based on impact assessment, input from federal, state and local agencies, and public input received at open houses held in November 2014 as well as FERC's scoping meetings held in February 2015.

The Project was designed to avoid or minimize impacts to land use wherever possible. Significant portions of the Project will be co-located throughout PA and NJ to minimize new ROW requirements but will still likely result in alterations to land cover, for instance forested to maintained, herbaceous ROW. Impacts to agricultural, open, residential, industrial, and commercial lands, or wetland and waterbody land uses will primarily be temporary during construction only. Construction impacts will be mitigated through stabilization and re-vegetation of the ROW. Additional mitigation techniques could include the planting of vegetation to serve as a visual screen along roadways, trails, and in residential areas as needed. Landowners will be allowed to continue agricultural production along the ROW post-construction with some restrictions.

Construction of the Project route and facilities will result in temporary impacts to visual and/or aesthetic resources due to the construction equipment and activities necessary for constructing the pipeline and associated facilities, as well as soil disturbance. Visual impacts associated with the Project have been evaluated, minimized, and avoided wherever possible. PennEast has minimized impacts to visual resources from construction of the pipeline segments by proposing to co-locate the pipeline with existing pipeline ROWs to the extent practicable. The Project will not have any visual impact on any federal or state-listed visually sensitive areas, such as scenic roads, rivers, or natural landmarks as these features are not present in the Project area.

Taking into account all past, present, and likely future impacts, the cumulative impacts to land use are currently expected to be minimal. Therefore, at this time there are no reasonable and foreseeable future cumulative impacts to land use arising from the Project.

1.4.3.8 Socioeconomics

As discussed in Resource Report 5, it is not anticipated that past, present and reasonably foreseeable future projects and activities would have a cumulative adverse impact on socioeconomic conditions in the region of influence for the proposed Project.

PennEast will procure easements, allowing PennEast to utilize certain portions of individual properties, rather than purchase all of the land required for the Project. The landowner will be compensated for the use of their property and there is no evidence that natural gas pipelines will depress the value of impacted properties.

Throughout the construction and operation phases of the Project, there will be an influx of approximately 2,500 direct individuals employed to work in the Project area, a population increase that would not affect the regional housing markets nor strain public services and facilities. The economic benefits during construction and annually thereafter from energy savings enabled by the Project, will continue to have broad and significant positive impacts to the region's economy. The jobs supported by the initial investment of the Project, and the increased spending from realized consumer energy savings, will create even greater benefits from increased income tax revenue to both

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PA and NJ. Meanwhile, the Project and its owners will also be subject to significant tax liabilities at the federal, state and local level. The community infrastructure and services such as police, fire, medical and education facilities within the Project area are sufficient to support both the larger influx of temporary workers and the smaller influx of permanent employees, and the Project is supplementing their capabilities with additional investments and training.

No adverse cumulative impacts have been identified within the Project area regarding population, demographics, economy and employment sectors, agriculture and timber production, tourism, housing, land acquisition and displacement, community services, taxes and revenues, and environmental justice populations. On the contrary, the Project is expected to enhance the economies of the affected areas with job opportunities, tax revenues and the anticipated decreased cost of natural gas creating increased disposable income for natural gas customers.

1.4.3.9 Cultural Resources

As discussed in Resource Report 4, potential cumulative impacts may include effects to cultural resources. For federal undertakings, cumulative impacts to cultural resources can be minimized through implementation of Section 106 of the NHPA. For state-funded or permitted projects in Pennsylvania, cumulative impacts to cultural resources can be minimized through the Pennsylvania History Code (37 Pa. Cons. Stat., Section 500). For state-funded or permitted projects in New Jersey, the Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A) can be used to reduce cumulative impacts to cultural resources.

1.4.3.10 Air Quality and Noise

As discussed in Resource Report 9, the projected cumulative impacts on air quality and noise are based on impact assessment, input from federal, state, and county agencies and public input received at open houses.

The primary air quality impacts from operations of the Project are related to the new compressor station and associated combustion turbines in PA (Kidder Township, Carbon County). The emissions from this facility are below Clean Air Act significance levels, and as such are not expected to have a cumulative significant air quality impact within the localized areas of the Project. The associated Plan Approval applications that will be submitted following the station will determine that the compressors (turbines) will be operated with emissions that represent Best Available Technology (BAT) for minimizing emissions.

Because of construction activities, the Project has been designed to minimize temporary impacts to air quality wherever possible. The operation of heavy construction equipment and its associated exhaust would increase diesel exhaust emissions and would suspend fugitive dust and other construction related particles in the air. The volume of dust emitted will vary depending on the level of activity, specific construction techniques, soil characterizations, and weather conditions. These temporary impacts will be minimized by requirements that the contractor keep machinery adequately maintained and operating. Construction dust and particles would be reduced by implementing fugitive dust control measures (water suppression).

PennEast is in coordination with the applicable county planning commissions and other agencies to identify proposed development projects in the ROI as defined in Section 1.4 above. At this time, PennEast has not identified a cumulative adverse impact on air quality from the implementation of the Project with other known planned developments.

[*PennEast is in the process of evaluating potential cumulative impacts of the proposed Project as they pertain to noise. Additional information will be included in PennEast's application anticipated to be filed in September 2015*].

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1.4.3.11 Reliability and Safety

Effects on reliability and public safety would be alleviated through the use of the DOT Minimum Federal Safety Standards in 49 CFR 192, which are intended to protect the public and to avert natural gas facility mishaps and failures. In addition, PennEast construction contractors would be required to observe the Occupational Safety and Health Administration Safety and Health Regulations for Construction in 29 CFR 1926. No cumulative impacts on safety and reliability are anticipated to occur as a result of the proposed Project.

1.4.3.12 Conclusion

[*PennEast is in the process of evaluating potential cumulative impacts of the proposed Project. Additional information will be included in PennEast's application anticipated to be filed in September 2015*].

1.5 Construction and Restoration

1.5.1 Standard Construction Methods

The proposed PennEast Project will be constructed in compliance with applicable specifications, Federal regulations and guidelines, and the Project-specific permit conditions (Section 1.7).

Construction and restoration techniques to be used will be those typical for cross-country and residential construction. The E&SCP (Appendix E) provides detail of such techniques and mitigation measures that will be used for the Project. Additional construction techniques and measures that will be employed are provided in the Spill Prevention, Control, and Countermeasure (SPCC) Plan (Appendix H).

The Project E&SCP will be consistent with the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 version) and Wetland and Waterbody Construction and Mitigation Procedures (May 2013 version).

Construction of the PennEast Pipeline will follow standard construction practices and will typically involve numerous divisions of the pipeline (spreads) with crews progressing work along the ROW within each spread in an ordered, choreographed fashion. The PennEast Project anticipates division of the PennEast Pipeline Route into four spreads.

Table 1.5-1
PennEast Construction Spreads

Spread	From MP	To MP	From	To
1	0.0	17.8	Origination	Meadow Run Road Crossing
2	17.8	48.1	Meadow Run Road Crossing	Little Gap Road Crossing
3	48.1	77.5	Little Gap Road Crossing	Delaware River
4	77.5	113.8	Delaware River	End

Typically, survey crews will begin the operations by demarcating the pipeline centerline and construction work area (CWA) along the ROW. Winter tree clearing may be employed in areas with sensitive habitat. Clearing, grading, trenching, and other crews would follow until a final cleanup crew initiates the restoration process. Crews most frequently progress in close sequence to facilitate orderly progress, minimize the active construction spread size, and expedite restoration efforts.

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Pipeline construction generally involves the following sequential operations which are discussed in more detail in the E&SCP (Appendix E).

Pipeline Construction - Typical Sequential Operation Steps:

1. Survey/demarcate the route and approved workspace.
2. Centerline survey of existing or proposed pipelines.
3. Clearing – remove vegetation from CWA; installation of erosion and sediment controls.
4. Additional protection of adjacent pipeline, as necessary; grading to establish safe workspace; completion of installation of erosion and sediment controls.
5. Trenching - pipeline trench excavation to design depths.
6. Stringing - placement of pipe joints along the trench line.
7. Bending – bending pipe joints, as needed, for route and terrain.
8. Weld pipe.
9. Pipe integrity - visual inspection, non-destructive examination (NDE) of welds.
10. Weld coating - corrosion protection and waterproofing.
11. Pipe placement - pipe placed in trench, tied to previously laid sections, backfilled.
12. Hydrostatic testing – confirmation of pipeline integrity.
13. In-line tool inspection of new pipeline segments.
14. Tie-in to existing pipeline, purge, pack new section with gas.
15. Grade restore of CWA to previous contours.
16. Final clean-up, restoration, and seeding.

During such operations PennEast will apply dust mitigation measures, as necessary. Such applications will be at the direction of the Contractor Supervisor, Environmental Inspector, and/or the onsite Chief Construction Inspector. Typical measures that may be employed to minimize dust will be the use of water trucks to dampen workspace, if necessary, and roadways to help maintain clear visibility.

1.5.1.1 Surveying

Access to the CWA will normally be obtained via public roads that intersect the ROW. Permission will be obtained from landowners for the use/upgrade of access roads across their property to the CWA. Prior to construction, survey crews will stake the centerline of the proposed pipeline, foreign line crossings, the limits of the CWA, and the location of approved work access roads. Wetland boundaries and other environmentally sensitive areas will also be re-marked at this time.

1.5.1.2 Clearing

The CWA will be cleared to remove brush, trees, roots, and other obstructions such as stumps. Non-woody vegetation may be mowed to ground level. No cleared material will be placed within wetland areas.

Clearing includes the removal of trees and brush from the CWA. With the exception of stream buffers and wetlands, tree stumps are removed from the permanent ROW. Stump grinding may be used as an alternative to removal to leave below grade root systems intact to aid in soil stabilization. PennEast anticipates disposal of trees cleared from the CWA using several different methods. Trees, if suitable, will be taken off-site by the clearing contractor and used for timber unless the landowner has made alternative arrangements for the salvageable timber. Trees and stumps may be chipped on-site and removed. Chipped material not removed from the site may be spread across the upland areas of the CWA in a manner that will not inhibit revegetation or broadcast into off-ROW and stable areas. Wood chips will not be left within agricultural lands, wetlands, or within 50 feet of wetlands. Wood chips will not be stockpiled in a manner that they may be transported into a wetland.

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1.5.1.3 Grading

Grading of the CWA will allow for the movement of heavy equipment and the safe passage of work crews. Grading will include removing rock outcrops, tree stumps, ridges, and topographic irregularities. Generally, machinery will operate on one side of the trench (working side) with excavated materials stockpiled on the other (non-working side).

Special construction procedures to minimize the amount of vegetation removed from stream banks and slopes, prevent undue disturbance of the soil profile, restore the original contours of the natural ground, and prevent topsoil erosion will be implemented as necessary. To minimize impact to the soil profile on agricultural lands, up to 12 inches of topsoil will be segregated from subsoil during trenching and will remain segregated during construction to avoid loss due to mixing with subsoil material. PennEast will utilize either full CWA topsoil segregation or ditch plus spoil side topsoil segregation, as requested by the landowner, as appropriate based upon site-specific conditions. Upon completion of backfilling operations, the topsoil will be properly replaced over the graded area. Grading activities will be scheduled to minimize the time between initial clearing operations and the actual installation of pipe.

1.5.1.4 Trenching

In most areas characterized by normal soils, the trench for the pipeline is excavated by crawler-mounted, rotary wheel-type trenching machines, or track–mounted excavators. The trench generally will 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 USDOT regulations pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended. Landowner requests or permitting requirements may dictate greater depth.

Except as depicted on site-specific plans, the depth of cover for the proposed pipeline facilities, as well as the depth of cover for other, non-typical conditions, such as HDD, will be in accordance with PennEast's minimum specifications. Scour analysis and the potential for external damage may increase these depths. In actively cultivated agricultural lands, PennEast plans to install the pipeline with 48 inches of cover, except where rock prevents this depth. In these cases, PennEast's minimum specifications for depth of cover will be used.

Crossing of foreign pipelines will generally require the pipeline to be buried at greater depths depending upon the depth of the foreign pipeline. A minimum of 12 inches of clearance will be maintained when crossing foreign pipelines, utilities, or other structures as required by USDOT. Pipeline burial depths in areas requiring special construction techniques through rock will be in accordance with USDOT requirements, 49 CFR Part 192. Prior to the commencement of construction activities, the appropriate "Dig Safe" call systems will be contacted to have underground utilities and foreign pipelines identified and marked. Trenching in the vicinity of any foreign utilities will begin only after completing the appropriate notification procedures.

Measures will be employed to minimize erosion during trenching operations and construction activities. Measures also will be taken to minimize the free flow of water into the trench and through the trench into waterbodies. Compacted earth for temporary trench breakers and sandbags for permanent trench breakers may be installed within the trench to reduce erosion.

1.5.1.5 Stringing

The stringing operation involves moving the pipe into position along the prepared ROW. Pipe will be delivered to the Project area's pipeline storage areas typically by truck and will then be moved by truck from the pipeline storage areas to the construction zone, where it will be placed along the ROW

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in a continuous line in preparation for subsequent lineup and welding operations. Individual joints of pipe will be strung along the ROW parallel to the centerline and arranged so they are easily accessible to construction personnel. The amount of pipe necessary for stream or road crossings will be stockpiled in pipeline storage areas in the vicinity of each crossing. Stringing activities will be coordinated with the advance of the trenching and pipe laying crews to minimize the potential impact to the resources. Steel pipe sections or joints in standard 40, 60, or 80-feet lengths will be welded together.

1.5.1.6 Bending

The pipe will be delivered to the Project site in straight sections. However, bending of the pipe will be required to allow the pipeline to follow natural grade changes and direction changes of the ROW. For this purpose, prior to line-up and welding, selected joints will be field-bent by track-mounted hydraulic bending machines. For larger horizontal changes of direction, manufactured induction bends may be used.

Pipe bending in the field will be utilized for turns involving slight deflections and/or large radii. For turns involving larger deflections and/or small radii, often related to spatial limitations due to easement and topographic constraints, prefabricated elbow fittings will be utilized, rather than pipe bending on-site.

1.5.1.7 Welding Inspections and Non-Destructive Examinations

Following stringing and bending, the joints of pipe will be placed on temporary supports adjacent to the trench. The ends will be carefully aligned and welded together using multiple passes for a full penetration weld. Only welders qualified according to applicable American National Standards Institute ("ANSI"), American Society of Mechanical Engineers ("ASME"), and American Petroleum Institute ("API") Standards will be permitted to perform the welding.

To ensure that the assembled pipe meets or exceeds the design strength requirements and to ensure weld quality and integrity, the welds will be inspected visually and tested non-destructively using radiographic (x-ray) or another approved test method, in accordance with API Standards. Welds displaying inclusions (void spaces) or other defects will be repaired if out of code, or they will be cut out (removed) and new welds installed and retested.

1.5.1.8 Coating

Following welding, the previously uncoated ends of the pipe at the joints will be field-coated per applicable coating specifications. Prior to lowering the pipe into the trench, the coating on the entire pipe section will be visually inspected and evaluated using a holiday detector (inspection of pipe coating using electronic equipment). Damaged areas will be repaired per applicable coating repair specifications.

1.5.1.9 Lowering-In

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). Connecting ends of the pipe are welded together in the ditch followed by the above inspection and coating process.

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1.5.1.10 Backfill

Following lowering-in, the trench and pipeline are backfilled. A bedding layer of rock-free pad dirt is placed first to protect the pipe and coatings. Final backfill makes use of material excavated from the trench.

1.5.1.11 Hydrostatic Testing

Completed sections of pipeline are further tested using water pressure. Pipes are filled with water and then pressurized to levels higher than the maximum operating pressure designated for the pipeline. The pressure test is held for a minimum of eight hours to be in compliance with U.S. Department of Transportation (USDOT) regulations.

1.5.1.12 Waterbody Crossings

Various methods will be used to cross streams and rivers and are described in Section 1.5.2 and Appendices C and E.

1.5.1.13 Cleanup and Restoration

Cleanup and restoration commence as soon as practicable following completion of backfilling and testing. These activities include replacing grade cuts to original contours, seeding fertilizer, and mulching to restore ground cover and minimize erosion. Temporary workspaces are stabilized for their natural reversion to their previous state.

1.5.2 Specialized Construction Methods

1.5.2.1 Streams and Rivers

PennEast is evaluating numerous methods for pipeline construction, particularly as it relates to traversing the numerous waterbodies (summarized in Resource Report 2). This evaluation includes consultations with the U.S. Fish and Wildlife Service (USFWS), Pennsylvania Department of Environmental Protection (PADEP), New Jersey Department of Environmental Protection (NJDEP), and the U.S. Army Corps of Engineers (USACE), among others. PennEast proposes to cross waterbodies with flow at the time of construction using a combination of horizontal directional drilling (HDD), bores, and dry-crossing methods, as described below.

Generally during crossings, the full width of the construction ROW will be used on either side of the waterbody for construction staging and pipeline fabrication. Additional temporary construction workspace (ATWS) may be required in some situations and will be located in upland areas a minimum of 50 feet from the waterbody, whenever possible; however, certain crossings may require ATWS in closer proximity to the waterbody. PennEast will request a variance and include justification for all ATWS not identified at this time, including ATWS within 50 feet of a wetland/waterbody, and these areas will be included as part of the Project study area in agency consultations, environmental permitting and resource surveys going forward.

PennEast will follow the timing restrictions identified by the Pennsylvania Fish and Boat Commission (PFBC). There is a March 1 to June 15 timing restriction for PFBC-approved trout waters and trout stocked streams, and an October 1 to December 31 timing restriction for PFBC-designated wild trout waters, and an October 1 to April 1 timing restriction for PFBC-designated Class A trout waters. The Chapter 93 “TSF” designation does not carry any timing restrictions. The approved trout water timing restrictions only apply to the stocked portions of the waterbody and any unnamed tributaries within

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0.5 mile of the stocked portions. These timing restrictions do not apply to unnamed tributaries outside of the 0.5 mile of the stocked streams. The timing restriction for PFBC wild trout waters applies to the entire reach of any stream within the designated watershed and the tributaries thereto. For Class A trout waters, the timing restriction applies to the stream reach defined by the PFBC.

The PFBC considers "in-stream construction" to consist of any impacts to the streambed/bank or flowing water below the top of bank, which would include the installation of a utility line dry crossing. The PFBC has confirmed that the installation of a temporary equipment bridge that spans from bank to bank, or any pre-blasting required outside of the top of banks, would not be subject to the timing restrictions. In New Jersey, NJDEP regulations impose timing restrictions on any regulated activity that would discharge sediment to the waterbody. PennEast will follow the timing restrictions set forth at N.J.A.C. 7:13-10.5(d) of the NJ Flood Hazard Area Control Act Rules. Timing restrictions are applied to trout-associated waters (within, or within 1 mile upstream of trout production, trout maintenance/stocked waters), and waters which support general game fish, pickerel, walleye, and anadromous fish species. The timing restrictions apply to construction activities in the channel, and in certain cases, the associated riparian zones of regulated waters. Where a waterbody is subject to more than one timing restriction, the NJDEP shall not limit regulated activities to less than 183 days per year. NJDEP determines periods that provide most protection for the resource and the 183 days may not be consecutive.

PennEast will also continue to consult with and follow any timing restrictions requested by the Susquehanna and Delaware River Basin Commissions. Any timing restrictions requested will be checked for consistency with FERC's Wetland and Waterbody Construction and Mitigation Procedures. If inconsistencies are found, PennEast will request that they be reviewed as an alternative measure with justification for their use.

1.5.2.2 Equipment

During clearing and grading activities, temporary bridges will be constructed across all waterbodies to permit construction equipment to cross. Construction equipment will be required to use the bridges, except the clearing crew who will be allowed one pass through the waterbodies before the bridges are installed. Bridges and supports will be removed after restoration is complete. If bridges are not installed at state-designated fishery streams, equipment will be required to move around the waterbodies to gain access to the other side.

In general, equipment refueling and lubricating will take place in upland areas that are more than 100 feet from the edges of streams and rivers and their associated wetlands. There may be certain instances where equipment refueling and lubrication may be necessary in or near streams and rivers. For example, stationary equipment, such as water pumps for hydrostatic test water, may need to be operated continuously on the banks of waterbodies and may require refueling in place. PennEast will identify areas where refueling or equipment lubrication may be required within 100 feet from streams and rivers and associated riparian zones in its necessary permit applications and final Resource Report filings. PennEast has prepared a SPCC Plan to address the handling of fuel and other materials in or within 100 feet of waterbodies. The SPCC Plan to be utilized during construction is included as Appendix H.

1.5.2.3 Clearing

Clearing will involve the removal of trees and brush from the construction ROW and temporary construction workspace. Woody vegetation will be cleared to the edge of the waterbodies, but a 10-foot-long herbaceous strip will 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 waterbodies. Initial grading of the herbaceous strip will be limited to the extent needed to install

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bridges 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 will be installed and maintained adjacent to waterbodies and within temporary construction workspaces, where needed, to minimize the potential for sediment runoff. Drivable berms may be installed and maintained across the ROW in lieu of silt fence or straw bales.

1.5.2.4 Pre-Blasting In Streams

PennEast is proposing that during the ditching activities, all streams that contain solid rock be drilled and blasted. An application for a Permit for Use of Explosives in Commonwealth Waters will be filed with the PFBC. Similarly, PennEast will submit a blasting plan to NJDEP prior to the commencement of blasting activities. Any blasting activities will be completed in accordance with the E&SCP. The ditch crew will drill the stream banks with a rock drill to determine if rock will be encountered. Should the test holes determine the area will need to be shot or blasted, the crew will continue to prepare the ditch line area for blasting. Upon completion of blasting, the crew will ensure that the stream bottom is restored to prevent interference with the flow. Once the mainline tie-in crews move to the area the stream will be excavated and installed in accordance with the E&SCP. The stream pre-blasting activities will reduce the duration of stream disturbance and enable the contractor to meet the timing restrictions for in-stream disturbance.

1.5.2.5 Flume Crossing Method

PennEast may choose to cross specific waterbodies by using the flume 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 (see E&SCP). 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 will 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 will excavate a trench under the flume pipe in the isolated streambed. Spoil excavated from the stream trench will be placed or stored a minimum of 10 feet from the edge of the waterbody for temporary storage. Once the trench is excavated, a pre-fabricated segment of pipe will be installed beneath the flume pipes. The trench will then be backfilled with native spoil from the streambed. Clean gravel or native cobbles will be used to backfill the top 12 inches of the trench in coldwater fisheries.

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 to prevent heavily silt-laden water from flowing into the waterbody.

1.5.2.6 Dam and Pump Crossing Method

PennEast may choose to cross specific waterbodies by using the dam and pump 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 (see E&SCP). Energy dissipation devices, such as steel plates will be placed on the downstream side at the discharge point to prevent streambed scour.

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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 will 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 will 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.

1.5.2.7 Restoration

Completed stream crossings using the flume or dam and pump methods will be stabilized before returning flow to the channel. Original streambed and bank contours will 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 will be stabilized before removing the flume pipes and returning flow to the waterbody channel.

Seeding of disturbed stream approaches will be completed in accordance with FERC's *Plan* and *Procedures* after final grading, weather and soil conditions permitting. Where necessary, slope breakers will be installed adjacent to stream banks to minimize the potential for erosion. Sediment barriers, such as silt fence and/or straw bales will be maintained across the ROW until permanent vegetation is established. Temporary equipment bridges will be removed following construction.

1.5.2.8 Major Waterbody Crossings

There are 5 major waterbody crossings associated with the Project: the Susquehanna River, the Lehigh River, Wild Creek and Pohopoco Creek (Beltsville Lake), and the Delaware River. PennEast is conducting ongoing evaluations of the different construction methods for each of the crossings. A team of engineers, environmental scientists, construction personnel and land agents conducted joint field investigations and reviewed each of the crossing areas.

1.5.2.8.1 Open Cut Crossing

The 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 will 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 will be met, contours will be restored within the waterbody, and the banks will 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.

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The Susquehanna River crossing is bordered by an airport and flood-control berm to the south and a newly constructed highway bridge to the north. The crossing area is in proximity to the historic 1959 Knox Mine disaster where the river bed collapsed into the mine. The crossing area is being carefully evaluated with PADEP's Abandoned Mine Reclamation Bureau for historic mine shafts and debris. Due to the presence of abandoned mines and the geomorphic conditions at the surface, PennEast is evaluating a potential open cut, dry crossing of the Susquehanna River. Two other pipeline crossings in the area used open cut methodology with a diversion of the river channel on the other side of an island (Monocanock) during construction so that the crossing was essentially done in the dry. Preliminary engineering of this crossing would involve installing a Portadam at the upstream tip of Monocanock Island, which is located in the center of the river, to divert flow to one side of the river. Bladder dams would be installed adjacent to the pipeline trench for further dewatering. After the pipe is installed under half of the river, the flow diversion, dewatering, and pipeline installation would be completed on the other half of the river.

1.5.2.8.2 Horizontal Directional Drilling

Directional drilling is an advanced boring method that requires the drilling of a small diameter hole, or pilot hole, along a predetermined design path. The pilot hole is then gradually enlarged until it is sufficient to accommodate the pipeline being installed. The pipeline may or may not be installed concurrently with the hole enlargement depending upon the final diameter of the enlarged hole and the soil conditions encountered.

Excavation of the drill entry and exit locations will be necessary to contain drilling fluids during all phases of the installation. These fluids and cuttings must be disposed of in an approved manner periodically or at the completion of the crossing installation. The crossing length and cross-sectional geometry are dependent upon the pipeline design parameters, the obstacle to be crossed, and the subsurface conditions. Additional temporary workspace, including pipe staging areas and storage areas for drilling mud and borehole cuttings, will be located in upland areas outside of wetlands and riparian zones wherever practicable.

Preliminary studies indicate that the Lehigh River, Wild Creek and Pohopoco Creek (Beltsville Lake) and the Delaware River can each be crossed using a bore or HDD. Geotechnical investigations to be conducted in 2015 will confirm these plans. Initial discussions with the USACE indicate that they are supportive of the general location of the Beltzville Lake crossings and additional coordination and studies will be necessary. These and other proposed HDD crossings are listed in table 1.5-2 below.

Table 1.5-2
Horizontal Directional Drilling

Location/Feature	Mile Post
US Hwy 81 / St. Hwy 315	10.6
Wild Creek (Beltzville Lake)	43.5
Pohopoco Stream (Beltzville Lake)	44.0
St. Luke's (Lowes)	70.0
Lehigh River	70.9
Interstate 78	71.6
Delaware River	77.5
Pleasant Valley Road	105.5
Washington Crossing Pennington Rd	110.6
Railroad	111.6

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PennEast will prepare a HDD Contingency Plan and unanticipated release plan that will be included with the September certificate filing and environmental permit applications for review and implementation as necessary.

1.5.2.9 Wetlands

Wetland construction will be done in accordance with FERC's *Wetland and Waterbody Crossing Procedures* as well as applicable BMPs required by the PADEP, NJDEP and County Conservation Districts. In accordance with FERC guidelines PennEast will limit the width of the construction ROW to 75 feet or less and would maintain a corridor centered on the pipeline and up to 10 feet wide, where practicable.

In addition, PennEast will follow the SPCC Plan and E&SCP provided in the Appendices as well as specific PA and NJ permit conditions.

1.5.2.10 Other Utilities

Publicly available utility mapping indicates that foreign pipelines and utilities are present in a number of locations. Locations of these existing facilities will be identified during surveys, site visits with known utility operators, and marked on Alignment Sheets. In addition, prior to construction, PennEast will contact the national "Call Before You Dig" number, 811, so that the locations can be properly marked in the field.

Table 1.5-3
Foreign Utilities Crossed

Mile Post	Facility Type	Owner	Size	HMMID
0.0	TBD	Transcontinental Gas Pipe Line Corp	TBD	65
1.7	TBD	PPL Corp	TBD	30
1.7	TBD	Columbia Pipeline Group	TBD	71
2.8	TBD	Transcontinental Gas Pipe Line Corp	TBD	64
6.6	TBD	Transcontinental Gas Pipe Line Corp	TBD	62
8.1	TBD	Transcontinental Gas Pipe Line Corp	TBD	62
8.8	TBD	PPL Electric Utilities Corp.	TBD	82
9.2	TBD	Unknown	TBD	90
10.5	TBD	Unknown	TBD	88
11.9	TBD	Transcontinental Gas Pipe Line Corp	TBD	63
15.6	TBD	Transcontinental Gas Pipe Line Corp	TBD	63
18.3	TBD	Black Hills Energy	TBD	95
18.6	TBD	Buckeye Partners, LP	TBD	18
20.4	TBD	Transcontinental Gas Pipe Line Corp	TBD	60
20.4	TBD	Transcontinental Gas Pipe Line Corp	TBD	61
26.2	TBD	UGI Utilities Inc.	TBD	77
29.0	TBD	Buckeye Partners, LP	TBD	4
35.5	TBD	Buckeye Partners, LP	TBD	14
36.6	TBD	Buckeye Partners, LP	TBD	14
37.4	TBD	Buckeye Partners, LP	TBD	5

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Mile Post	Facility Type	Owner	Size	HMMID
37.4	TBD	Buckeye Partners, LP	TBD	3
39.6	TBD	Buckeye Partners, LP	TBD	3
39.6	TBD	Buckeye Partners, LP	TBD	5
40.7	TBD	Buckeye Partners, LP	TBD	9
64.5	TBD	Transcontinental Gas Pipe Line Corp	TBD	78
67.7	TBD	PPL Corp	TBD	2
73.9	TBD	Columbia Pipeline Group	TBD	68
79.0	TBD	Elizabethtown Gas Co	TBD	67
79.0	TBD	Elizabethtown Gas Co	TBD	66
89.8	TBD	Buckeye Partners, LP	TBD	10
89.8	TBD	Buckeye Partners, LP	TBD	11
99.8	TBD	Texas Eastern Transmission LP	TBD	22
99.8	TBD	Texas Eastern Transmission LP	TBD	27
100.2	TBD	PECO Energy Co.	TBD	85
100.2	TBD	Texas Eastern Transmission LP	TBD	34
100.2	TBD	Texas Eastern Transmission LP	TBD	39
112.1	TBD	Transcontinental Gas Pipe Line Corp	TBD	49
112.7	TBD	Transcontinental Gas Pipe Line Corp	TBD	49

1.5.2.11 Rugged Topography

Rugged topography is considered areas with steep slopes and side slopes greater than 30% and for pipeline length of greater than 68 feet (triple length of pipe) where recorded. PennEast will cross 180 areas of rugged topography totaling 7.0 miles.

Table 1.5-4
Rugged Topography

Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
1	PennEast Mainline Route	0.4	0.5	576.7
2	PennEast Mainline Route	0.5	0.6	200.9
3	PennEast Mainline Route	0.6	0.6	107.2
4	PennEast Mainline Route	0.7	0.7	117.8
5	PennEast Mainline Route	2.3	2.3	140.1
6	PennEast Mainline Route	3.1	3.2	204.1
7	PennEast Mainline Route	3.2	3.2	76.6
8	PennEast Mainline Route	3.6	3.6	229.6
9	PennEast Mainline Route	3.6	3.7	505.7
10	PennEast Mainline Route	4.3	4.4	76.1
11	PennEast Mainline Route	4.9	4.9	106.5
12	PennEast Mainline Route	5.0	5.2	698.3

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Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
13	PennEast Mainline Route	5.2	5.2	84.2
14	PennEast Mainline Route	5.2	5.3	362.9
15	PennEast Mainline Route	5.5	5.5	90.2
16	PennEast Mainline Route	5.9	5.9	88.4
17	PennEast Mainline Route	7.6	7.7	107.4
18	PennEast Mainline Route	8.5	8.6	192.2
19	PennEast Mainline Route	8.6	8.6	299.1
20	PennEast Mainline Route	8.6	8.7	306.1
21	PennEast Mainline Route	9.1	9.2	101.4
22	PennEast Mainline Route	9.2	9.2	117.8
23	PennEast Mainline Route	9.4	9.5	77.0
24	PennEast Mainline Route	9.5	9.6	99.0
25	PennEast Mainline Route	9.6	9.6	70.4
26	PennEast Mainline Route	9.6	9.6	73.6
27	PennEast Mainline Route	9.7	9.8	254.6
28	PennEast Mainline Route	10.0	10.0	88.0
29	PennEast Mainline Route	10.0	10.1	273.2
30	PennEast Mainline Route	10.1	10.1	75.5
31	PennEast Mainline Route	10.1	10.2	321.3
32	PennEast Mainline Route	10.3	10.4	74.7
33	PennEast Mainline Route	10.4	10.4	81.0
34	PennEast Mainline Route	10.5	10.5	181.2
35	PennEast Mainline Route	10.6	10.6	76.8
36	PennEast Mainline Route	11.1	11.2	300.0
37	PennEast Mainline Route	11.7	11.7	185.6
38	PennEast Mainline Route	12.0	12.1	123.0
39	PennEast Mainline Route	12.9	13.0	364.0
40	PennEast Mainline Route	13.3	13.4	373.3
41	PennEast Mainline Route	13.6	13.6	72.2
42	PennEast Mainline Route	14.1	14.1	196.4
43	PennEast Mainline Route	14.2	14.3	526.6
44	PennEast Mainline Route	14.3	14.3	90.5
45	PennEast Mainline Route	15.9	16.0	143.8
46	PennEast Mainline Route	16.6	16.7	316.3
47	PennEast Mainline Route	18.1	18.1	215.5

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Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
48	PennEast Mainline Route	19.7	19.7	105.3
49	PennEast Mainline Route	19.7	19.8	239.2
50	PennEast Mainline Route	19.9	19.9	94.1
51	PennEast Mainline Route	20.0	20.0	220.4
52	PennEast Mainline Route	22.5	22.6	404.2
53	PennEast Mainline Route	22.6	22.6	182.8
54	PennEast Mainline Route	22.7	22.7	78.1
55	PennEast Mainline Route	23.0	23.1	338.0
56	PennEast Mainline Route	23.1	23.1	92.0
57	PennEast Mainline Route	23.6	23.6	303.7
58	PennEast Mainline Route	23.7	23.7	108.4
59	PennEast Mainline Route	33.0	33.0	195.2
60	PennEast Mainline Route	33.1	33.1	119.3
61	PennEast Mainline Route	33.1	33.2	117.5
62	PennEast Mainline Route	34.0	34.0	140.0
63	PennEast Mainline Route	38.0	38.1	121.8
64	PennEast Mainline Route	38.2	38.2	109.3
65	PennEast Mainline Route	38.2	38.2	70.1
66	PennEast Mainline Route	38.3	38.3	102.1
67	PennEast Mainline Route	39.0	39.1	460.3
68	PennEast Mainline Route	39.2	39.2	103.8
69	PennEast Mainline Route	39.8	39.8	90.1
70	PennEast Mainline Route	39.9	40.0	278.6
71	PennEast Mainline Route	40.1	40.2	699.4
72	PennEast Mainline Route	42.2	42.3	118.5
73	PennEast Mainline Route	43.5	43.5	78.2
74	PennEast Mainline Route	43.5	43.5	98.2
75	PennEast Mainline Route	44.4	44.4	386.1
76	PennEast Mainline Route	44.7	44.7	377.1
77	PennEast Mainline Route	44.8	44.8	225.0
78	PennEast Mainline Route	44.9	45.0	136.8
79	PennEast Mainline Route	45.0	45.0	275.8
80	PennEast Mainline Route	45.0	45.1	413.0
81	PennEast Mainline Route	45.2	45.2	164.6
82	PennEast Mainline Route	45.3	45.3	196.3

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Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
83	PennEast Mainline Route	45.4	45.5	164.6
84	PennEast Mainline Route	45.5	45.6	319.7
85	PennEast Mainline Route	46.9	46.9	181.9
86	PennEast Mainline Route	47.0	47.0	94.0
87	PennEast Mainline Route	47.5	47.5	71.9
88	PennEast Mainline Route	47.6	47.6	161.6
89	PennEast Mainline Route	47.7	47.8	735.1
90	PennEast Mainline Route	48.0	48.0	221.7
91	PennEast Mainline Route	48.1	48.1	132.1
92	PennEast Mainline Route	48.3	48.4	255.5
93	PennEast Mainline Route	48.5	48.5	152.0
94	PennEast Mainline Route	48.6	48.6	361.3
95	PennEast Mainline Route	49.2	49.2	153.6
96	PennEast Mainline Route	49.9	49.9	69.1
97	PennEast Mainline Route	50.0	50.1	585.4
98	PennEast Mainline Route	50.1	50.3	967.5
99	PennEast Mainline Route	50.3	50.4	211.8
100	PennEast Mainline Route	50.8	50.8	83.3
101	PennEast Mainline Route	51.0	51.1	278.6
102	PennEast Mainline Route	51.1	51.1	97.5
103	PennEast Mainline Route	51.2	51.2	159.6
104	PennEast Mainline Route	51.4	51.5	620.0
105	PennEast Mainline Route	55.8	55.8	170.0
106	PennEast Mainline Route	56.0	56.1	378.4
107	PennEast Mainline Route	56.7	56.7	120.2
108	PennEast Mainline Route	59.4	59.4	73.1
109	PennEast Mainline Route	59.4	59.5	222.7
110	PennEast Mainline Route	59.5	59.6	306.0
111	PennEast Mainline Route	59.6	59.7	517.5
112	PennEast Mainline Route	60.3	60.3	219.2
113	PennEast Mainline Route	61.3	61.3	78.1
114	PennEast Mainline Route	67.7	67.7	107.0
115	PennEast Mainline Route	68.3	68.3	117.5
116	PennEast Mainline Route	69.5	69.5	79.2
117	PennEast Mainline Route	70.6	70.6	165.5

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Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
118	PennEast Mainline Route	70.7	70.8	461.4
119	PennEast Mainline Route	70.9	71.0	380.1
120	PennEast Mainline Route	71.3	71.3	89.3
121	PennEast Mainline Route	71.5	71.5	185.2
122	PennEast Mainline Route	73.9	73.9	172.6
123	PennEast Mainline Route	74.0	74.0	111.0
124	PennEast Mainline Route	77.2	77.2	90.7
125	PennEast Mainline Route	77.4	77.4	81.5
126	PennEast Mainline Route	77.7	77.8	99.6
127	PennEast Mainline Route	77.8	77.8	104.0
128	PennEast Mainline Route	78.3	78.4	124.9
129	PennEast Mainline Route	78.8	78.8	72.0
130	PennEast Mainline Route	79.0	79.0	195.5
131	PennEast Mainline Route	79.9	79.9	246.2
132	PennEast Mainline Route	80.2	80.2	91.9
133	PennEast Mainline Route	80.2	80.2	110.3
134	PennEast Mainline Route	80.3	80.4	500.1
135	PennEast Mainline Route	80.5	80.5	185.7
136	PennEast Mainline Route	80.6	80.6	90.4
137	PennEast Mainline Route	80.7	80.7	156.2
138	PennEast Mainline Route	80.9	81.0	521.9
139	PennEast Mainline Route	81.0	81.0	142.6
140	PennEast Mainline Route	81.4	81.4	194.2
141	PennEast Mainline Route	81.5	81.5	144.1
142	PennEast Mainline Route	82.0	82.1	207.4
143	PennEast Mainline Route	82.5	82.5	163.3
144	PennEast Mainline Route	82.5	82.6	169.6
145	PennEast Mainline Route	82.6	82.6	221.7
146	PennEast Mainline Route	82.9	83.0	214.4
147	PennEast Mainline Route	83.0	83.0	179.7
148	PennEast Mainline Route	83.2	83.3	589.7
149	PennEast Mainline Route	83.6	83.6	148.5
150	PennEast Mainline Route	83.6	83.7	99.9
151	PennEast Mainline Route	84.2	84.3	194.9
152	PennEast Mainline Route	85.0	85.1	89.7

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Row ID	Route	Mile Post Start	Mile Post End	Distance (feet)
153	PennEast Mainline Route	85.7	85.7	94.0
154	PennEast Mainline Route	85.7	85.7	146.9
155	PennEast Mainline Route	85.8	85.8	75.4
156	PennEast Mainline Route	86.5	86.5	120.0
157	PennEast Mainline Route	86.6	86.6	115.8
158	PennEast Mainline Route	87.4	87.4	137.9
159	PennEast Mainline Route	87.4	87.4	108.3
160	PennEast Mainline Route	87.5	87.5	112.4
161	PennEast Mainline Route	87.6	87.6	104.6
162	PennEast Mainline Route	87.7	87.7	119.4
163	PennEast Mainline Route	88.1	88.1	241.3
164	PennEast Mainline Route	88.2	88.2	139.1
165	PennEast Mainline Route	88.6	88.7	112.7
166	PennEast Mainline Route	89.5	89.5	92.5
167	PennEast Mainline Route	96.5	96.5	218.4
168	PennEast Mainline Route	99.7	99.7	88.2
169	PennEast Mainline Route	99.7	99.8	176.2
170	PennEast Mainline Route	99.9	100.0	190.9
171	PennEast Mainline Route	101.6	101.7	297.3
172	PennEast Mainline Route	104.5	104.6	139.1
173	PennEast Mainline Route	106.3	106.5	1165.6
174	Hellertown Lateral	HL-0.4	0.5	209.6
175	Hellertown Lateral	HL-1.8	1.8	111.3
176	Hellertown Lateral	HL-2.0	2.1	106.0
177	Lambertville Lateral	LL-0.0	0.0	73.4
178	Lambertville Lateral	LL-0.1	0.1	105.8
179	Lambertville Lateral	LL-0.8	0.8	138.9
180	Lambertville Lateral	LL-1.3	1.3	73.7
			Total Distance (feet)	**36962.9**
			Total Distance (miles)	**7.0**

[1]Data Sources include PAMAP 1-meter DEM for Pennsylvania and USGS 10-meter DEM for New Jersey.
[2]Pipeline segments intersecting terrain greater than 30% and for a pipeline length of greater than
[3]68 feet (triple length of pipe) were recorded.
The totals shown in this table may not equal the sum of addends due to rounding

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1.5.2.12 Residential or Commercial

During the next phase of the Project, the construction workspace will be refined to maximize the distance from residential and commercial buildings. As the Project footprint is further defined, field surveys will be made at locations where structures are in close proximity of the foot print. Site-specific drawings will be created where residential or commercial properties are located within 25 feet of the workspace.

1.5.2.13 Active Croplands

Resource Report 8 – Land Use, Recreation and Aesthetics provides an analysis of active croplands (agricultural lands) crossed by the Project. Active croplands observed during field surveys conducted to date include corn, soybeans, and hay fields. PennEast is working with state agencies as well as advocacy groups to formulate a comprehensive Agricultural Impact Minimization Plan to be implemented during construction. The plan will outline agriculture-specific construction methods and BMP's as well as restoration methods and monitoring to ensure that crop yields are not significantly impacted as a result of construction of the Project.

1.5.2.14 Road Crossings

The Project will cross a total of 189 roadways. Table 1.5-5 provides the name, type, location by MP, and anticipated crossing method of these roadways.

Table 1.5-5
Roadways Crossed by the Project

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
Pennsylvania					
PennEast Mainline Pipeline					
PA Crossing	0.6	Lower Demunds Rd	A	U	B
PA Crossing	1.1	Gypsy Ln	G	N	OC
PA Crossing	1.6	Manor Dr / State Rte 1029	A	S	B
PA Crossing	2.1	Green Rd	A	T	B
PA Crossing	3.0	Carverton Rd	A	S	B
PA Crossing	3.5	Bunker Hill Rd	A	T	B
PA Crossing	3.7	Unnamed Road	G	U	OC
PA Crossing	4.2	Reggie Ln	G	U	OC
PA Crossing	5.4	Unnamed Road	A	U	OC
PA Crossing	5.4	Shoemaker Ave	A	S	B
PA Crossing	6.0	Swetland Ln	A	N	B
PA Crossing	6.0	Unnamed Road	D	U	OC
PA Crossing	6.4	Unnamed Road	D	U	OC
PA Crossing	3.4	Shulde Ln	A	U	OC
PA Crossing	6.5	US Hwy 11	A	S	B
PA Crossing	7.3	Paradise by the River	D	U	OC
PA Crossing	7.3	Main St	A	S	HDD
PA Crossing	7.4	Unnamed Road	D	U	OC
PA Crossing	8.1	N Main St	A	S	B
PA Crossing	8.2	E Saylor Ave	A	S	B
PA Crossing	9.1	Shantytown Rd	A	U	OC
PA Crossing	9.1	Main St	A	S	B

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
PA Crossing	9.5	Main St	A	S	B
PA Crossing	9.6	Unnamed Road	G	U	OC
PA Crossing	10.2	Unnamed Road	G	U	OC
PA Crossing	10.5	State Rte 315	A	S	HDD
PA Crossing	10.5	I- 81	A	I	HDD
PA Crossing	11.7	State Rte 2039	A	S	B
PA Crossing	11.8	Old Pittston Blvd	A	S	B
PA Crossing	12.7	Unnamed Road	G	U	OC
PA Crossing	13.0	State Rte 2039	A	S	B
PA Crossing	13.3	I- 476	A	I	B
PA Crossing	14.9	Unnamed Road	D	U	OC
PA Crossing	15.3	Election Rd	D	U	OC
PA Crossing	17.8	State Rte 2038	A	S	B
PA Crossing	19.4	Unnamed Road	D	U	OC
PA Crossing	19.5	Unnamed Road	D	U	OC
PA Crossing	19.6	Bear Creek Blvd / State Rte 115	A	S	B
PA Crossing	19.6	Shades Glen Rd	D	U	OC
PA Crossing	24.9	Unnamed Road	D	U	OC
PA Crossing	26.3	State Rte 940	A	S	OC
PA Crossing	26.8	I- 80	A	I	B
PA Crossing	26.9	Unnamed Road	D	U	OC
PA Crossing	31.6	N Old Stage Rd / T516	A	T	B
PA Crossing	32.1	State Rte 534	A	S	B
PA Crossing	32.7	Unnamed Road	D	U	OC
PA Crossing	33.5	State Rte 903	A	S	B
PA Crossing	34.5	Balsam Dr	G	N	OC

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
PA Crossing	35.0	Redwood Dr	A	N	B
PA Crossing	35.6	T473	A	T	B
PA Crossing	37.8	Hatchery Rd / Reservoir Rd	A	S	B
PA Crossing	40.6	Forest St	G	N	OC
PA Crossing	40.7	Forest St	A	T	B
PA Crossing	40.9	Woods Way	A	U	OC
PA Crossing	41.7	Towamensing Rd	A	N	B
PA Crossing	42.0	Lovitt Rd / T527	A	T	B
PA Crossing	42.8	T437B / Station St	A	T	B
PA Crossing	43.1	Pohopoco Dr / T435	A	T	B
PA Crossing	43.8	Penn Forest Rd S / T490	A	N	B
PA Crossing	44.5	US Hwy 209 / Interchange Rd	A	S	B
PA Crossing	44.7	Unnamed Road	D	U	OC
PA Crossing	44.8	Sei Pike Ln	A	U	B
PA Crossing	45.0	Spruce Hollow Rd	A	S	OC
PA Crossing	45.3	Long Fence Rd	A	T	B
PA Crossing	45.5	Beers Ln	A	T	B
PA Crossing	45.5	Unnamed Road	G	U	OC
PA Crossing	46.0	Stagecoach Rd E	A	T	B
PA Crossing	47.1	Spruce Rd	A	T	B
PA Crossing	48.1	Little Gap Rd	A	U	B
PA Crossing	48.6	Whitetail Ln	G	U	OC
PA Crossing	48.9	Lower Smith Gap Rd	A	U	B
PA Crossing	51.0	Unnamed Road	G	U	OC
PA Crossing	51.6	State Game Land Rd	D	U	OC
PA Crossing	54.1	Delps Rd / T555	A	U	B

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
PA Crossing	54.6	Unnamed Road	G	U	OC
PA Crossing	54.7	Sr4014	A	S	B
PA Crossing	54.8	Applebutter Rd	A	U	B
PA Crossing	55.3	Biegley Rd	A	U	B
PA Crossing	55.5	Glase Rd	A	T	B
PA Crossing	56.0	Mountain View Dr / State Rte 946	A	S	B
PA Crossing	56.6	S Oaks Rd / T566	A	T	B
PA Crossing	57.0	E Walker Rd / T588	A	T	B
PA Crossing	57.6	Sr4008 / Valley View Dr	A	S	B
PA Crossing	57.8	W Beersville Rd / W T559	A	T	B
PA Crossing	58.1	E Dannersville Rd / Sr 4014	A	T	B
PA Crossing	58.9	Sr4027 / Grouse Dr	A	S	B
PA Crossing	59.0	Whitetail Deer Dr / Sr4006	A	S	B
PA Crossing	59.2	Hatch Gravel Rd	A	T	B
PA Crossing	59.5	Unnamed Road	D	U	OC
PA Crossing	60.2	Unnamed Road	A	U	OC
PA Crossing	60.3	State Rte 987 / Monocacy Dr	A	S	B
PA Crossing	60.6	Moorestown Dr / Hwy 512	A	S	B
PA Crossing	61.4	Penn Dixie Rd	A	U	B
PA Crossing	62.0	Michaels School Rd	A	S	B
PA Crossing	62.1	State Rte 248 / Bath Pike	A	S	B
PA Crossing	62.3	Gun Club Rd	A	T	B
PA Crossing	63.6	Blossom Hill Rd	A	T	B
PA Crossing	63.7	Georgetown Rd	A	T	B
PA Crossing	64.3	Daniels Rd / Hwy 946	A	S	B
PA Crossing	65.0	State Rte 191 / Nazareth Bethlehem Pike	A	S	B

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
PA Crossing	65.1	Gradwohl Switch Rd	A	T	B
PA Crossing	65.8	Newburg Rd	A	S	B
PA Crossing	66.7	Hecktown Rd	A	U	B
PA Crossing	67.6	US Hwy 22	A	S	B
PA Crossing	67.8	Green Pond Rd	A	S	B
PA Crossing	68.2	Church Rd	A	T	B
PA Crossing	68.3	State Rte 33	A	S	B
PA Crossing	69.0	Hwy 2020 / William Penn Hwy	A	S	B
PA Crossing	69.8	Birkland Pl	A	S	B
PA Crossing	69.9	Southmont Way	A	S	B
PA Crossing	70.0	Freemansburg Ave	A	S	HDD
PA Crossing	70.2	Hope Rd	A	U	B
PA Crossing	70.7	State Rte 33	A	S	HDD
PA Crossing	70.8	Hope Rd	A	U	B
PA Crossing	71.6	I- 78	A	I	HDD
PA Crossing	71.9	Lower Saucon Rd	A	S	HDD
PA Crossing	73.2	Unnamed Road	D	U	OC
PA Crossing	73.3	Unnamed Road	D	U	OC
PA Crossing	73.6	Unnamed Road	D	U	OC
PA Crossing	73.6	Hexenkoph Rd	A	S	B
PA Crossing	74.3	Buttermilk Rd	A	T	B
PA Crossing	74.8	Durham Rd	A	S	B
PA Crossing	75.7	County Line Rd E	A	T	B
PA Crossing	75.8	Unnamed Road	D	U	OC
PA Crossing	76.0	Spring Hill Rd	A	T	B
PA Crossing	76.5	Sherers Hill Rd / Delaware Rd	A	N	B

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
PA Crossing	77.4	State Rte 611 / Easton Rd	A	S	HDD
PA Crossing	77.6	Old River Rd	A	T	HDD
Hellertown Lateral					
PA Crossing	HL 0.02	Redington Rd	A	U	B
PA Crossing	HL 0.8	Applebutter Rd	A	U	B
PA Crossing	HL 1.3	Sherry Hill Rd	A	U	B
New Jersey					
PennEast Mainline Pipeline					
NJ Crossing	77.7	Riegelsville Milford Rd	A	C	HDD
NJ Crossing	78.1	Church Rd	A	T	B
NJ Crossing	78.9	Dogwood Dr	A	U	OC
NJ Crossing	79.3	Phillips Rd	A	T	B
NJ Crossing	80.0	Crab Apple Hill Rd	A	T	B
NJ Crossing	81.5	Spring Garden Rd	A	T	B
NJ Crossing	82.1	Milford Warren Glen Rd / Hwy 519	A	C	HDD
NJ Crossing	83.1	Javes Rd	A	T	B
NJ Crossing	84.1	Milford Mt Pleasant Rd / Hwy 519	A	U	B
NJ Crossing	85.5	Stamets Rd	A	T	B
NJ Crossing	87.2	Everittstown Rd / Hwy 513	A	C	B
NJ Crossing	87.5	Creek Rd	A	T	B
NJ Crossing	88.0	Ridge Rd	A	T	B
NJ Crossing	88.6	State Rte 12 / Frenchtown Flemington Rd	A	S	B
NJ Crossing	89.4	Unnamed Road	D	U	OC
NJ Crossing	90.0	Spring Hill Rd	A	T	B
NJ Crossing	90.7	Co Rd 519 / Kingwood Rd	A	C	B
NJ Crossing	91.8	Barbertown Point Breeze Rd	A	T	B

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
NJ Crossing	92.9	Kingwood Locktown Rd	A	T	B
NJ Crossing	93.6	Featherbed Ln	A	T	B
NJ Crossing	94.6	Hewitt Rd	A	T	B
NJ Crossing	95.3	Sanford Rd	A	T	B
NJ Crossing	96.2	Unnamed Road	A	U	OC
NJ Crossing	96.3	Rosemont Ringoes Rd / Co Rd 604	A	C	B
NJ Crossing	96.6	Unnamed Road	D	U	OC
NJ Crossing	96.7	Lower Creek Rd	A	T	B
NJ Crossing	97.2	Worman Rd	G	T	OC
NJ Crossing	97.4	Co Rd 523 / Sergeantsville Rd	A	C	B
NJ Crossing	97.7	Sandy Ridge Rd	A	U	B
NJ Crossing	98.4	Brookville Hollow Rd	A	T	B
NJ Crossing	99.1	Lambertville Headquarters Rd	A	T	B
NJ Crossing	100.2	Alexauken Creek Rd	A	T	HDD
NJ Crossing	100.3	US Hwy 202	A	F	B
NJ Crossing	101.1	State Rte 179	A	S	B
NJ Crossing	102.0	Rocktown Lambertville Rd	A	T	B
NJ Crossing	102.7	State Rte 518 / Brunswick Ave	A	U	HDD
NJ Crossing	102.8	Old 518 W	A	U	HDD
NJ Crossing	103.5	Hewitt Rd	A	U	B
NJ Crossing	103.9	Goat Hill Rd	A	U	B
NJ Crossing	104.5	Goat Hill Rd	A	U	B
NJ Crossing	104.7	Unnamed Road	D	U	OC
NJ Crossing	104.7	Valley Rd	A	U	B
NJ Crossing	105.2	Unnamed Road	D	U	OC
NJ Crossing	105.2	Pleasant Valley Rd	A	U	HDD

Project Components	Mile Post	Roadway Name	Roadway Type A, G, D, C[1]	Jurisdiction F, S, T, C, I, N, U[2]	Construction Method B, OC, HDD[3]
NJ Crossing	105.2	Unnamed Road	G	U	OC
NJ Crossing	107.0	Unnamed Road	G	U	OC
NJ Crossing	107.1	Unnamed Road	G	U	OC
NJ Crossing	108.2	Bear Tavern Rd / Hwy 579	A	U	B
NJ Crossing	109.5	Pennington Titusville Rd	A	U	B
NJ Crossing	110.6	Co Rd 546 / Washington Crossing Pennington Rd	A	U	HDD
NJ Crossing	110.9	Scotch Rd	A	U	B
NJ Crossing	111.3	N Rd	A	U	B
NJ Crossing	111.8	Reed Rd	A	U	B
NJ Crossing	112.4	State Rte 31	A	U	B
NJ Crossing	112.6	Blackwell Rd	A	U	B
NJ Crossing	112.8	Lawrenceville Pennington Rd	A	U	B
NJ Crossing	113.8	Blackwell Rd	A	U	B
Gilbert Lateral					
NJ Crossing	GL 0.2	Riegelsville Milford Rd / Co Rd 627	A	C	B

[1] A = Asphalt, G = Gravel, D = Dirt, and C = Concrete
[2] F = Federal, S = State, T = Township, C = County, I = Interstate, N = No Jurisdiction, and U = Unknown
[3] B = Bore, OC = Open Cut, and HDD = Horizontal Directional Drilling

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1.5.2.15 Rock Removal and Blasting

Rock encountered during trenching will be removed using one of the available rock removal techniques:

- Conventional excavation with a backhoe;
- Ripping with a bulldozer followed by backhoe excavation;
- Pneumatic hammering followed by backhoe excavation;
- Blasting followed by backhoe excavation; and
- Blasting surface rock prior to excavation.

The technique selected is dependent on relative hardness, fracture susceptibility, expected volume, and location.

All blasting activity will be performed according to federal and state safety standards and in accordance with PennEast's comprehensive Blasting Plan to be implemented by a certified blasting contractor..

Excess rock generated during the construction of the Project will be hauled to approved quarries near the pipeline route and disposed of.

1.5.3 Aboveground Facilities

The proposed aboveground facilities will be constructed in accordance with ASME B31.8 standards. Appendix B (Volume IV) provides preliminary design plans. The duration of construction for the aboveground facilities is approximately seven and a half months. Approximately 75 to 85 workers including subcontractors will be required for construction of the aboveground facilities. The only permanent employees will be located at the proposed Compressor Station.

1.5.4 Environmental Training for Construction

Once the Certificate of Public Convenience and Necessity has been received and the Implementation Plan is submitted and approved by FERC, Environmental Training will be required for all land agents, construction personnel, environmental inspectors and agency personnel interested in participating. This training will include an overview of the FERC *Plan and Procedures*, and detailed sessions using the Environmental Permit Notebooks that describe the timing, notification and environmental permit conditions required to be implemented and adhered to at each phase of construction, restoration and mitigation. PennEast will use the FERC's third-party monitoring program during construction.

1.5.5 Construction Workforce

It is anticipated that four construction spreads will be employed for the PennEast Project. There will be approximately 525 personnel involved in each spread, with an additional 200 anticipated with spread three for an approximate total of 2,300 workers. In addition, it is planned that there will be a Chief Environmental Inspector as well as two Environmental Inspectors (EIs) for each spread. Third-party EIs will also review construction throughout the construction time period.

1.5.6 Abandonment of Facilities

There is no abandonment of facilities required for construction of the proposed facilities.

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1.6 Operation and Maintenance Procedures

PennEast will own, operate, and maintain the pipeline, and compressor station and other facilities associated with the Project.

The proposed facilities will be operated and maintained in a manner to ensure that a safe, continuous supply of natural gas reaches each of the delivery points. Maintenance activities will include regularly scheduled ground and overflight surveys. Signs, marker posts, aerial markers, and decals will be painted or replaced to ensure that the pipeline locations will be visible from the air and ground.

The facilities will be patrolled from the air periodically. This will provide information on possible leaks, construction activities, erosion, population density, possible encroachment, and any other potential problems that may affect the safety and operation of the facility. In addition, PennEast contractors will adhere to the Dig Safe system. Under the Dig Safe system, anyone planning excavation activities may call a single number to alert all utility companies. Representatives of the utility companies that might be affected then visit the site and mark their facilities so that the excavation can proceed with relative certainty as to the location of all underground lines.

Other maintenance functions will include:

- Mowing of the ROW in accordance with the timing restrictions outlined in FERC's *Plan and Procedures*;
- Periodic inspection of water crossings and erosion control devices;
- Maintenance of a supply of emergency pipe, leak repair clamps, sleeves, and other equipment needed for repair activities;
- Periodic internal inspection with in-line inspection tools or "pigs;" and
- Calibration of equipment and transmitters.

No herbicides or pesticides will be sprayed anywhere along the permanently maintained ROW.

A cathodic protection system for the pipeline and station will be constructed and maintained. Exact locations for both the anode bed(s) and test stations will be determined as PennEast finalizes the design and will be filed with the full FERC filing.

In areas where the proposed pipeline parallels high-voltage electric transmission lines, an alternating current mitigation system will be implemented as necessary to reduce stray current, prevent possible shock to personnel during post-construction activities, and prevent interference with the cathodic protection system. This system will be primarily composed of zinc ribbon.

1.6.1 Cleared Areas

A 30 foot cleared area in the 50 foot permanent ROW, in non-wetland resource areas, will be maintained over the centerline of the pipeline. A permanent 10-foot wide cleared corridor will be maintained through wetland resource areas in accordance with FERC's *Plan* and *Procedures*. Maintaining a cleared ROW is required:

- For pipeline patrols and corrosion surveys;
- For emergency repairs of the pipeline; and
- For visibility during aerial patrols.

1.6.2 Erosion Control

Erosion problems on the pipeline ROW will be identified and repaired in accordance with the FERC-approved O&M plan.

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1.6.3 Periodic Pipeline and ROW Patrols

Erosion control devices will be regularly inspected and maintained, including:

- Stormwater outfalls;
- Water control bars;
- Stream and river banks;
- other conditions that could affect operation of the pipeline.

1.7 Agency and Public Consultations and Required Authorizations

PennEast will obtain all applicable permits and licenses relating to the aboveground facilities across or under roads, drainage facilities, waterbodies, wetlands, and through any other sites or places that a governmental license or permit may be required. Table 1.7-1 provides a list of permits and the applicable federal, state, and local agencies. Agency consultation letters to date are included in Appendix G. PennEast will include copies of all relevant environmental permits and approvals in the construction bid packages and contracts. The contractor will be required to be familiar with all permits and licenses obtained by PennEast. The contractor will be also required to comply with all the requirements related to the construction of the aboveground facilities and to the restoration of any areas disturbed by the construction of the certificated facilities.

Table 1.7-1
Required Environmental Permits and Approvals for the Project

Agency	Permit/Approval	Status	Anticipated Filing/Receipt Dates
FEDERAL			
U.S. Army Corps of Engineers - Philadelphia and Baltimore Districts	Clean Water Act Section 404, Rivers and Harbors Act Section 10, and Title 33 Section 408 Approvals	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting held 10/30/14. Updated route materials sent 7/24/15. Pre-application meetings held 7/13/2015 and 7/16/2015.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
U.S. Fish and Wildlife Service - Pennsylvania	Endangered Species Act, Section 7 Consultation and Clearance	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting held 10/29/14. Updated route materials sent 7/24/15. RTE survey coordination meeting held 4/22/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
U.S. Fish and Wildlife Service - New Jersey	Endangered Species Act, Section 7 Consultation and Clearance	Initial consultation letter sent 8/12/2014. Consultation discussions ongoing. Updated route materials sent 7/24/15. RTE survey coordination meeting held 4/23/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
National Marine Fisheries Service	Endangered Species Act, Section 7 Consultation and Clearance	Initial consultation letter sent 8/12/2014. Response received stating that no threatened or endangered species under the jurisdiction of the NMFS are known to occur in the Project area, and no further consultation is necessary. Updated route materials sent 7/24/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
National Park Service	NPS Consultation and Clearance for National Natural Landmarks, National Trails, and National Historic Sites	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting with National Wild and Scenic Rivers Program managers held 10/1/14. Updated route materials sent 7/24/15.	TBD
National Resources Conservation Service	NRCS Consultation	Initial coordination meeting held 3/18/15. Updated route materials sent 7/24/15.	TBD

Agency	Permit/Approval	Status	Anticipated Filing/Receipt Dates
STATE - PENNSYLVANIA			
PADEP (Northeast and Southeast Regional Offices)	Water Obstruction and Encroachment Permits Submerged Lands License Agreements Section 401 Water Quality Certification Erosion and Sediment Control General Permit (ESCGP-2) Hydrostatic Testing Discharge General Permits (PAG-10) Plan Approval and Operating Permit for a Non-Major Source	Initial consultation letter sent 8/12/2014. Coordination meeting held 11/19/14. Updated route materials sent 7/24/15. Pre-application meeting held 7/13/15.	Sept. 2015 Applications/ Nov.- Dec. 2016 Receipt
Pennsylvania Game Commission (PGC)	T&E Species Consultation and Clearance	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting held 9/25/14. Special Use Permits for surveys on PGC lands issued 9/2014. Updated route materials sent 7/24/15. Land use consultations ongoing.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
Pennsylvania Fish and Boat Commission (PFBC)	T&E Species Consultation and Clearance Permit for Use of Explosives in Commonwealth Waters Aid to Navigation Plan Approval	Initial consultation letter sent 8/12/2014. Introduction and coordination meetings held 11/4/14 and 11/24/14. Updated route materials sent 7/24/15.RTE species survey and land use consultations ongoing.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt

Agency	Permit/Approval	Status	Anticipated Filing/Receipt Dates
Pennsylvania Department of Conservation and Natural Resources (DCNR)	T&E Species Consultation and Clearance	Initial consultation letter sent 8/12/2014. Introduction and coordination meetings held 11/4/14 and 11/24/14. Updated route materials sent 7/24/15. Special Use Permits for surveys on state park lands issued 4/2015.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
Pennsylvania Historical and Museum Commission (PHMC)	National Historic Preservation Act, Section 106 Consultation and Clearance	Initial consultation letter received 08/21/2014. Consultations ongoing. Updated route materials sent 7/24/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
STATE – NEW JERSEY			
NJDEP, Division of Land Use Regulation	NJ Freshwater Wetlands Letter of Interpretations and Individual Permit, includes Federal wetlands certification NJ Flood Hazard Area Verifications and Individual Permit	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting held 9/23/14. Interagency coordination meeting held 12/2/14. Updated route materials sent 7/24/15. Consultation meetings held 7/2/15 and 7/30/15.	Application process commencing Fall 2015
NJDEP, Green Acres Program	NJ Green Acres Minor/Major Diversion	Initial consultation letter sent 8/12/2014. Introduction and coordination meeting held 9/23/14. Interagency coordination meeting held 12/2/14. Updated route materials sent 7/24/15. Consultation meeting held 7/2/15.	Commencing August 2015
NJDEP, Division of Air Quality	Air Quality General Permits, including Federal Air Permits	Scheduled prior to construction.	TBD
NJDEP, Division of Water Resources	Discharge to Surface Water Permit Water Allocation Permit NJDEP General Permit No. 5G3 (NJ0088323) for Stormwater Discharge Associated with Construction Activity	Applicability will be determined as Project design advances.	TBD

Agency	Permit/Approval	Status	Anticipated Filing/Receipt Dates
Delaware and Raritan Canal Commission	Certificate of Approval	Applicability will be determined as Project design advances. Consultation planned for August 2015.	TBD
New Jersey State Historic Preservation Office (NJSHPO)	National Historic Preservation Act, Section 106 Consultation and Clearance	Initial consultation letter sent 8/19/2014. Introduction and coordination meeting held 9/16/14. Interagency coordination meeting held 12/2/14. Updated route materials sent 7/24/15. Revised archaeological sensitivity model accepted 4/8/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
NJ State Agriculture Development Committee	NJ Farmland Preservation Program Consultation	Introductory meeting held 9/12/14. Interagency coordination meeting held 12/2/14. Updated route materials sent 7/24/15. Joint agricultural community meeting held 6/2/15.	N/A
COUNTY			
Luzerne Conservation District	Erosion and Sediment Control General Permit (ESCGP-2) Technical Review	Initial consultation letter sent 8/21/2014. Pre-application meeting held 7/13/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
Carbon County Conservation District	Erosion and Sediment Control General Permit (ESCGP-2) Technical Review	Initial consultation letter sent 8/21/2014. Pre-application meeting held 7/13/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
Northampton County Conservation District	Erosion and Sediment Control General Permit (ESCGP-2) Technical Review	Initial consultation letter sent 8/21/2014. Pre-application meeting held 7/13/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt

Agency	Permit/Approval	Status	Anticipated Filing/Receipt Dates
Bucks County Conservation District	Erosion and Sediment Control General Permit (ESCGP-2) Technical Review	Initial consultation letter sent 8/21/2014. Pre-application meeting held 7/13/15.	Sept. 2015 Application/ Nov - Dec. 2016 Receipt
Hunterdon County Conservation District	Soil Erosion and Sediment Control (SESC) Plan Certification	Initial consultation letter sent 8/21/2014.	TBD
Mercer County Conservation District	Soil Erosion and Sediment Control (SESC) Plan Certification	Initial consultation letter sent 8/21/2014.	TBD
WATERSHED-SPECIFIC REGULATORY AUTHORITIES			
Delaware River Basin Commission (DRBC)	Water Withdrawal Approval and Project Review	Initial consultation letter sent 8/21/2014. Introduction and coordination meeting held 9/3/14. Updated route materials sent 7/24/15. Pre-application meeting held 7/13/15.	Sept. 2015 Application/ Nov.- Dec. 2016 Receipt
Susquehanna River Basin Commission (SRBC)	Water Withdrawal Approval if more than 100,000 gallons per day averaged over 30 days	Initial consultation letter sent 8/21/2014. Introduction and coordination meeting held 11/6/14. Updated route materials sent 7/24/15.	TBD

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1.7.1 Agency Consultations

PennEast has initiated consultation with federal, state, and local agencies regarding the construction of the proposed pipeline in Pennsylvania and New Jersey, to request involvement and encourage agency participation during the pre-filing process. At the Federal level, these consultations have included USACE, USFWS, National Marine Fisheries Service (NMFS), Natural Resources Conservation Service (NRCS), and National Park Service (NPS). At the state level, these consultations have included PADEP, Pennsylvania Game Commission (PGC), PFBC, Pennsylvania Department of Conservation and Natural Resources (DCNR), and Pennsylvania Historical and Museum Commission (PHMC) in Pennsylvania; and NJDEP, New Jersey State Historic Preservation Office (NJSHPO), and the New Jersey State Agriculture Development Committee in New Jersey. At the local and watershed/regional level, these consultations have included Luzerne Conservation District, Carbon County Conservation District, Northampton County Conservation District, Bucks County Conservation District, Hunterdon County Conservation District, Mercer County Conservation District, Delaware River Basin Commission (DRBC), and Susquehanna River Basin Commission (SRBC).

1.7.2 Public Participation and Outreach Program

PennEast believes that effective stakeholder engagement is achieved through a consistent, twofold approach of sharing information and listening to feedback. PennEast views such proactive stakeholder engagement as the foundation for earning and building positive relations critical to responsive business operations. Early and effective engagement of stakeholders ultimately can lead to prompt identification and resolution of issues, resulting in a comprehensive project design and application.

PennEast's goal is to minimize impact to the community and environment while being able to safely and responsibly build and operate the pipeline to meet the energy needs of consumers in New Jersey and Pennsylvania. Throughout the pre-filing process, PennEast has received extensive feedback ranging from stakeholders' desire to receive natural gas service to questions regarding the ability to use property post-construction.

PennEast is committed to continuing to work as best as possible with directly involved landowners, as well as agencies and public officials to address New Jersey stakeholders' concerns, particularly those focused on the use of preserved space, waterways and historic designations. Similarly, PennEast pledges to continue efforts in Pennsylvania to address stakeholders' concerns, especially those centered on the Poconos, historic designations and the preservation of waterways and recreational areas.

The Project Public Participation Program will continue throughout the life of the Project:

- Informing landowners and other stakeholders about the Project through early public notification and regular communication;
- Sharing fact-based, accurate information;
- Communicating clearly about the proposed Project and its potential impacts;
- Providing timely opportunities for stakeholders to pose questions or express concerns;
- Taking such input into consideration, and as feasible, sharing with stakeholders how their input influenced the Project.

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The PennEast outreach team (public affairs and communications), in concert with the overall Project team (e.g. safety, land, environment, engineering, construction, and operations), will plan and implement this Public Participation Program. Elements of the Program include:

1. Identifying stakeholders with whom PennEast will communicate about the Company, the proposed Project and potential impacts to the community and its citizens;
2. Designating a single point of contact;
3. Establishing a website presence; dedicated toll-free phone number; e-mail address; and physical mailing address;
4. Identifying hours PennEast will be available (during work day and weekends);
5. Conducting consultation meetings with elected officials and other community leaders;
6. Hosting open houses for landowners, elected officials and other stakeholders;
7. Producing and distributing informational materials; and
8. Supporting on-going outreach throughout the life of the Project, including documentation of issues.

1.7.2.1 Stakeholder Identification

The Project team has gathered stakeholder contact information for landowners; local, county, commonwealth, state, and federally elected officials and staff; business, community and civic organizations; first responders; homeowner associations; other non-governmental organizations; and media.

1.7.2.2 Single Point of Contact

Anthony Cox, Manager for the Project, will serve as the single point of contact. Additionally, PennEast has established a project-specific web site; toll-free number; e-mail address; and physical mailing address to facilitate and enhance communication between stakeholders and the Project team. PennEast routinely responds to inquiries within 24 hours Monday through Friday and a maximum of 48 hours Saturdays, Sundays and holidays. The combination of the following resources will help ensure information is accessible to all stakeholders:

Website Address: www.penneastpipeline.com

Toll-free Number: (844) 347-7119

E-mail Address: answers@penneastpipeline.com

Mailing Address: 55 West Street Tunkhannock, PA 18657

1.7.2.3 Website

The PennEast web site provides information about the Project. It is updated regularly, and specifically, at relevant Project and regulatory milestones. The web site includes:

- Project information
  - Overview
  - Proposed route location maps
  - Expected timeline
- Meeting information
  - News releases
  - Open houses (dates and locations)
  - Displays
  - Other materials used at meetings

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- Informational resources
  - Interactive map
  - Fact sheets and benefits studies
  - Answers to frequently asked questions
  - Public participation opportunities
  - Regulatory process descriptions
  - Pipeline safety
  - Construction procedures
  - A list of public repositories along the proposed route where all project-related information, including project maps, will be available for inspection
  - Route selection process
  - Other information of interest to stakeholders
  - Project newsletters (as applicable)
- Contact information
  - Project toll-free number
  - E-mail address
  - Physical mailing address
- FERC information
  - Link to the FERC web site
  - Project docket
  - Links to Project filings
  - FERC landowner brochure
  - Environmental documents issued by FERC

1.7.2.4 Community Leader Outreach

PennEast has identified community leaders, including local, regional and federal officials, along the proposed route. PennEast has completed one-on-one meetings with many of the elected officials, while others have received initial contact via letter, e-mail and/or phone call to alert them to the proposed Project. PennEast will identify and conduct outreach with other stakeholders, including first responders and community groups, throughout the FERC Pre-filing Process.

1.7.2.5 Responses to Requests from Federal and State Permitting Agencies

PennEast has identified the requisite federal and state agencies and has conducted initial stakeholder consultations with them. Additionally, PennEast will respond to requests for information from these agencies in a timely manner, providing the most up-to-date and responsive information available. (Exhibit C-1 of the pre-filing contains the list of agencies.).

1.7.2.6 Open Houses

PennEast hosted four open houses in the Project area in November 2014. Once the proposed alternative alignment was revised in March 2015, PennEast hosted additional invitation-only informational sessions for impacted landowners in select areas where the route changed. The landowner informational sessions included a presentation on the Project and the FERC process, a question-and-answer session with senior PennEast staff, and a separate area with mapping and land agent and environmental tables offering the same informational resources offered during the open houses. The open house dates and locations are described below in Table 10.7-1. Structured to foster one-on-one discussions with experts in the areas of safety, environment, land, construction, and operations, the open houses provided stakeholders and members of the public the opportunity to gain

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insight about the Project, as well as share their concerns. Project maps and informational materials were distributed. Open house venues and times were communicated in the following manner:

- Letter of invitation - landowners will receive a letter of invitation after the pre-filing request is made, as will agency representatives, elected officials and other community leaders
- Advertisements in area newspapers that include the invitation and map
- Advertisements will be published consecutively over the two weeks nearest the open houses;
- News release to local media and on the Project website
- Posting on the Project web site.

The open houses were designed in a tradeshow-style format, with tabletop displays around the room and subject-matter experts available to discuss the Project, answer questions and address issues. The land agent tables were organized by township, which allowed landowners and other interested stakeholders to pinpoint with whom they should speak about a particular property. The land agent tables included a number of computer monitors featuring the alignment overlaid onto Google™earth, allowing guests to zoom in and focus on a particular property or area of interest.

Based on sign-in sheets, an estimated 1,100 guests attended the open houses, with a number of unaccounted attendees slightly increasing the overall guest numbers. Inquiry forms were offered to all attendees and available at each display station. In all, 269 forms were gathered. Information from the inquiry forms were captured and documented in a comprehensive spreadsheet and distributed to key team members for additional action as warranted.

Table 1.7-2
Open Houses and Informational Meetings Held

Region	Date	Location
Wilkes-Barre, PA	Monday, November 10 (Luzerne County)	Coughlin High School 80 North Washington Street Wilkes-Barre, PA 18702
Bethlehem, PA	Wednesday, November 12 (Northampton County)	Hanover Township Community Center 3660 Jacksonville Road Bethlehem, PA 18017
Lambertville, NJ	Thursday, November 13 (Hunterdon County)	South Hunterdon Regional High School 301 Mt. Airy-Harbourton Road Lambertville, NJ 08530
Palmerton, PA	Tuesday, November 18 (Carbon County)	Aquashicola Volunteer Fire Company 270 Little Gap Road Palmerton, PA 18071
Pennington, NJ (landowner informational session)	Thursday, January 22 (Mercer County)	Diamond's Restaurant 25 Route 31 S. Pennington, NJ 08534
Frenchtown, NJ (landowner informational session)	Monday, April 13 (Kingwood, West Amwell and Delaware Township)	Razberry's Banquet & Conference Center 834 State Route 12 Frenchtown, NJ 08825

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Region	Date	Location
Holland, NJ (landowner informational session)	Tuesday, April 14 (Holland and Alexandria Townships)	Whispering Pines 971 Milford-Warren Glen Road (County Rd 519) Milford, NJ 08848
Hopewell, NJ (landowner informational session)	Tuesday, April 21 (Hopewell Township)	Hopewell Valley Golf Club 114 Pennington-Hopewell Road Hopewell, NJ 08525
Wilkes-Barre, PA (landowner informational session)	Tuesday, June 2 (Plains and Kingston Townships)	The Woodlands Inn 1073 Highway 315 Wilkes-Barre, PA 18702
Jim Thorpe, PA (landowner informational session)	Wednesday, June 3 (Penn Forest and Towamensing Townships)	Flagstaff Ballroom Flagstaff Road Jim Thorpe, PA 18229
Hellertown, PA (landowner informational session)	Wednesday, June 10 (Bethlehem, Lower Saucon, and Williams Townships)	The Meadows 1770 Meadows Road Hellertown, PA 18055
Bethlehem, PA (landowner informational session)	Thursday, June 11 (Moore, Upper Nazareth, and Lower Nazareth Townships)	Green Pond Country Club 3604 Farmersville Road Bethlehem, PA 18020

1.7.2.7 Informational Materials

PennEast augmented its outreach efforts by developing printed materials tailored to address questions and concerns of stakeholders. Though the landowner survey brochure was included in the introductory letter to landowners, it is available now upon request and was made available at the open houses. Fact sheets and question-and-answer documents were distributed through direct mail, as well as at the open houses, at individual meetings and by request. Updates will be sent to landowners and stakeholders at appropriate Project milestones.

1.7.2.8 Ongoing Stakeholder Outreach

PennEast will conduct proactive outreach throughout the Project with all interested stakeholders, including landowners, media, public officials and other community leaders.

1.7.2.9 Documentation

PennEast has established a database and tracking system to ensure stakeholder contacts and issues are documented and addressed timely and accurately. PennEast is making diligent efforts to inform the public about the proposed Project. PennEast sent initial letters to landowners the week of August 11, 2014. Updates were sent to landowners and abutters along the proposed pipeline route where reroutes were implemented to avoid constraints.

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1.8 Landowner Names and Addresses

The proposed Project facilities will affect limited portions of four counties in Pennsylvania and two counties in New Jersey. Updates were sent to landowners and abutters along the proposed pipeline route where reroutes were implemented to avoid constraints. Invitations were also sent to property owners within a half mile of the proposed compressor station location option. The letters introduced the Project, contained a brochure explaining the survey process and provided the Project contact vehicles, including a toll-free number established specifically for landowners. Abutters, defined as landowners within 1,000' of the 400' survey corridor, received a similar Project introductory letter.

PennEast continues to engage landowners through individual discussions and site visits, as well as through response to e-mail inquiries and calls to the toll-free line. To date, PennEast has been granted survey permission by more than 60 percent of the Project ROW needing to be surveyed.

1.9 Future Expansion

There are no plans to expand the PennEast Pipeline beyond its current alignment.

1.10 Proposed Non-Jurisdictional Facilities

At this time the PennEast Pipeline does not anticipate any non-jurisdictional facilities.

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PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

RESOURCE REPORT 8

Land Use, Recreation, and Aesthetics

FERC Docket No. PF15-1-000

Revised Draft

JULY 2015

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Resource Report 8 – Land Use, Recreation, and Aesthetics
FERC Environmental Checklist

PART 380-APPENDIX A MINIMUM FILING REQUIREMENTS FOR ENVIRONMENTAL REPORTS	COMPANY COMPLIANCE OR INAPPLICABILITY OF REQUIREMENT
Minimum FERC Requirements	
☐ Classify and quantify land use affected by: (§380.12 (j) (1)) Pipeline construction and permanent rights-of-way (§380.12 (j) (1)); • Extra work/staging areas (§380.12 (j) (1)); • Access roads (§380.12 (j) (1)); • Pipe and contractor yards (§380.12 (j) (1)); and • Aboveground facilities (§380.12 (j) (1)). 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 operations.	Section 8.2.1 Section 8.2.1.1 Section 8.2.1.3 Section 8.2.1.4 Section 8.2.2 Table 8.2-1 Table 8.2-2 Table 8.2-4 Table 8.2-5 Table 8.2-6 Table 8.2-7
☐ Identify by milepost all locations where the pipeline ROW would at least partially coincide with existing ROW, where it would be adjacent to existing rights-of-way, and where it would be outside of existing ROW. (§380.12 (j) (1)).	Section 8.2.1.2 Table 8.2-3
☐ Provide detailed typical construction ROW cross-section diagrams showing information such as widths and relative locations of existing rights- of-way, new permanent ROW, and temporary construction ROW. (§380.12 (j) (1))	Appendix E, Erosion and Sediment Control Plan
☐ Summarize the total acreage of land affected by construction and operation of the Project. (§380.12 (j) (1))	Tables 8.2-2, 8.2-4, and 8.2-7
☐ Identify by milepost all planned residential or commercial/business development and the time frame for construction. (§380.12 (j) (3)) • Identify all planned development crossed or within 0.25 mile of proposed facilities.	Section 8.3.1
☐ Identify by milepost special land uses (e.g., sugar maple stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§380.12 (j) (4))	Section 8.3.4 Section 8.4.2 Table 8.3-2 Table 8.4-1 Table 8.4-2
☐ 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))	Section 8.4 Table 8.4-1 Table 8.4-2
☐ Identify by milepost all natural, recreational, or scenic areas, and all registered natural landmarks crossed by the Project. (§380.12 (j) (4 & 6)) Identify areas within 0.25 mile of any proposed facility.	Section 8.4 Table 8.4-1
☐ Identify all facilities that would be within designated coastal zone management areas. Provide a consistency determination or evidence that a request for a consistency determination has been filed with the appropriate state agency. (§380.12(j)(4 & 7))	Section 8.4.3
☐ Identify by milepost all residences that would be within 50 feet of the construction ROW or extra work area. (§380.12 (j) (5))	Section 8.3.2 Table 8.3-1

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PART 380-APPENDIX A MINIMUM FILING REQUIREMENTS FOR ENVIRONMENTAL REPORTS	COMPANY COMPLIANCE OR INAPPLICABILITY OF REQUIREMENT
☐ Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the Project. (§380.12 (j) (6))	Section 8.4.2.1
☐ Describe any measures to visually screen aboveground facilities, such as compressor stations. (§380.12 (j) (11))	Section 8.6
☐ 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 over land that would be affected by the Project. (§380.12 (j) (12))	Section 8.7
Additional Information Often Missing and Resulting in Data Requests	
☐ Identify all buildings within 50 feet of the construction right-of-way or extra work areas.	Table 8.3-1
☐ Describe the management and use of all public lands that would be crossed.	Section 8.4.1 Table 8.4-1
☐ Provide a list of landowners by milepost or tract number that corresponds to information on alignment sheets.	Appendix F, Names and Addresses of Affected Landowners and Stakeholders
☐ Provide a site-specific construction plan for residences within 50 feet of construction.	Will be included in PennEast's application anticipated to be filed in September 2015.

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8.0 LAND USE, RECREATION, AND AESTHETICS

PennEast Pipeline Company, LLC (PennEast) has prepared this Resource Report to support its application to the Federal Energy Regulatory Commission (FERC or Commission) for a certificate of public convenience and necessity (Certificate) for the Project. PennEast designed its PennEast Pipeline Project (PennEast Project or Project) to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production area in northeastern Pennsylvania (PA) to growing natural gas markets in eastern PA, southeastern PA, New Jersey (NJ) and surrounding states with the capability of providing approximately 1.0 MMDth/day of year-round natural gas transportation service.

This Resource Report focuses on the Project facilities and locations that PennEast selected as of July 30, 2015.

The Project consists of the following primary components:

- 113.8 miles of new 36-inch diameter mainline pipeline extending from Dallas Township in Luzerne County, PA to Hopewell Township in Mercer County, NJ;
- 2.1-miles of new 24-inch diameter lateral near Hellertown, Northampton County, PA to transport gas to an interconnection with Columbia Gas Transmission, LLC and UGI Utilities, Inc.;
- 0.3-miles of new 12-inch diameter lateral near Holland Township, Hunterdon County, NJ to transport gas to Elizabethtown Gas and NRG REMA's Gilbert Power Station;
- 1.4-miles of new 36-inch diameter lateral in West Amwell Township, Hunterdon County, NJ to transport gas to an interconnection with Algonquin Gas Transmission, LLC and Texas Eastern Transmission, LP;
- One new compressor station in PA; and
- Various associated aboveground facilities including interconnects, launchers, receivers, and mainline block valves to support the pipeline system.

The Project will be rated for a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig). Figure 1.2-1 in Resource Report 1 provides a Project Overview Map showing the locations of the proposed pipeline route and associated facilities. A detailed discussion of the Project route selection and alternatives analysis is contained in Resource Report 10.

8.1 Introduction

Resource Report 8 characterizes land uses that will be affected by the proposed Project. This report provides information on existing land uses within the Project areas and provides information on planned residential, commercial, and business development, special land uses, and lands administered by federal, state, local agencies and private conservation organizations. It also describes natural, recreational, or scenic areas that may be affected by activities associated with the Project. In addition, this Resource Report quantifies potential impacts on land uses that will be affected by construction and operation of the Project and identifies proposed mitigation measures to help avoid or minimize these impacts.

The sources of information used to prepare this Resource Report include U.S. Geological Service (USGS) 7.5-minute series quadrangle maps, aerial photography, various publicly-available databases and Geographic Information System (GIS) data layers, landowner contacts, and field views. Land use information obtained from field reconnaissance conducted in 2014 and 2015 was recorded on aerial photography and digitized using GIS technology. Statistical analysis of the data was generated for acreage and percentage of each land use or land cover classified within the Project. Consultations

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with various federal, state, and local agencies are ongoing, and correspondence letters are provided in Appendix G and summarized in this Resource Report.

8.2 Land Use

Construction and operation of the Project's facilities may result in both temporary and permanent alterations to land use and land cover. This section identifies land requirements for the Project and describes existing land use within the proposed Project areas. Information provided in this section includes land that will be affected by the temporary construction and permanent right-of-way (ROW), any aboveground facilities, extra work or staging areas, pipeyards, and wareyards. Land use data were calculated based on information obtained through field surveys, review of 2013 aerial photography and United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Cropland Data Layer (USDA-NASS, 2014). The land use characteristics evaluated in this Resource Report are classified by primary vegetation cover type and/or predominant land use. Land use types within the Project area are classified into the following six categories:

- Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;
- Forest and Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction ROW or extra work or staging areas;
- Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility ROW;
- Residential Land - Residential yards, residential subdivisions, and planned new residential developments;
- Industrial or Commercial Land - Electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, and roads; and
- Waterbody - Water Crossings greater than 100 feet.

8.2.1 Pipeline Facilities

As discussed in Section 1.2 of Resource Report 1, the proposed Project facilities will consist of the approximately 113.8 mile new 36 inch mainline PennEast pipeline, 2.1 miles of the new 24-inch Hellertown lateral pipeline, 0.3 miles of the new 12-inch Gilbert lateral pipeline, 1.4-miles of the new 36-inch Lambertville lateral pipeline, one new compressor station, and various pipeline support facilities including interconnects, launchers, receivers, and mainline block valves. Table 8.2-1 presents existing land uses that will be crossed by the Project pipeline facilities by distance and percentage. Table 8.2-2 summarizes the acreage of impacts to each land use type by construction and operation of the Project, including access roads, contractor yards and pipe yards, additional temporary workspace (ATWS) and extra work/staging areas, and above ground facilities. Table 8.2-7 outlines the acreage of impacts to each land use type by construction and operation of the above ground facilities. Preliminary site-specific plot plans for aboveground facilities proposed by PennEast are provided in Appendix B, while alignments sheets showing the locations of all facilities associated with the Project can be found in Appendix C. Details on land use affected by the proposed pipeline facilities, temporary workspaces, access roads, laydown areas, and aboveground facilities are described in the following sections.

Table 8.2-1
Land Use Types Crossed by the Pipeline Facilities

State/Facility/ County	Municipality	Agricultural (Distance)[a]	%	Forest/ Woodland (Distance)[a]	%	Open Land (Distance)[a]	%	Residential (Distance)[a]	%	Industrial/ Commercial (Distance)[a]	%	Open Water (Distance)[a]	%	Total (Distance)[a]	%
Pennsylvania															
PennEast Mainline Route Pipeline															
Luzerne	Dallas Twp	0.0	0%	6,498.3	96%	195.6	3%	0.0	0%	65.9	1%	0.0	0%	6,759.8	100%
Luzerne	Kingston Twp	1,123.5	7%	13,497.5	88%	447.3	3%	171.4	1%	172.8	1%	0.0	0%	15,412.5	100%
Luzerne	West Wyoming Boro	674.5	7%	6,776.0	70%	571.5	6%	0.0	0%	1,590.5	17%	0.0	0%	9,612.6	100%
Luzerne	Wyoming Boro	3,409.6	60%	1,644.5	29%	94.6	2%	0.0	0%	67.7	1%	512.8	9%	5,837	100%
Luzerne	Jenkins Twp	0.0	0%	7,156.6	73%	1,699.6	17%	208.4	2%	309.6	3%	450.2	5%	9,824.4	100%
Luzerne	Plains Twp	772.1	6%	10,062.7	74%	2,311.3	17%	238.8	2%	225.9	2%	36.2	0%	13,646.9	100%
Luzerne	Laflin Boro	0.0	0%	3,719.4	66%	0.0	0%	0.0	0%	1,875.0	34%	0.0	0%	5,594.4	100%
Luzerne	Bear Creek Twp	0.0	0%	53,225.7	97%	965.6	2%	325.0	1%	214.9	0%	263.4	0%	54,994.5	100%
Subtotal		**5,979.7**	**5%**	**102,580.6**	**84%**	**6,285.5**	**5%**	**943.6**	**1%**	**4,522.2**	**4%**	**1,262.5**	**1%**	**121,574.1**	**100%**
Carbon	Kidder Twp	1,570.3	3%	47,948.2	90%	2,644.7	5%	385.4	1%	244.3	0%	243.9	0%	53,036.9	100%
Carbon	Penn Forest Twp	1,083.6	3%	36,409.6	91%	2,306.9	6%	0.0	0%	152.1	0%	0.0	0%	39,952.1	100%
Carbon	Towamensing Twp	8,421.3	25%	21,793.1	65%	465.7	1%	1,964.7	6%	524.0	2%	564.8	2%	33,733.6	100%
Carbon	Lower Towamensing Twp	2,583.1	12%	14,696.8	68%	2,058.5	10%	0.0	0%	2,153.4	10%	23.4	0%	21,515.2	100%
Subtotal		**13,658.2**	**9%**	**120,847.7**	**82%**	**7,475.7**	**5%**	**2,350.2**	**2%**	**3,073.8**	**2%**	**832.1**	**1%**	**148,237.7**	**100%**
Northampton	Lehigh Twp	0.0	0%	12,440.5	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	12,440.5	100%
Northampton	Moore Twp	22,290.2	62%	11,623.4	32%	412.6	1%	969.1	3%	758.7	2%	0.0	0%	36,054.0	100%
Northampton	East Allen Twp	3,362.6	76%	977.5	22%	0.0	0%	0.0	0%	56.8	1%	0.0	0%	4,396.8	100%
Northampton	Upper Nazareth Twp	11,422.0	78%	1,462.5	10%	226.2	2%	733.9	5%	791.1	5%	0.0	0%	14,635.7	100%
Northampton	Lower Nazareth Twp	16,219.3	98%	158.1	1%	0.0	0%	0.0	0%	219.9	1%	0.0	0%	16,597.3	100%
Northampton	Bethlehem Twp	11,756.8	60%	996.4	5%	246.7	1%	0.0	0%	6,718.5	34%	0.0	0%	19,718.4	100%
Northampton	Easton City	0.0	0%	604.5	80%	0.0	0%	0.0	0%	10.9	1%	140.0	19%	755.4	100%
Northampton	Lower Saucon Twp	1,789.1	25%	2,478.3	35%	1,918.2	27%	126.6	2%	555.4	8%	179.7	3%	7,047.3	100%
Northampton	Williams Twp	5,769.3	32%	10,141.7	56%	1,460.9	8%	675.8	4%	176.0	1%	0.0	0%	18,223.7	100%
Subtotal		**72,609.2**	**56%**	**40,882.9**	**31%**	**4,264.6**	**3%**	**2,505.4**	**2%**	**9,287.2**	**7%**	**319.7**	**0%**	**129,869.0**	**100%**
Bucks	Durham Twp	5,944.1	74%	1,687.6	21%	0.0	0%	0.0	0%	108.1	1%	240.7	3%	7,980.6	100%
Bucks	Riegelsville Boro	1,232.6	96%	0.0	0%	0.0	0%	16.6	1%	35.1	3%	0.0	0%	1,284.3	100%
Subtotal		7,176.8	77%	1,687.6	18%	0.0	0%	16.6	0%	143.2	2%	240.7	3%	9,264.9	100%
Hellertown 24-inch Lateral															

State/Facility/ County	Municipality	Agricultural (Distance)[a]	%	Forest/ Woodland (Distance)[a]	%	Open Land (Distance)[a]	%	Residential (Distance)[a]	%	Industrial/ Commercial (Distance)[a]	%	Open Water (Distance)[a]	%	Total (Distance)[a]	%
Northampton	Lower Saucon Twp	4,265.3	38%	6,005.2	53%	863.7	8%	0.0	0%	158.7	1%	0.0	0%	11,292.9	100%
Subtotal		4,265.3	38%	6,005.2	53%	863.7	8%	0.0	0%	158.7	1%	0.0	0%	11,292.9	100%
New Jersey															
PennEast Mainline Route Pipeline															
Hunterdon	Holland Twp	17,134.8	41%	21,262.4	50%	2,569.1	6%	473.6	1%	378.2	1%	325.6	1%	42,143.6	100%
Hunterdon	Alexandria Twp	5,871.6	54%	4,516.9	42%	0.0	0%	398.1	4%	79.2	1%	0.0	0%	10,865.8	100%
Hunterdon	Kingwood Twp	16,836.9	47%	17,716.9	50%	237.8	1%	524.1	1%	214.3	1%	0.0	0%	35,529.9	100%
Hunterdon	Delaware Twp	16,262.4	53%	12,483.0	40%	820.8	3%	1,084.0	4%	229.1	1%	0.0	0%	30,879.4	100%
Hunterdon	West Amwell Twp	7,643.1	35%	9,115.7	42%	4,580.1	21%	0.0	0%	437.6	2%	0.0	0%	21,776.4	100%
Subtotal		**63,748.8**	**45%**	**65,094.8**	**46%**	**8,207.7**	**6%**	**2,479.7**	**2%**	**1,338.3**	**1%**	**325.6**	**0%**	**141,195.0**	**100%**
Mercer	Hopewell Twp	20,067.8	40%	22,972.9	45%	4,714.0	9%	1,377.6	3%	1,490.7	3%	165.1	0%	50,788.1	100%
Subtotal		**20,067.8**	**40%**	**22,972.9**	**45%**	**4,714.0**	**9%**	**1,377.6**	**3%**	**1,490.7**	**3%**	**165.1**	**0%**	**50,788.1**	**100%**
Gilbert 12-inch Lateral															
Hunterdon	Holland Twp	989.7	52%	472.5	25%	413.2	22%	0.0	0%	25.9	1%	0.0	0%	1,901.2	100%
Subtotal		**989.7**	**52%**	**472.5**	**25%**	**413.2**	**22%**	**0.0**	**0%**	**25.9**	**1%**	**0.0**	**0%**	**1,901.2**	**100%**
Lambertville 36-inch Lateral															
Hunterdon	West Amwell Twp	3,103.8	41%	3,800.8	50%	671.8	9%	0.0	0%	0.0	0%	0.0	0%	7,576.4	100%
Subtotal		**3,103.8**	**41%**	**3,800.8**	**50%**	**671.8**	**9%**	**0.0**	**0%**	**0.0**	**0%**	**0.0**	**0%**	**7,576.4**	**100%**
Project Total		**191,599.2**	**31%**	**364,345.2**	**59%**	**32,896.2**	**5%**	**9,673.0**	**2%**	**20,040.1**	**3%**	**3,145.6**	**1%**	**621,699.2**	**100%**

Notes

Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;

Forest and Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction ROW or extra work or staging areas;

Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility ROW;

Residential Land - Residential yards, residential subdivisions, and planned new residential developments;

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

Open Water – Water Crossings greater than 100 feet.

[a] – Distance displayed in linear feet

Data Source: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) Cropland Data Layer (USDA-NASS, 2014) and 2013 Aerial Photographs. Adjustments were made to the 2014 USDA-NASS Cropland Data Layer based on manual review of high-resolution 2013 aerial photography and information gathered during field surveys conducted in 2014 and 2015.

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8.2.1.1 Construction and Permanent Rights-of-Way

The PennEast Project will require the acquisition of both temporary and permanent ROWs as well as additional temporary workspace for the construction and operation of the pipeline facilities. However, PennEast has minimized cumulative impacts to land use by co-locating much of the proposed facilities with existing utility corridors. As discussed in Section 1.3 (Land Requirements) of Resource Report 1, the Project will require a 50-foot permanent ROW and, on average, an approximately 50-foot temporary construction workspace for a nominal 100-foot wide construction corridor.

In agricultural areas where full topsoil segregation of 12 inches deep is required, an additional 25 feet of temporary construction workspace is needed for a total of a 125-foot wide construction corridor. Parcels where topsoils staging will be required are summarized in Table 8.2-2a below. Certain conditions may require additional workspace that would extend beyond the nominal 100-foot corridor in order to maintain safe practices in specific locations; these areas are still being evaluated and will be included in PennEast's application anticipated to be filed in September 2015.

Additionally, in certain areas where specific environmental or residential constraints are present along the proposed pipeline route, reductions or "neck-downs" of the construction ROW may be necessary. An example includes the use of a 75-foot wide construction corridor in wetlands, except where PennEast requested site-specific ATWS as listed in Table 8.2-6. These areas are still being evaluated and will be included in PennEast's application anticipated to be filed in September 2015. Wetland crossing construction methods are discussed in more detail in Section 2.5.2 (Wetlands Crossing Construction Methods) of Resource Report 2.

Following construction, operational and maintenance clearing will be 50 feet in open areas, and limited to 30 feet in forested areas and 10 feet in wetland areas centered over the pipeline as specified in FERC Plan and Procedures.

Impacts to each land use type by construction (temporary ROW) and operation (permanent ROW) of the Project are discussed below, and summarized in Table 8.2-2.

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Table 8.2-2
Land Use Acreage Affected by Construction and Operation of Project Pipeline Facilities

State/Facility/County	Municipality	Agricultural		Forest/ Woodland[1]		Open Land		Residential		Industrial/ Commercial		Open Water		Total	
		Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW
Pennsylvania															
PennEast Mainline Route Pipeline															
Luzerne	Dallas Twp	0.0	0.0	10.9	10.6	0.5	0.2	0.0	0.0	0.1	0.1	0.0	0.0	11.4	10.9
Luzerne	Kingston Twp	2.5	1.3	28.7	17.1	0.8	0.5	0.3	0.2	0.3	0.2	0.0	0.0	32.7	19.3
Luzerne	West Wyoming Boro	1.0	0.8	10.4	8.4	1.2	2.9	0.0	0.0	2.5	1.8	0.0	0.0	15.1	13.8
Luzerne	Wyoming Boro	7.6	4.0	8.0	1.7	0.3	0.1	0.0	0.0	0.1	0.1	29.2	0.6	45.1	6.5
Luzerne	Jenkins Twp	0.0	0.0	18.9	8.4	4.2	1.7	0.9	0.2	0.1	0.4	28.6	0.5	52.8	11.2
Luzerne	Plains Twp	1.6	0.9	41.7	22.8	2.2	2.8	0.6	0.3	0.4	0.3	0.1	0.0	46.6	27.1
Luzerne	Laffin Boro	0.0	0.0	7.5	4.3	0.0	0.0	0.0	0.0	5.4	2.1	0.0	0.0	12.9	6.5
Luzerne	Bear Creek Twp	0.0	0.0	87.2	61.1	11.5	1.1	0.5	0.4	0.2	0.2	0.3	0.3	99.7	63.1
Subtotal		**12.7**	**7.0**	**213.4**	**134.5**	**20.8**	**9.3**	**2.3**	**1.1**	**9.1**	**5.2**	**58.1**	**1.5**	**316.3**	**158.5**
Carbon	Kidder Twp	14.0	1.8	96.6	130.4	6.6	3.5	1.1	0.4	0.1	0.1	0.3	0.3	118.7	136.5
Carbon	Penn Forest Twp	2.8	1.7	87.9	58.9	4.6	5.7	0.0	0.0	0.2	0.2	0.0	0.0	95.4	66.5
Carbon	Towamensing Twp	18.9	10.2	37.9	27.1	0.5	0.5	4.2	2.2	0.7	0.5	0.0	0.6	62.1	41.2
Carbon	Lower Towamensing Twp	9.4	6.0	27.3	21.2	4.2	2.3	0.0	0.0	9.4	2.6	0.0	0.0	50.2	32.2
Subtotal		45.0	19.7	249.6	237.6	15.9	12.1	5.3	2.7	10.4	3.5	0.3	1.0	326.5	276.4
Northampton	Lehigh Twp	0.0	0.0	28.8	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8	14.3
Northampton	Moore Twp	65.1	33.3	32.2	21.3	1.1	0.5	3.0	1.2	1.4	1.0	0.0	0.0	102.9	57.2
Northampton	East Allen Twp	6.6	3.9	1.9	1.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	8.5	5.0
Northampton	Upper Nazareth Twp	41.7	13.1	3.6	2.0	0.9	0.3	1.7	0.8	2.0	0.9	0.0	0.0	49.9	17.1
Northampton	Lower Nazareth Twp	31.3	18.7	0.6	0.2	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	32.3	19.1
Northampton	Bethlehem Twp	58.1	13.5	0.5	1.1	0.2	0.3	0.0	0.0	11.1	7.7	0.0	0.0	69.9	22.6

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State/Facility/County	Municipality	Agricultural		Forest/ Woodland[1]		Open Land		Residential		Industrial/ Commercial		Open Water		Total	
		Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW
Northampton	Easton City	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.9
Northampton	Lower Saucon Twp	3.3	2.0	2.6	2.9	2.8	3.5	0.0	0.1	0.0	0.6	0.0	0.2	8.7	9.4
Northampton	Williams Twp	11.8	6.7	15.0	12.0	2.8	1.9	1.3	0.8	0.2	0.2	0.0	0.0	31.0	21.6
Subtotal		**217.9**	**91.1**	**85.1**	**55.5**	**7.7**	**6.4**	**6.1**	**3.0**	**15.3**	**10.8**	**0.0**	**0.4**	**332.1**	**167.1**
Bucks	Durham Twp	12.1	7.1	1.9	2.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.3	14.3	9.6
Bucks	Riegelsville Boro	2.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	2.4	1.5
Subtotal		**14.5**	**8.5**	**1.9**	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.2**	**0.0**	**0.3**	**16.7**	**11.1**
Hellertown 24-inch Lateral															
Northampton	Lower Saucon Twp	9.7	6.5	7.8	13.9	3.0	2.7	0.0	0.0	0.2	0.2	0.0	0.0	20.8	23.4
Subtotal		9.7	6.5	7.8	13.9	3.0	2.7	0.0	0.0	0.2	0.2	0.0	0.0	20.8	23.4
New Jersey															
PennEast Mainline Route Pipeline															
Hunterdon	Holland Twp	45.1	26.6	47.2	32.1	5.5	3.3	0.7	0.6	1.0	0.4	0.0	0.4	99.4	63.3
Hunterdon	Alexandria Twp	0.0	8.3	0.0	7.4	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.0	16.2
Hunterdon	Kingwood Twp	42.3	26.2	30.6	27.7	0.2	0.3	0.8	0.6	0.3	0.2	0.0	0.0	74.2	55.0
Hunterdon	Delaware Twp	33.7	21.3	23.2	16.3	1.5	1.0	1.2	1.1	0.3	0.3	0.0	0.0	60.0	40.0
Hunterdon	West Amwell Twp	81.3	14.9	17.3	12.1	10.5	5.9	0.0	0.0	0.5	0.5	0.0	0.0	109.6	33.4
Subtotal		202.4	97.3	118.4	95.6	17.6	10.5	2.7	2.7	2.0	1.5	0.0	0.4	343.2	208.0
Mercer	Hopewell Twp	32.8	23.4	62.8	44.1	9.3	9.5	4.0	1.6	2.4	2.0	0.0	0.2	111.3	80.8
Subtotal		32.8	23.4	62.8	44.1	9.3	9.5	4.0	1.6	2.4	2.0	0.0	0.2	111.3	80.8
Gilbert 12-inch Lateral															
Hunterdon	Holland Twp	2.0	1.8	0.8	0.5	2.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8
Subtotal		2.0	1.8	0.8	0.5	2.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8
Lambertville 36-inch Lateral															

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State/Facility/County	Municipality	Agricultural		Forest/ Woodland[1]		Open Land		Residential		Industrial/ Commercial		Open Water		Total	
		Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW	Temp. ROW	Perm. ROW
Hunterdon	West Amwell Twp	7.9	8.1	9.3	6.7	0.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	15.8
Subtotal		7.9	8.1	9.3	6.7	0.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	15.8
Project Total		**544.9**	**263.5**	**749.1**	**590.5**	**77.3**	**53.9**	**20.4**	**11.1**	**39.7**	**23.3**	**58.4**	**3.6**	**1,489.8**	**945.9**

Notes

Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;

Forest And Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction row or extra work or staging areas;

Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility row;

Residential Land - Residential yards, residential subdivisions, and planned new residential developments;

Industrial Or Commercial Land - Electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, and roads;

Open Water – Water crossings greater than 100 feet.

Temp. ROW – Temporary ROW for construction of the project; includes temporary ROW for access roads, contractor yards and pipe yards, ATWS and extra work/staging areas, and above ground facilities. All units in acres and rounded to the nearest 0.1. Values of 0.0 represent impacts less than 0.05 acre and are included in the total project impacts.

Perm. ROW – New permanent ROW; includes access roads, contractor yards and pipe yards, ATWS and extra work/stagin areas, and above ground facilities; all units in acres and rounded to the nearest 0.1. Values of 0.0 represent impacts less than 0.05 acre and are included in the total project impacts.

1 – Permanent impacts to forest/woodland were calculated for the entire 50-foot permanent ROW, however, only the management of the 30-foot wide cleared permanent ROW in upland forests and 10-foot wide cleared operational ROW in wetlands will require the permanent removal of trees in these forested areas.

Data Source: United States Department Of Agriculture (USDA), National Agricultural Statistics Service (Nass) Cropland Data Layer (USDA-Nass, 2014) and 2013 aerial photographs. Adjustments were made to the 2014 Usda-Nass Cropland Data Layer based on manual review of high-resolution 2013 aerial photography and information gathered during field surveys conducted in 2014 and 2015.

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Table 8.2-2a
Parcels Identified for Topsoil Segregation

Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Pennsylvania					
PennEast Mainline					
Upper Susquehanna					
Luzerne	Dallas	10-D8-00A-062-000	0.1	0.2	Wetland
Luzerne	Kingston	35-D9-00A-002-000	1.5	1.5	Agricultural
Luzerne	Kingston	35-D9-00A-02K-000	1.5	1.5	Agricultural
Luzerne	Kingston	35-D9-00A-02H-000	1.6	1.6	Residential
Luzerne	Kingston	35-D9-00A-02I-000	1.6	1.6	Residential
Luzerne	Kingston	35-D9-00A-02I-000	1.6	1.6	Residential
Luzerne	Kingston	35-D9-00A-027-000	1.6	1.7	Agricultural
Luzerne	Kingston	35-D9-00A-027-000	1.7	1.7	Agricultural
Luzerne	Kingston	35-D9-00A-006-000	1.7	1.7	Agricultural
Luzerne	Kingston	35-D9S2-001-04C-000	1.7	1.7	Agricultural
Luzerne	Kingston	35-E9-00A-018-000	2.9	3.0	Agricultural
Luzerne	Kingston	35-E9-00A-018B-000	3.1	3.1	Wetland
Luzerne	West Wyoming	66-E10-00A-001-000	4.2	4.4	Agricultural
Luzerne	West Wyoming	66-F10-00A-004-000	5.8	5.8	Wetland
Luzerne	West Wyoming	66-F10-00A-006-000	6.0	6.0	Wetland
Luzerne	Wyoming	67-F10-00A-001-000	6.1	6.3	Agricultural
Luzerne	Wyoming	67-F10NE1-001-13K-000	6.1	6.3	Agricultural
Luzerne	Wyoming	67-F10-00A-001-000	6.3	6.3	Agricultural
Luzerne	Wyoming	67-F10NE1-001-13M-000	6.3	6.4	Agricultural
Luzerne	Wyoming	67-F10NE1-001-13H-000	6.3	6.3	Agricultural
Luzerne	Wyoming	67-F10NE1-001-13G-000	6.3	6.4	Agricultural
Luzerne	Wyoming	LOT 2 (IN LIEU)	6.3	6.4	Agricultural
Luzerne	Wyoming	67-F10NE1-001-13A-000	6.4	6.4	Agricultural
Luzerne	Wyoming	67-F10NE1-001-013-000	6.4	6.5	Agricultural
Luzerne	Wyoming	67-F10-00A-006-000	6.5	6.9	Agricultural
Luzerne	Jenkins	33-F10-00A-07E-000	7.2	7.3	Residential
Luzerne	Jenkins	33-E11-00A-0A1-000	7.3	7.3	Residential
Luzerne	Plains	50-F10S2-002-008-000	8.1	8.1	Residential
Luzerne	Plains	50-F10S2-002-003-000	8.1	8.1	Residential
Luzerne	Plains	50-F10S2-002-05A-000	8.1	8.2	Residential
Luzerne	Plains	50-F10S2-002-06A-000	8.1	8.2	Residential
Luzerne	Plains	50-F10S2-002-006-000	8.2	8.2	Residential
Luzerne	Plains	50-F10S3-001-01J-000	8.2	8.2	Residential
Luzerne	Plains	50-F10S3-001-001-000	8.2	8.2	Residential
Luzerne	Plains	50-F10S3-001-001-000	8.2	8.3	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Luzerne	Plains	50-F10S3-001-01G-000	8.2	8.2	Agricultural
Luzerne	Plains	50-F10S3-001-01F-000	8.2	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-01E-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-01D-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-01C-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-01B-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-01A-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10S3-001-002-000	8.3	8.3	Agricultural
Luzerne	Plains	50-F10-00E-009-000	8.3	8.3	Agricultural
Luzerne	Bear Creek	04-H12-00A-05E-000	13.0	13.0	Residential
Luzerne	Bear Creek	04-H12-00A-05T-000	13.1	13.1	Residential
Luzerne	Bear Creek	04-H12-00A-05P-000	13.1	13.1	Residential
Luzerne	Bear Creek	04-H12-00A-05P-000	13.1	13.1	Wetland
Luzerne	Bear Creek	04-H12-00A-05T-000	13.1	13.1	Wetland
Luzerne	Bear Creek	04-H12-00A-05W-000	13.1	13.1	Residential
Luzerne	Bear Creek	04-H12-00A-05W-000	13.1	13.2	Wetland
Luzerne	Bear Creek	04-H12-00A-05W-000	13.2	13.2	Wetland
Luzerne	Bear Creek	04-H12-00A-05F-000	13.7	13.7	Wetland
Luzerne	Bear Creek	04-H12-00A-041-000	14.1	14.1	Wetland
Upper Delaware					
Luzerne	Bear Creek	04-I12-00A-002-000	14.9	15.0	Wetland
Luzerne	Bear Creek	04-I13-00A-001-000	16.0	16.2	Wetland
Luzerne	Bear Creek	04-I13-00A-001-000	16.2	16.2	Wetland
Luzerne	Bear Creek	04-I13-00A-001-000	16.4	16.4	Wetland
Luzerne	Bear Creek	04-I13-00A-001-000	16.8	16.9	Wetland
Luzerne	Bear Creek	04-I13-00A-001-000	17.7	17.8	Wetland
Luzerne	Bear Creek	04-L13-00A-005	19.6	19.7	Wetland
Carbon	Kidder	44-20-A1	24.2	24.3	Wetland
Carbon	Kidder	45-20-A12.09	26.4	26.5	Wetland
Carbon	Kidder	46-20-A1	26.5	27.3	Wetland
Carbon	Kidder	46-20-A1	27.5	27.6	Wetland
Carbon	Kidder	46-20-A1	27.9	27.9	Wetland
Carbon	Kidder	47-21-A1	29.5	29.6	Wetland
Carbon	Kidder	33-21-B2	30.2	30.3	Wetland
Carbon	Kidder	34-21-A4	30.9	31.2	Wetland
Carbon	Kidder	34-21-A4	31.2	31.3	Agricultural
Carbon	Kidder	34-21-A3	31.2	31.3	Agricultural
Carbon	Kidder	34-21-A2.02	31.8	31.8	Residential
Carbon	Kidder	34-21-A2.21	31.8	31.8	Residential
Carbon	Kidder	34-21-A2.12	31.8	31.8	Residential

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Carbon	Kidder	34-21-A2.15	31.8	31.9	Agricultural
Carbon	Kidder	34A-21-A6	31.9	31.9	Agricultural
Carbon	Kidder	34A-21-A3	31.9	32.0	Agricultural
Carbon	Kidder	34-21-A2.07	31.9	31.9	Agricultural
Carbon	Kidder	34-21-A8.03	32.0	32.0	Agricultural
Carbon	Kidder	34-21-A9.03	32.1	32.1	Residential
Carbon	Kidder	34A-21-A7	32.1	32.3	Agricultural
Carbon	Kidder	34-21-A9.02	32.1	32.2	Agricultural
Carbon	Kidder	34A-21-A7	32.2	32.2	Agricultural
Carbon	Penn Forest	35-21-A4	33.1	33.1	Wetland
Carbon	Penn Forest	35-21-A4	33.5	33.6	Wetland
Carbon	Penn Forest	35-21-A4	34.4	34.7	Wetland
Carbon	Penn Forest	23A-51-B78	34.4	34.4	Wetland
Carbon	Penn Forest	23A-51-B79	34.4	34.5	Wetland
Carbon	Penn Forest	23A-51-B80A	34.5	34.5	Wetland
Carbon	Penn Forest	23A-51-B87A	34.5	34.6	Wetland
Carbon	Penn Forest	23A-51-B90	34.6	34.6	Wetland
Carbon	Penn Forest	23A-51-B91	34.6	34.6	Wetland
Carbon	Penn Forest	23A-51-B96	34.7	34.7	Wetland
Carbon	Penn Forest	23A-51-B97	34.7	34.7	Wetland
Carbon	Penn Forest	36-51-A9.03	35.4	35.4	Wetland
Carbon	Penn Forest	36-51-A9.05	35.6	35.6	Agricultural
Carbon	Penn Forest	36-51-A3.01	35.6	36.1	Agricultural
Carbon	Penn Forest	36-51-A14	36.1	36.2	Agricultural
Carbon	Penn Forest	37-51-A10	36.5	36.6	Wetland
Carbon	Penn Forest	37-51-A7	37.1	37.2	Wetland
Carbon	Penn Forest	37-51-A7	37.4	37.5	Wetland
Carbon	Penn Forest	38-51-A4INLIEU	39.5	39.6	Wetland
Carbon	Towamensing	26-56-A26	42.7	42.8	Agricultural
Carbon	Towamensing	26-56-A26	42.8	42.8	Residential
Carbon	Towamensing	15-56-A18.07A	42.8	42.9	Agricultural
Carbon	Towamensing	15-56-A18.09	42.9	43.0	Agricultural
Carbon	Towamensing	15-56-A18,18.02	42.9	43.1	Agricultural
Carbon	Towamensing	15-56-A18.04USA	43.1	43.3	Agricultural
Carbon	Towamensing	15-56-A18,18.02	43.1	43.1	Agricultural
Carbon	Towamensing	15-56-A34USA	43.9	44.0	Wetland
Carbon	Towamensing	15-56-A11	44.2	44.3	Wetland
Carbon	Towamensing	16-56-A27	44.5	44.6	Residential
Carbon	Towamensing	16D-56-A26	44.6	44.7	Residential
Carbon	Towamensing	16D-56-A27	44.7	44.7	Residential

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Carbon	Towamensing	16D-56-A27	44.7	44.7	Agricultural
Carbon	Towamensing	16D-56-A27	44.7	44.8	Residential
Carbon	Towamensing	16D-56-A28	44.8	44.8	Residential
Carbon	Towamensing	16D-56-A29	44.8	44.8	Residential
Carbon	Towamensing	16D-56-A2	44.9	44.9	Residential
Carbon	Towamensing	16D-56-A9	44.9	44.9	Residential
Carbon	Towamensing	16D-56-A1	44.9	44.9	Residential
Carbon	Towamensing	16-56-A71.02	44.9	44.9	Residential
Carbon	Towamensing	16-56-A71.02	45.0	45.0	Wetland
Carbon	Towamensing	16-56-A72.02	45.2	45.3	Residential
Carbon	Towamensing	16-56-A72.02	45.2	45.3	Agricultural
Carbon	Towamensing	5-56-A11.18	45.5	45.5	Wetland
Carbon	Towamensing	5-56-A11.16	45.5	45.5	Wetland
Carbon	Towamensing	16-56-A74	45.7	46.0	Agricultural
Carbon	Towamensing	5-56-A10.01	45.8	45.8	Agricultural
Carbon	Towamensing	16-56-A74	46.0	46.0	Agricultural
Carbon	Towamensing	6-56-A14.02	46.0	46.4	Agricultural
Carbon	Towamensing	6-56-A11.14	46.4	46.6	Agricultural
Carbon	Towamensing	6-56-A11.12	46.6	46.7	Agricultural
Carbon	Towamensing	6-56-A11.13	46.6	46.7	Agricultural
Carbon	Lower Towamensing	7-32-A59A	46.7	47.2	Agricultural
Carbon	Lower Towamensing	7-32-A58	47.2	47.2	Agricultural
Carbon	Lower Towamensing	7-32-A44	47.8	48.0	Agricultural
Carbon	Lower Towamensing	7-32-A34	48.1	48.1	Wetland
Carbon	Lower Towamensing	7-32-A33.01	48.1	48.1	Wetland
Carbon	Lower Towamensing	UNKNOWN (RAILROAD)	48.1	48.1	Wetland
Carbon	Lower Towamensing	7-32-A6	48.6	48.8	Agricultural
Carbon	Lower Towamensing	8-32-A4.01	48.8	48.9	Agricultural
Carbon	Lower Towamensing	8-32-A4	48.9	49.0	Agricultural
Northampton	Moore	G4-1-17	53.5	53.5	Wetland
Northampton	Moore	G4-1-24A	53.6	54.1	Agricultural
Northampton	Moore	H4-7-2	54.1	54.7	Agricultural
Northampton	Moore	H4-7-4	54.7	54.7	Agricultural
Northampton	Moore	H4-7-5B	54.7	54.7	Agricultural
Northampton	Moore	H4-7-4	54.7	54.7	Residential

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Northampton	Moore	H4-8-7-38	54.8	54.8	Residential
Northampton	Moore	H4-8-7-37	54.8	54.8	Residential
Northampton	Moore	H4-8-9	54.8	54.8	Residential
Northampton	Moore	H4-8-7-10	54.8	54.9	Agricultural
Northampton	Moore	H4-8-7-11	54.8	55.0	Agricultural
Northampton	Moore	H4-8-7	54.9	55.1	Agricultural
Northampton	Moore	H4-8-7-12	55.0	55.0	Agricultural
Northampton	Moore	H4-8-7-13	55.0	55.0	Agricultural
Northampton	Moore	H4-8-5	55.1	55.2	Agricultural
Northampton	Moore	H4-8-6	55.1	55.2	Agricultural
Northampton	Moore	H4-8-6C	55.2	55.3	Agricultural
Northampton	Moore	H4-9-6	55.3	55.5	Agricultural
Northampton	Moore	H4-17-1	55.5	55.6	Agricultural
Northampton	Moore	H4-17-5	55.7	55.8	Agricultural
Northampton	Moore	H4-17-2	55.7	55.8	Agricultural
Northampton	Moore	H5-17-1	56.0	56.0	Agricultural
Northampton	Moore	H5-17-5	56.1	56.6	Agricultural
Northampton	Moore	H5-17-4	56.2	56.2	Agricultural
Northampton	Moore	H5-21-7	56.8	56.9	Agricultural
Northampton	Moore	H5-21-8	56.8	57.0	Agricultural
Northampton	Moore	H5-22-16	57.0	57.3	Agricultural
Northampton	Moore	H5-22-15	57.0	57.3	Agricultural
Northampton	Moore	H5-22-15	57.4	57.6	Agricultural
Northampton	Moore	J5-3-3	57.6	57.6	Residential
Northampton	Moore	J5-3-36A	57.6	57.6	Residential
Northampton	Moore	J5-3-36	57.6	57.7	Residential
Northampton	Moore	J5-3-6	57.7	57.7	Residential
Northampton	Moore	J5-3-6	57.7	57.8	Agricultural
Northampton	Moore	J5-3-4L	57.7	57.8	Agricultural
Northampton	Moore	J5-3-4L	57.7	57.8	Residential
Northampton	Moore	J5-9-1	57.8	58.1	Agricultural
Northampton	Moore	J5-9-2	58.1	58.1	Agricultural
Northampton	Moore	J5-10-10	58.1	58.2	Residential
Northampton	Moore	J5-10-10	58.2	58.5	Agricultural
Northampton	Moore	J5-10-9	58.2	58.2	Agricultural
Northampton	Moore	J5-10-5	58.6	58.7	Agricultural
Northampton	Moore	J5-10-6C	58.7	58.7	Agricultural
Northampton	Moore	J5-10-6C	58.7	58.8	Residential
Northampton	Moore	J5-10-5	58.7	58.7	Residential
Northampton	Moore	J5-10-6	58.7	58.8	Residential

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Northampton	Moore	J5-10-6	58.7	58.9	Agricultural
Northampton	Moore	J5-17-7A	58.9	58.9	Agricultural
Northampton	Moore	J5-17-5	58.9	59.0	Agricultural
Northampton	Moore	J5-20-15A	59.0	59.1	Agricultural
Northampton	Moore	J5-20-1A	59.1	59.1	Agricultural
Northampton	Moore	J5-20-1	59.1	59.1	Agricultural
Northampton	Moore	J5-20-1	59.1	59.2	Residential
Northampton	Moore	J5-20-2	59.2	59.2	Residential
Northampton	Moore	J5-21-1	59.2	59.2	Wetland
Northampton	Moore	J5-21-8	59.2	59.2	Wetland
Northampton	Moore	J5-21-1	59.3	59.5	Agricultural
Northampton	Moore	J6-15-6	59.9	60.2	Agricultural
Northampton	Moore	J5-21-5	60.0	60.2	Agricultural
Northampton	East Allen	K6-2-1	60.2	60.3	Agricultural
Northampton	Moore	J6-15-4	60.2	60.3	Agricultural
Northampton	East Allen	K6-4-1	60.3	60.6	Agricultural
Northampton	Moore	J6-16-8	60.6	60.6	Agricultural
Northampton	East Allen	K6-5-26	60.6	60.6	Agricultural
Northampton	East Allen	K6-5-25	60.6	60.7	Wetland
Northampton	East Allen	K6-5-25A	60.7	60.7	Agricultural
Northampton	East Allen	K6-5-24	60.7	61.1	Agricultural
Northampton	East Allen	K6-5-1	61.1	61.2	Agricultural
Northampton	Upper Nazareth	K6-5-5D	61.2	61.4	Agricultural
Northampton	Upper Nazareth	K6-6-3	61.4	61.4	Agricultural
Northampton	Upper Nazareth	K6-6-3	61.5	61.5	Wetland
Northampton	Upper Nazareth	K6-6-1	61.5	61.7	Agricultural
Northampton	Upper Nazareth	K6-6-3	61.6	62.0	Agricultural
Northampton	Upper Nazareth	K6-7-2K	62.0	62.1	Agricultural
Northampton	Upper Nazareth	K6-10-2	62.1	62.1	Agricultural
Northampton	Upper Nazareth	K6-10-2	62.1	62.2	Residential
Northampton	Upper Nazareth	K6-10-3	62.2	62.2	Residential
Northampton	Upper Nazareth	K6-11-1	62.3	62.5	Agricultural
Northampton	Upper Nazareth	K6-11-11B	62.5	62.7	Agricultural
Northampton	Upper Nazareth	K6-12-1A	62.7	62.7	Agricultural
Northampton	Upper Nazareth	K6-12-1	62.8	62.8	Agricultural
Northampton	Upper Nazareth	K6-21-1	62.8	63.0	Agricultural
Northampton	Upper Nazareth	K6-21-2A	62.8	62.8	Agricultural
Northampton	Upper Nazareth	K7-14-1	63.0	63.2	Agricultural
Northampton	Upper Nazareth	K7-14-5	63.3	63.6	Agricultural
Northampton	Upper Nazareth	K7-19-5	63.7	63.8	Residential

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Northampton	Upper Nazareth	K7-19-5	63.7	63.8	Agricultural
Northampton	Lower Nazareth	K7-19-13	63.9	64.2	Agricultural
Northampton	Lower Nazareth	K7-19-12C	64.0	64.0	Agricultural
Northampton	Lower Nazareth	K7-19-13-1	64.1	64.2	Agricultural
Northampton	Lower Nazareth	K7-19-12	64.2	64.3	Agricultural
Northampton	Lower Nazareth	K7-20-9	64.3	64.3	Wetland
Northampton	Lower Nazareth	K7-20-9	64.3	65.0	Agricultural
Northampton	Lower Nazareth	K7-20-1	64.4	64.6	Agricultural
Northampton	Lower Nazareth	K7-20-8A	64.6	64.9	Agricultural
Northampton	Lower Nazareth	K7-20-11	65.0	65.0	Agricultural
Northampton	Lower Nazareth	K7-21-3	65.0	65.1	Agricultural
Northampton	Lower Nazareth	K7SE4-2-1	65.0	65.1	Agricultural
Northampton	Lower Nazareth	K7SE4-3-10	65.1	65.1	Agricultural
Northampton	Lower Nazareth	K7SE4-3-11	65.1	65.1	Agricultural
Northampton	Lower Nazareth	K7SE4-3-10	65.1	65.1	Agricultural
Northampton	Lower Nazareth	K7SE4-3-11	65.1	65.1	Agricultural
Northampton	Lower Nazareth	K7-21-4A	65.1	65.1	Agricultural
Northampton	Lower Nazareth	K7-23-1B	65.1	65.2	Agricultural
Northampton	Lower Nazareth	K7-23-1A	65.1	65.4	Agricultural
Northampton	Lower Nazareth	K7-23-1A-1	65.2	65.2	Agricultural
Northampton	Lower Nazareth	K7-23-2	65.4	65.5	Agricultural
Northampton	Lower Nazareth	L7-3-3	65.5	65.5	Agricultural
Northampton	Lower Nazareth	L7-3-5	65.5	65.8	Agricultural
Northampton	Lower Nazareth	L7-3-5G	65.7	65.7	Agricultural
Northampton	Lower Nazareth	L7-6-9	65.8	66.2	Agricultural
Northampton	Lower Nazareth	L7-6-10	66.1	66.3	Agricultural
Northampton	Lower Nazareth	L7-6-11	66.3	66.7	Agricultural
Northampton	Lower Nazareth	L7-6-12	66.3	66.7	Agricultural
Northampton	Lower Nazareth	L7-6-11	66.6	66.7	Agricultural
Northampton	Lower Nazareth	L7-13-1	66.7	66.8	Agricultural
Northampton	Lower Nazareth	L7-13-2	66.7	66.8	Agricultural
Northampton	Bethlehem	L8-10-9	66.8	67.4	Agricultural
Northampton	Bethlehem	L8-10-12	67.3	67.5	Agricultural
Northampton	Bethlehem	L8-10-13	67.5	67.6	Agricultural
Northampton	Bethlehem	L8-18-3	67.6	67.6	Agricultural
Northampton	Bethlehem	L8-18-4	67.6	67.7	Agricultural
Northampton	Bethlehem	L8-18-5	67.7	67.7	Agricultural
Northampton	Bethlehem	M8-1-2A	68.0	68.0	Agricultural
Northampton	Bethlehem	M8-1-3	68.0	68.2	Agricultural
Northampton	Bethlehem	M8-2-2A	68.2	68.3	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Northampton	Bethlehem	M8-2-2B	68.2	68.3	Agricultural
Northampton	Bethlehem	M8-2-3	68.3	68.3	Agricultural
Northampton	Bethlehem	M8-2-3C	68.5	68.6	Agricultural
Northampton	Bethlehem	M8-2-3-12	68.5	68.5	Agricultural
Northampton	Bethlehem	M8-2-3C	68.6	68.9	Agricultural
Northampton	Bethlehem	M8-2-3-3	68.8	68.8	Agricultural
Northampton	Bethlehem	M8-9-10	69.0	69.2	Agricultural
Northampton	Bethlehem	M8-9-15B	69.2	69.4	Agricultural
Northampton	Bethlehem	M8-9-15	69.4	69.4	Agricultural
Northampton	Bethlehem	N8-4A-1	70.0	70.2	Agricultural
Northampton	Bethlehem	N8-4-1	70.3	70.6	Agricultural
Northampton	Lower Saucon	N8-12-11C	71.7	71.7	Residential
Northampton	Lower Saucon	N8-15-4A	71.9	71.9	Agricultural
Northampton	Lower Saucon	N8-15-4	71.9	71.9	Agricultural
Northampton	Lower Saucon	N8-18-3	71.9	72.0	Agricultural
Northampton	Lower Saucon	N8-18-3A	71.9	71.9	Agricultural
Northampton	Lower Saucon	N8-18-3	71.9	72.0	Agricultural
Northampton	Lower Saucon	N8-18-3	72.0	72.1	Wetland
Northampton	Lower Saucon	N8-18-3	72.0	72.3	Agricultural
Northampton	Williams	N8-18-4A	72.4	72.4	Wetland
Northampton	Williams	P8-2-7	72.6	72.6	Wetland
Northampton	Williams	P8-2-6	72.6	72.9	Wetland
Northampton	Williams	P8-2-4A	72.9	72.9	Residential
Northampton	Williams	P8-2-4	72.9	73.0	Residential
Northampton	Williams	P8-8-3	73.1	73.1	Agricultural
Northampton	Williams	P9-6-12	73.1	73.1	Agricultural
Northampton	Williams	P9-6-12	73.2	73.3	Residential
Northampton	Williams	P9-6-14	73.4	73.4	Wetland
Northampton	Williams	P9-6-6	73.6	73.6	Agricultural
Northampton	Williams	P9-7-4	74.2	74.2	Agricultural
Northampton	Williams	P9-7-4D	74.2	74.3	Agricultural
Northampton	Williams	P9-11-3	74.3	74.7	Agricultural
Northampton	Williams	P9-11-4B	74.8	74.8	Wetland
Northampton	Williams	P9-12-32A	74.8	74.9	Agricultural
Northampton	Williams	P9-12-32C	74.8	74.9	Agricultural
Northampton	Williams	P9-12-31	74.9	75.0	Agricultural
Northampton	Williams	P9-12-30	75.1	75.4	Agricultural
Northampton	Williams	P9-12-19	75.4	75.4	Agricultural
Northampton	Williams	P9-12-19	75.5	75.6	Wetland
Northampton	Williams	P9-12-21	75.6	75.7	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Bucks	Durham	11-002-050	75.7	76.0	Agricultural
Bucks	Durham	11-002-057	76.0	76.3	Agricultural
Bucks	Durham	11-005-106	76.3	76.5	Agricultural
Bucks	Durham	11-002-056	76.5	76.5	Agricultural
Bucks	Durham	11-005-106	76.5	76.5	Agricultural
Bucks	Durham	11-005-104	76.5	76.5	Residential
Bucks	Durham	11-002-056	76.5	76.5	Agricultural
Bucks	Durham	11-002-056	76.5	76.5	Residential
Bucks	Durham	11-005-104	76.5	76.5	Residential
Bucks	Riegelsville	38-008-001	76.5	76.7	Agricultural
Bucks	Durham	11-005-109	76.7	76.9	Agricultural
Bucks	Durham	11-005-110	76.9	77.4	Agricultural
Bucks	Durham	11-005-119	77.3	77.3	Wetland
Hellertown Lateral					
Upper Delaware					
Northampton	Lower Saucon	N8-14-9	0.0	0.2	Agricultural
Northampton	Lower Saucon	P8-4-39	0.8	0.8	Agricultural
Northampton	Lower Saucon	P8-4-18	0.8	1.1	Agricultural
Northampton	Lower Saucon	P8-4-38	0.8	0.8	Agricultural
Northampton	Lower Saucon	P8-5-12	1.3	1.3	Agricultural
Northampton	Lower Saucon	P8-5-13	1.3	1.7	Agricultural
Northampton	Lower Saucon	P8-5-13	1.6	1.8	Agricultural
Northampton	Lower Saucon	P8-5-17	2.1	2.1	Residential
New Jersey					
PennEast Mainline					
Upper Delaware					
Hunterdon	Holland	1015-18-12	77.5	77.6	Wetland
Hunterdon	Holland	1015-13-41	77.7	77.8	Agricultural
Hunterdon	Holland	1015-13-41	77.8	77.8	Residential
Hunterdon	Holland	1015-13-30	77.9	78.1	Agricultural
Hunterdon	Holland	1015-13-29	78.1	78.1	Residential
Hunterdon	Holland	1015-13-78	78.1	78.2	Residential
Hunterdon	Holland	1015-13-30	78.1	78.1	Residential
Hunterdon	Holland	1015-21-14	78.2	78.2	Agricultural
Hunterdon	Holland	1015-21-22	78.5	78.6	Agricultural
Hunterdon	Holland	1015-21-18.01	78.8	78.8	Agricultural
Hunterdon	Holland	1015-21-18	79.2	79.3	Agricultural
Hunterdon	Holland	1015-21-18	79.2	79.3	Residential
Hunterdon	Holland	1015-20-10	79.4	79.5	Agricultural
Hunterdon	Holland	1015-20-9	79.5	79.7	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Hunterdon	Holland	1015-20-12	79.7	79.8	Agricultural
Hunterdon	Holland	1015-20-13	79.8	79.9	Agricultural
Hunterdon	Holland	1015-22-47	80.0	80.2	Agricultural
Hunterdon	Holland	1015-22-58.01	81.1	81.1	Agricultural
Hunterdon	Holland	1015-22-56	81.1	81.4	Agricultural
Hunterdon	Holland	1015-22-57	81.5	81.5	Residential
Hunterdon	Holland	1015-22-91	81.5	81.5	Residential
Hunterdon	Holland	1015-24-6	81.6	81.7	Agricultural
Hunterdon	Holland	1015-24-11	81.6	81.6	Agricultural
Hunterdon	Holland	1015-24-11	81.6	81.6	Residential
Hunterdon	Holland	1015-24-6	81.8	81.8	Agricultural
Hunterdon	Holland	1015-24-13	81.9	82.0	Agricultural
Hunterdon	Holland	1015-24-13.01	82.0	82.1	Agricultural
Hunterdon	Holland	1015-15-3.01	82.1	82.3	Agricultural
Hunterdon	Holland	1015-15-3	82.3	82.5	Agricultural
Hunterdon	Holland	1015-15-7	82.6	83.0	Agricultural
Hunterdon	Holland	1015-17-20	83.5	83.6	Agricultural
Hunterdon	Holland	1015-17-24	84.0	84.0	Residential
Hunterdon	Holland	1015-25-30	84.1	84.2	Agricultural
Hunterdon	Holland	1015-25-59	84.3	84.7	Agricultural
Hunterdon	Holland	1015-25-60	84.8	85.3	Agricultural
Hunterdon	Holland	1015-25-60	85.3	85.3	Residential
Hunterdon	Holland	1015-25-91	85.3	85.3	Residential
Hunterdon	Holland	1015-25-90	85.3	85.3	Residential
Hunterdon	Holland	1015-25-90	85.3	85.3	Agricultural
Hunterdon	Holland	1015-25-92	85.3	85.4	Residential
Hunterdon	Holland	1015-25-76	85.4	85.4	Residential
Hunterdon	Alexandria	1001-18-11	85.5	85.5	Residential
Hunterdon	Alexandria	1001-18-9	85.5	85.5	Residential
Hunterdon	Alexandria	1001-18-9	85.5	85.7	Agricultural
Hunterdon	Alexandria	1001-18-9	85.8	86.0	Agricultural
Hunterdon	Alexandria	1001-18-9.08	85.9	86.0	Agricultural
Hunterdon	Alexandria	1001-18-9.08	86.0	86.0	Residential
Hunterdon	Alexandria	1001-18-9	86.0	86.0	Residential
Hunterdon	Alexandria	1001-18-9.08	86.0	86.0	Agricultural
Hunterdon	Alexandria	1001-18-9	86.0	86.3	Agricultural
Hunterdon	Alexandria	1001-18-9.01	86.3	86.6	Agricultural
Hunterdon	Alexandria	1001-18-20.01	86.7	86.8	Agricultural
Hunterdon	Alexandria	1001-18-20.01	86.9	86.9	Agricultural
Hunterdon	Alexandria	1001-18-20	86.9	86.9	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Hunterdon	Alexandria	1001-18-20.04	87.2	87.2	Residential
Hunterdon	Alexandria	1001-19-27	87.2	87.3	Wetland
Hunterdon	Alexandria	1001-19-27	87.2	87.3	Agricultural
Hunterdon	Kingwood	1016-5-6	87.8	88.0	Agricultural
Hunterdon	Kingwood	1016-6-2	88.0	88.2	Agricultural
Hunterdon	Kingwood	1016-6-17	88.3	88.6	Agricultural
Hunterdon	Kingwood	1016-12-1	88.7	88.8	Agricultural
Hunterdon	Kingwood	1016-12-19	88.8	89.0	Agricultural
Hunterdon	Kingwood	1016-12-26	89.4	89.5	Agricultural
Hunterdon	Kingwood	1016-12-31.01	89.8	89.9	Agricultural
Hunterdon	Kingwood	1016-12-32	89.8	89.9	Agricultural
Hunterdon	Kingwood	1016-13-14.08	90.4	90.5	Residential
Hunterdon	Kingwood	1016-13-16.04	90.5	90.7	Agricultural
Hunterdon	Kingwood	1016-13-16	90.6	90.7	Agricultural
Hunterdon	Kingwood	1016-13-16.04	90.6	90.6	Residential
Hunterdon	Kingwood	1016-23-10	90.7	90.7	Residential
Hunterdon	Kingwood	1016-23-11	90.7	90.7	Residential
Hunterdon	Kingwood	1016-23-11	90.8	91.3	Agricultural
Hunterdon	Kingwood	1016-23-14	91.2	91.2	Agricultural
Hunterdon	Kingwood	1016-23-11	91.3	91.4	Agricultural
Hunterdon	Kingwood	1016-23-17	91.4	91.8	Agricultural
Hunterdon	Kingwood	1016-24-2.03	91.8	91.8	Residential
Hunterdon	Kingwood	1016-24-2.04	91.8	91.8	Residential
Hunterdon	Kingwood	1016-24-8	92.0	92.2	Agricultural
Hunterdon	Kingwood	1016-24-8	92.2	92.4	Agricultural
Hunterdon	Kingwood	1016-24-8.01	92.4	92.4	Agricultural
Hunterdon	Kingwood	1016-24-9.01	92.4	92.4	Agricultural
Hunterdon	Kingwood	1016-24-13	92.6	92.9	Agricultural
Hunterdon	Kingwood	1016-24-14.01	92.8	92.9	Agricultural
Hunterdon	Kingwood	1016-26-4.02	92.9	93.0	Agricultural
Hunterdon	Kingwood	1016-26-3.01	92.9	92.9	Agricultural
Hunterdon	Kingwood	1016-26-4.02	93.0	93.0	Wetland
Hunterdon	Kingwood	1016-26-4.02	93.0	93.0	Wetland
Hunterdon	Kingwood	1016-26-4.02	93.0	93.1	Wetland
Hunterdon	Kingwood	1016-26-16	93.5	93.5	Agricultural
Hunterdon	Kingwood	1016-26-16.02	93.5	93.5	Agricultural
Hunterdon	Kingwood	1016-26-16.02	93.5	93.6	Residential
Hunterdon	Kingwood	1016-36-5	93.7	93.8	Agricultural
Hunterdon	Kingwood	1016-36-11	94.2	94.3	Agricultural
Hunterdon	Delaware	1007-19-37	94.3	94.6	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Hunterdon	Delaware	1007-19-37	94.4	94.4	Residential
Hunterdon	Delaware	1007-19-38	94.7	94.7	Wetland
Hunterdon	Delaware	1007-19-21	94.9	95.0	Agricultural
Hunterdon	Delaware	1007-19-21	95.2	95.2	Residential
Hunterdon	Delaware	1007-19-21	95.2	95.3	Agricultural
Hunterdon	Delaware	1007-31-10	95.3	95.5	Agricultural
Hunterdon	Delaware	1007-31-11	95.4	95.4	Agricultural
Hunterdon	Delaware	1007-31-12.04	95.6	95.6	Residential
Hunterdon	Delaware	1007-31-10	95.6	95.7	Agricultural
Hunterdon	Delaware	1007-31-12.04	95.6	95.7	Agricultural
Hunterdon	Delaware	1007-31-10	95.6	95.6	Residential
Hunterdon	Delaware	1007-31-4	95.7	96.0	Agricultural
Hunterdon	Delaware	1007-31-3	96.0	96.3	Agricultural
Hunterdon	Delaware	1007-32-33	96.3	96.5	Agricultural
Hunterdon	Delaware	1007-33-21	96.7	96.7	Residential
Hunterdon	Delaware	1007-33-19	96.7	96.7	Residential
Hunterdon	Delaware	1007-33-19	96.7	96.8	Agricultural
Hunterdon	Delaware	1007-33-21	96.7	96.7	Agricultural
Hunterdon	Delaware	1007-33-23	96.7	96.8	Residential
Hunterdon	Delaware	1007-33-20	96.8	96.8	Residential
Hunterdon	Delaware	1007-33-19.01	96.8	96.8	Residential
Hunterdon	Delaware	1007-33-19.01	96.8	96.8	Agricultural
Hunterdon	Delaware	1007-33-19	96.8	96.9	Agricultural
Hunterdon	Delaware	1007-33-19.01	96.8	96.9	Agricultural
Hunterdon	Delaware	1007-33-4.01	97.0	97.2	Agricultural
Hunterdon	Delaware	1007-33-4	97.0	97.1	Agricultural
Hunterdon	Delaware	1007-53-1.03	97.2	97.3	Agricultural
Hunterdon	Delaware	1007-54-5	97.6	97.6	Residential
Hunterdon	Delaware	1007-54-5.02	97.6	97.7	Residential
Hunterdon	Delaware	1007-54-10	97.7	97.7	Residential
Hunterdon	Delaware	1007-55-2	97.7	98.1	Agricultural
Hunterdon	Delaware	1007-55-8	97.7	97.7	Agricultural
Hunterdon	Delaware	1007-55-2.03	98.1	98.3	Agricultural
Hunterdon	Delaware	1007-55-3	98.4	98.4	Agricultural
Hunterdon	Delaware	1007-60-12	98.6	98.7	Agricultural
Hunterdon	Delaware	1007-62-12.03	99.2	99.3	Agricultural
Hunterdon	Delaware	1007-62-12	99.3	99.6	Agricultural
Hunterdon	Delaware	1007-62-12	99.7	99.7	Agricultural
Hunterdon	West Amwell	1026-3-14	100.5	100.5	Agricultural
Hunterdon	West Amwell	1026-3-16	100.8	101.0	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Hunterdon	West Amwell	1026-3-15	101.0	101.1	Agricultural
Hunterdon	West Amwell	1026-3-15	101.0	101.1	Residential
Hunterdon	West Amwell	1026-8-20	101.1	101.3	Agricultural
Hunterdon	West Amwell	1026-8-20	101.1	101.2	Wetland
Hunterdon	West Amwell	1026-8-36	101.3	101.4	Agricultural
Hunterdon	West Amwell	1026-8-36	101.3	101.4	Wetland
Hunterdon	West Amwell	1026-8-14	101.4	101.7	Agricultural
Hunterdon	West Amwell	1026-8-38	101.8	102.0	Agricultural
Hunterdon	West Amwell	1026-8-38	101.9	102.0	Residential
Hunterdon	West Amwell	1026-17-5.01	102.0	102.1	Agricultural
Hunterdon	West Amwell	1026-17-5	102.0	102.2	Agricultural
Hunterdon	West Amwell	1026-17-4	102.1	102.3	Agricultural
Hunterdon	West Amwell	1026-16.01-1.01	102.7	102.7	Residential
Hunterdon	West Amwell	1026-29-12	103.5	103.5	Residential
Hunterdon	West Amwell	1026-29-12	103.6	103.7	Wetland
Hunterdon	West Amwell	1026-26-11	104.0	104.2	Agricultural
Mercer	Hopewell	1106-56-11	104.6	104.7	Residential
Mercer	Hopewell	1106-56-6	104.7	104.7	Residential
Mercer	Hopewell	1106-56-10	104.7	104.8	Residential
Mercer	Hopewell	1106-59-4	104.7	105.1	Agricultural
Mercer	Hopewell	1106-59-6.01	105.1	105.1	Wetland
Mercer	Hopewell	1106-59-6.01	105.1	105.2	Agricultural
Mercer	Hopewell	1106-59-13.01	105.2	105.4	Agricultural
Mercer	Hopewell	1106-59-13.01	105.2	105.3	Wetland
Mercer	Hopewell	1106-59-13.01	105.5	105.5	Wetland
Mercer	Hopewell	1106-60-5	105.8	105.8	Wetland
Mercer	Hopewell	1106-60-5	106.0	106.0	Agricultural
Mercer	Hopewell	1106-60-4.02	106.0	106.3	Agricultural
Mercer	Hopewell	1106-60-5	106.3	106.3	Agricultural
Mercer	Hopewell	1106-61-9.01	107.9	107.9	Wetland
Mercer	Hopewell	1106-62-2.02	108.2	108.4	Agricultural
Mercer	Hopewell	1106-62-3	108.6	108.7	Agricultural
Mercer	Hopewell	1106-62-2.02	108.6	108.6	Agricultural
Mercer	Hopewell	1106-62-3	108.7	108.8	Agricultural
Mercer	Hopewell	1106-62-24	108.9	109.0	Wetland
Mercer	Hopewell	1106-62-24	109.0	109.5	Agricultural
Mercer	Hopewell	1106-62-24	109.4	109.4	Wetland
Mercer	Hopewell	1106-62-24	109.5	109.5	Residential
Mercer	Hopewell	1106-62-12.28	109.5	109.5	Residential
Mercer	Hopewell	1106-92-2.01	109.6	109.8	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Mercer	Hopewell	1106-93-3.01	110.7	110.9	Agricultural
Mercer	Hopewell	1106-91-1.03	110.9	110.9	Agricultural
Mercer	Hopewell	1106-91-1.04	110.9	111.1	Agricultural
Mercer	Hopewell	1106-91-1	111.1	111.2	Agricultural
Mercer	Hopewell	1106-91-3.11	111.2	111.3	Agricultural
Mercer	Hopewell	1106-91-3.12	111.2	111.3	Agricultural
Mercer	Hopewell	1106-91-3.21	111.3	111.3	Agricultural
Mercer	Hopewell	1106-91-3.95	111.3	111.4	Agricultural
Mercer	Hopewell	1106-91-5	111.4	111.6	Agricultural
Mercer	Hopewell	1106-91-22	111.6	111.7	Agricultural
Mercer	Hopewell	1106-91-34	111.7	111.7	Agricultural
Mercer	Hopewell	1106-91-9	111.7	111.8	Agricultural
Mercer	Hopewell	1106-91-9	111.7	111.8	Residential
Mercer	Hopewell	1106-91-25	111.7	111.8	Agricultural
Lower Hudson					
Mercer	Hopewell	1106-91-25	111.8	111.8	Residential
Mercer	Hopewell	1106-91-25.02	111.8	111.8	Residential
Mercer	Hopewell	1106-91-23	111.8	111.8	Residential
Mercer	Hopewell	1106-91-10	111.8	111.8	Residential
Mercer	Hopewell	1106-85-22	111.8	111.9	Residential
Mercer	Hopewell	1106-85-9	111.8	111.9	Residential
Mercer	Hopewell	1106-85-2	111.9	111.9	Residential
Mercer	Hopewell	1106-85-9	111.9	112.0	Agricultural
Mercer	Hopewell	1106-85-3	112.0	112.1	Agricultural
Mercer	Hopewell	1106-85-5.01	112.3	112.4	Wetland
Mercer	Hopewell	1106-78-30	112.4	112.5	Agricultural
Mercer	Hopewell	1106-78-2	112.5	112.5	Wetland
Mercer	Hopewell	1106-78-30	112.5	112.5	Wetland
Mercer	Hopewell	1106-78-9.40	112.5	112.5	Wetland
Mercer	Hopewell	1106-78-68	112.5	112.5	Wetland
Mercer	Hopewell	1106-78-68	112.5	112.5	Agricultural
Mercer	Hopewell	1106-78-9.40	112.5	112.6	Agricultural
Mercer	Hopewell	1106-78-68	112.5	112.5	Wetland
Mercer	Hopewell	1106-71-19.03	112.6	112.8	Agricultural
Mercer	Hopewell	1106-71-19.03	112.6	112.7	Wetland
Mercer	Hopewell	1106-71-19.02	112.7	112.7	Agricultural
Mercer	Hopewell	1106-71-19.02	112.7	112.8	Residential
Mercer	Hopewell	1106-72-11	112.8	113.0	Agricultural
Mercer	Hopewell	1106-72-11	112.8	112.8	Wetland
Mercer	Hopewell	1106-72-31	112.9	113.2	Agricultural

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Facility/State/ River Basin/ County	Municipality	Parcel Number	MP Start	MP End	Justification
Mercer	Hopewell	1106-72-10.11	113.0	113.1	Agricultural
Mercer	Hopewell	1106-72-10.12	113.1	113.2	Agricultural
Mercer	Hopewell	1106-72-10.13	113.2	113.3	Residential
Mercer	Hopewell	1106-72-10.14	113.3	113.3	Residential
Mercer	Hopewell	1106-72-9	113.4	113.7	Agricultural
Mercer	Hopewell	1106-72-6.16	113.8	113.8	Residential
Mercer	Hopewell	1106-72-9	113.8	113.8	Residential
Gilbert Lateral					
Upper Delaware					
Hunterdon	Holland	1015-21-18.04	0.0	0.2	Agricultural
Hunterdon	Holland	1015-26-11	0.4	0.4	Residential
Lambertville Lateral					
Upper Delaware					
Hunterdon	West Amwell	1026-5-5	0.9	1.4	Agricultural

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8.2.1.2 Existing Rights-of-Way

In order to minimize impacts to existing land use, PennEast has proposed to co-locate much of the construction ROW adjacent to or in proximity to existing ROWs wherever possible (e.g., gas pipeline, transmission line, or product pipeline). Approximately 43.1 miles, or 36 percent, of the total length of the pipeline is proposed to be co-located with existing utility ROWs. The type of existing ROW and Project milepost (MP) locations where these features are paralleled or coincide are presented in Table 8.2-3. Also included is the width of the existing ROW used for temporary construction, the permanent width used for operation of the Project facilities, and the area of new permanent ROW and temporary ROW required adjacent to the existing utility ROWs. These overlapping areas are currently being worked out with each existing utility company as to the amount of overlap that can be safely allowed. It is PennEast's desire to overlap as much of the workspace and still maintain safe construction and operating conditions for both PennEast and the existing utility. Final tabulation of these areas will be provided in the filing and environmental permit applications.

8.2.1.3 Access Roads

Existing public and private roads will be utilized as the primary means of access to the ROW to the greatest extent possible; however, PennEast has identified the need for 104 temporary and 11 permanent access roads for use during construction and operation of the Project. These access roads include use of 63 existing roads and construction or enhancement of 52 new/partially existing access roads for a total length of approximately 32.2 miles (117.2 acres). Minor improvements will likely be required on a majority of the existing private access roads proposed for use; these improvements may include tree branch clearing, gravel placement, and/or access path widening. Of the 32.2 miles of access roads needed for the Project, approximately 2.2 miles (7.9 acres) will remain as new permanent access roads, with 1.2 miles requiring improvements. Agricultural land constitutes the majority of acreage affected by the new permanent access roads with 2.4 acres of permanent disturbance. Approximately 0.8 acres of forest/woodland, 2.3 acres of industrial/commercial land, 0.2 acres of residential land, and 1.8 acres of open land will also be permanently impacted by the permanent access roads required for the construction and operation of the Project facilities. Additionally, ATWS may be needed to serve as temporary vehicle parking and/or staging areas of minor supplies. The location of each of these roads and associated ATWS is identified on the Project alignment sheets and USGS topographic maps provided in Appendices A and C of Resource Report 1.

Table 8.2-4 lists the proposed temporary and permanent private access roads to be utilized for the Project and identifies them by MP where they intersect the ROW, and by Project facility for which the access road will serve. Other information presented includes acreage of existing land use to be affected, width and extent of modification of the roads, land affected during operation, and justification for the use of the access road. All temporary access roads used for construction will be restored in accordance with landowner agreements.

Table 8.2-3
Co-location of the Project Pipeline Facilities with Existing Rights-of-Way

State/Facility/ River Basin/ County	Municipality	Begin MP	End MP	Type of Right-of-Way	Paralleled Length (miles)	New Permanent Easement Inside Existing Right-of-Way (acres)	New Permanent Easement Outside Existing Right-of-Way (acres)	New Temporary Workspace Inside Existing Right-of-Way (acres)	New Temporary Workspace Outside of Existing Right-of-Way (acres)
Pennsylvania									
PennEast Mainline Route Pipeline									
Upper Susquehanna									
Luzerne	Jenkins TWP, Plains TWP	10.5	11.9	Pipeline	1.5	0.0	8.7	1.0	7.2
Luzerne	Plains TWP	11.9	11.9	Pipeline	0.0	0.0	0.1	0.1	0.1
Luzerne	Plains TWP, Bear Creek TWP	12.2	12.8	Pipeline	0.6	0.0	3.8	0.8	6.2
Upper Delaware									
Luzerne	Bear Creek TWP	13.4	15.7	Pipeline	2.2	0.0	13.5	2.6	14.2
Luzerne	Bear Creek TWP	15.7	19.6	Pipeline	3.9	0.1	23.5	4.5	22.6
Luzerne	Bear Creek TWP	19.7	22.5	Pipeline	2.7	0.0	16.6	3.2	14.8
				Subtotal	11.0	0.1	66.3	12.3	65.0
Carbon	Kidder TWP	23.2	26.0	Pipeline	2.8	0.0	17.1	3.5	18.2
Carbon	Kidder TWP, Penn Forest TWP	26.3	34.8	Pipeline*	8.5	1.4	116.0	8.7	47.2
Carbon	Penn Forest TWP	35.9	36.6	Pipeline	0.8	1.5	3.2	0.8	5.0
Carbon	Penn Forest TWP	36.7	37.0	Pipeline	0.3	1.2	0.8	0.4	2.6
Carbon	Penn Forest TWP, Towamensing TWP	38.0	40.8	Pipeline	2.7	1.2	15.4	1.9	22.4
				Subtotal	15.1	5.3	152.5	15.4	95.4
Northampton	Lower Nazareth TWP	64.2	64.3	Pipeline	0.1	0.0	0.9	0.2	1.2
Northampton	Bethlehem TWP	67.7	68.3	Pipeline	0.5	0.0	3.3	0.7	4.6

State/Facility/ River Basin/ County	Municipality	Begin MP	End MP	Type of Right-of-Way	Paralleled Length (miles)	New Permanent Easement Inside Existing Right-of-Way (acres)	New Permanent Easement Outside Existing Right-of-Way (acres)	New Temporary Workspace Inside Existing Right-of-Way (acres)	New Temporary Workspace Outside of Existing Right-of-Way (acres)
				Subtotal	0.7	0.0	4.2	0.8	5.8
Hellertown 24-inch Lateral									
Upper Delaware									
Northampton	Lower Saucon TWP	1.7	2.1	Pipeline*	0.4	0.3	6.6	0.2	1.9
				Subtotal	0.4	0.3	6.6	0.2	1.9
				Pennsylvania Total	27.2	5.7	229.6	28.7	168.2
New Jersey									
PennEast Mainline Route Pipeline									
Upper Delaware									
Hunterdon	Holland TWP	80.3	80.4	Transmission	0.1	0.2	0.2	0.1	0.4
Hunterdon	Kingwood TWP	89.3	89.9	Transmission	0.5	0.0	3.1	1.4	3.8
Hunterdon	Kingwood TWP	90.0	90.3	Transmission	0.3	0.0	1.5	0.3	1.2
Hunterdon	Kingwood TWP	90.8	91.2	Transmission	0.3	0.0	2.1	0.5	2.3
Hunterdon	Kingwood TWP, Delaware TWP	93.3	95.4	Transmission	2.1	0.4	12.6	3.6	12.4
Hunterdon	Delaware TWP	96.1	96.9	Transmission	0.8	0.0	4.7	0.9	5.7
Hunterdon	Delaware TWP	97.6	98.8	Transmission	1.2	0.0	7.2	2.6	8.7
Hunterdon	West Amwell TWP	100.8	101.5	Transmission	0.7	2.6	1.8	1.5	4.8
Hunterdon	West Amwell TWP	101.6	102.1	Transmission	0.5	0.0	3.2	0.9	5.3
Hunterdon	West Amwell TWP	102.2	102.4	Transmission	0.3	0.9	0.6	1.0	2.4
Hunterdon	West Amwell TWP	102.5	102.9	Transmission	0.5	0.0	3.0	0.7	2.9
Hunterdon	West Amwell TWP	103.0	103.2	Transmission	0.2	0.0	1.2	0.4	1.2
Hunterdon	West Amwell TWP	103.9	104.2	Transmission	0.2	0.0	1.4	0.4	2.2
Hunterdon, Mercer	West Amwell TWP, Hopewell TWP	104.2	104.3	Transmission	0.1	0.0	0.4	0.2	0.7

State/Facility/ River Basin/ County	Municipality	Begin MP	End MP	Type of Right-of-Way	Paralleled Length (miles)	New Permanent Easement Inside Existing Right-of-Way (acres)	New Permanent Easement Outside Existing Right-of-Way (acres)	New Temporary Workspace Inside Existing Right-of-Way (acres)	New Temporary Workspace Outside of Existing Right-of-Way (acres)
				Subtotal	7.8	4.2	42.9	14.3	54.0
Mercer	Hopewell TWP	104.3	104.7	Transmission	0.4	1.3	1.0	1.3	2.8
Mercer	Hopewell TWP	104.8	107.3	Transmission	2.5	9.5	5.4	3.3	15.2
Mercer	Hopewell TWP	107.3	107.9	Transmission	0.6	2.1	1.4	0.8	3.7
Mercer	Hopewell TWP	108.0	108.5	Transmission	0.6	1.8	1.6	1.4	3.5
Mercer	Hopewell TWP	108.6	108.7	Transmission	0.2	0.0	1.1	0.3	1.3
Mercer	Hopewell TWP	108.8	111.2	Transmission	2.4	10.8	3.9	6.6	12.0
Mercer	Hopewell TWP	111.2	111.7	Transmission	0.5	1.8	1.1	0.4	0.9
Lower Hudson									
Mercer	Hopewell TWP	112.2	112.3	Pipeline	0.1	0.0	0.7	0.1	0.5
Mercer	Hopewell TWP	112.5	112.6	Pipeline	0.1	0.0	0.5	0.1	0.3
				Subtotal	7.3	27.3	16.6	14.4	40.3
PennEast Gilbert Lateral									
Upper Delaware									
Hunterdon	Holland TWP	0.0	0.3	Transmission	0.3	1.0	1.1	0.5	1.8
				Subtotal	0.3	1.0	1.1	0.5	1.8
Lambertville 36-inch Lateral									
Upper Delaware									
Hunterdon	West Amwell TWP	1.0	1.4	Pipeline*	0.5	0.6	8.4	1.0	5.7
				Subtotal	0.5	0.6	8.4	1.0	5.7
				New Jersey Total	15.9	33.1	69.0	30.2	101.8
				Project Total	43.1	38.8	298.5	58.9	269.9

Notes:
The totals shown in this table may not equal the sum of addends due to rounding.
* Where indicated, values for Acreage include Above Ground Facilities, Access Roads, or Compressor Stations

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Table 8.2-4
Summary of Public and Private Access Roads Associated with the Project Facilities

State/Facility/ County	Municipality	MP	Access Road ID	Existing Land Use (acreage affected)						Temporary/ Permanent	Existing Width (feet)	Improvement Length (feet)	Total Length (feet)	Area Affected (Operation) (Acres)	Justification
				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Pennsylvania															
PennEast Mainline Pipeline Route															
Upper Susquehanna															
Luzerne	Dallas Twp	0.03	AR-001	0.0	0.1	0.9	0.0	0.0	0.0	Permanent	30.0	1367.0	1400.8	1.0	Wyoming Interconnect access
Luzerne	Dallas Twp	0.52	AR-002	0.0	0.0	0.1	0.0	1.1	0.0	Permanent	30.0	0.0	1690.5	1.2	Springville Interconnect access
Luzerne	Kingston Twp	4.48	AR-003	0.0	0.0	0.6	0.0	0.0	0.0	Permanent	30.0	85.0	1211.3	0.8	Leidy, Auburn Interconnect access
Luzerne	West Wyoming Boro	5.39	AR-004	0.0	0.6	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	907.3	0.6	Clearing crew access for light traffic
Luzerne	Wyoming Boro	6.36	AR-005	0.3	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	438.2	0.3	light vehicle access prior to clearing and construction
Luzerne	Wyoming Boro	6.46	AR-006	0.0	0.1	0.1	0.0	0.0	0.0	Temporary	30.0	225.0	229.0	0.2	Access for light and major equipment for construction between Route 11 and the Susquehanna River
Luzerne	Jenkins Twp	7.26	AR-007	0.0	0.0	0.0	0.6	0.0	0.0	Temporary	30.0	800.0	873.9	0.6	Access to south side of Susquehanna River crossing
Luzerne	Plains Twp	8.09	AR-008	0.0	0.3	0.0	0.0	0.0	0.0	Temporary	30.0	125.1	506.8	0.3	Access for major equipment North of Lakewood Drive
Luzerne	Plains Twp	8.10	AR-009	0.0	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	248.0	141.5	0.1	Access around guard rails on N Main street
Luzerne	Plains Twp	8.49	AR-011	0.0	0.2	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	235.9	0.2	Acces for light equipment to support construction to the north up to North Main Street
Luzerne	Plains Twp	8.64	AR-012	0.0	0.2	0.0	0.0	0.0	0.0	Temporary	30.0	233.6	233.6	0.2	Acces for light equipment to support construction to the north and south while avoiding steep terrain
Luzerne	Plains Twp	8.81	AR-013	0.0	0.0	0.2	0.0	0.0	0.0	Temporary	30.0	0.0	291.7	0.2	Access for heavy construction equipment
Luzerne	Jenkins Twp	9.07	AR-014	0.0	0.4	0.0	0.0	0.0	0.0	Temporary	30.0	243.0	562.2	0.4	Access for light and major equipment for construction north of the existing quarry
Luzerne	Laflin Boro	9.12	AR-015	0.0	0.3	0.0	0.0	2.3	0.0	Temporary	30.0	0.0	5067.2	3.5	Access to ROW for materials and major equipment. Access to west side of Union Street HDD.
Luzerne	Jenkins Twp	9.13	AR-016	0.0	0.0	0.0	0.0	0.2	0.0	Temporary	30.0	0.0	328.2	0.2	Access for light and major equipment from the south for construction through the existing quarry
Luzerne	Laflin Boro	9.23	AR-017A	0.0	0.0	0.0	0.0	0.1	0.0	Temporary	30.0	0.0	157.3	0.1	Access for light and major equipment from the south for construction through the existing quarry to the east

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State/Facility/ County	Municipality	MP	Access Road ID	Existing Land Use (acreage affected)						Temporary/ Permanent	Existing Width (feet)	Improvement Length (feet)	Total Length (feet)	Area Affected (Operation) (Acres)	Justification
				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Luzerne	Jenkins Twp	9.26	AR-017B	0.0	0.0	0.0	0.0	0.7	0.0	Temporary	30.0	0.0	1036.7	0.7	Access for light and major equipment from the south for construction to the west up to the railroad crossing
Luzerne	Laflin Boro	9.46	AR-018A	0.0	0.0	0.0	0.0	0.6	0.0	Temporary	30.0	0.0	947.9	0.7	Access for light and major equipment from the south for construction to the east up to the railroad crossing
Luzerne	Laflin Boro	9.47	AR-018B	0.0	0.0	0.0	0.0	0.1	0.0	Temporary	30.0	0.0	229.4	0.2	Access for light and major equipment from the north for construction to the west to support the stream crossing and Main Street crossing
Luzerne	Jenkins Twp	10.16	AR-021A	0.0	1.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	2413.8	1.7	Access for light and major equipment from the north for construction to the east and support for the Main Street road crossing
Luzerne	Jenkins Twp	10.40	AR-021B	0.0	0.2	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	256.2	0.2	Access for light and major equipment from the south for construction of the crossing of highway 81 and route 315
Luzerne	Jenkins Twp	10.57	AR-022	0.0	3.5	0.0	0.0	0.0	0.0	Temporary	30.0	196.4	6195.5	4.3	Access to south side of Hwy 315 and Interstate 81 HDD
Luzerne	Jenkins Twp	10.82	AR-023	0.0	1.0	0.0	0.0	0.0	0.0	Temporary	30.0	1407.1	1407.1	1.0	Access for light equipment from the south for construction to the east and access to ATWS and to support the I-81 road crossing from the east
Luzerne	Plains Twp	11.25	AR-024A	0.0	2.5	0.0	0.0	0.0	0.0	Temporary	30.0	196.4	3710.8	2.6	Access to south side of Hwy 315 and Interstate 81 HDD
Luzerne	Plains Twp	11.27	AR-024B	0.0	1.3	0.0	0.0	0.0	0.0	Temporary	30.0	1846.4	1846.4	1.3	Access for light equipment from the south for construction to the east
Luzerne	Bear Creek Twp	12.91	AR-025	0.0	1.4	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	1994.2	1.4	Clearing crew access for light traffic
Luzerne	Bear Creek Twp	13.02	AR-028	0.0	0.0	0.8	0.0	0.0	0.0	Temporary	30.0	811.6	1172.2	0.8	Access for light and major equipment from the east for construction of the crossing of highway 476 while avoiding a major wetland
Luzerne	Bear Creek Twp	13.29	AR-029	0.0	1.7	0.0	0.0	0.0	0.0	Temporary	30.0	2563.0	2525.1	1.7	Access to south side of Interstate 476 crossing
Luzerne	Bear Creek Twp	14.39	AR-030	0.0	0.0	7.6	0.0	0.0	0.0	Temporary	30.0	0.0	10993.5	7.6	Access to ROW in remote area. Will minimize clearing.
Upper Delaware										Temporary	30.0	14038.0			Access to ROW in remote area. Will minimize impact to and crossing of parallel creek.
Luzerne	Bear Creek Twp	16.63	AR-031	0.0	9.7	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	14122.0	9.7	Access to ROW and clearing in remote area.
Luzerne	Bear Creek Twp	20.43	AR-032	0.0	0.0	1.8	0.0	0.0	0.0	Temporary	30.0	0.0	3404.8	2.3	Access to ROW in remote area. Access to north side of Lehigh River crossing
Luzerne	Bear Creek Twp	21.79	AR-033	0.0	6.1	0.0	0.0	0.0	0.0	Permanent	30.0	1367.0	11862.5	8.2	Wyoming Interconnect access

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
										Subtotal			78393.5	54.0	
Carbon	Kidder Twp	25.03	AR-034	0.0	6.2	0.0	0.0	0.0	0.0	Temporary	30.0	2342.8	9027.0	6.2	Access to ROW in remote area. Access to south side of Lehigh River crossing
Carbon	Kidder Twp	26.93	AR-035	0.0	4.2	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	6170.8	4.2	Access to south side of Interstate 80 crossing
Carbon	Kidder Twp	28.82	AR-036	0.0	0.0	2.3	0.0	0.0	0.0	Temporary	30.0	0.0	3322.5	2.3	Access to ROW south of large wetland complex
Carbon	Kidder Twp	31.91	AR-037	0.3	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	49.0	444.2	0.3	Access to Spread 2 Preferred Contractor Yard
Carbon	Kidder Twp	32.68	AR-038	0.0	2.2	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	3265.5	2.2	Access to ROW north of Mud Run during pre-clearing activities, i.e. survey
Carbon	Penn Forest Twp	34.55	AR-039	0.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	40.6	0.0	Construction access across adjacent line from Balsam Drive
Carbon	Penn Forest Twp	35.61	AR-040	0.8	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	524.0	1192.4	0.8	Access for light and major equipment from the northfor construction to the south
Carbon	Penn Forest Twp	37.09	AR-041	0.0	0.7	0.0	0.0	0.0	0.0	Temporary	30.0	983.9	983.9	0.7	Access for light and major equipment from the south for construction to the north and construction through the wetland
Carbon	Penn Forest Twp	37.23	AR-042	0.0	1.9	0.0	0.0	0.0	0.0	Temporary	30.0	103.3	2739.5	1.9	Access for light and major equipment from the south for construction to the south and construction through the wetland
Carbon	Towamensing Twp	42.49	AR-043	0.0	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	110.3	0.1	Construction access
Carbon	Towamensing Twp	44.48	AR-044	0.0	0.2	0.0	0.0	0.0	0.0	Temporary	30.0	249.3	249.3	0.2	Access for light and major equipment from the east for HDD construction support
Carbon	Towamensing Twp	44.77	AR-045	0.0	0.0	0.0	0.1	0.0	0.0	Temporary	30.0	0.0	144.8	0.1	Access to west side of creek crossing at Sei Pike Ln
Carbon	Towamensing Twp	45.00	AR-046	0.0	0.2	0.0	0.0	0.0	0.0	Temporary	30.0	269.6	269.6	0.2	Access for light and major equipment for construction to the east and through the wetland to the south
Carbon	Towamensing Twp	46.55	AR-047	0.0	0.0	0.0	0.0	0.8	0.0	Temporary	30.0	0.0	1193.7	0.8	Access to ROW in remote area
Carbon	Lower Towamensing Twp	48.10	AR-048	0.0	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	289.0	188.5	0.1	Access around guard rails to south side of Little Gap Rd crossing
Carbon	Lower Towamensing Twp	48.56	AR-049	0.0	0.0	0.0	0.0	1.8	0.0	Temporary	30.0	2798.1	2658.2	1.8	Access to ROW in a steep area
Carbon	Lower Towamensing Twp	49.62	AR-050	0.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	52.6	0.0	Access for light and major equipment from the north for construction to the east and west

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Carbon	Lower Towamensing Twp	51.01	AR-051	0.0	0.0	0.0	0.0	0.7	0.0	Permanent	30.0	0.0	1023.5	0.7	Access for light and major equipment from the west for construction to the north and south and for the blue mountain interconnect
										Subtotal			33076.9	22.8	
Northampton	Lehigh Twp	52.53	AR-052	0.0	0.8	0.0	0.0	0.0	0.0	Temporary	30.0	494.0	1175.3	0.8	Access for light and major equipment from the south for construction to the east and west
Northampton	Moore Twp	53.91	AR-053	0.7	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	150.6	949.7	0.7	Access for light and major equipment from the east for construction to the north and south
Northampton	Moore Twp	55.94	AR-054	0.0	0.0	0.1	0.0	0.0	0.0	Temporary	30.0	48.6	120.0	0.1	Access for light and major equipment from the east for construction to the north to support crossing Mountain view drive and multiple stream crossings
Northampton	East Allen Twp	60.19	AR-055	0.4	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	750.6	0.5	Access to ROW that minimizes impact to Monocacy Creek
Northampton	Bath Boro	60.36	AR-056	0.9	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	1156.4	1762.1	1.2	Access for light and major equipment from the south for construction to the east and west to support crossing Monocacy Drive and North Walnut Street
Northampton	Upper Nazareth Twp	62.77	AR-057	0.0	0.0	0.0	0.0	1.0	0.0	Temporary	30.0	0.0	1435.9	1.0	Access to south side of railroad crossing
Northampton	Upper Nazareth Twp	63.35	AR-058	1.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	1480.2	1.0	Access for light and major equipment from the south for construction to the east and west
Northampton	Lower Nazareth Twp	63.95	AR-059	0.0	0.0	0.0	0.0	0.3	0.0	Temporary	30.0	52.9	527.7	0.4	Access for light and major equipment from the east for construction to the north and south and to access the proposed ATWS
Northampton	Lower Nazareth Twp	64.15	AR-060	0.7	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	390.3	1062.3	0.7	Access for light and major equipment from the west for construction to the north and south and to support crossing route 946
Northampton	Lower Nazareth Twp	64.31	AR-061	0.0	0.0	0.0	0.0	0.1	0.0	Temporary	30.0	0.0	179.2	0.1	Access for light and major equipment for construction to the east and south and to support crossing route 946
Northampton	Lower Nazareth Twp	65.01	AR-062	0.1	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	147.6	188.6	0.1	Access for light and major equipment from the south for construction to the north and to support crossing route 191
Northampton	Lower Nazareth Twp	66.47	AR-063	0.7	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	1111.2	0.8	Access for light and major equipment from the south for construction to the north

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Northampton	Lower Nazareth Twp	66.63	AR-064	0.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	34.5	0.0	Access for light and major equipment from the south for construction to support crossing Hecktown Road
Northampton	Bethlehem Twp	67.04	AR-065A	0.1	0.0	0.0	0.0	0.6	0.0	Temporary	30.0	458.3	1251.4	0.9	Access for light and major equipment from the west for construction to the north
Northampton	Bethlehem Twp	67.08	AR-065B	0.1	0.0	0.0	0.0	0.2	0.0	Temporary	30.0	447.0	447.0	0.3	Access for light and major equipment from the west for construction of Lehigh valley Thruway and construction to the south
Northampton	Bethlehem Twp	67.94	AR-066	0.0	0.0	0.0	0.0	0.3	0.0	Temporary	30.0	0.0	537.8	0.4	Access for light and major equipment to support crossing Green pond Road and construction to the south
Northampton	Bethlehem Twp	68.42	AR-067	0.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	21.3	21.3	0.0	Access for light and major equipment to support crossing Route 33 and construction to the south
Northampton	Bethlehem Twp	68.83	AR-068	0.0	0.0	0.0	0.0	0.2	0.0	Temporary	30.0	0.0	230.3	0.2	Access for light and heavy equipment to support crossing Route 2020 and construction to the north
Northampton	Bethlehem Twp	69.59	AR-069	0.0	0.0	0.0	0.0	0.3	0.0	Temporary	30.0	0.0	452.2	0.3	Access to North side of and berm crossing. Access for light and heavy equipment to support access ATWS and support construction through the existing shopping mall parking lots
Northampton	Bethlehem Twp	69.80	AR-070	0.0	0.0	0.0	0.0	0.7	0.0	Temporary	30.0	0.0	952.5	0.7	Access for light and heavy equipment to support access ATWS and support construction through the existing shopping mall parking lots
Northampton	Bethlehem Twp	70.35	AR-071	1.4	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	1764.8	1966.3	1.4	Access for light and heavy equipment to support access from staging area and support construction to the south
Northampton	Lower Saucon Twp	71.24	AR-072A	0.0	0.0	1.3	0.0	0.0	0.0	Temporary	30.0	1978.4	1978.4	1.4	Access for light and heavy equipment to support access for the Lehigh River crossing and construction to the south
Northampton	Lower Saucon Twp	71.48	AR-072B	0.0	0.0	0.0	0.0	0.0	0.0	Permanent	30.0	44.2	44.2	0.0	Access for light and heavy equipment to support access for the Hellertown Lateral launcher and receiver site
Northampton	Lower Saucon Twp	71.94	AR-073	0.2	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	199.1	328.8	0.2	Access for light and heavy equipment to support construction of the Lower Saucon Road crossing and wetland and stream crossing to the south

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Northampton	Lower Saucon Twp	72.10	AR-074	0.3	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	314.1	422.8	0.3	Access for light and heavy equipment to support construction of the wetland and stream crossing to the north as well as construction to the south
Northampton	Williams Twp	72.80	AR-075	0.0	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	112.1	113.3	0.1	Access for light and heavy equipment to support construction of the large wetland crossing to the north as well as construction to the east
Northampton	Williams Twp	73.23	AR-076	0.0	0.0	0.0	0.2	0.0	0.0	Temporary	30.0	0.0	337.2	0.2	Access for light and heavy equipment to support construction of the wetland crossing to the east as well as construction to the east and west
Northampton	Williams Twp	73.84	AR-077	0.0	0.7	0.0	0.0	0.0	0.0	Permanent	30.0	532.6	1079.0	0.7	TCO Interconnect access. Access for light and heavy equipment to support construction of the Hexenkopf Road crossing from the west as well as construction to the east
Northampton	Williams Twp	74.71	AR-078	0.0	0.4	0.0	0.0	0.0	0.0	Temporary	30.0	524.3	524.3	0.4	Access for light and heavy equipment to support construction of the Durham Road crossing from the east as well as construction to the west
										Subtotal			21464.1	14.8	
Bucks	Durham Twp	76.30	AR-079	0.1	0.1	0.0	0.0	1.6	0.0	Temporary	30.0	0.0	2648.7	1.8	Access for light and heavy equipment to support construction of the Delaware Road crossing from the west as well as construction to the west
Bucks	Durham Twp	77.19	AR-080	0.5	0.0	0.0	0.0	0.3	0.0	Temporary	30.0	1046.1	1144.7	0.8	Access for light and heavy equipment to support construction of the Delware River HDD to the east as well as construction to the west
										Subtotal			3793.4	2.6	
Hellertown 24-Inch Lateral															
Upper Delaware															
Northampton	Lower Saucon Twp	2.14	AR-201	0.0	0.0	0.0	0.0	0.0	0.0	Permanent	30.0	291.1	7.3	0.0	Access to TCO and UGI-LEH interconnect sites
										Subtotal			7.3	0.0	
										Pennsylvania Subtotal			136727.9	94.1	
New Jersey															
PennEast Mainline Pipeline Route															
Upper Delaware															
Hunterdon	Holland Twp	77.76	AR-081	0.1	0.0	0.0	0.0	0.1	0.0	Temporary	30.0	0.0	294.4	0.2	Access to east side of Delaware River HDD

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Hunterdon	Holland Twp	80.34	AR-082	0.0	0.7	0.0	0.0	0.0	0.0	Temporary	30.0	199.0	1021.6	0.7	Access for light and heavy equipment to support construction to the east and west
Hunterdon	Holland Twp	81.12	AR-083	1.2	0.1	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	1895.3	1.3	Access for light and heavy equipment to support construction of the Spring Garden Road crossing from the west as well as construction to the west
Hunterdon	Holland Twp	81.95	AR-084	0.0	0.2	0.4	0.0	0.3	0.0	Temporary	30.0	0.0	1378.8	0.9	Access to West side of St Hwy519/Wetland HDD
Hunterdon	Holland Twp	82.29	AR-085	0.0	0.1	0.3	0.1	0.0	0.0	Temporary	30.0	967.0	911.4	0.6	Access to East side of St Hwy519/Wetland HDD and access to west side of creek crossing
Hunterdon	Holland Twp	82.72	AR-086	0.0	0.2	0.1	0.0	0.4	0.0	Temporary	30.0	0.0	1481.0	1.0	Access ROW that minimizes impact to tributary to Hakihokake Creek
Hunterdon	Holland Twp	84.05	AR-087A	0.0	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	30.0	0.0	Access for light and heavy equipment to support construction of the Milford Mt Pleasant Road crossing from the south as well as construction to the south
Hunterdon	Holland Twp	84.25	AR-087B	0.5	0.1	0.0	0.1	0.0	0.0	Temporary	30.0	0.0	1093.9	0.8	Access for light and heavy equipment to support construction of the Milford Mt Pleasant Road crossing from the south as well as construction to the south
Hunterdon	Holland Twp	85.01	AR-088	1.4	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	2028.2	1.4	Access to ROW in remote area
Hunterdon	Alexandria Twp	85.89	AR-089	0.6	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	892.5	0.6	Access to ROW that minimizes impact to tributary to Harihokake Creek
Hunterdon	Alexandria Twp	86.21	AR-090	0.8	0.5	0.0	0.2	0.0	0.0	Temporary	30.0	408.8	2447.7	1.7	Access for light and heavy equipment to support construction to the north and south
Hunterdon	Alexandria Twp	86.66	AR-091	0.0	1.1	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	1558.8	1.1	Access to ROW that minimizes impact to Harihokake
Hunterdon	Kingwood Twp	89.36	AR-092	0.0	1.0	0.0	0.0	0.0	0.0	Temporary	30.0	531.8	1441.2	1.0	Access to ROW in remote area
Hunterdon	Kingwood Twp	92.01	AR-093	0.0	0.3	0.0	0.0	0.0	0.0	Temporary	30.0	400.9	400.9	0.3	Access for light and heavy equipment to support construction of the Barbertown Point Breeze Road crossing from the south as well as construction to the south
Hunterdon	Delaware Twp	95.24	AR-094	0.2	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	257.5	0.2	Access for light and heavy equipment to support construction of the Sanford Road crossing from the north as well as construction to the north
Hunterdon	Delaware Twp	96.12	AR-096	0.6	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	892.2	0.6	Access for light and heavy equipment to support construction of the Rosemont Ringoes Road crossing from the west as well as construction to the west

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Hunterdon	Delaware Twp	99.66	AR-097	1.2	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	1000.0	1724.3	1.2	Access to ROW in remote area
Hunterdon	West Amwell Twp	100.26	AR-098	0.0	0.0	0.2	0.0	0.0	0.0	Temporary	30.0	338.5	338.5	0.2	Access for light and heavy equipment to support construction of the Route 202 Road crossing and multiple foreign line crossings from the west as well as construction to the west
Hunterdon	West Amwell Twp	100.52	AR-099	0.3	0.0	0.2	0.1	0.0	0.0	Permanent	30.0	972.8	972.8	0.7	Access for light and heavy equipment to support construction of the mainline block valve and the tie in to the Lambertville Lateral launcher and receiver site as well as construction to the east and west
Hunterdon	West Amwell Twp	104.21	AR-100	0.0	0.0	0.1	0.0	0.0	0.0	Temporary	30.0	139.7	139.7	0.1	Access for light and heavy equipment to support construction to the east and west
										Subtotal			21200.6	14.6	
Mercer	Hopewell Twp	107.04	AR-101	0.0	0.0	0.1	0.0	0.4	0.0	Temporary	30.0	0.0	851.0	0.6	Access for light and heavy equipment to support construction to the east and west
Mercer	Hopewell Twp	107.76	AR-102	0.0	0.9	0.0	0.0	0.0	0.0	Temporary	30.0	1311.9	1311.9	0.9	Access for light and heavy equipment to support construction to the east and west
Mercer	Hopewell Twp	109.20	AR-103A	0.1	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	180.3	180.3	0.1	Access for light and heavy equipment to support construction to the west
Mercer	Hopewell Twp	109.28	AR-103B	0.3	0.0	0.0	0.7	0.0	0.0	Temporary	30.0	649.0	1969.6	1.4	Access for light and heavy equipment to support construction to the east
Mercer	Hopewell Twp	109.61	AR-104	0.3	0.0	0.2	0.0	0.0	0.0	Temporary	30.0	720.2	863.4	0.6	Access for light and heavy equipment to support construction of the Pennington Titusville Road crossing from the south as well as construction to the south
Mercer	Hopewell Twp	110.37	AR-105A	0.0	0.0	0.2	0.0	0.1	0.0	Temporary	30.0	525.0	600.7	0.4	Access to North side of Hopewell Township HDD.
Mercer	Hopewell Twp	110.44	AR-105B	0.0	0.0	0.0	0.0	0.9	0.0	Temporary	30.0	525.0	1396.6	1.0	Access to North side of Hopewell Township HDD.
Mercer	Hopewell Twp	110.86	AR-106	0.4	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	600.6	600.6	0.4	Southbound Access for light and heavy equipment to support construction of the Scotch Road crossing from the west as well as construction to the west
Mercer	Hopewell Twp	110.90	AR-107	0.2	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	228.7	327.9	0.2	Northbound Access for light and heavy equipment to support construction of the Scotch Road crossing from the east as well as construction to the east

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				Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water						
Lower Hudson										Temporary	30.0	165.3			Access for light and heavy equipment to support construction of the North Road crossing from the west as well as construction to the west
Mercer	Hopewell Twp	111.28	AR-108	0.1	0.0	0.0	0.0	0.0	0.0	Temporary	30.0	0.0	165.3	0.1	Access for light and heavy equipment to support construction to the east and west
										Subtotal			8267.2	5.7	
Gilbert 12-Inch Lateral															
Upper Delaware															
Hunterdon	Holland Twp	0.36	AR-301	0.0	0.0	0.1	0.1	0.3	0.0	Permanent	30.0	40.0	644.3	0.4	Access to Etown interconnect and Gilbert Station
										Subtotal			644.3	0.4	
Lambertville 36-Inch Lateral															
Upper Delaware															
Hunterdon	West Amwell Twp	1.01	AR-401	1.4	0.0	0.0	0.0	0.0	0.0	Permanent	30.0	2057.8	2057.8	1.4	Access for light and heavy equipment to support construction of the Lambertville Lateral
Hunterdon	West Amwell Twp	1.43	AR-402	0.7	0.0	0.0	0.0	0.2	0.0	Permanent	30.0	1094.0	1295.4	0.9	Algonquin and Tetco Interconnect access
										Subtotal			3353.2	2.3	
										New Jersey Subtotal			33465.4	23.0	
										PROJECT TOTAL			170193.3	117.2	

Notes

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

Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;

Forest and Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction ROW or extra work or staging areas;

Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility ROW;

Residential Land - Residential yards, residential subdivisions, and planned new residential developments;

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

Open Water – Water Crossings greater than 100 feet.

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8.2.1.4 Pipeyards, Wareyards, and Extra Work/Staging Areas

PennEast has identified eight areas that are under consideration for use during construction of the Project that will serve as pipeyards and contractor yards. These areas will be used for the storage of pipe, equipment, and materials, and will also serve as areas for temporary contractor office space and parking. Upon completion of the Project, these areas will be allowed to revert to prior land uses or will be restored in accordance with landowner agreements. Therefore, no permanent impacts to these areas are anticipated as a result of the Project.

PennEast has also identified areas along the proposed pipeline construction corridor where extra work or staging areas will be required. These ATWS are typically used to facilitate construction at waterbody crossings, agricultural land crossings, road crossings, railroad crossings, and areas where special construction techniques will be utilized [e.g. horizontal directional drill (HDD) entry locations or steep slopes]. Over 1,000 areas of ATWS have been identified as being needed for the Project and will total 445.5 acres. Forest and woodland constitutes the majority of acreage to be affected by the ATWS with 188.8 acres of disturbance. Approximately 151.1 acres of agricultural land, 24.1 acres of open land, 12.3 acres of industrial land, and 12.0 acres of residential land will also be impacted by the ATWS required for the construction of the Project. An additional 57.2 acres of open water will be impacted by ATWS, however, these impacts represent the proposed open cut crossing of the Susquehanna River. The current land use classification of the areas impacted by the ATWS is open water, however the potential open cut will be a dry crossing, and constructed by diverting the flow of the river during low flow conditions. A detailed description of the proposed dry crossing of the Susquehanna River is included in section 1.5.2.8 Major Water Body Crossings of Resource Report 1. Upon completion of the Project, these areas will be allowed to revert to prior land uses through natural successional processes or will be restored in accordance with landowner agreements.

Table 8.2-5 identifies, by nearest approximate MP, the location, existing land use to be affected, and land requirements for all contractor yards and pipeyards under consideration for use during construction of the Project. Table 8.2-6 identifies by nearest approximate MP the location; existing land use to be affected, and land requirements for all extra work/staging areas. All pipeyards, contractor yards, wareyards, and extra work/staging areas required for construction of the Project facilities are presented on the Project alignment sheets and USGS topographic maps provided in Appendices A and C of Resource Report 1.

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Table 8.2-5
Contractor Yards and Pipe Yards for the Project

State/Facility/ River Basin/ County	Municipality	MP	Type	Contractor Yard/ Pipeyard ID	Total Acres*	Existing Land Use (acreage affected)					
						Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water
Pennsylvania											
PennEast Mainline Pipeline Route											
Upper Susquehanna											
Luzerne	Jenkins Twp	9.26	Contractor Pipe and Laydown Yard	Pipeyard 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Luzerne	Laflin Twp	9.26	Contractor Pipe and Laydown Yard	Pipeyard 1	2.0	0.0	1.6	0.0	0.0	0.3	0.0
Luzerne	Plains Twp	9.26	Contractor Pipe and Laydown Yard	Pipeyard 1	194.7	0.0	97.1	0.3	0.0	97.3	0.0
				Subtotal	196.6	0.0	98.7	0.3	0.0	97.6	0.0
Upper Deleware											
Carbon	Kidder Twp	31.78	Contractor Pipe and Laydown Yard	Pipeyard 2	1.4		0.8	0.0	0.6	0.0	0.0
Carbon	Kidder Twp	31.83	Contractor Pipe and Laydown Yard	Pipeyard 3	14.5	11.6	2.9	0.0	0.0	0.0	0.0
				Subtotal	15.8	11.6	3.7	0.0	0.6	0.0	0.0
Northampton	Upper Nazareth Twp	62.45	Contractor Pipe and Laydown Yard	Pipeyard 4	20.4	20.3	0.1	0.0	0.0	0.0	0.0
Northampton	Lower Nazareth Twp	64.69	Contractor Pipe and Laydown Yard	Pipeyard 5	92.7	0.0	0.0	0.0	0.0	92.7	0.0
Northampton	Bethlehem Twp	70.11	Contractor Pipe and Laydown Yard	Pipeyard 6	40.6	40.3	0.3	0.0	0.0	0.0	0.0
				Subtotal	153.8	60.7	0.4	0.0	0.0	92.7	0.0
New Jersey											
PennEast Mainline Pipeline Route											
Upper Deleware											
Hunterdon	Kingwood Twp	93.88	Contractor Pipe and Laydown Yard	Pipeyard 7	74.5	39.5	34.9	0.0	0.0	0.0	0.0
Hunterdon	West Amwell Twp	101.22	Contractor Pipe and Laydown Yard	Pipeyard 8	22.2	21.2	0.5	0.0	0.4	<0.00	0.0
				Subtotal	96.6	60.8	35.5	0.0	0.4	0.0	0.0
				PROJECT TOTAL	462.9	133.0	138.2	0.3	1.0	190.4	0.0

Notes
Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;
Forest and Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction ROW or extra work or staging areas;
Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility ROW;
Residential Land - Residential yards, residential subdivisions, and planned new residential developments;
Industrial or Commercial Land - Electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, and roads;
Open Water – Water Crossings greater than 100 feet.
* - All units in acres and rounded to the nearest 0.1.
The totals shown in this table may not equal the sum of addends due to rounding.

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Table 8.2-6
Additional Temporary Work Space and Extra Work/Staging Areas for the Project

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Pennsylvania											
PennEast Mainline Route Pipeline											
Upper Susquehanna											
Luzerne	Dallas Twp	0.0	ATWS-0001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Luzerne	Dallas Twp	0.0	ATWS-0002	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing, side bend construction and wetland crossing.
Luzerne	Dallas Twp	0.2	ATWS-0003	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and rugged topography / sloped construction.
Luzerne	Dallas Twp	0.3	ATWS-0004	1.3	0.0	1.2	0.1	0.0	0.0	0.0	ATWS is required for wetland crossing and road crossing.
Luzerne	Dallas Twp	0.5	ATWS-0005	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	0.5	ATWS-0006	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	0.6	ATWS-0007	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Dallas Twp	0.6	ATWS-0008	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Dallas Twp	0.6	ATWS-0009	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Dallas Twp	0.6	ATWS-0010	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Dallas Twp	1.1	ATWS-0011	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	1.1	ATWS-0012	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	1.1	ATWS-0013	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	1.1	ATWS-0014	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Dallas Twp	1.2	ATWS-0015	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Luzerne	Kingston Twp	1.4	ATWS-0016	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	1.4	ATWS-0017	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	1.4	ATWS-0018	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	1.4	ATWS-0019	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	1.6	ATWS-0020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, rugged topography / sloped construction and residential construction.
Luzerne	Kingston Twp	1.6	ATWS-0021	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, road crossing, rugged topography / sloped construction and residential construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	Kingston Twp	1.6	ATWS-0022	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and rugged topography / sloped construction.
Luzerne	Kingston Twp	1.6	ATWS-0023	2.7	0.3	2.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing, rugged topography / sloped construction, topsoil segregation and side bend construction.
Luzerne	Kingston Twp	1.7	ATWS-0024	0.4	0.1	0.3	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, topsoil segregation and side bend construction.
Luzerne	Kingston Twp	2.0	ATWS-0025	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and side bend construction.
Luzerne	Kingston Twp	2.1	ATWS-0026	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	2.1	ATWS-0027	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	2.1	ATWS-0028	1.2	0.0	1.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	2.1	ATWS-0029	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	2.5	ATWS-0030	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	2.5	ATWS-0031	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Kingston Twp	2.6	ATWS-0032	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Luzerne	Kingston Twp	2.6	ATWS-0033	1.4	0.0	1.4	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, rugged topography / sloped construction and foreign pipeline crossing.
Luzerne	Kingston Twp	2.8	ATWS-0034	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and foreign pipeline crossing.
Luzerne	Kingston Twp	2.8	ATWS-0035	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and foreign pipeline crossing.
Luzerne	Kingston Twp	2.9	ATWS-0036	0.9	0.7	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, foreign pipeline crossing, topsoil segregation and road crossing.
Luzerne	Kingston Twp	3.0	ATWS-0037	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, topsoil segregation and road crossing.
Luzerne	Kingston Twp	3.0	ATWS-0038	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, road crossing, wetland crossing and stream crossing.
Luzerne	Kingston Twp	3.0	ATWS-0039	0.3	0.0	0.1	0.2	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, road crossing, wetland crossing and stream crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	Kingston Twp	3.1	ATWS-0040	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Kingston Twp	3.2	ATWS-0041	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Kingston Twp	3.4	ATWS-0042	0.4	0.0	0.3	0.1	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	3.5	ATWS-0043	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	3.5	ATWS-0044	2.3	0.0	2.3	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	3.5	ATWS-0045	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Kingston Twp	3.9	ATWS-0046	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for forested construction
Luzerne	Kingston Twp	4.0	ATWS-0047	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Luzerne	Kingston Twp	4.2	ATWS-0048	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	West Wyoming Boro	4.3	ATWS-0049	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and residential construction.
Luzerne	West Wyoming Boro	4.3	ATWS-0050	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and wetland crossing.
Luzerne	West Wyoming Boro	4.3	ATWS-0051	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and residential construction.
Luzerne	West Wyoming Boro	4.3	ATWS-0052	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and wetland crossing.
Luzerne	West Wyoming Boro	4.5	ATWS-0053	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	West Wyoming Boro	5.0	ATWS-0054	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.0	ATWS-0055	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.0	ATWS-0056	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.1	ATWS-0057	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.4	ATWS-0058	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	West Wyoming Boro	5.4	ATWS-0059	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	West Wyoming Boro	5.4	ATWS-0060	0.3	0.0	0.2	0.0	0.0	0.1	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	West Wyoming Boro	5.4	ATWS-0061	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	West Wyoming Boro	5.5	ATWS-0062	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.5	ATWS-0063	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	West Wyoming Boro	5.7	ATWS-0064	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	West Wyoming Boro	5.8	ATWS-0065	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	West Wyoming Boro	5.8	ATWS-0066	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	West Wyoming Boro	5.8	ATWS-0067	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	West Wyoming Boro	5.9	ATWS-0068	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for road crossing.
Luzerne	West Wyoming Boro	5.9	ATWS-0069	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for stream crossing and wetland crossing.
Luzerne	West Wyoming Boro	6.0	ATWS-0070	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for stream crossing, wetland crossing and road crossing.
Luzerne	West Wyoming Boro	6.0	ATWS-0071	0.4	0.0	0.1	0.0	0.0	0.3	0.0	ATWS is required for road crossing and side bend construction.
Luzerne	Wyoming Boro	6.0	ATWS-0072	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	Wyoming Boro	6.1	ATWS-0073	0.6	0.4	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and topsoil segregation.
Luzerne	Wyoming Boro	6.2	ATWS-0074	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Luzerne	Wyoming Boro	6.3	ATWS-0075	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Luzerne	Wyoming Boro	6.3	ATWS-0076	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Luzerne	Wyoming Boro	6.3	ATWS-0077	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Luzerne	Wyoming Boro	6.4	ATWS-0078	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Luzerne	Wyoming Boro	6.4	ATWS-0079	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Luzerne	Wyoming Boro	6.4	ATWS-0080	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Wyoming Boro	6.5	ATWS-0081	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Wyoming Boro	6.5	ATWS-0082	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Wyoming Boro	6.5	ATWS-0083	0.5	0.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign pipeline crossing.
Luzerne	Wyoming Boro	6.5	ATWS-0084	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Luzerne	Wyoming Boro	6.6	ATWS-0085	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign pipeline crossing.
Luzerne	Wyoming Boro	6.6	ATWS-0086	46.1	0.8	2.3	0.0	0.0	0.0	42.9	ATWS is required for topsoil segregation, foreign pipeline crossing, side bend construction and major river.
Luzerne	Wyoming Boro	6.6	ATWS-0087	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, foreign pipeline crossing and side bend construction.
Luzerne	Wyoming Boro	6.9	ATWS-0088	24.9	0.0	10.6	0.0	0.0	0.0	14.2	ATWS is required for major river.
Luzerne	Jenkins Twp	7.3	ATWS-0089	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, road crossing and residential construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	Jenkins Twp	7.3	ATWS-0090	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Jenkins Twp	7.3	ATWS-0091	1.5	0.0	0.0	1.5	0.0	0.0	0.0	ATWS is required for major river, road crossing and side bend construction.
Luzerne	Jenkins Twp	7.4	ATWS-0092	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing and side bend construction.
Luzerne	Jenkins Twp	7.5	ATWS-0093	0.4	0.0	0.1	0.3	0.0	0.0	0.0	ATWS is required for side bend construction.
Luzerne	Jenkins Twp	7.8	ATWS-0094	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for side bend construction and wetland crossing.
Luzerne	Jenkins Twp	7.8	ATWS-0095	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Jenkins Twp	7.9	ATWS-0096	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Jenkins Twp	7.9	ATWS-0097	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Jenkins Twp	8.0	ATWS-0098	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Plains Twp	8.1	ATWS-0099	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing, side bend construction and foreign pipeline crossing.
Luzerne	Plains Twp	8.1	ATWS-0100	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for road crossing and foreign pipeline crossing.
Luzerne	Plains Twp	8.1	ATWS-0101	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for road crossing, foreign pipeline crossing, topsoil segregation and residential construction.
Luzerne	Plains Twp	8.1	ATWS-0102	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for foreign pipeline crossing, topsoil segregation and road crossing.
Luzerne	Plains Twp	8.2	ATWS-0103	0.2	0.1	0.0	0.0	0.1	0.0	0.0	ATWS is required for road crossing, topsoil segregation and residential construction.
Luzerne	Plains Twp	8.2	ATWS-0104	0.2	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and residential construction.
Luzerne	Plains Twp	8.2	ATWS-0105	0.6	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and stream crossing.
Luzerne	Plains Twp	8.3	ATWS-0106	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Plains Twp	8.4	ATWS-0107	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Plains Twp	8.4	ATWS-0108	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Plains Twp	8.6	ATWS-0109	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for residential construction.
Luzerne	Plains Twp	8.9	ATWS-0110	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and side bend construction.
Luzerne	Laflin Boro	9.3	ATWS-0111	0.5	0.0	0.0	0.0	0.0	0.5	0.0	ATWS is required for road crossing and side bend construction.
Luzerne	Laflin Boro	9.3	ATWS-0112	0.8	0.0	0.0	0.0	0.0	0.8	0.0	ATWS is required for road crossing and side bend construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	Laflin Boro	9.4	ATWS-0113	0.3	0.0	0.0	0.0	0.0	0.3	0.0	ATWS is required for road crossing, stream crossing and side bend construction.
Luzerne	Laflin Boro	9.4	ATWS-0114	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	Laflin Boro	9.5	ATWS-0115	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Laflin Boro	9.5	ATWS-0116	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Laflin Boro	9.5	ATWS-0117	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Laflin Boro	9.6	ATWS-0118	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Laflin Boro	9.7	ATWS-0119	0.5	0.0	0.5	0.0	0.0	0.0	0.0	TBD
Luzerne	Laflin Boro	9.8	ATWS-0120	2.1	0.0	2.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and side bend construction.
Luzerne	Jenkins Twp	10.4	ATWS-0121	1.0	0.0	1.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, foreign pipeline crossing and HDD construction.
Luzerne	Jenkins Twp	10.8	ATWS-0122	1.0	0.0	1.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, foreign pipeline crossing and HDD construction.
Luzerne	Plains Twp	11.6	ATWS-0123	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Plains Twp	11.7	ATWS-0124	0.5	0.0	0.3	0.1	0.0	0.1	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Luzerne	Plains Twp	11.9	ATWS-0125	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Luzerne	Plains Twp	11.9	ATWS-0126	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Luzerne	Plains Twp	12.0	ATWS-0127	1.0	0.0	1.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and foreign pipeline crossing.
Luzerne	Plains Twp	12.1	ATWS-0128	3.2	0.0	3.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, side bend construction and stream crossing.
Luzerne	Bear Creek Twp	12.7	ATWS-0129	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Bear Creek Twp	12.8	ATWS-0130	0.9	0.0	0.8	0.2	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Luzerne	Bear Creek Twp	13.0	ATWS-0131	0.2	0.0	0.1	0.0	0.1	0.0	0.0	ATWS is required for road crossing and residential construction.
Luzerne	Bear Creek Twp	13.0	ATWS-0132	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	Bear Creek Twp	13.0	ATWS-0133	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	13.1	ATWS-0134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Luzerne	Bear Creek Twp	13.1	ATWS-0135	0.4	0.0	0.0	0.0	0.4	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.

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Luzerne	Bear Creek Twp	13.2	ATWS-0136	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS is required for stream crossing and access road.
Luzerne	Bear Creek Twp	13.3	ATWS-0137	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Luzerne	Bear Creek Twp	13.3	ATWS-0138	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing and access road.
Luzerne	Bear Creek Twp	13.5	ATWS-0140	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Bear Creek Twp	13.6	ATWS-0141	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Bear Creek Twp	13.7	ATWS-0142	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, stream crossing and wetland crossing.
Luzerne	Bear Creek Twp	13.7	ATWS-0143	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, stream crossing and wetland crossing.
Luzerne	Bear Creek Twp	13.9	ATWS-0144	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Bear Creek Twp	13.9	ATWS-0145	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Luzerne	Bear Creek Twp	14.1	ATWS-0146	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	14.1	ATWS-0147	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Upper Delaware											
Luzerne	Bear Creek Twp	14.4	ATWS-0148	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Bear Creek Twp	14.4	ATWS-0149	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, access road and stream crossing.
Luzerne	Bear Creek Twp	14.7	ATWS-0150	1.5	0.0	1.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	15.0	ATWS-0151	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	15.6	ATWS-0152	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and side bend construction.
Luzerne	Bear Creek Twp	15.7	ATWS-0153	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and side bend construction.
Luzerne	Bear Creek Twp	16.0	ATWS-0154	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	16.2	ATWS-0155	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	16.3	ATWS-0156	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	16.4	ATWS-0157	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	16.5	ATWS-0158	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	16.6	ATWS-0159	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	16.7	ATWS-0160	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.

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					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Luzerne	Bear Creek Twp	16.8	ATWS-0161	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	16.9	ATWS-0162	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	16.9	ATWS-0162	0.1	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	17.3	ATWS-0163	0.2	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Luzerne	Bear Creek Twp	17.5	ATWS-0164	0.6	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Luzerne	Bear Creek Twp	17.7	ATWS-0165	0.2	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Luzerne	Bear Creek Twp	17.8	ATWS-0166	0.4	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, road crossing and rugged topography / sloped construction.
Luzerne	Bear Creek Twp	18.3	ATWS-0167	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and stream crossing.
Luzerne	Bear Creek Twp	18.4	ATWS-0168	0.2	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and stream crossing.
Luzerne	Bear Creek Twp	18.6	ATWS-0169	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and side bend construction.
Luzerne	Bear Creek Twp	18.6	ATWS-0170	0.3	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and side bend construction.
Luzerne	Bear Creek Twp	19.0	ATWS-0171	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	19.1	ATWS-0172	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	19.5	ATWS-0173	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Luzerne	Bear Creek Twp	19.6	ATWS-0174	0.2	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing.
Luzerne	Bear Creek Twp	19.6	ATWS-0175	0.3	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and side bend construction.
Luzerne	Bear Creek Twp	19.7	ATWS-0176	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Luzerne	Bear Creek Twp	20.0	ATWS-0177	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	20.1	ATWS-0178	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	20.2	ATWS-0179	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	20.4	ATWS-0180	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing and access road.
Luzerne	Bear Creek Twp	20.4	ATWS-0181	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Luzerne	Bear Creek Twp	20.7	ATWS-0182	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	20.7	ATWS-0183	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	21.1	ATWS-0184	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	21.2	ATWS-0185	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	22.6	ATWS-0186	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	22.6	ATWS-0187	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.

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Luzerne	Bear Creek Twp	22.7	ATWS-0188	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	22.7	ATWS-0189	0.1	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Luzerne	Bear Creek Twp	22.8	ATWS-0190	0.5	0.0	4.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
			Subtotal	**129.2**	**5.7**	**61.9**	**4.3**	**1.0**	**3.3**	**57.2**	
Carbon	Kidder Twp	23.2	ATWS-0191	4.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for major river and rugged topography / sloped construction.
Carbon	Kidder Twp	24.1	ATWS-0192	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	24.3	ATWS-0193	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	25.0	ATWS-0194	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for access road.
Carbon	Kidder Twp	25.0	ATWS-0195	0.1	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for access road.
Carbon	Kidder Twp	25.2	ATWS-0196	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	25.2	ATWS-0197	0.2	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	26.1	ATWS-0198	0.3	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Carbon	Kidder Twp	26.1	ATWS-0199	0.7	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Carbon	Kidder Twp	26.2	ATWS-0200	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Kidder Twp	26.3	ATWS-0201	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for road crossing, side bend construction and wetland crossing.
Carbon	Kidder Twp	26.4	ATWS-0202	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Kidder Twp	26.5	ATWS-0203	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Kidder Twp	26.7	ATWS-0204	0.8	0.0	0.8	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, road crossing and wetland crossing.
Carbon	Kidder Twp	26.9	ATWS-0205	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and pipeline crossing.
Carbon	Kidder Twp	27.3	ATWS-0206	1.8	0.0	1.8	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Kidder Twp	27.6	ATWS-0207	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	27.9	ATWS-0208	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	27.9	ATWS-0209	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and side bend construction.
Carbon	Kidder Twp	29.0	ATWS-0210	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Carbon	Kidder Twp	29.4	ATWS-0211	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	29.7	ATWS-0212	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Kidder Twp	30.2	ATWS-0213	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Kidder Twp	30.4	ATWS-0214	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Kidder Twp	30.8	ATWS-0215	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Kidder Twp	31.2	ATWS-0216	0.6	0.1	0.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and topsoil segregation.
Carbon	Kidder Twp	31.6	ATWS-0217	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Kidder Twp	31.7	ATWS-0218	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Kidder Twp	31.9	ATWS-0219	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Kidder Twp	31.9	ATWS-0220	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Kidder Twp	32.1	ATWS-0221	0.3	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation, road crossing and stream crossing.
Carbon	Kidder Twp	32.2	ATWS-0222	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and stream crossing.
Carbon	Kidder Twp	32.7	ATWS-0223	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for access road.
Carbon	Kidder Twp	32.7	ATWS-0224	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for access road.
Carbon	Kidder Twp	33.0	ATWS-0225	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Carbon	Penn Forest Twp	33.1	ATWS-0226	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Carbon	Penn Forest Twp	33.3	ATWS-0227	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Penn Forest Twp	33.4	ATWS-0228	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, road crossing and wetland crossing.
Carbon	Penn Forest Twp	33.7	ATWS-0229	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Penn Forest Twp	33.9	ATWS-0230	0.9	0.0	0.9	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Carbon	Penn Forest Twp	34.3	ATWS-0231	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Penn Forest Twp	34.8	ATWS-0232	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and side bend construction.
Carbon	Penn Forest Twp	34.8	ATWS-0233	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Carbon	Penn Forest Twp	35.3	ATWS-0234	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and side bend construction.
Carbon	Penn Forest Twp	35.3	ATWS-0235	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and side bend construction.
Carbon	Penn Forest Twp	35.4	ATWS-0236	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Penn Forest Twp	35.4	ATWS-0237	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Penn Forest Twp	35.5	ATWS-0238	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, side bend construction and pipeline crossing.
Carbon	Penn Forest Twp	35.6	ATWS-0239	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and pipeline crossing.
Carbon	Penn Forest Twp	35.6	ATWS-0240	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and pipeline crossing.
Carbon	Penn Forest Twp	35.6	ATWS-0241	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and pipeline crossing.
Carbon	Penn Forest Twp	35.7	ATWS-0242	0.5	0.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and residential construction.
Carbon	Penn Forest Twp	36.0	ATWS-0243	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Penn Forest Twp	36.1	ATWS-0244	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Penn Forest Twp	36.4	ATWS-0245	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Carbon	Penn Forest Twp	36.6	ATWS-0246	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, side bend construction and pipeline crossing.
Carbon	Penn Forest Twp	36.6	ATWS-0247	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, side bend construction and pipeline crossing.
Carbon	Penn Forest Twp	36.8	ATWS-0248	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Penn Forest Twp	37.1	ATWS-0249	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and access road.
Carbon	Penn Forest Twp	37.1	ATWS-0250	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Penn Forest Twp	37.2	ATWS-0251	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Penn Forest Twp	37.2	ATWS-0252	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Penn Forest Twp	37.4	ATWS-0253	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and pipeline crossing.
Carbon	Penn Forest Twp	37.4	ATWS-0254	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and pipeline crossing.
Carbon	Penn Forest Twp	37.5	ATWS-0255	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and pipeline crossing.
Carbon	Penn Forest Twp	37.5	ATWS-0256	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and pipeline crossing.
Carbon	Penn Forest Twp	37.7	ATWS-0257	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Penn Forest Twp	37.7	ATWS-0258	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and residential construction.
Carbon	Penn Forest Twp	37.8	ATWS-0259	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Penn Forest Twp	37.8	ATWS-0260	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and residential construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Penn Forest Twp	38.0	ATWS-0261	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and side bend construction.
Carbon	Penn Forest Twp	38.1	ATWS-0262	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Carbon	Penn Forest Twp	38.3	ATWS-0263	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Penn Forest Twp	38.3	ATWS-0264	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Penn Forest Twp	38.4	ATWS-0265	3.4	0.0	3.4	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Carbon	Penn Forest Twp	39.5	ATWS-0266	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Carbon	Penn Forest Twp	39.6	ATWS-0267	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing, rugged topography / sloped construction and pipeline crossing.
Carbon	Penn Forest Twp	39.7	ATWS-0268	1.7	0.0	1.7	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, pipeline crossing and stream crossing.
Carbon	Penn Forest Twp	40.3	ATWS-0269	1.3	0.0	0.8	0.6	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Carbon	Towamensing Twp	40.7	ATWS-0270	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	40.7	ATWS-0271	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing, side bend construction and pipeline crossing.
Carbon	Towamensing Twp	40.7	ATWS-0272	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for pipeline crossing and road crossing.
Carbon	Towamensing Twp	40.8	ATWS-0273	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for pipeline crossing and road crossing.
Carbon	Towamensing Twp	41.0	ATWS-0274	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Carbon	Towamensing Twp	41.0	ATWS-0275	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Carbon	Towamensing Twp	41.1	ATWS-0276	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.1	ATWS-0277	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.2	ATWS-0278	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.2	ATWS-0279	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.2	ATWS-0280	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.3	ATWS-0281	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.3	ATWS-0282	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.3	ATWS-0283	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.5	ATWS-0284	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.5	ATWS-0285	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Towamensing Twp	41.6	ATWS-0286	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Towamensing Twp	41.6	ATWS-0287	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	41.7	ATWS-0288	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	41.7	ATWS-0289	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	41.7	ATWS-0290	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	42.0	ATWS-0291	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	42.0	ATWS-0292	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	42.0	ATWS-0293	0.3	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Carbon	Towamensing Twp	42.0	ATWS-0294	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Carbon	Towamensing Twp	42.1	ATWS-0295	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, rugged topography / sloped construction and side bend construction.
Carbon	Towamensing Twp	42.1	ATWS-0296	1.7	0.0	1.7	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Carbon	Towamensing Twp	42.7	ATWS-0297	0.3	0.2	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Towamensing Twp	42.7	ATWS-0298	0.2	0.1	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Towamensing Twp	42.8	ATWS-0299	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	42.8	ATWS-0300	1.5	1.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and rugged topography / sloped construction.
Carbon	Towamensing Twp	43.0	ATWS-0301	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	43.1	ATWS-0302	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, road crossing and waterbody.
Carbon	Towamensing Twp	43.1	ATWS-0303	0.8	0.6	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, road crossing and waterbody.
Carbon	Towamensing Twp	43.2	ATWS-0304	0.5	0.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for waterbody.
Carbon	Towamensing Twp	43.7	ATWS-0305	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for waterbody and road crossing.
Carbon	Towamensing Twp	43.7	ATWS-0306	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for waterbody and road crossing.
Carbon	Towamensing Twp	43.8	ATWS-0307	0.3	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for waterbody and road crossing.
Carbon	Towamensing Twp	43.8	ATWS-0308	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for waterbody and road crossing.
Carbon	Towamensing Twp	44.2	ATWS-0309	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for waterbody and stream crossing.

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Carbon	Towamensing Twp	44.2	ATWS-0310	2.6	0.0	2.1	0.5	0.0	0.0	0.0	ATWS is required for waterbody and ware yard / equipment storage.
Carbon	Towamensing Twp	44.3	ATWS-0311	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for wetland crossing.
Carbon	Towamensing Twp	44.4	ATWS-0312	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and stream crossing.
Carbon	Towamensing Twp	44.4	ATWS-0313	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	44.5	ATWS-0314	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	44.5	ATWS-0315	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for road crossing, topsoil segregation and residential construction.
Carbon	Towamensing Twp	44.5	ATWS-0316	0.4	0.0	0.0	0.0	0.4	0.0	0.0	ATWS is required for road crossing, topsoil segregation, side bend construction and residential construction.
Carbon	Towamensing Twp	44.7	ATWS-0317	0.4	0.0	0.0	0.0	0.3	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, side bend construction and road crossing.
Carbon	Towamensing Twp	44.7	ATWS-0318	0.4	0.0	0.0	0.0	0.4	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and side bend construction.
Carbon	Towamensing Twp	44.8	ATWS-0319	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, road crossing and stream crossing.
Carbon	Towamensing Twp	44.8	ATWS-0320	0.6	0.0	0.2	0.0	0.3	0.0	0.0	ATWS is required for road crossing, rugged topography / sloped construction and topsoil segregation.
Carbon	Towamensing Twp	44.8	ATWS-0321	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, rugged topography / sloped construction and stream crossing.
Carbon	Towamensing Twp	45.0	ATWS-0322	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, road crossing and residential construction.
Carbon	Towamensing Twp	45.0	ATWS-0323	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, road crossing and access road.
Carbon	Towamensing Twp	45.0	ATWS-0324	1.7	0.2	1.3	0.0	0.2	0.0	0.0	ATWS is required for wetland crossing, stream crossing and road crossing.
Carbon	Towamensing Twp	45.0	ATWS-0325	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and road crossing.
Carbon	Towamensing Twp	45.3	ATWS-0326	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, road crossing and topsoil segregation.
Carbon	Towamensing Twp	45.3	ATWS-0327	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Towamensing Twp	45.3	ATWS-0328	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Towamensing Twp	45.5	ATWS-0329	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing.
Carbon	Towamensing Twp	45.5	ATWS-0330	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing.
Carbon	Towamensing Twp	45.5	ATWS-0331	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, stream crossing and rugged topography / sloped construction.
Carbon	Towamensing Twp	45.6	ATWS-0332	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, stream crossing and rugged topography / sloped construction.
Carbon	Towamensing Twp	45.8	ATWS-0333	1.2	1.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Towamensing Twp	46.0	ATWS-0334	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Towamensing Twp	46.0	ATWS-0335	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Carbon	Towamensing Twp	46.0	ATWS-0336	3.1	3.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, rugged topography / sloped construction and side bend construction.
Carbon	Towamensing Twp	46.9	ATWS-0337	0.8	0.5	0.3	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Lower Towamensing Twp	47.0	ATWS-0338	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Lower Towamensing Twp	47.1	ATWS-0339	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Lower Towamensing Twp	47.1	ATWS-0340	0.6	0.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Carbon	Lower Towamensing Twp	47.4	ATWS-0341	1.0	0.0	1.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Carbon	Lower Towamensing Twp	47.6	ATWS-0342	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Carbon	Lower Towamensing Twp	47.6	ATWS-0343	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Lower Towamensing Twp	47.6	ATWS-0344	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Lower Towamensing Twp	47.7	ATWS-0345	1.2	0.3	0.9	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, topsoil segregation and wetland crossing.
Carbon	Lower Towamensing Twp	48.0	ATWS-0346	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing.
Carbon	Lower Towamensing Twp	48.0	ATWS-0347	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing.
Carbon	Lower Towamensing Twp	48.0	ATWS-0348	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Carbon	Lower Towamensing Twp	48.1	ATWS-0349	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and access road.
Carbon	Lower Towamensing Twp	48.1	ATWS-0350	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Carbon	Lower Towamensing Twp	48.1	ATWS-0351	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Carbon	Lower Towamensing Twp	48.5	ATWS-0352	0.4	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction.
Carbon	Lower Towamensing Twp	48.7	ATWS-0353	0.3	0.1	0.3	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction.
Carbon	Lower Towamensing Twp	48.9	ATWS-0354	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Lower Towamensing Twp	48.9	ATWS-0355	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Lower Towamensing Twp	48.9	ATWS-0356	0.5	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and side bend construction.
Carbon	Lower Towamensing Twp	48.9	ATWS-0357	0.3	0.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and side bend construction.
Carbon	Lower Towamensing Twp	49.2	ATWS-0358	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for commercial site construction and side bend construction.
Carbon	Lower Towamensing Twp	49.4	ATWS-0359	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for commercial site construction.
Carbon	Lower Towamensing Twp	49.4	ATWS-0360	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for commercial site construction.
Carbon	Lower Towamensing Twp	49.5	ATWS-0361	0.3	0.0	0.0	0.0	0.0	0.3	0.0	ATWS is required for side bend construction and commercial site construction.
Carbon	Lower Towamensing Twp	49.5	ATWS-0362	0.5	0.0	0.0	0.0	0.0	0.5	0.0	ATWS is required for side bend construction and commercial site construction.
Carbon	Lower Towamensing Twp	49.6	ATWS-0363	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for road crossing and commercial site construction.
Carbon	Lower Towamensing Twp	49.7	ATWS-0364	0.4	0.0	0.0	0.4	0.0	0.0	0.0	ATWS is required for side bend construction and commercial site construction.
Carbon	Lower Towamensing Twp	50.0	ATWS-0365	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for side bend construction and residential construction.
Carbon	Lower Towamensing Twp	50.2	ATWS-0366	0.9	0.0	0.0	0.9	0.0	0.0	0.0	ATWS is required for residential construction.
Carbon	Lower Towamensing Twp	50.5	ATWS-0367	1.5	0.0	0.0	0.0	0.0	1.5	0.0	ATWS is required for road crossing, side bend construction and commercial site construction.
Carbon	Lower Towamensing Twp	51.0	ATWS-0368	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Lower Towamensing Twp	51.0	ATWS-0369	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for road crossing, side bend construction and facility site construction.
Carbon	Lower Towamensing Twp	51.0	ATWS-0370	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Carbon	Lower Towamensing Twp	51.0	ATWS-0371	1.9	0.0	1.8	0.0	0.0	0.0	0.0	ATWS is required for road crossing and side bend construction.
Carbon	Lower Towamensing Twp	51.1	ATWS-0372	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
			Subtotal	**74.1**	**12.0**	**49.5**	**2.8**	**2.5**	**3.2**	**0.0**	

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Lehigh Twp	51.2	ATWS-0373	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	51.3	ATWS-0374	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	51.3	ATWS-0375	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	51.5	ATWS-0376	8.8	0.0	8.8	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend and rugged topography / sloped construction
Northampton	Lehigh Twp	52.8	ATWS-0377	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.0	ATWS-0378	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.0	ATWS-0379	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.0	ATWS-0380	0.7	0.0	0.7	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.1	ATWS-0381	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.2	ATWS-0382	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.2	ATWS-0383	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.3	ATWS-0384	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Lehigh Twp	53.3	ATWS-0385	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for pipeline bend
Northampton	Moore Twp	53.5	ATWS-0386	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Northampton	Moore Twp	53.5	ATWS-0387	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Northampton	Moore Twp	53.5	ATWS-0388	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and pipeline bend
Northampton	Moore Twp	53.5	ATWS-0389	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Northampton	Moore Twp	53.6	ATWS-0390	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Moore Twp	53.7	ATWS-0391	1.2	1.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.0	ATWS-0392	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.1	ATWS-0393	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.1	ATWS-0394	0.3	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.1	ATWS-0395	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend and wetland crossing
Northampton	Moore Twp	54.2	ATWS-0396	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Northampton	Moore Twp	54.3	ATWS-0397	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Northampton	Moore Twp	54.3	ATWS-0398	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing and rugged topography / sloped construction
Northampton	Moore Twp	54.5	ATWS-0399	1.0	1.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend, road crossing and rugged topography / sloped construction

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Moore Twp	54.7	ATWS-0400	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.8	ATWS-0401	0.4	0.0	0.0	0.0	0.4	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.8	ATWS-0402	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.8	ATWS-0403	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	54.8	ATWS-0404	2.6	2.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, pipeline bend and rugged topography / sloped construction
Northampton	Moore Twp	55.0	ATWS-0405	0.2	0.1	0.0	0.1	0.0	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend and rugged topography / sloped construction
Northampton	Moore Twp	55.3	ATWS-0406	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	55.3	ATWS-0407	1.0	1.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, pipeline bend and rugged topography / sloped construction
Northampton	Moore Twp	55.3	ATWS-0408	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	55.4	ATWS-0409	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	55.5	ATWS-0410	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	55.5	ATWS-0411	0.5	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and pipeline bend
Northampton	Moore Twp	55.7	ATWS-0412	0.9	0.3	0.5	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and rugged topography / sloped construction
Northampton	Moore Twp	55.8	ATWS-0413	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing / rugged topography / sloped construction
Northampton	Moore Twp	55.9	ATWS-0414	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Moore Twp	55.9	ATWS-0415	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, road crossing and wetland crossing
Northampton	Moore Twp	55.9	ATWS-0416	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing
Northampton	Moore Twp	56.0	ATWS-0417	0.3	0.1	0.2	0.0	0.0	0.0	0.0	ATWS is required for road and wetland crossing / pipeline bend and topsoil segregation
Northampton	Moore Twp	56.0	ATWS-0418	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Northampton	Moore Twp	56.1	ATWS-0419	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Moore Twp	56.3	ATWS-0420	1.4	1.2	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	56.6	ATWS-0421	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline bend
Northampton	Moore Twp	56.6	ATWS-0422	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing
Northampton	Moore Twp	56.6	ATWS-0423	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing
Northampton	Moore Twp	56.7	ATWS-0424	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Moore Twp	56.7	ATWS-0425	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Moore Twp	56.8	ATWS-0426	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline bend
Northampton	Moore Twp	56.9	ATWS-0427	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	57.0	ATWS-0428	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	57.0	ATWS-0429	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, pipeline bend and rugged topography / sloped construction
Northampton	Moore Twp	57.0	ATWS-0430	1.5	1.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	57.0	ATWS-0431	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, pipeline bend and rugged topography / sloped construction
Northampton	Moore Twp	57.4	ATWS-0432	0.8	0.6	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and pipeline bend
Northampton	Moore Twp	57.5	ATWS-0433	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Northampton	Moore Twp	57.6	ATWS-0434	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and residential construction
Northampton	Moore Twp	57.6	ATWS-0435	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction, topsoil segregation, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	57.6	ATWS-0436	0.9	0.4	0.0	0.0	0.4	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	57.8	ATWS-0437	0.2	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	57.8	ATWS-0438	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	57.8	ATWS-0439	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Moore Twp	58.1	ATWS-0440	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	58.1	ATWS-0441	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation and rugged topography / sloped construction
Northampton	Moore Twp	58.1	ATWS-0442	1.7	1.5	0.2	0.0	0.1	0.0	0.0	ATWS is required for road crossing and rugged topography / sloped construction
Northampton	Moore Twp	58.2	ATWS-0443	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing
Northampton	Moore Twp	58.4	ATWS-0444	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing
Northampton	Moore Twp	58.4	ATWS-0445	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Moore Twp	58.5	ATWS-0446	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Moore Twp	58.5	ATWS-0447	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, pipeline bend, road crossing and rugged topography / sloped construction
Northampton	Moore Twp	58.6	ATWS-0448	1.6	1.4	0.0	0.0	0.3	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	58.8	ATWS-0449	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and stream crossing
Northampton	Moore Twp	58.9	ATWS-0450	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	58.9	ATWS-0451	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and road crossing
Northampton	Moore Twp	59.0	ATWS-0452	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and road crossing
Northampton	Moore Twp	59.0	ATWS-0453	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and road crossing
Northampton	Moore Twp	59.0	ATWS-0454	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	59.0	ATWS-0455	0.6	0.4	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	59.1	ATWS-0456	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Moore Twp	59.2	ATWS-0457	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing
Northampton	Moore Twp	59.2	ATWS-0458	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and stream crossing
Northampton	Moore Twp	59.2	ATWS-0459	5.5	2.6	2.5	0.4	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing, topsoil segregation, and rugged topography / sloped construction

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Moore Twp	59.3	ATWS-0460	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and rugged topography / sloped construction
Northampton	Moore Twp	60.2	ATWS-0461	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Moore Twp	60.2	ATWS-0462	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Moore Twp	60.2	ATWS-0463	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and road crossing
Northampton	Moore Twp	60.2	ATWS-0464	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and road crossing
Northampton	Moore Twp	60.3	ATWS-0465	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing
Northampton	Moore Twp	60.3	ATWS-0466	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing
Northampton	East Allen Twp	60.4	ATWS-0467	1.1	1.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, stream crossing and rugged topography / sloped construction
Northampton	East Allen Twp	60.5	ATWS-0468	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and stream crossing
Northampton	East Allen Twp	60.6	ATWS-0469	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing and wetland crossing
Northampton	East Allen Twp	60.7	ATWS-0471	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing
Northampton	East Allen Twp	60.7	ATWS-0472	0.3	0.1	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and topsoil segregation
Northampton	East Allen Twp	60.8	ATWS-0473	1.2	1.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Upper Nazareth Twp	61.2	ATWS-0474	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Upper Nazareth Twp	61.3	ATWS-0475	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Upper Nazareth Twp	61.4	ATWS-0476	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, and road crossing
Northampton	Upper Nazareth Twp	61.4	ATWS-0477	0.2	0.1	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and stream crossing.
Northampton	Upper Nazareth Twp	61.4	ATWS-0478	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing and wetland crossing.
Northampton	Upper Nazareth Twp	61.5	ATWS-0479	1.8	1.7	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, topsoil segregation and road crossing.
Northampton	Upper Nazareth Twp	61.5	ATWS-0480	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and wetland crossing.
Northampton	Upper Nazareth Twp	61.6	ATWS-0481	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and side bend construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Upper Nazareth Twp	61.9	ATWS-0482	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Upper Nazareth Twp	62.0	ATWS-0483	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and side bend construction.
Northampton	Upper Nazareth Twp	62.0	ATWS-0484	0.6	0.4	0.1	0.2	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and side bend construction.
Northampton	Upper Nazareth Twp	62.1	ATWS-0485	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Upper Nazareth Twp	62.1	ATWS-0486	0.4	0.1	0.0	0.0	0.4	0.0	0.0	ATWS is required for topsoil segregation, road crossing and side bend construction.
Northampton	Upper Nazareth Twp	62.1	ATWS-0487	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for topsoil segregation, road crossing and side bend construction.
Northampton	Upper Nazareth Twp	62.2	ATWS-0488	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for topsoil segregation, residential construction, and stream crossing.
Northampton	Upper Nazareth Twp	62.2	ATWS-0489	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for stream crossing.
Northampton	Upper Nazareth Twp	62.3	ATWS-0490	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Northampton	Upper Nazareth Twp	62.3	ATWS-0491	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for stream crossing and road crossing.
Northampton	Upper Nazareth Twp	62.3	ATWS-0492	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Upper Nazareth Twp	62.3	ATWS-0493	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Upper Nazareth Twp	62.5	ATWS-0494	0.8	0.7	0.0	0.0	0.0	0.1	0.0	ATWS is required for topsoil segregation, side bend construction, road crossing, and stream crossing.
Northampton	Upper Nazareth Twp	62.7	ATWS-0495	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for stream crossing and road crossing.
Northampton	Upper Nazareth Twp	62.7	ATWS-0496	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and railroad crossing.
Northampton	Upper Nazareth Twp	62.7	ATWS-0497	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for stream crossing and railroad crossing.
Northampton	Upper Nazareth Twp	62.8	ATWS-0498	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and railroad crossing.
Northampton	Upper Nazareth Twp	62.8	ATWS-0499	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and railroad crossing.
Northampton	Upper Nazareth Twp	63.0	ATWS-0500	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Upper Nazareth Twp	63.2	ATWS-0501	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Upper Nazareth Twp	63.4	ATWS-0502	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and side bend construction.
Northampton	Upper Nazareth Twp	63.5	ATWS-0503	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Upper Nazareth Twp	63.6	ATWS-0504	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and road crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Upper Nazareth Twp	63.6	ATWS-0505	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and road crossing.
Northampton	Upper Nazareth Twp	63.6	ATWS-0506	0.5	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and side bend construction.
Northampton	Upper Nazareth Twp	63.6	ATWS-0507	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and side bend construction.
Northampton	Upper Nazareth Twp	63.7	ATWS-0508	0.6	0.4	0.0	0.0	0.2	0.0	0.0	ATWS is required for road crossing, topsoil segregation and side bend construction.
Northampton	Upper Nazareth Twp	63.7	ATWS-0509	0.4	0.1	0.0	0.0	0.2	0.0	0.0	ATWS is required for road crossing, topsoil segregation and side bend construction.
Northampton	Upper Nazareth Twp	63.8	ATWS-0510	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Upper Nazareth Twp	63.9	ATWS-0511	0.8	0.3	0.5	0.0	0.0	0.0	0.0	ATWS is required for side bend construction and topsoil segregation.
Northampton	Upper Nazareth Twp	63.9	ATWS-0512	0.4	0.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for side bend construction and topsoil segregation.
Northampton	Lower Nazareth Twp	64.2	ATWS-0513	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and wetland crossing.
Northampton	Lower Nazareth Twp	64.3	ATWS-0514	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and side bend construction.
Northampton	Lower Nazareth Twp	64.4	ATWS-0515	0.2	0.1	0.0	0.0	0.0	0.1	0.0	ATWS is required for topsoil segregation, road crossing and wetland crossing.
Northampton	Lower Nazareth Twp	64.5	ATWS-0516	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline crossing.
Northampton	Lower Nazareth Twp	64.5	ATWS-0517	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline crossing.
Northampton	Lower Nazareth Twp	64.5	ATWS-0518	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline crossing.
Northampton	Lower Nazareth Twp	64.6	ATWS-0519	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and pipeline crossing.
Northampton	Lower Nazareth Twp	64.7	ATWS-0520	0.9	0.9	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and side bend construction.
Northampton	Lower Nazareth Twp	64.9	ATWS-0521	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and road crossing.
Northampton	Lower Nazareth Twp	65.0	ATWS-0522	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	65.0	ATWS-0523	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	65.0	ATWS-0524	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	65.1	ATWS-0525	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Lower Nazareth Twp	65.1	ATWS-0526	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and road crossing.
Northampton	Lower Nazareth Twp	65.4	ATWS-0527	1.6	1.5	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, side bend construction and road crossing.
Northampton	Lower Nazareth Twp	65.7	ATWS-0528	0.4	0.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	65.8	ATWS-0529	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Northampton	Lower Nazareth Twp	65.8	ATWS-0530	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	65.9	ATWS-0531	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Lower Nazareth Twp	66.1	ATWS-0532	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Lower Nazareth Twp	66.2	ATWS-0533	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and side bend construction.
Northampton	Lower Nazareth Twp	66.3	ATWS-0534	1.2	1.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	66.7	ATWS-0535	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	66.7	ATWS-0536	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Lower Nazareth Twp	66.8	ATWS-0537	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Lower Nazareth Twp	66.8	ATWS-0538	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Lower Nazareth Twp	66.9	ATWS-0539	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Lower Nazareth Twp	66.9	ATWS-0540	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Bethlehem Twp	67.1	ATWS-0541	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Bethlehem Twp	67.5	ATWS-0542	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Bethlehem Twp	67.5	ATWS-0543	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Bethlehem Twp	67.6	ATWS-0544	0.6	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and foreign pipeline crossing.
Northampton	Bethlehem Twp	67.6	ATWS-0545	1.1	0.6	0.0	0.0	0.0	0.5	0.0	ATWS is required for topsoil segregation, road crossing, side bend construction and foreign pipeline crossing.
Northampton	Bethlehem Twp	67.8	ATWS-0546	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for road crossing.
Northampton	Bethlehem Twp	67.8	ATWS-0547	0.5	0.0	0.0	0.0	0.0	0.5	0.0	ATWS is required for road crossing.
Northampton	Bethlehem Twp	68.0	ATWS-0548	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Bethlehem Twp	68.0	ATWS-0549	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Bethlehem Twp	68.2	ATWS-0550	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Bethlehem Twp	68.3	ATWS-0551	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Bethlehem Twp	68.4	ATWS-0552	0.4	0.2	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and side bend construction.
Northampton	Bethlehem Twp	68.4	ATWS-0553	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Bethlehem Twp	68.5	ATWS-0554	0.2	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and residential construction.
Northampton	Bethlehem Twp	68.5	ATWS-0555	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Bethlehem Twp	68.6	ATWS-0556	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and residential construction.
Northampton	Bethlehem Twp	68.7	ATWS-0557	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and residential construction.
Northampton	Bethlehem Twp	68.8	ATWS-0558	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing and residential construction.
Northampton	Bethlehem Twp	68.9	ATWS-0559	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for residential construction and side bend construction.
Northampton	Bethlehem Twp	68.9	ATWS-0560	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for residential construction, side bend construction and road crossing.
Northampton	Bethlehem Twp	68.9	ATWS-0561	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for residential construction, side bend construction and road crossing.
Northampton	Bethlehem Twp	69.0	ATWS-0562	0.1	0.0	0.0	0.0	0.0	0.1	0.0	ATWS is required for side bend construction, road crossing and residential construction.
Northampton	Bethlehem Twp	69.0	ATWS-0563	0.9	0.7	0.0	0.0	0.0	0.1	0.0	ATWS is required for residential construction, side bend construction and topsoil segregation.
Northampton	Bethlehem Twp	69.2	ATWS-0564	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Bethlehem Twp	69.4	ATWS-0565	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Bethlehem Twp	69.4	ATWS-0566	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction.
Northampton	Bethlehem Twp	69.4	ATWS-0567	0.7	0.0	0.0	0.0	0.0	0.7	0.0	ATWS is required for residential construction and side bend construction.
Northampton	Bethlehem Twp	69.6	ATWS-0568	0.3	0.0	0.0	0.0	0.0	0.3	0.0	ATWS is required for residential construction and side bend construction.
Northampton	Bethlehem Twp	69.6	ATWS-0569	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for side bend construction.
Northampton	Bethlehem Twp	69.6	ATWS-0570	0.2	0.0	0.0	0.0	0.0	0.2	0.0	ATWS is required for side bend construction, road crossing ,and parking lot crossing.
Northampton	Bethlehem Twp	69.7	ATWS-0571	0.6	0.0	0.0	0.0	0.0	0.6	0.0	ATWS is required for road crossing, HDD construction and parking lot crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Bethlehem Twp	69.8	ATWS-0572	0.3	0.0	0.0	0.0	0.0	0.3	0.0	ATWS is required for road crossing, HDD construction and parking lot crossing.
Northampton	Bethlehem Twp	70.4	ATWS-0573	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, major river, road crossing and HDD construction.
Northampton	Bethlehem Twp	70.4	ATWS-0574	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, major river, road crossing and HDD construction.
Northampton	Lower Saucon Twp	71.2	ATWS-0575	0.7	0.0	0.5	0.3	0.0	0.0	0.0	ATWS is required for major river, road crossing, HDD construction, stream crossing, and rugged topography / sloped construction.
Northampton	Lower Saucon Twp	71.2	ATWS-0576	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for major river, road crossing, HDD construction and rugged topography / sloped construction.
Northampton	Lower Saucon Twp	71.3	ATWS-0577	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Northampton	Lower Saucon Twp	71.3	ATWS-0578	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Northampton	Lower Saucon Twp	71.3	ATWS-0579	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Northampton	Lower Saucon Twp	71.9	ATWS-0580	0.6	0.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation,road crossing, wetland crossing and stream crossing.
Northampton	Lower Saucon Twp	71.9	ATWS-0581	0.5	0.3	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation,road crossing, wetland crossing and stream crossing.
Northampton	Lower Saucon Twp	72.1	ATWS-0582	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Northampton	Lower Saucon Twp	72.1	ATWS-0583	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Northampton	Williams Twp	72.3	ATWS-0584	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.3	ATWS-0585	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.5	ATWS-0586	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.5	ATWS-0587	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.5	ATWS-0588	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.5	ATWS-0589	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	72.9	ATWS-0590	0.6	0.0	0.0	0.0	0.6	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, stream crossing and road crossing.
Northampton	Williams Twp	72.9	ATWS-0591	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, stream crossing and road crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Williams Twp	73.0	ATWS-0592	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Williams Twp	73.0	ATWS-0593	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Williams Twp	73.1	ATWS-0594	0.3	0.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and side bend construction.
Northampton	Williams Twp	73.3	ATWS-0595	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, and road crossing.
Northampton	Williams Twp	73.3	ATWS-0596	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	73.5	ATWS-0597	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	73.5	ATWS-0598	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	73.6	ATWS-0599	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	73.6	ATWS-0600	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	73.6	ATWS-0601	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Williams Twp	73.6	ATWS-0602	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Williams Twp	74.2	ATWS-0603	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Northampton	Williams Twp	74.2	ATWS-0604	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	74.3	ATWS-0605	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	74.3	ATWS-0606	0.9	0.9	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	74.5	ATWS-0607	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and stream crossing.
Northampton	Williams Twp	74.5	ATWS-0608	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Williams Twp	74.5	ATWS-0609	0.9	0.7	0.2	0.1	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Northampton	Williams Twp	74.8	ATWS-0610	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, wetland crossing and rugged topography / sloped construction.
Northampton	Williams Twp	74.8	ATWS-0611	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for stream crossing.
Northampton	Williams Twp	74.8	ATWS-0612	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Northampton	Williams Twp	74.8	ATWS-0613	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and road crossing.
Northampton	Williams Twp	74.8	ATWS-0614	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Williams Twp	74.9	ATWS-0615	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Northampton	Williams Twp	75.1	ATWS-0616	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Northampton	Williams Twp	75.1	ATWS-0617	2.2	0.7	1.2	0.4	0.0	0.0	0.0	ATWS is required for side bend construction.
Northampton	Williams Twp	75.5	ATWS-0618	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing and rugged topography / sloped construction.
Northampton	Williams Twp	75.6	ATWS-0619	0.8	0.6	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing and rugged topography / sloped construction.
Northampton	Williams Twp	75.6	ATWS-0620	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, topsoil segregation, road crossing and rugged topography / sloped construction.
Northampton	Williams Twp	75.7	ATWS-0621	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Northampton	Williams Twp	75.7	ATWS-0622	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, and road crossing.
			Subtotal	**100.4**	**62.1**	**26.9**	**2.9**	**3.5**	**5.1**	**0.0**	
Bucks	Durham Twp	75.7	ATWS-0623	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing / residential construction
Bucks	Durham Twp	75.8	ATWS-0624	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing / residential construction
Bucks	Durham Twp	76.0	ATWS-0625	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Bucks	Durham Twp	76.0	ATWS-0626	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation / road crossing, and stream crossing
Bucks	Durham Twp	76.1	ATWS-0627	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Bucks	Durham Twp	76.1	ATWS-0628	0.4	0.1	0.3	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction.
Bucks	Durham Twp	76.2	ATWS-0629	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Bucks	Durham Twp	76.2	ATWS-0630	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Bucks	Durham Twp	76.3	ATWS-0631	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Bucks	Durham Twp	76.3	ATWS-0632	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Bucks	Durham Twp	76.5	ATWS-0633	0.2	0.1	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Bucks	Riegelsville Boro	76.5	ATWS-0634	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Bucks	Riegelsville Boro	76.5	ATWS-0635	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Bucks	Riegelsville Boro	76.6	ATWS-0636	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Bucks	Durham Twp	76.7	ATWS-0637	1.3	1.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction.
Bucks	Durham Twp	77.1	ATWS-0638	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, stream crossing, and HDD construction.
Bucks	Durham Twp	77.2	ATWS-0639	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, stream crossing, and HDD construction.
			Subtotal	**6.3**	**5.6**	**0.6**	**0.0**	**0.1**	**0.1**	**0.0**	
Hellertown Lateral Route											
Upper Delaware											
Northampton	Lower Saucon Twp	0.0	ATWS-0694	1.4	0.6	0.2	0.5	0.0	0.1	0.0	ATWS is required for road crossing, stream crossing, topsoil segregation, and facility site construction
Northampton	Lower Saucon Twp	0.3	ATWS-0695	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Lower Saucon Twp	0.3	ATWS-0696	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Northampton	Lower Saucon Twp	0.6	ATWS-0697	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction
Northampton	Lower Saucon Twp	0.7	ATWS-0698	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction
Northampton	Lower Saucon Twp	0.7	ATWS-0699	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for residential construction and road crossing
Northampton	Lower Saucon Twp	0.8	ATWS-0700	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction, road crossing, and topsoil segregation
Northampton	Lower Saucon Twp	0.8	ATWS-0701	2.2	0.9	1.3	0.0	0.0	0.0	0.0	ATWS is required for residential construction, road crossing, topsoil segregation, and rugged topography /sloped construction
Northampton	Lower Saucon Twp	1.2	ATWS-0702	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Northampton	Lower Saucon Twp	1.3	ATWS-0703	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Northampton	Lower Saucon Twp	1.3	ATWS-0704	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Northampton	Lower Saucon Twp	1.3	ATWS-0705	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Northampton	Lower Saucon Twp	1.4	ATWS-0706	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing
Northampton	Lower Saucon Twp	1.4	ATWS-0707	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction
Northampton	Lower Saucon Twp	1.6	ATWS-0708	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, foreign pipeline crossing, and rugged topography / sloped construction

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Northampton	Lower Saucon Twp	1.7	ATWS-0709	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, foreign pipeline crossing, and rugged topography / sloped construction
Northampton	Lower Saucon Twp	1.7	ATWS-0710	1.8	0.2	1.7	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, foreign pipeline crossing, and rugged topography / sloped construction
			Subtotal	**8.4**	**3.7**	**4.0**	**0.5**	**0.0**	**0.1**	**0.0**	
New Jersey											
PennEast Mainline Route Pipeline											
Upper Delaware											
Hunterdon	Holland Twp	77.8	ATWS-0640	0.8	0.1	0.7	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and residential construction.
Hunterdon	Holland Twp	77.8	ATWS-0641	0.6	0.4	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and residential construction.
Hunterdon	Holland Twp	77.9	ATWS-0642	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	78.1	ATWS-0643	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and residential construction.
Hunterdon	Holland Twp	78.1	ATWS-0644	0.2	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for residential construction and road crossing.
Hunterdon	Holland Twp	78.1	ATWS-0645	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Holland Twp	78.2	ATWS-0646	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Holland Twp	78.5	ATWS-0647	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	79.0	ATWS-0648	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for utility corssing
Hunterdon	Holland Twp	79.0	ATWS-0649	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Hunterdon	Holland Twp	79.1	ATWS-0650	0.5	0.1	0.0	0.4	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	79.1	ATWS-0651	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for foreign pipeline crossing.
Hunterdon	Holland Twp	79.2	ATWS-0652	0.2	0.1	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, and residential construction
Hunterdon	Holland Twp	79.2	ATWS-0653	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, and residential construction
Hunterdon	Holland Twp	79.3	ATWS-0654	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, and residential construction
Hunterdon	Holland Twp	79.3	ATWS-0655	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Holland Twp	79.4	ATWS-0656	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	79.4	ATWS-0657	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	79.5	ATWS-0658	0.9	0.8	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, and stream crossing.
Hunterdon	Holland Twp	79.6	ATWS-0659	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Holland Twp	79.7	ATWS-0660	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	79.7	ATWS-0661	0.4	0.3	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	79.8	ATWS-0662	0.5	0.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Hunterdon	Holland Twp	79.9	ATWS-0663	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Hunterdon	Holland Twp	80.0	ATWS-0664	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Hunterdon	Holland Twp	80.0	ATWS-0665	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing and stream crossing.
Hunterdon	Holland Twp	80.0	ATWS-0666	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	80.0	ATWS-0667	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	80.0	ATWS-0668	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	80.2	ATWS-0669	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	80.2	ATWS-0670	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	80.2	ATWS-0671	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	80.3	ATWS-0672	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Hunterdon	Holland Twp	80.4	ATWS-0673	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and rugged topography / sloped construction.
Hunterdon	Holland Twp	80.4	ATWS-0674	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing
Hunterdon	Holland Twp	80.5	ATWS-0675	2.0	0.0	2.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Hunterdon	Holland Twp	81.0	ATWS-0676	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for pipe bend
Hunterdon	Holland Twp	81.0	ATWS-0677	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	81.0	ATWS-0678	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	81.1	ATWS-0679	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Hunterdon	Holland Twp	81.1	ATWS-0680	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Hunterdon	Holland Twp	81.1	ATWS-0681	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Hunterdon	Holland Twp	81.3	ATWS-0682	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	81.4	ATWS-0683	0.2	0.0	0.1	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and residential construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Holland Twp	81.5	ATWS-0684	0.2	0.0	0.1	0.0	0.1	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and residential construction.
Hunterdon	Holland Twp	81.5	ATWS-0685	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Holland Twp	81.5	ATWS-0686	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and wetland crossing.
Hunterdon	Holland Twp	81.6	ATWS-0687	2.4	0.7	1.7	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Hunterdon	Holland Twp	81.6	ATWS-0688	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	82.0	ATWS-0689	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction and road crossing.
Hunterdon	Holland Twp	82.1	ATWS-0690	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction and road crossing.
Hunterdon	Holland Twp	82.2	ATWS-0691	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Holland Twp	82.2	ATWS-0692	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Holland Twp	82.2	ATWS-0693	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing.
Hunterdon	Holland Twp	82.3	ATWS-0716	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for wetland crossing.
Hunterdon	Holland Twp	82.4	ATWS-0717	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	82.5	ATWS-0718	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Holland Twp	82.5	ATWS-0719	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Holland Twp	82.6	ATWS-0720	1.0	0.3	0.3	0.4	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, rugged topography / sloped construction, road crossing, and topsoil segregation.
Hunterdon	Holland Twp	82.6	ATWS-0721	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, and rugged topography / sloped construction.
Hunterdon	Holland Twp	82.7	ATWS-0722	0.3	0.1	0.0	0.1	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, road crossing, and topsoil segregation.
Hunterdon	Holland Twp	82.8	ATWS-0723	0.7	0.6	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation, and stream crossing.
Hunterdon	Holland Twp	83.0	ATWS-0724	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	83.0	ATWS-0725	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Hunterdon	Holland Twp	83.0	ATWS-0726	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS is required for road crossing and rugged topography / sloped construction.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Holland Twp	83.0	ATWS-0727	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and road crossing.
Hunterdon	Holland Twp	83.1	ATWS-0728	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing and rugged topography / sloped construction.
Hunterdon	Holland Twp	83.3	ATWS-0729	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction.
Hunterdon	Holland Twp	83.5	ATWS-0730	0.6	0.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, and wetland crossing.
Hunterdon	Holland Twp	83.6	ATWS-0731	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Hunterdon	Holland Twp	83.7	ATWS-0732	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Hunterdon	Holland Twp	83.8	ATWS-0733	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and road crossing.
Hunterdon	Holland Twp	83.8	ATWS-0734	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and road crossing.
Hunterdon	Holland Twp	83.9	ATWS-0735	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Hunterdon	Holland Twp	84.0	ATWS-0736	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Holland Twp	84.1	ATWS-0737	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing.
Hunterdon	Holland Twp	84.2	ATWS-0738	0.5	0.3	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and rugged topography / sloped construction.
Hunterdon	Holland Twp	84.3	ATWS-0739	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, and rugged topography / sloped construction.
Hunterdon	Holland Twp	84.4	ATWS-0740	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and topsoil segregation.
Hunterdon	Holland Twp	84.4	ATWS-0741	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and topsoil segregation.
Hunterdon	Holland Twp	84.5	ATWS-0742	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and topsoil segregation.
Hunterdon	Holland Twp	84.5	ATWS-0743	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing and topsoil segregation.
Hunterdon	Holland Twp	84.5	ATWS-0744	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	84.6	ATWS-0745	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	84.7	ATWS-0746	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	84.7	ATWS-0747	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Holland Twp	84.8	ATWS-0748	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	84.8	ATWS-0749	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	84.8	ATWS-0750	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	84.8	ATWS-0751	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing.
Hunterdon	Holland Twp	84.9	ATWS-0752	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	85.0	ATWS-0753	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	85.0	ATWS-0754	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	85.0	ATWS-0755	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	85.1	ATWS-0756	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	85.1	ATWS-0757	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing.
Hunterdon	Holland Twp	85.2	ATWS-0758	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing
Hunterdon	Holland Twp	85.2	ATWS-0759	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and stream crossing
Hunterdon	Holland Twp	85.3	ATWS-0760	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Holland Twp	85.3	ATWS-0761	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing.
Hunterdon	Holland Twp	85.4	ATWS-0762	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for wetland crossing and residential construction.
Hunterdon	Holland Twp	85.4	ATWS-0763	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction, wetland crossing, stream crossing, and road crossing.
Hunterdon	Holland Twp	85.4	ATWS-0764	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS is required for residential construction and road crossing.
Hunterdon	Alexandria Twp	85.5	ATWS-0765	0.8	0.6	0.3	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, residential construction, road crossing, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	85.7	ATWS-0766	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	85.7	ATWS-0767	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	85.8	ATWS-0768	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	85.8	ATWS-0769	0.9	0.9	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	85.8	ATWS-0770	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.

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					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Alexandria Twp	86.1	ATWS-0771	1.3	1.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	86.6	ATWS-0772	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, and stream crossing.
Hunterdon	Alexandria Twp	86.6	ATWS-0773	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Hunterdon	Alexandria Twp	86.7	ATWS-0774	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing.
Hunterdon	Alexandria Twp	86.7	ATWS-0775	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Alexandria Twp	86.8	ATWS-0776	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation.
Hunterdon	Alexandria Twp	86.9	ATWS-0777	0.5	0.2	0.3	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, wetland crossing, stream crossing, and rugged topography / sloped construction.
Hunterdon	Alexandria Twp	86.9	ATWS-0778	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, and rugged topography / sloped construction.
Hunterdon	Alexandria Twp	87.0	ATWS-0779	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, and rugged topography / sloped construction.
Hunterdon	Alexandria Twp	87.1	ATWS-0780	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing.
Hunterdon	Alexandria Twp	87.2	ATWS-0781	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Alexandria Twp	87.2	ATWS-0782	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing.
Hunterdon	Alexandria Twp	87.3	ATWS-0783	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing and topsoil segregation.
Hunterdon	Alexandria Twp	87.3	ATWS-0784	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, topsoil segregation, and residential construction
Hunterdon	Alexandria Twp	87.5	ATWS-0785	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, and wetland crossing
Hunterdon	Alexandria Twp	87.5	ATWS-0786	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, and wetland crossing
Hunterdon	Kingwood Twp	87.6	ATWS-0787	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, and wetland crossing
Hunterdon	Kingwood Twp	87.6	ATWS-0788	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, wetland crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	87.7	ATWS-0789	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing, and topsoil segregation
Hunterdon	Kingwood Twp	87.8	ATWS-0790	0.5	0.4	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing, and topsoil segregation

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Kingwood Twp	87.9	ATWS-0791	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Hunterdon	Kingwood Twp	88.0	ATWS-0792	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Hunterdon	Kingwood Twp	88.0	ATWS-0793	0.6	0.5	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation, wetland crossing, and stream crossing
Hunterdon	Kingwood Twp	88.0	ATWS-0794	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Hunterdon	Kingwood Twp	88.2	ATWS-0795	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for stream crossing and wetland crossing
Hunterdon	Kingwood Twp	88.2	ATWS-0796	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for stream crossing, wetland crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.3	ATWS-0797	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.3	ATWS-0798	0.2	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, stream crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.5	ATWS-0799	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	88.5	ATWS-0800	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, rugged topography / sloped construction, and stream crossing
Hunterdon	Kingwood Twp	88.6	ATWS-0801	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.6	ATWS-0802	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, stream crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.6	ATWS-0803	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.7	ATWS-0804	0.3	0.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	88.7	ATWS-0805	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	88.8	ATWS-0806	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	88.8	ATWS-0807	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil construction
Hunterdon	Kingwood Twp	89.3	ATWS-0808	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, and stream crossing
Hunterdon	Kingwood Twp	89.3	ATWS-0809	0.2	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, stream crossing, and rugged topography / sloped construction

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Kingwood Twp	89.4	ATWS-0810	1.0	0.6	0.5	0.0	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, and stream crossing, rugged topography / sloped construction, and topsoil segregation
Hunterdon	Kingwood Twp	89.4	ATWS-0811	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing, wetland crossing, and stream crossing, rugged topography / sloped construction, and topsoil segregation
Hunterdon	Kingwood Twp	89.5	ATWS-0812	0.2	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for wetland crossing, stream crossing, and rugged topography / sloped construction
Hunterdon	Kingwood Twp	89.6	ATWS-0813	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing
Hunterdon	Kingwood Twp	89.6	ATWS-0814	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and stream crossing
Hunterdon	Kingwood Twp	89.8	ATWS-0815	0.2	0.2	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign line crossing
Hunterdon	Kingwood Twp	89.8	ATWS-0816	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign line crossing
Hunterdon	Kingwood Twp	89.8	ATWS-0817	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign line crossing
Hunterdon	Kingwood Twp	89.8	ATWS-0818	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and foreign line crossing
Hunterdon	Kingwood Twp	89.9	ATWS-0819	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Kingwood Twp	89.9	ATWS-0820	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Kingwood Twp	90.0	ATWS-0821	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Kingwood Twp	90.0	ATWS-0822	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Kingwood Twp	90.5	ATWS-0823	0.2	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction and topsoil segregation
Hunterdon	Kingwood Twp	90.5	ATWS-0824	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction and topsoil segregation
Hunterdon	Kingwood Twp	90.6	ATWS-0825	0.3	0.2	0.0	0.0	0.1	0.0	0.0	ATWS is required for residential construction, topsoil segregation, and road crossing
Hunterdon	Kingwood Twp	90.6	ATWS-0826	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for residential construction, topsoil segregation, and road crossing
Hunterdon	Kingwood Twp	90.7	ATWS-0827	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for residential construction, road crossing, topsoil segregation, and wetland crossing
Hunterdon	Kingwood Twp	90.7	ATWS-0828	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for residential construction, road crossing, topsoil segregation, and wetland crossing
Hunterdon	Kingwood Twp	90.8	ATWS-0829	0.9	0.8	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	91.0	ATWS-0830	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Kingwood Twp	91.1	ATWS-0831	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	91.1	ATWS-0832	1.0	1.0	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	91.4	ATWS-0833	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	91.5	ATWS-0834	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	91.6	ATWS-0835	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	91.7	ATWS-0836	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Hunterdon	Kingwood Twp	91.8	ATWS-0837	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Hunterdon	Kingwood Twp	91.8	ATWS-0838	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing, topsoil segregation, and residential construction
Hunterdon	Kingwood Twp	91.8	ATWS-0839	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS is required for road crossing, topsoil segregation, and residential construction
Hunterdon	Kingwood Twp	92.0	ATWS-0840	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
Hunterdon	Kingwood Twp	92.1	ATWS-0841	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	92.2	ATWS-0842	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	92.3	ATWS-0843	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	92.3	ATWS-0844	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	92.5	ATWS-0845	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Hunterdon	Kingwood Twp	92.5	ATWS-0846	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing
Hunterdon	Kingwood Twp	92.6	ATWS-0847	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and topsoil segregation
Hunterdon	Kingwood Twp	92.6	ATWS-0848	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing and topsoil segregation
Hunterdon	Kingwood Twp	92.8	ATWS-0849	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS is required for wetland crossing, topsoil segregation, and road crossing
Hunterdon	Kingwood Twp	92.9	ATWS-0850	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation and road crossing
Hunterdon	Kingwood Twp	92.9	ATWS-0851	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, stream crossing, and wetland crossing
Hunterdon	Kingwood Twp	92.9	ATWS-0852	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation, road crossing, stream crossing, and wetland crossing

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Kingwood Twp	93.2	ATWS-0853	0.7	0.0	0.5	0.2	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Hunterdon	Kingwood Twp	93.5	ATWS-0854	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	93.6	ATWS-0855	0.5	0.3	0.3	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	93.7	ATWS-0856	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Kingwood Twp	94.1	ATWS-0857	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Kingwood Twp	94.2	ATWS-0858	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Kingwood Twp	94.2	ATWS-0859	0.5	0.4	0.0	0.0	0.1	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	94.4	ATWS-0860	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Delaware Twp	94.4	ATWS-0861	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Delaware Twp	94.4	ATWS-0862	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	Delaware Twp	94.5	ATWS-0863	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	Delaware Twp	94.5	ATWS-0864	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	Delaware Twp	94.6	ATWS-0865	0.2	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	94.6	ATWS-0866	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	94.6	ATWS-0867	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	94.7	ATWS-0868	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	94.7	ATWS-0869	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	94.8	ATWS-0870	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	94.8	ATWS-0871	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Hunterdon	Delaware Twp	94.8	ATWS-0872	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Hunterdon	Delaware Twp	94.9	ATWS-0873	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and topsoil segregation
Hunterdon	Delaware Twp	94.9	ATWS-0874	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and topsoil segregation
Hunterdon	Delaware Twp	95.2	ATWS-0875	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Hunterdon	Delaware Twp	95.3	ATWS-0876	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Hunterdon	Delaware Twp	95.4	ATWS-0877	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation

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Hunterdon	Delaware Twp	95.7	ATWS-0878	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	95.9	ATWS-0879	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	95.9	ATWS-0880	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	96.0	ATWS-0881	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	96.0	ATWS-0882	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	96.1	ATWS-0883	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	96.2	ATWS-0884	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	Delaware Twp	96.3	ATWS-0885	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	Delaware Twp	96.4	ATWS-0886	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	96.5	ATWS-0887	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for stream crossing and wetland crossing
Hunterdon	Delaware Twp	96.7	ATWS-0888	0.4	0.1	0.2	0.0	0.1	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	96.8	ATWS-0889	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	97.0	ATWS-0890	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	97.1	ATWS-0891	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	97.3	ATWS-0892	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	97.4	ATWS-0893	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	97.4	ATWS-0894	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	97.4	ATWS-0895	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	97.5	ATWS-0896	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS required for Utility crossing, forested construction and residential construction
Hunterdon	Delaware Twp	97.5	ATWS-0897	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS required for Utility crossing, Forested construction and residential construction
Hunterdon	Delaware Twp	97.6	ATWS-0898	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for Utility crossing, Forested construction, topsoil segregation and residential construction
Hunterdon	Delaware Twp	97.6	ATWS-0899	0.5	0.0	0.2	0.1	0.2	0.0	0.0	ATWS required for Utility crossing, Forested construction, topsoil segregation and residential construction
Hunterdon	Delaware Twp	97.7	ATWS-0900	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS required for road crossing and residential construction
Hunterdon	Delaware Twp	97.7	ATWS-0901	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Delaware Twp	97.7	ATWS-0902	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Hunterdon	Delaware Twp	97.7	ATWS-0903	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Hunterdon	Delaware Twp	97.8	ATWS-0904	1.2	1.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	98.3	ATWS-0905	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	98.3	ATWS-0906	0.1	0.0	0.0	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	98.3	ATWS-0907	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing and road crossing
Hunterdon	Delaware Twp	98.4	ATWS-0908	0.2	0.1	0.0	0.1	0.0	0.0	0.0	ATWS required for stream crossing and road crossing
Hunterdon	Delaware Twp	98.4	ATWS-0909	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	98.4	ATWS-0910	0.2	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	98.5	ATWS-0911	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	98.5	ATWS-0912	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	98.6	ATWS-0913	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing
Hunterdon	Delaware Twp	98.6	ATWS-0914	0.3	0.2	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and topsoil segregation
Hunterdon	Delaware Twp	98.8	ATWS-0915	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS required for Sidebend installation and forested construction
Hunterdon	Delaware Twp	98.8	ATWS-0916	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for Sidebend installation and forested construction
Hunterdon	Delaware Twp	98.9	ATWS-0917	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	98.9	ATWS-0918	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	99.0	ATWS-0919	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	99.0	ATWS-0920	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	99.1	ATWS-0921	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	99.1	ATWS-0922	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	99.1	ATWS-0923	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	99.2	ATWS-0924	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	Delaware Twp	99.2	ATWS-0925	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	Delaware Twp	99.3	ATWS-0926	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	99.5	ATWS-0927	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	99.5	ATWS-0928	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, stream crossing and sideslope construction
Hunterdon	Delaware Twp	99.6	ATWS-0929	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, stream crossing and sideslope construction
Hunterdon	Delaware Twp	99.6	ATWS-0930	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, stream crossing and sideslope construction

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					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	Delaware Twp	99.6	ATWS-0931	0.2	0.1	0.1	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	99.7	ATWS-0932	0.2	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	Delaware Twp	99.7	ATWS-0933	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	99.7	ATWS-0934	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	Delaware Twp	99.8	ATWS-0935	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS required for Utility crossing
Hunterdon	Delaware Twp	99.8	ATWS-0936	0.6	0.0	0.6	0.0	0.0	0.0	0.0	ATWS required for stream crossing and Utility crossing
Hunterdon	Delaware Twp	99.9	ATWS-0937	0.7	0.0	0.6	0.0	0.0	0.0	0.0	ATWS required for Utility crossing and wetland crossing
Hunterdon	Delaware Twp	99.9	ATWS-0938	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS required for Utility crossing and wetland crossing
Hunterdon	Delaware Twp	100.1	ATWS-0939	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Hunterdon	Delaware Twp	100.1	ATWS-0940	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Hunterdon	West Amwell Twp	100.1	ATWS-0941	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	100.2	ATWS-0942	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for stream crossing and road crossing
Hunterdon	West Amwell Twp	100.2	ATWS-0943	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing and Utility crossing
Hunterdon	West Amwell Twp	100.2	ATWS-0944	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing and Utility crossing
Hunterdon	West Amwell Twp	100.3	ATWS-0945	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for Utility crossing and road crossing
Hunterdon	West Amwell Twp	100.3	ATWS-0946	0.2	0.0	0.1	0.2	0.0	0.0	0.0	ATWS required for Utility crossing and road crossing
Hunterdon	West Amwell Twp	100.3	ATWS-0947	0.2	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	100.3	ATWS-0948	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	100.6	ATWS-0949	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	100.6	ATWS-0950	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	100.6	ATWS-0951	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	100.6	ATWS-0952	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	100.8	ATWS-0953	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	West Amwell Twp	101.0	ATWS-0954	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	West Amwell Twp	101.0	ATWS-0955	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	West Amwell Twp	101.1	ATWS-0956	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, road crossing, and stream crossing
Hunterdon	West Amwell Twp	101.1	ATWS-0957	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, road crossing, and stream crossing

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	West Amwell Twp	101.2	ATWS-0958	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and stream crossing
Hunterdon	West Amwell Twp	101.2	ATWS-0959	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	West Amwell Twp	101.3	ATWS-0960	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	West Amwell Twp	101.4	ATWS-0961	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	West Amwell Twp	101.4	ATWS-0962	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and wetland crossing
Hunterdon	West Amwell Twp	101.5	ATWS-0963	0.8	0.8	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	West Amwell Twp	101.7	ATWS-0964	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	101.7	ATWS-0965	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for stream crossing
Hunterdon	West Amwell Twp	101.7	ATWS-0966	1.2	0.7	0.5	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, road crossing and stream crossing
Hunterdon	West Amwell Twp	101.8	ATWS-0967	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for stream crossing and sideslope construction
Hunterdon	West Amwell Twp	101.9	ATWS-0968	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, and road crossing
Hunterdon	West Amwell Twp	102.0	ATWS-0969	1.3	1.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, and road crossing
Hunterdon	West Amwell Twp	102.0	ATWS-0970	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, and road crossing
Hunterdon	West Amwell Twp	102.1	ATWS-0971	1.1	1.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and sideslope construction
Hunterdon	West Amwell Twp	102.3	ATWS-0972	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Hunterdon	West Amwell Twp	102.3	ATWS-0973	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for Utility crossing
Hunterdon	West Amwell Twp	102.3	ATWS-0974	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for Utility crossing
Hunterdon	West Amwell Twp	102.4	ATWS-0975	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS required for Utility crossing
Hunterdon	West Amwell Twp	102.4	ATWS-0976	0.6	0.0	0.5	0.1	0.0	0.0	0.0	ATWS required for Utility crossing
Hunterdon	West Amwell Twp	102.5	ATWS-0977	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS required for sideslope construction and stream crossing
Hunterdon	West Amwell Twp	102.6	ATWS-0978	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for sideslope construction and stream crossing
Hunterdon	West Amwell Twp	102.7	ATWS-0979	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing and road crossing
Hunterdon	West Amwell Twp	102.7	ATWS-0980	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for stream crossing and road crossing
Hunterdon	West Amwell Twp	102.7	ATWS-0981	0.2	0.0	0.0	0.0	0.2	0.0	0.0	ATWS required for stream crossing, road crossing, residential construction, and wetland crossing
Hunterdon	West Amwell Twp	102.9	ATWS-0982	0.5	0.0	0.5	0.1	0.0	0.0	0.0	ATWS required for stream crossing, road crossing, and wetland crossing

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Hunterdon	West Amwell Twp	103.0	ATWS-0983	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for wetland crossing and Utility crossing
Hunterdon	West Amwell Twp	103.2	ATWS-0984	0.8	0.0	0.8	0.0	0.0	0.0	0.0	ATWS required for sideslope construction
Hunterdon	West Amwell Twp	103.4	ATWS-0985	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	103.4	ATWS-0986	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	103.5	ATWS-0987	0.3	0.0	0.0	0.3	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	103.5	ATWS-0988	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing and residential construction
Hunterdon	West Amwell Twp	103.6	ATWS-0989	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and sideslope construction
Hunterdon	West Amwell Twp	103.6	ATWS-0990	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and sideslope construction
Hunterdon	West Amwell Twp	103.6	ATWS-0991	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and sideslope construction
Hunterdon	West Amwell Twp	103.7	ATWS-0992	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and sideslope construction
Hunterdon	West Amwell Twp	103.7	ATWS-0993	1.2	0.0	1.1	0.1	0.0	0.0	0.0	ATWS required for sideslope construction and road crossing
Hunterdon	West Amwell Twp	103.9	ATWS-0994	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for sideslope construction and road crossing
Hunterdon	West Amwell Twp	103.9	ATWS-0995	1.2	0.8	0.0	0.4	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Hunterdon	West Amwell Twp	103.9	ATWS-0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing
Hunterdon	West Amwell Twp	104.1	ATWS-0997	1.3	0.1	0.0	1.1	0.0	0.0	0.0	ATWS required for Utility crossing and topsoil segregation
Hunterdon	West Amwell Twp	104.2	ATWS-0998	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for Utility crossing and access road turnaround
			Subtotal	**90.4**	**46.3**	**31.0**	**10.5**	**2.3**	**0.3**	**0.0**	
Mercer	Hopewell Twp	104.3	ATWS-0999	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for Utility crossing and Sidebend installation
Mercer	Hopewell Twp	104.4	ATWS-1000	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	104.4	ATWS-1001	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	104.4	ATWS-1002	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	104.5	ATWS-1003	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	104.6	ATWS-1004	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	104.6	ATWS-1005	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	104.6	ATWS-1006	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for stream crossing and topsoil segregation
Mercer	Hopewell Twp	104.6	ATWS-1007	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for stream crossing and topsoil segregation

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Mercer	Hopewell Twp	104.7	ATWS-1008	0.2	0.0	0.0	0.1	0.1	0.0	0.0	ATWS required for road crossing, topsoil segregation, and wetland crossing
Mercer	Hopewell Twp	104.7	ATWS-1009	0.5	0.0	0.0	0.0	0.5	0.0	0.0	ATWS required for road crossing and topsoil segregation
Mercer	Hopewell Twp	104.7	ATWS-1010	2.1	1.7	0.2	0.2	0.0	0.0	0.0	ATWS required for road crossing, topsoil segregation, Utility crossing, sideslope construction, wetland crossing, and stream crossing
Mercer	Hopewell Twp	104.8	ATWS-1011	0.4	0.2	0.0	0.2	0.0	0.0	0.0	ATWS required for sideslope construction, road crossing, topsoil segregation, and Utility crossing
Mercer	Hopewell Twp	105.0	ATWS-1012	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for sideslope construction, wetland crossing and stream crossing
Mercer	Hopewell Twp	105.1	ATWS-1013	0.4	0.2	0.2	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, wetland crossing, stream crossing and HDD construction
Mercer	Hopewell Twp	105.1	ATWS-1014	0.7	0.3	0.2	0.1	0.0	0.0	0.0	ATWS required for topsoil segregation, sideslope construction, wetland crossing, stream crossing and HDD construction
Mercer	Hopewell Twp	105.9	ATWS-1015	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS required for HDD construction
Mercer	Hopewell Twp	105.9	ATWS-1016	0.3	0.0	0.3	0.1	0.0	0.0	0.0	ATWS required for HDD construction
Mercer	Hopewell Twp	106.0	ATWS-1017	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Mercer	Hopewell Twp	106.4	ATWS-1018	1.1	0.0	1.1	0.0	0.0	0.0	0.0	ATWS required for sideslope construction
Mercer	Hopewell Twp	106.7	ATWS-1019	1.8	0.0	1.8	0.0	0.0	0.0	0.0	ATWS required for sideslope construction
Mercer	Hopewell Twp	107.2	ATWS-1020	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for Utility crossing and Sidebend installation
Mercer	Hopewell Twp	107.2	ATWS-1021	0.7	0.0	0.5	0.1	0.0	0.0	0.0	ATWS required for Utility crossing, Sidebend installation and sideslope construction
Mercer	Hopewell Twp	107.3	ATWS-1022	1.0	0.0	1.0	0.0	0.0	0.0	0.0	ATWS required for sideslope construction and Sidebend installation
Mercer	Hopewell Twp	107.9	ATWS-1023	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	107.9	ATWS-1024	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	107.9	ATWS-1025	0.7	0.0	0.6	0.1	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and Utility crossing
Mercer	Hopewell Twp	107.9	ATWS-1026	0.3	0.0	0.2	0.1	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and Utility crossing
Mercer	Hopewell Twp	108.0	ATWS-1027	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Mercer	Hopewell Twp	108.1	ATWS-1028	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Mercer	Hopewell Twp	108.1	ATWS-1029	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Mercer	Hopewell Twp	108.1	ATWS-1030	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	108.2	ATWS-1031	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and road crossing
Mercer	Hopewell Twp	108.2	ATWS-1032	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, road crossing and topsoil segregation
Mercer	Hopewell Twp	108.2	ATWS-1033	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Mercer	Hopewell Twp	108.4	ATWS-1034	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Mercer	Hopewell Twp	108.5	ATWS-1035	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for wetland crossing
Mercer	Hopewell Twp	108.6	ATWS-1036	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and topsoil segregation
Mercer	Hopewell Twp	108.6	ATWS-1037	0.6	0.6	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and topsoil segregation
Mercer	Hopewell Twp	108.9	ATWS-1038	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	108.9	ATWS-1039	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	109.0	ATWS-1040	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and topsoil segregation
Mercer	Hopewell Twp	109.0	ATWS-1041	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and topsoil segregation
Mercer	Hopewell Twp	109.1	ATWS-1042	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Mercer	Hopewell Twp	109.2	ATWS-1043	0.3	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Mercer	Hopewell Twp	109.3	ATWS-1044	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, wetland crossing and stream crossing
Mercer	Hopewell Twp	109.3	ATWS-1045	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, wetland crossing and stream crossing
Mercer	Hopewell Twp	109.4	ATWS-1046	0.4	0.4	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, wetland crossing and stream crossing
Mercer	Hopewell Twp	109.4	ATWS-1047	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation, wetland crossing and stream crossing
Mercer	Hopewell Twp	109.5	ATWS-1048	0.1	0.1	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Mercer	Hopewell Twp	109.5	ATWS-1049	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Mercer	Hopewell Twp	109.5	ATWS-1050	0.7	0.5	0.0	0.3	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Mercer	Hopewell Twp	109.6	ATWS-1051	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS required for road crossing

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Mercer	Hopewell Twp	110.0	ATWS-1052	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	110.0	ATWS-1053	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	110.0	ATWS-1054	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	110.0	ATWS-1055	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and stream crossing
Mercer	Hopewell Twp	110.2	ATWS-1056	0.3	0.0	0.1	0.3	0.0	0.0	0.0	ATWS required for HDD construction
Mercer	Hopewell Twp	110.2	ATWS-1057	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS required for HDD construction
Mercer	Hopewell Twp	110.7	ATWS-1058	0.4	0.4	0.1	0.0	0.0	0.0	0.0	ATWS required for HDD construction, road crossing and topsoil segregation
Mercer	Hopewell Twp	110.7	ATWS-1059	0.8	0.2	0.5	0.1	0.0	0.0	0.0	ATWS required for HDD construction and topsoil segregation
Mercer	Hopewell Twp	110.8	ATWS-1060	0.2	0.0	0.1	0.1	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	110.9	ATWS-1061	2.0	2.0	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Mercer	Hopewell Twp	110.9	ATWS-1062	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and road crossing
Mercer	Hopewell Twp	111.1	ATWS-1063	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation and HDD construction
Mercer	Hopewell Twp	111.7	ATWS-1064	0.7	0.0	0.0	0.0	0.7	0.0	0.0	ATWS required for HDD construction and residential construction
Mercer	Hopewell Twp	111.7	ATWS-1065	0.3	0.0	0.0	0.0	0.3	0.0	0.0	ATWS required for HDD construction and residential construction
Lower Hudson											
Mercer	Hopewell Twp	111.8	ATWS-1066	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for road crossing and residential construction
Mercer	Hopewell Twp	111.8	ATWS-1067	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for road crossing and residential construction
Mercer	Hopewell Twp	111.8	ATWS-1068	0.3	0.2	0.0	0.0	0.2	0.0	0.0	ATWS required for road crossing, topsoil segregation and residential construction
Mercer	Hopewell Twp	111.9	ATWS-1069	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for topsoil segregation and residential construction
Mercer	Hopewell Twp	112.0	ATWS-1070	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS required for Utility crossing and topsoil segregation
Mercer	Hopewell Twp	112.1	ATWS-1071	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for Utility crossing and topsoil segregation
Mercer	Hopewell Twp	112.1	ATWS-1072	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for Utility crossing and topsoil segregation

tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
Mercer	Hopewell Twp	112.2	ATWS-1073	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing
Mercer	Hopewell Twp	112.3	ATWS-1074	0.3	0.0	0.1	0.0	0.0	0.2	0.0	ATWS required for wetland crossing and road crossing
Mercer	Hopewell Twp	112.4	ATWS-1075	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing and road crossing
Mercer	Hopewell Twp	112.4	ATWS-1076	0.3	0.0	0.3	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and road crossing
Mercer	Hopewell Twp	112.6	ATWS-1077	0.5	0.0	0.5	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and road crossing
Mercer	Hopewell Twp	112.6	ATWS-1078	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for wetland crossing, stream crossing and road crossing
Mercer	Hopewell Twp	112.7	ATWS-1079	0.7	0.2	0.4	0.0	0.1	0.0	0.0	ATWS required for wetland crossing and road crossing
Mercer	Hopewell Twp	112.8	ATWS-1080	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Mercer	Hopewell Twp	112.9	ATWS-1081	0.5	0.4	0.1	0.0	0.0	0.0	0.0	ATWS required for road crossing and topsoil segregation
Mercer	Hopewell Twp	113.0	ATWS-1082	0.3	0.3	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Mercer	Hopewell Twp	113.1	ATWS-1083	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS required for topsoil segregation
Mercer	Hopewell Twp	113.2	ATWS-1084	0.1	0.0	0.0	0.0	0.1	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	113.2	ATWS-1085	0.1	0.0	0.1	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	113.2	ATWS-1086	0.2	0.0	0.1	0.0	0.1	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	113.2	ATWS-1087	0.4	0.0	0.4	0.0	0.0	0.0	0.0	ATWS required for stream crossing
Mercer	Hopewell Twp	113.8	ATWS-1088	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for road crossing and residential construction
Mercer	Hopewell Twp	113.8	ATWS-1089	0.2	0.0	0.0	0.1	0.1	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	113.8	ATWS-1090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ATWS required for road crossing
Mercer	Hopewell Twp	113.8	ATWS-1091	0.1	0.0	0.0	0.1	0.0	0.0	0.0	ATWS required for road crossing
			Subtotal	**31.0**	**12.8**	**12.4**	**2.8**	**2.6**	**0.4**	**0.0**	
Gilbert 12-inch Lateral											
Upper Delaware											
Hunterdon	Holland Twp	0.0	ATWS-0711	0.7	0.7	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Hunterdon	Holland Twp	0.2	ATWS-0712	0.2	0.2	0.0	0.0	0.0	0.0	0.0	ATWS is required for road crossing and topsoil segregation
Hunterdon	Holland Twp	0.2	ATWS-0713	0.2	0.0	0.2	0.0	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Holland Twp	0.2	ATWS-0714	0.2	0.0	0.0	0.2	0.0	0.0	0.0	ATWS is required for road crossing
Hunterdon	Holland Twp	0.3	ATWS-0715	0.4	0.0	0.3	0.1	0.0	0.0	0.0	ATWS is required for sidebend installation

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tate/ Facility/ County	Municipality	Mile Post	Description	Total Acres[1]	Existing Land Use (acreage affected)						Justification
					Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water	
			Subtotal	**1.7**	**0.9**	**0.6**	**0.3**	**0.0**	**0.0**	**0.0**	ATWS is required for road crossing and topsoil segregation
Lambertville 36-inch Lateral											
Upper Delaware											
Hunterdon	West Amwell Twp	0.4	ATWS-1092	2.0	0.0	2.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction
Hunterdon	West Amwell Twp	0.9	ATWS-1093	1.5	1.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for rugged topography / sloped construction / topsoil segregation
Hunterdon	West Amwell Twp	1.3	ATWS-1094	0.5	0.5	0.0	0.0	0.0	0.0	0.0	ATWS is required for topsoil segregation
			Subtotal	**4.0**	**2.0**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	
			Project Total	**445.0**	**150.6**	**188.8**	**24.1**	**12.0**	**12.3**	**57.2**	

Notes
The totals shown in this table may not equal the sum of addends due to rounding.
1 - Values Of 0.0 Represent Impacts Less Than 0.05 Acre And Are Included In The Total Project Impacts.

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8.2.2 Above Ground Facilities

As discussed in Section 1.2.2 (Aboveground Facilities) in Resource Report 1, the Project will involve the construction of a single new compressor station at MP 26.7 that will serve the entire pipeline. In addition, various associated above ground facilities including interconnects, launchers, receivers, and mainline block valves will also be constructed to support the pipeline. Location of the above ground facilities by nearest MP, existing land use, and acreage affected by the construction and operation of above ground facilities is summarized in Table 8.2-7. See Section 1.2.3 (Location Maps, Detailed Site Maps, and Plot and Site Maps) in Resource Report 1 for locations of USGS topographic maps, plot plans, and aerial photographs displaying locations of these facilities.

8.2.2.1 Compressor Station

The Compressor Station will be a new facility constructed to serve the entire Project. PennEast has selected an approximately 40-acre site in Carbon County, Pennsylvania for the compressor station. A property of this size was chosen in order to provide adequate setbacks to reduce impacts on visual and aesthetic resources. The anticipated land requirement for construction and operation of the facility is approximately 9.9 acres, and existing land use on the proposed property is forest and woodland. The construction of the compressor station will result in 9.9 acres of permanent tree clearing for the construction and operation of the compression station.

8.2.2.2 Associated Facilities

Various associated above ground facilities including interconnects, launchers, receivers, and mainline block valves will also be constructed to support the pipeline. The construction of these associated facilities will result in approximately 23.6 acres of permanent disturbance. Of this area, approximately 20.5 acres is located within the 50-foot permanent ROW, and 3.2 acres is located outside of the permanent ROW. Open land constitutes the majority of acreage affected by the construction of the associated Project facilities with 11.4 acres of temporary disturbance. Approximately 6.0 acres of agricultural land, 8.1 acres of forest and woodland, 0.9 acres of residential land, and 1.3 acres of industrial/commercial land will also be temporarily impacted by the construction of the associated Project facilities.

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Table 8.2-7
Acreage Affected by Construction and Operation of the Above Ground Facilities

Associated Facility/ River Basin	Type	Nearest MP	State	County	Municipality	Existing Land Use (acreage affected)						Temporary Disturbed Acreage for Construction (acres)	Permanently Disturbed Acreage on ROW (acres)	Permanently Disturbed Acreage off ROW (acres)	Total Permanently Disturbed Area (acres)
						Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water				
PennEast Mainline Route Pipeline/ Upper Susquehanna	Wyoming Interconnect (Energy Transfer Partners, L.P.)	0.00	PA	Luzerne	Dallas Twp	0.0	1.7	0.0	0.0	0.0	0.0	0.0	1.2	0.5	1.7
	Springville Interconnect (Williams Partners LP)	0.23	PA	Luzerne	Dallas Twp	0.0	3.0	0.0	0.0	0.0	0.0	0.0	1.8	1.1	3.0
	Auburn (UGI Energy Services, LLC) and Leidy Interconnects (Transcontinental Gas Pipe Line Company, LLC)	4.56	PA	Luzerne	West Wyoming Boro	0.0	1.1	3.0	0.0	0.0	0.0	0.9	3.2	0.0	3.2
	Mainline Block Valve 1	8.20	PA	Luzerne	Plains Twp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
					Subtotal	0.1	5.7	3.0	0.0	0.0	0.0	0.9	6.2	1.6	7.9
PennEast Mainline Route Pipeline/ Upper Delaware	Compressor Station	26.68	PA	Carbon	Kidder Twp	0.0	9.9	0.0	0.0	0.0	0.0	0.0	9.9	0.0	9.9
	Mainline Block Valve 2	32.16	PA	Carbon	Kidder Twp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
	Mainline Block Valve 3	45.99	PA	Carbon	Towamensing Twp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
	Blue Mountain Interconnect (UGI Central Penn Gas, Inc.)	50.96	PA	Carbon	Lower Towamensing Twp	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
					Subtotal	0.1	10.1	0.0	0.0	0.0	0.0	0.1	10.0	0.1	10.1
PennEast Mainline Route Pipeline/ Upper Delaware	Mainline Block Valve 4	62.18	PA	Northampton	Upper Nazareth Twp	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1
	Hellertown Lateral Launcher and Mainline Launcher/ Receiver Site	71.50	PA	Northampton	Lower Saucon Twp	0.0	0.0	2.8	0.0	0.0	0.0	1.0	1.2	0.5	1.7
					Subtotal	0.0	0.0	2.8	0.1	0.0	0.0	1.0	1.3	0.5	1.8

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Associated Facility/ River Basin	Type	Nearest MP	State	County	Municipality	Existing Land Use (acreage affected)						Temporary Disturbed Acreage for Construction (acres)	Permanently Disturbed Acreage on ROW (acres)	Permanently Disturbed Acreage off ROW (acres)	Total Permanently Disturbed Area (acres)
						Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water				
PennEast Mainline Route Pipeline/ Upper Delaware	Mainline Block Valve 5/Gilbert Lateral Tap Site	78.77	NJ	Hunterdon	Holland Twp	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.3
	Mainline Block Valve 6	88.01	NJ	Hunterdon	Kingwood Twp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
PennEast Mainline Route Pipeline/ Upper Delaware	Mainline Block Valve 7/ Lambertville Lateral Launcher Site	100.47	NJ	Hunterdon	West Amwell Twp	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.3
					Subtotal	0.3	0.4	0.1	0.0	0.0	0.0	0.2	0.4	0.2	0.6
PennEast Mainline Route Pipeline/ Lower Hudson	Transco Interconnect (Transcontinental Gas Pipe Line Company, LLC)	113.85	NJ	Mercer	Hopewell Twp	0.0	0.0	1.4	0.0	0.0	0.0	0.0	1.4	0.0	1.4
					Subtotal	0.0	0.0	1.4	0.0	0.0	0.0	0.0	1.4	0.0	1.4
Hellertown 24-inch Lateral/ Upper Delaware	TCO (Columbia Gas Transmission, LLC) and UGI-LEH (UGI Utilities, Inc.) Interconnects	HL-2.14	PA	Northampton	Lower Saucon Twp	0.0	1.8	2.7	0.7	0.0	0.0	0.3	4.8	0.0	4.8
					Subtotal	0.0	1.8	2.7	0.7	0.0	0.0	0.3	4.8	0.0	4.8
Gilbert 12-inch Lateral/ Upper Delaware	Etown (Elizabethtown Gas) and Gilbert (NRG REMA LLC Gilbert Generating Station) Interconnects	GL-0.36	PA	Hunterdon	Holland Twp	0.0	0.0	1.6	0.1	0.5	0.0	0.3	1.2	0.7	1.9
Lambertville 36-inch Lateral/ Upper Delaware	Algonquin (Algonquin Gas Transmission, LLC) and TETCO (Texas Eastern Transmission, LP) Interconnects	LL-1.43	NJ	Hunterdon	West Amwell Twp	5.6	0.0	0.0	0.0	0.9	0.0	1.3	5.1	0.0	5.1
					Subtotal	5.6	0.0	1.6	0.1	1.3	0.0	1.6	6.3	0.7	7.0
					Project Total	6.0	17.9	11.4	0.9	1.3	0.0	4.1	30.3	3.2	33.5

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Associated Facility/ River Basin	Type	Nearest MP	State	County	Municipality	Existing Land Use (acreage affected)						Temporary Disturbed Acreage for Construction (acres)	Permanently Disturbed Acreage on ROW (acres)	Permanently Disturbed Acreage off ROW (acres)	Total Permanently Disturbed Area (acres)
						Agricultural	Forest/ Woodland	Open Land	Residential	Industrial/ Commercial	Open Water				

Notes
Agricultural Land - Active cropland, pasture, orchards, vineyards, and/or hay fields;
Forest and Woodland - Tracts of upland or wetland forest or woodland that would be removed for the construction ROW or extra work or staging areas;
Open Land - Non-forested lands, herbaceous and scrub-shrub wetlands, and maintained utility ROW;
Residential Land - Residential yards, residential subdivisions, and planned new residential developments;
Industrial or Commercial Land - Electric power or gas utility stations, manufacturing or industrial plants, landfills, mines, quarries, commercial or retail facilities, and roads;
Open Water – Water Crossings greater than 100 feet.
The totals shown in this table may not equal the sum of addends due to rounding.

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8.2.3 Facility Abandonment/Replacement

The proposed Project involves the construction of a new pipeline and associated facilities; there is no facility abandonment or replacement associated with the Project.

8.3 Residential, Commercial, Industrial, and Agricultural Areas

To the extent possible, PennEast has minimized impacts to residential, commercial, industrial, and agricultural areas by co-locating the Project facilities with existing utility ROWs. Appropriate easements will be acquired to construct, operate, and maintain the pipelines and associated facilities, and all landowners will be compensated accordingly for use of the land. Easement negotiations will include compensation for loss of use, loss of resources, and any damages that may occur to property during construction.

8.3.1 Planned Residential and Commercial Developments

Planned residential and commercial developments include any development on file with a local planning board or those included in a municipal master plan. PennEast has initiated consultation with local and county government planning officials to determine if any new residential or commercial development is scheduled to occur within 0.25 mile of the Project. A 0.25 mile radius was chosed based on FERC's Guidance Manual for Environmental Report Preperation. Additionally, information on planned developments was obtained by research of publicly-available websites, through public comments received by FERC, and through discussions with landowners during the survey process.

Following feedback from open houses held in November 2014 as well as FERC's scoping meetings held in February 2015 and numerous conversations with landowners, state and local agencies, and other various stakeholders, PennEast revised and refined various portions of the preferred alternative route in March, 2015, and again in July, 2015. To the greatest extent possible, PennEast has worked with planning officials and private developers to avoid and/or minimize potential direct impacts to residential and commercial areas identified during these discussions. An example of a route realignment to avoid future development includes shifting the route for approximately 2.5 miles to the north side of State Route 33 near Bethlehem, PA to accommodate future expansion plans of the St. Luke's Hospital complex. In total, PennEast has implemented 14 reroutes to date to avoid planned residential or commercial development and they are summarized in Table 8.3-1. Table 10.3-12 and 10.3-18 in Resource Report 10 provide a summary of all major and minor reroutes that have been adopted or considered to date. A detailed discussion of pipeline route alternatives and deviations is contained in Section 10.3 Pipeline Key Route Alternatives and Pipeline Deviations in Resource Report 10. An updated summary of all reroutes made to avoid planned residential and commercial developments will be provided in PennEast's application anticipated to be filed in September 2015 once all reroute considerations are fully documented.

A summary of planned residential and commercial development identified to occur within 0.25 mile of the Project including their approximate location by MP and their approximate distance to the proposed Project are provided in Table 8.3-2 below. Based on information received to date, six planned residential or commercial development projects have been identified within 0.25 mile of the proposed Project. PennEast will potentially cross two residential/commercial projects in Pennsylvania; however, only one of these projects appears to be active. These projects include the Susquehanna Estates Subdivision project and planned development on properties owned by Blue Ridge Real Estate.

The Susquehanna Estates Subdivision project in Jenkins Township, Luzerne County, PA was identified in comments submitted by landowner and developer Harry Salavantis to FERC. However,

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a conversation with Jenkins Township Manager in June, 2015 informed PennEast that the subdivision project is currently on hold (see Appendix G).

The current Project alignment crosses properties owned by Blue Ridge Real Estate Inc. between MPs 26.1 and 28.7 in Kidder Township, Carbon County, PA where development is proposed to occur (Blue Ridge Real Estate, 2015). The Blue Ridge Real Estate Properties project consists of resort residential communities in the Pocono Mountains, including properties such as the Jack Frost National Golf Course. PennEast is coordinating with Blue Ridge Real Estate to minimize impacts on planned development and to allow access to the natural gas in the PennEast pipeline through the Blue Mountain Interconnect at MP 50.9.

PennEast is coordinating with the affected landowners, developers, and planning officials to obtain details regarding development plans and to determine steps to minimize impacts on planned development. This may include minor route variations, timing restrictions, or increased traffic control in areas where development is planned to occur. Further conditions to satisfy landowner's requests will be included in individual landowner easement agreements. A summary of communications with planning officials is included in Appendix G.

In addition, the Pennsylvania Department of Transportation (PennDOT) and the New Jersey Department of Transportation (NJDOT) have numerous projects either proposed and/or currently under construction within 10 miles of the proposed Project (NJDOT, 2015; NJTPA, 2013; PADOT, 2013; PADOT, 2015). As discussed in Section 1.4, minor transportation projects were evaluated within 0.25 mile of the proposed Project and major transportation projects were evaluated within 10-miles of the proposed Project. The scope of the majority of these projects includes repairs or replacement of existing structures, such as bridges and roadways. The exact locations of many of these transportation projects are not known or are proposed to occur at multiple locations. Thus, it is difficult to determine the exact proximity of transportation projects to the proposed PennEast Project. Four transportation projects were identified, including:

- PennDOT's Interstate 81 project in Plains Township, Luzerne County, PA consisting of the replacement of four bridges, two over Jumper Road and two over Sunset Road. The project is located 0.1 to 1.7 miles to the southwest of MP 10.5 in the Upper Susquehanna watershed. This transportation project is currently under construction.

- PennDOT's US 209 Interchange Road project is located in Franklin and Towamensing Townships in Carbon County, PA within two of the same watersheds as the proposed PennEast Project (Pohopoco Creek and Aquashicola Creek). Highway restoration will consist of mill and fill of 8.4 miles of roadway and repair of various drainages. US 209 intersects the proposed PennEast Project at MP 44.4. This project is currently in the preliminary engineering phase with an estimated project state date of early 2016.

- PennDOT's Freemansburg Avenue Interchange project is located in Bethlehem Township in Northampton County, PA. The project will entail roadway reconstruction and bridge rehabilitation. The proposed project would be 0.1 mile from the proposed PennEast Project and within one of the same watershed (Lower Lehigh).

- NJDOT's Route 31 Expansion project is located through Raritan Township and Flemington Borough in Hunterdon County, NJ. The project involves construction of a new parkway system and expansion of street networking to Route 31 throughout Raritan Township and Flemington Borough. The transportation expansion project will be located 7.4 miles to the northwest of the proposed PennEast Project.

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The anticipated completion date of these projects is unknown; however, based on available information, each project could overlap temporally with the proposed PennEast Project. Details regarding major transportation projects located within 10 miles of the proposed PennEast Project are provided in Table 1.4-1 in Resource Report 1.

Additional information on planned development located outside of the 0.25 mile corridor of the Project and a discussion on cumulative impacts associated with the Project are located in Section 1.4 (Cumulative Impacts) of Resource Report 1.

Table 8.3-1
Summary of Pipeline Reroutes to Avoid Planned Residential and Commercial Developments

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
Penneast Mainline Route	11	60.50 – 61.15	Landowner Request	●Routed pipeline to minimize impacts to planned land development	Implemented	P-11
Penneast Mainline Route	16	61.55 – 62.23	Landowner Request	● Rec'd notice from township on development work ● Landowner has existing plans for two warehouses	Implemented	P-16
Penneast Mainline Route	19	66.09 – 68.91	Landowner Request	● Future hospital is planed near current route on prop. ● Requested using their property on east side of St. Hwy 33 ● Avoids new development on north side of Freemansburg Ave (800 housing units) ● Fixes route for US Hwy 78 HDD crossing	Implemented	P-19
Penneast Mainline Route	25A	64.83 – 65.14	Landowner Request	● Green Pond Subdivision presented plans ● Church to East has plans for expansion of parking log. New baseball diamond. ● Foreign lines and septic system are in the field	Implemented	P-25A
Penneast Mainline Route	29A	77.83 – 79.92	Landowner Request	●Landowner requested line be routed to south of property due to planned development	Implemented	P-29A
Penneast Mainline Route	35A	66.00 – 66.69	Landowner Request	●Hope Road Commercial Development has plans to run Hope Road through property and develop the area commercially. ●This route variant crosses the PennDOT yard.	Implemented	P-35A

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
Penneast Mainline Route	36	59.03 – 60.10	Landowner Request	●Mohawk Properties has plans for future quarry in this area	Implemented	P-36
Penneast Mainline Route	37	8.73 – 9.33	Landowner Request	●Line needs to be routed away from the quarry. Their phase 2 expansion will have that land.	Implemented	P-37
Penneast Mainline Route	42	59.85 – 61.07	Landowner Request	●Retention pond and sewer irrigation is located where the proposed route was planned	Implemented	P-42
Penneast Mainline Route	51	8.17-11.76	Landowner Request	●Concerns with future quarry areas and limit to expansion.	Implemented	P-51
Penneast Mainline Route	54	64.75-64.88	Landowner Request	●Development plans are in place for a new home along Green Pond Rd. ●Line placed south of tree line	Implemented	P-54
Penneast Mainline Route	56	52.67-53.10	Landowner Requst	●There are plans to construct a home on this property.	Implemented	P-56
PennEast Mainline Route	57	52.00-52.39	Landowner Requst	●There are plans to construct a home on this property.	Implemented	P-57
Penneast Mainline Route	64	71.80-72.00	Landowner Request	● Cultural Resources	Implemented	P-64

Table 8.3-2
Planned Residential and Commercial Development Identified Within 0.25 Miles of the Project

Project	Location (Address, Township, County, State)	Description	Permit Number	Closest Mile Post*	Approx. Distance to Project (Miles, Direction)
Susquehanna Estates Subdivision	Jenkins Township, Luzerne County, PA	Project on hold per conversation with Township Manager, Bob Jones. Project identified per FERC comment provided by landowner and developer Harry Salavantis	Not Available	Not Available	Not Available
Blue Ridge Real Estate Properties	Multiple Resort Residential and Commercial Properties, Carbon County, PA	Real estate company specializing in resort residential communities in the Pocono Mountains; properties include Jack Frost National Golf Course	Not Available	24.4- 30.5	<1 mile, West and East
Trio Fields Subdivision	Gremar Road in Lower Nazareth Township, Northampton County, PA	Three hundred and seventy-four lots residential subdivision. Per zoning officer, Laurie Sesse	Not Available	61.8– 64.7	0.1 miles, Southwest
Potential development of a park between William Penn and Freemansburg Avenue	Bethlehem Township, Northampton, PA	Per FERC comment provided by Barry Roth	Not Available	Not Available	Not Available
Huntington Knolls, LLC Housing Development	West of Route 519 and south of the Fox Hill development in Holland Township, Hunterdon County, NJ	Twenty nine buildings with age-restricted housing units as well as assisted-living units. Per FERC comment provided by Philip Giebel	Not Available	79.7-82.5	0.1 miles, North
Subdivision	Block 72, Lot 9, commonly known as 135 Blackwell Rd., Pennington, Hopewell Township, Mercer County, NJ	Seven lot subdivision. RJA Investment Fund VIII, LP is contract purchasers of the property. FERC comment provided by Jonathan Feinberg.	Not Available	113.3- to 113.8	0.1 miles, Northeast

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8.3.2 Existing Residences and Buildings

Construction workspace requirements identified during this phase of the Project are based on standard workspace requirements for a pipeline of this size. These workspaces are being reviewed and reduced where possible conflicts with nearby structures exist. Once the Project footprint is finalized, field surveys will be conducted at locations where structures are in close proximity of the construction work. All residential or commercial structures located within 50 feet of the edge of the construction right-of-way and extra work/staging areas will be identified. In cases where the workspace cannot reduce to maintain a 25-foot separation from the residence, a site-specific construction plan will be created.

Table 8.3-1 identifies the location by MP, description, and distance from the centerline and workspace of each structure located within 50 feet of the edge of the construction right-of-way identified to date. This table will continue to be updated as engineering progresses and construction workspaces are adjusted. Areas identified as High Occupancy Areas in the vicinity of the proposed Project and site-specific residential construction plans for any residences located within 25 feet of the construction work area will be developed and included in PennEast's application anticipated to be filed in September 2015.

Table 8.3-3
Existing Residences and Buildings within 50 feet of the Construction Workspace

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Pennsylvania							
Penneast Mainline Route Pipeline							
Upper Susquehanna							
Luzerne	Kingston Twp	shed	1.5	81+46	SW	0	0
Luzerne	Kingston Twp	shed	1.6	81+95	SW	4	0
Luzerne	Kingston Twp	shed	1.6	82+67	NE	92	21
Luzerne	Kingston Twp	building	1.6	83+59	SW	69	23
Luzerne	Kingston Twp	building	1.6	83+74	NE	112	35
Luzerne	Kingston Twp	shed	1.7	88+18	SW	96	38
Luzerne	Kingston Twp	shed	3.0	158+59	SW	60	5
Luzerne	Kingston Twp	building	3.1	161+94	NE	72	2
Luzerne	Kingston Twp	building	3.1	164+03	NE	49	4
Luzerne	Kingston Twp	building	3.2	170+23	NE	59	10
Luzerne	West Wyoming Boro	building	4.2	222+99	NE	108	3
Luzerne	West Wyoming Boro	building	5.4	285+40	SW	91	24
Luzerne	West Wyoming Boro	shed	5.4	286+12	SW	63	0
Luzerne	West Wyoming Boro	building	5.4	286+58	NE	94	10
Luzerne	West Wyoming Boro	building	5.5	289+17	NE	136	21
Luzerne	West Wyoming Boro	building	5.5	289+67	NE	147	47
Luzerne	West Wyoming Boro	openair	5.5	290+27	SW	45	0
Luzerne	West Wyoming Boro	building	6.0	315+06	NE	112	18
Luzerne	West Wyoming Boro	building	6.0	315+75	NE	158	42
Luzerne	Wyoming Boro	gathering	6.4	336+93	NE	64	0
Luzerne	Wyoming Boro	building	6.4	337+93	SW	146	3
Luzerne	Wyoming Boro	building	6.4	339+67	SW	163	6
Luzerne	Wyoming Boro	building	6.4	339+75	NE	131	16
Luzerne	Wyoming Boro	openair	6.5	341+49	NE	49	0

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Luzerne	Jenkins Twp	openair	7.3	384+50	SW	726	21
Luzerne	Jenkins Twp	shed	7.8	413+51	SE	106	37
Luzerne	Jenkins Twp	building	7.8	413+65	SE	73	9
Luzerne	Jenkins Twp	openair	7.9	414+79	SE	60	0
Luzerne	Jenkins Twp	openair	7.9	414+88	SE	82	0
Luzerne	Jenkins Twp	openair	7.9	415+24	SE	104	0
Luzerne	Jenkins Twp	openair	7.9	415+46	SE	76	0
Luzerne	Jenkins Twp	building	8.0	424+13	NW	76	38
Luzerne	Jenkins Twp	shed	8.0	424+87	NW	76	38
Luzerne	Jenkins Twp	shed	8.0	424+91	NW	7	0
Luzerne	Plains Twp	garage	8.1	427+25	NW	419	31
Luzerne	Plains Twp	building	8.1	427+25	NW	492	31
Luzerne	Plains Twp	storage	8.1	427+64	NW	366	38
Luzerne	Plains Twp	shed	8.1	428+22	NW	150	10
Luzerne	Plains Twp	building	8.1	428+27	SE	142	27
Luzerne	Plains Twp	shed	8.1	428+28	NW	82	0
Luzerne	Plains Twp	building	8.1	429+17	NW	149	47
Luzerne	Plains Twp	building	8.2	430+54	NW	104	26
Luzerne	Plains Twp	building	8.2	430+64	SE	47	0
Luzerne	Plains Twp	garage	8.2	431+01	NW	35	0
Luzerne	Plains Twp	building	8.2	433+53	NE	124	13
Luzerne	Plains Twp	shed	8.2	433+74	NE	72	5
Luzerne	Plains Twp	shed	8.3	435+92	NE	107	4
Luzerne	Plains Twp	shed	8.3	437+12	NE	110	5
Luzerne	Plains Twp	shed	8.3	437+21	NE	114	9
Luzerne	Plains Twp	shed	8.3	438+54	NE	120	13
Luzerne	Plains Twp	building	8.3	439+85	SW	62	0
Luzerne	Plains Twp	shed	8.3	440+22	SW	106	31
Luzerne	Plains Twp	shed	8.4	441+24	NE	48	12

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Luzerne	Plains Twp	shed	8.4	443+23	NE	60	0
Luzerne	Plains Twp	shed	8.4	445+16	NE	57	21
Luzerne	Plains Twp	shed	8.6	452+26	NE	50	13
Luzerne	Plains Twp	garage	8.6	452+65	NE	73	37
Luzerne	Plains Twp	shed	8.6	454+00	NE	80	44
Luzerne	Plains Twp	building	8.7	460+92	SW	2992	46
Luzerne	Plains Twp	shed	8.7	460+92	SW	2999	16
Luzerne	Plains Twp	shed	8.7	460+92	SW	2879	30
Luzerne	Plains Twp	shed	8.7	460+92	SW	2931	0
Luzerne	Plains Twp	shed	8.7	460+92	SW	2953	0
Luzerne	Plains Twp	shed	8.7	460+92	SW	2973	0
Luzerne	Plains Twp	shed	8.9	467+89	SW	34	2
Luzerne	Plains Twp	other	8.9	471+09	SW	925	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	497	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	478	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	490	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	954	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	934	0
Luzerne	Plains Twp	storage	8.9	471+09	SW	919	0
Luzerne	Plains Twp	shed	8.9	471+09	SW	992	0
Luzerne	Plains Twp	other	8.9	471+09	SW	959	0
Luzerne	Plains Twp	shed	8.9	471+26	SW	513	0
Luzerne	Plains Twp	building	8.9	471+49	SW	943	0
Luzerne	Plains Twp	other	8.9	471+49	SW	881	0
Luzerne	Plains Twp	shed	9.0	474+16	SE	622	0
Luzerne	Plains Twp	building	9.0	474+39	SE	618	0
Luzerne	Plains Twp	building	9.0	475+39	SE	634	0
Luzerne	Jenkins Twp	building	9.1	481+37	NE	72	36
Luzerne	Laflin Boro	building	9.3	488+43	NE	604	48

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Luzerne	Laflin Boro	other	9.3	492+40	SE	51	0
Luzerne	Laflin Boro	other	9.3	492+88	SE	49	0
Luzerne	Laflin Boro	shed	9.4	494+58	SE	79	0
Luzerne	Laflin Boro	storage	9.4	496+16	SW	51	0
Luzerne	Laflin Boro	storage	9.4	496+27	SW	35	0
Luzerne	Laflin Boro	shed	9.5	498+99	NE	107	9
Luzerne	Laflin Boro	openair	9.5	499+70	NE	303	5
Luzerne	Laflin Boro	garage	9.6	505+32	NE	135	48
Luzerne	Jenkins Twp	building	10.5	553+36	SW	770	44
Luzerne	Plains Twp	shed	10.6	559+35	SW	1123	34
Luzerne	Plains Twp	shed	10.6	559+94	SW	1064	3
Luzerne	Jenkins Twp	shed	10.6	560+17	SW	891	38
Luzerne	Plains Twp	building	10.6	560+22	SW	986	33
Luzerne	Plains Twp	garage	10.6	560+39	SW	1180	13
Luzerne	Plains Twp	openair	11.9	626+72	NW	55	0
Luzerne	Plains Twp	shed	11.9	627+56	NW	31	0
Luzerne	Plains Twp	building	11.9	629+59	NE	105	20
Luzerne	Plains Twp	shed	11.9	629+86	NE	61	4
Luzerne	Plains Twp	building	11.9	630+34	SE	103	18
Luzerne	Plains Twp	shed	12.0	631+06	SW	36	0
Luzerne	Plains Twp	shed	12.0	631+71	NE	42	7
Luzerne	Plains Twp	shed	12.0	633+91	SW	18	0
Luzerne	Bear Creek Twp	building	13.0	685+59	NE	498	21
Luzerne	Bear Creek Twp	shed	13.0	686+23	NE	141	25
Luzerne	Bear Creek Twp	building	13.0	686+45	NE	330	15
Luzerne	Bear Creek Twp	building	13.0	686+72	NE	64	0
Luzerne	Bear Creek Twp	building	13.1	691+88	SW	164	9
Luzerne	Bear Creek Twp	shed	13.1	692+72	SW	114	34
Luzerne	Bear Creek Twp	openair	13.1	693+79	SW	237	49

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Upper Delaware							
Luzerne	Bear Creek Twp	other	14.4	760+91	NE	189	26
Luzerne	Bear Creek Twp	other	14.5	765+47	NE	836	31
Luzerne	Bear Creek Twp	other	14.6	769+86	NE	1518	32
Luzerne	Bear Creek Twp	building	17.8	938+22	SW	135	49
Luzerne	Bear Creek Twp	openair	17.8	938+33	SW	123	22
Luzerne	Bear Creek Twp	shed	19.4	1026+83	NE	112	47
Carbon	Kidder Twp	building	26.2	1382+17	SW	68	8
Carbon	Kidder Twp	building	26.2	1382+69	SW	68	8
Carbon	Kidder Twp	openair	31.5	1665+57	SW	81	46
Carbon	Kidder Twp	building	31.6	1668+05	NE	57	9
Carbon	Kidder Twp	building	31.6	1670+01	NE	100	35
Carbon	Kidder Twp	shed	31.7	1674+86	SW	12	0
Carbon	Kidder Twp	shed	31.7	1675+58	NE	28	0
Carbon	Kidder Twp	shed	31.7	1676+04	NE	45	0
Carbon	Kidder Twp	shed	31.7	1676+26	SW	0	0
Carbon	Kidder Twp	shed	31.8	1676+47	NE	49	0
Carbon	Kidder Twp	shed	31.8	1676+73	NE	0	0
Carbon	Kidder Twp	openair	31.8	1676+74	NE	90	25
Carbon	Kidder Twp	shed	31.8	1676+78	NE	81	16
Carbon	Kidder Twp	building	31.8	1677+16	NE	113	0
Carbon	Kidder Twp	building	31.8	1677+26	SW	165	0
Carbon	Kidder Twp	shed	31.8	1678+64	SW	0	0
Carbon	Kidder Twp	shed	31.8	1680+44	NE	22	0
Carbon	Penn Forest Twp	building	34.7	1834+64	SE	16	1
Carbon	Penn Forest Twp	shed	35.1	1853+54	SE	80	15
Carbon	Penn Forest Twp	shed	35.2	1856+15	NW	53	18
Carbon	Penn Forest Twp	building	35.3	1861+74	NW	78	43
Carbon	Penn Forest Twp	shed	35.3	1862+20	NW	42	7

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Carbon	Penn Forest Twp	openair	35.3	1862+44	NW	43	8
Carbon	Penn Forest Twp	building	35.7	1886+97	NW	92	40
Carbon	Penn Forest Twp	garage	37.7	1992+83	NE	115	30
Carbon	Towamensing Twp	building	42.8	2259+31	NE	111	0
Carbon	Towamensing Twp	building	44.5	2347+80	NE	944	40
Carbon	Towamensing Twp	shed	44.5	2348+00	NE	900	36
Carbon	Towamensing Twp	garage	44.5	2349+22	NE	706	29
Carbon	Towamensing Twp	shed	44.9	2371+19	NE	152	37
Carbon	Towamensing Twp	building	45.0	2374+77	NE	116	1
Carbon	Towamensing Twp	building	45.0	2374+85	NE	112	0
Carbon	Towamensing Twp	shed	45.0	2374+87	NE	90	0
Carbon	Towamensing Twp	shed	45.0	2375+07	NE	101	0
Carbon	Towamensing Twp	shed	45.0	2377+68	NW	42	7
Carbon	Towamensing Twp	building	45.6	2406+95	NE	135	20
Carbon	Towamensing Twp	building	45.7	2414+78	NE	44	0
Carbon	Towamensing Twp	building	46.5	2456+47	NE	254	25
Carbon	Towamensing Twp	shed	46.5	2457+80	NE	121	4
Carbon	Towamensing Twp	shed	46.6	2459+51	SW	45	10
Carbon	Lower Towamensing Twp	shed	48.9	2579+81	NE	1430	11
Carbon	Lower Towamensing Twp	shed	48.9	2580+70	NE	1340	17
Carbon	Lower Towamensing Twp	shed	49.4	2608+24	SE	44	0
Carbon	Lower Towamensing Twp	building	49.4	2608+25	SE	57	0
Carbon	Lower Towamensing Twp	building	49.4	2608+41	SE	58	0
Carbon	Lower Towamensing Twp	openair	49.4	2608+45	SE	44	0
Carbon	Lower Towamensing Twp	openair	49.4	2608+53	NW	3	0
Carbon	Lower Towamensing Twp	openair	49.4	2608+64	SE	57	0
Northampton	Moore Twp	shed	54.5	2879+14	NE	62	0
Northampton	Moore Twp	shed	54.5	2879+22	NE	65	0
Northampton	Moore Twp	openair	54.5	2879+75	NE	35	0

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Northampton	Moore Twp	building	54.5	2879+84	NE	114	43
Northampton	Moore Twp	storage	54.5	2879+95	NE	102	22
Northampton	Moore Twp	storage	54.5	2880+15	NE	125	35
Northampton	Moore Twp	shed	54.7	2890+45	NE	120	5
Northampton	Moore Twp	building	54.8	2893+35	SW	72	9
Northampton	Moore Twp	building	54.8	2893+47	NE	52	8
Northampton	Moore Twp	shed	54.8	2893+66	NE	26	0
Northampton	Moore Twp	garage	54.9	2896+19	SW	100	15
Northampton	Moore Twp	shed	54.9	2896+40	SW	98	14
Northampton	Moore Twp	building	55.3	2917+73	NE	159	44
Northampton	Moore Twp	openair	55.9	2950+36	NE	142	27
Northampton	Moore Twp	shed	55.9	2953+47	NE	144	0
Northampton	Moore Twp	building	57.6	3040+11	NE	75	10
Northampton	Moore Twp	openair	57.6	3042+63	NE	116	26
Northampton	Moore Twp	building	57.6	3042+72	NE	136	46
Northampton	Moore Twp	shed	57.7	3048+89	NE	121	6
Northampton	Moore Twp	building	57.8	3049+76	NE	144	29
Northampton	Moore Twp	building	58.1	3069+76	NE	131	16
Northampton	Moore Twp	shed	59.2	3123+44	SW	134	49
Northampton	Moore Twp	shed	59.2	3124+44	SW	108	23
Northampton	Moore Twp	openair	59.5	3141+60	SW	51	16
Northampton	Moore Twp	building	60.1	3174+58	NE	132	17
Northampton	East Allen Twp	shed	60.2	3178+17	SW	230	15
Northampton	Moore Twp	shed	60.2	3178+20	SW	220	14
Northampton	East Allen Twp	shed	60.2	3178+82	SW	248	17
Northampton	East Allen Twp	building	60.2	3179+89	SW	353	45
Northampton	Bath Boro	storage	60.5	3193+39	SW	877	45
Northampton	Bath Boro	storage	60.5	3193+50	SW	873	39
Northampton	Bath Boro	storage	60.5	3193+63	SW	872	34

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Northampton	Bath Boro	shed	60.5	3193+68	SW	874	12
Northampton	Bath Boro	storage	60.5	3193+73	SW	871	29
Northampton	Bath Boro	storage	60.5	3193+83	SW	869	23
Northampton	Bath Boro	shed	60.5	3193+87	SW	1367	42
Northampton	Bath Boro	storage	60.5	3193+94	SW	865	13
Northampton	Bath Boro	storage	60.5	3194+07	SW	863	5
Northampton	Bath Boro	building	60.5	3194+14	SW	1179	25
Northampton	Bath Boro	shed	60.5	3194+27	SW	980	44
Northampton	Bath Boro	storage	60.5	3195+68	SW	918	16
Northampton	Bath Boro	storage	60.5	3195+80	SW	883	39
Northampton	Bath Boro	storage	60.5	3195+97	SW	941	19
Northampton	East Allen Twp	building	60.6	3199+76	NE	159	44
Northampton	East Allen Twp	shed	60.6	3200+86	NE	67	0
Northampton	Upper Nazareth Twp	shed	61.4	3242+56	NE	159	44
Northampton	Upper Nazareth Twp	openair	61.4	3243+17	SW	26	0
Northampton	Upper Nazareth Twp	openair	61.4	3243+35	NE	5	0
Northampton	Upper Nazareth Twp	shed	62.2	3285+14	NE	45	0
Northampton	Upper Nazareth Twp	building	62.2	3285+61	NE	41	6
Northampton	Upper Nazareth Twp	shed	62.2	3286+29	NE	16	0
Northampton	Upper Nazareth Twp	building	62.3	3289+81	SW	66	5
Northampton	Upper Nazareth Twp	garage	62.5	3297+97	NE	200	26
Northampton	Upper Nazareth Twp	shed	62.5	3298+04	NE	188	26
Northampton	Upper Nazareth Twp	shed	62.5	3298+33	NE	118	16
Northampton	Upper Nazareth Twp	shed	62.5	3300+73	SW	1031	50
Northampton	Upper Nazareth Twp	building	62.5	3302+60	SW	1016	38
Northampton	Upper Nazareth Twp	openair	62.7	3309+39	NE	104	12
Northampton	Upper Nazareth Twp	shed	62.7	3309+84	NE	131	16
Northampton	Upper Nazareth Twp	building	62.7	3312+09	NE	145	46
Northampton	Upper Nazareth Twp	building	62.7	3312+68	SW	889	31

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Northampton	Upper Nazareth Twp	storage	62.7	3313+02	SW	9	0
Northampton	Upper Nazareth Twp	building	62.8	3313+28	NE	35	0
Northampton	Upper Nazareth Twp	building	62.8	3315+09	SW	140	41
Northampton	Upper Nazareth Twp	shed	63.5	3353+74	SW	676	29
Northampton	Upper Nazareth Twp	building	63.7	3364+20	NE	123	8
Northampton	Upper Nazareth Twp	building	63.7	3364+52	SW	92	7
Northampton	Upper Nazareth Twp	shed	63.7	3364+76	SW	14	0
Northampton	Upper Nazareth Twp	shed	63.7	3365+52	NE	160	45
Northampton	Upper Nazareth Twp	shed	63.9	3373+61	NE	97	0
Northampton	Upper Nazareth Twp	building	63.9	3375+98	NE	128	13
Northampton	Upper Nazareth Twp	building	64.0	3377+36	NE	619	42
Northampton	Lower Nazareth Twp	shed	64.0	3379+34	NE	118	11
Northampton	Lower Nazareth Twp	shed	64.0	3380+33	NE	93	28
Northampton	Lower Nazareth Twp	building	64.2	3387+64	SW	703	37
Northampton	Lower Nazareth Twp	building	64.2	3387+64	SW	642	40
Northampton	Lower Nazareth Twp	building	64.2	3387+64	SW	765	31
Northampton	Lower Nazareth Twp	building	64.2	3387+64	SW	488	41
Northampton	Lower Nazareth Twp	building	64.2	3387+76	SW	571	36
Northampton	Lower Nazareth Twp	building	64.2	3387+98	SW	503	29
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	801	34
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	776	34
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	747	31
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	721	32
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	375	37
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	344	31
Northampton	Lower Nazareth Twp	building	64.2	3388+04	SW	599	25
Northampton	Lower Nazareth Twp	shed	64.2	3392+12	NE	135	45
Northampton	Lower Nazareth Twp	garage	64.2	3392+40	NE	91	1
Northampton	Lower Nazareth Twp	building	64.3	3393+05	NE	103	13

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Northampton	Lower Nazareth Twp	building	65.0	3433+21	SW	240	26
Northampton	Lower Nazareth Twp	openair	65.1	3434+65	SW	53	0
Northampton	Lower Nazareth Twp	shed	65.1	3435+48	SW	94	9
Northampton	Lower Nazareth Twp	building	65.1	3436+35	SW	116	31
Northampton	Lower Nazareth Twp	building	65.1	3437+45	NE	74	9
Northampton	Lower Nazareth Twp	shed	67.0	3535+85	SW	1166	20
Northampton	Lower Nazareth Twp	building	67.0	3535+86	SW	1185	3
Northampton	Lower Nazareth Twp	building	67.0	3536+14	SW	1081	10
Northampton	Bethlehem Twp	building	67.0	3535+99	SW	1205	0
Northampton	Bethlehem Twp	building	67.0	3539+65	SW	505	30
Northampton	Bethlehem Twp	gathering	67.9	3586+31	NE	146	0
Northampton	Bethlehem Twp	openair	68.7	3625+70	NE	68	33
Northampton	Bethlehem Twp	garage	68.7	3629+17	NE	80	45
Northampton	Bethlehem Twp	shed	68.8	3632+55	NE	68	6
Northampton	Bethlehem Twp	building	68.8	3633+30	NE	128	38
Northampton	Bethlehem Twp	shed	68.8	3633+89	NE	79	0
Northampton	Bethlehem Twp	shed	68.8	3634+69	NE	119	24
Northampton	Bethlehem Twp	building	68.9	3635+78	NE	120	45
Northampton	Bethlehem Twp	building	68.9	3637+03	NE	100	20
Northampton	Bethlehem Twp	shed	68.9	3637+17	SW	67	2
Northampton	Bethlehem Twp	openair	68.9	3638+47	SW	75	10
Northampton	Bethlehem Twp	building	68.9	3639+22	SW	80	6
Northampton	Bethlehem Twp	building	68.9	3639+42	NE	86	14
Northampton	Bethlehem Twp	building	69.0	3641+93	SE	20	0
Northampton	Bethlehem Twp	shed	69.0	3645+30	NW	18	0
Northampton	Bethlehem Twp	shed	69.4	3665+78	NE	61	0
Northampton	Bethlehem Twp	storage	69.4	3666+52	NE	94	0
Northampton	Bethlehem Twp	storage	69.4	3666+66	NE	94	0
Northampton	Bethlehem Twp	storage	69.5	3667+11	NE	73	0

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Northampton	Bethlehem Twp	building	69.5	3669+97	NE	90	0
Northampton	Bethlehem Twp	building	69.5	3670+31	SW	32	5
Northampton	Bethlehem Twp	shed	69.5	3671+51	NE	113	0
Northampton	Bethlehem Twp	building	69.5	3672+16	NE	93	3
Northampton	Bethlehem Twp	building	69.6	3672+68	SW	22	0
Northampton	Bethlehem Twp	building	69.7	3679+22	NE	59	0
Northampton	Bethlehem Twp	building	69.9	3688+15	NE	87	24
Northampton	Bethlehem Twp	shed	70.0	3696+34	NE	1012	0
Northampton	Bethlehem Twp	building	70.3	3709+58	SW	537	29
Northampton	Lower Saucon Twp	shed	71.8	3790+66	SW	50	25
Northampton	Lower Saucon Twp	openair	71.9	3796+72	NE	185	30
Northampton	Lower Saucon Twp	building	71.9	3796+93	NE	198	43
Northampton	Lower Saucon Twp	shed	71.9	3797+73	SW	242	5
Northampton	Lower Saucon Twp	building	71.9	3798+12	SW	327	2
Northampton	Lower Saucon Twp	shed	72.0	3799+41	SW	119	39
Northampton	Williams Twp	openair	72.8	3844+91	NE	165	42
Northampton	Williams Twp	garage	72.9	3847+95	SW	98	38
Northampton	Williams Twp	shed	72.9	3851+40	SW	117	31
Northampton	Williams Twp	shed	73.2	3864+73	NE	58	0
Northampton	Williams Twp	building	73.2	3866+44	NE	86	21
Northampton	Williams Twp	shed	73.6	3884+72	NE	82	17
Bucks	Durham Twp	building	75.8	4003+50	NE	64	0
Bucks	Durham Twp	storage	75.8	4003+73	NE	93	28
Bucks	Durham Twp	storage	75.8	4003+83	NE	81	16
Bucks	Durham Twp	building	76.2	4020+98	SW	1642	45
Bucks	Durham Twp	openair	76.2	4022+00	SW	2021	10
Bucks	Durham Twp	shed	76.2	4022+17	SW	1957	17
Bucks	Durham Twp	building	76.2	4022+20	SW	2050	1
Bucks	Durham Twp	building	76.2	4022+45	SW	2200	27

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Bucks	Durham Twp	shed	77.3	4080+87	SW	691	1
Bucks	Durham Twp	shed	77.3	4081+01	SW	716	8
Bucks	Durham Twp	shed	77.3	4081+05	SW	773	42
Bucks	Durham Twp	shed	77.3	4081+11	SW	663	0
Bucks	Durham Twp	building	77.3	4081+29	SW	765	22
Hellerton 24-Inch Lateral							
Upper Delaware							
Northampton	Lower Saucon Twp	shed	0.1	05+41	NW	132	47
Northampton	Lower Saucon Twp	shed	0.1	06+23	NW	131	46
Northampton	Lower Saucon Twp	building	0.7	37+74	SE	85	5
Northampton	Lower Saucon Twp	shed	0.7	39+27	NW	81	21
Northampton	Lower Saucon Twp	shed	0.8	40+75	NW	61	1
Northampton	Lower Saucon Twp	building	0.8	40+76	NW	63	3
Northampton	Lower Saucon Twp	building	0.8	40+90	SE	125	45
Northampton	Lower Saucon Twp	shed	0.8	41+99	NW	23	0
Northampton	Lower Saucon Twp	shed	0.8	42+62	SE	110	30
Northampton	Lower Saucon Twp	shed	0.8	44+26	SE	52	22
Northampton	Lower Saucon Twp	shed	0.8	44+56	SE	51	21
Northampton	Lower Saucon Twp	shed	0.9	45+48	SE	53	23
Northampton	Lower Saucon Twp	shed	1.0	50+94	SE	78	48
Northampton	Lower Saucon Twp	shed	1.0	52+11	SE	71	41
Northampton	Lower Saucon Twp	storage	2.1	112+93	SW	61	9
Northampton	Lower Saucon Twp	storage	2.1	112+93	SW	54	9
Northampton	Lower Saucon Twp	shed	2.1	112+93	SW	119	16
Northampton	Lower Saucon Twp	shed	2.1	112+93	SW	192	47
Northampton	Lower Saucon Twp	storage	2.1	112+93	SW	64	23
New Jersey							
Penneast Mainline Route Pipeline							
Upper Delaware							

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Hunterdon	Holland Twp	building	77.7	4103+87	SW	200	26
Hunterdon	Holland Twp	shed	77.7	4104+99	SW	82	3
Hunterdon	Holland Twp	shed	78.1	4123+36	SW	44	9
Hunterdon	Holland Twp	shed	78.1	4123+85	SW	43	8
Hunterdon	Holland Twp	shed	78.1	4124+60	SW	104	19
Hunterdon	Holland Twp	building	78.1	4125+69	NE	118	3
Hunterdon	Holland Twp	shed	78.8	4161+21	NE	103	38
Hunterdon	Holland Twp	shed	79.2	4184+09	NW	151	36
Hunterdon	Holland Twp	openair	80.0	4226+05	SE	67	32
Hunterdon	Holland Twp	shed	81.6	4307+69	SE	93	33
Hunterdon	Holland Twp	building	81.9	4326+88	NW	984	36
Hunterdon	Holland Twp	garage	84.0	4437+02	SW	84	49
Hunterdon	Holland Twp	shed	84.1	4440+10	SW	342	17
Hunterdon	Holland Twp	openair	85.3	4505+63	NE	47	0
Hunterdon	Alexandria Twp	building	85.5	4514+51	SW	94	47
Hunterdon	Alexandria Twp	shed	85.5	4515+17	NE	9	0
Hunterdon	Alexandria Twp	openair	85.5	4515+23	SW	55	20
Hunterdon	Alexandria Twp	building	85.8	4528+78	SW	599	4
Hunterdon	Alexandria Twp	garage	85.8	4530+04	SW	562	0
Hunterdon	Alexandria Twp	shed	85.8	4530+31	SW	572	0
Hunterdon	Alexandria Twp	shed	85.8	4530+36	SW	617	7
Hunterdon	Alexandria Twp	shed	85.8	4530+58	SW	653	49
Hunterdon	Alexandria Twp	shed	85.8	4530+72	SW	502	0
Hunterdon	Alexandria Twp	storage	85.8	4530+94	SW	576	3
Hunterdon	Alexandria Twp	building	85.8	4531+16	SW	462	0
Hunterdon	Alexandria Twp	storage	85.8	4531+24	SW	568	14
Hunterdon	Alexandria Twp	storage	85.8	4531+52	SW	561	24
Hunterdon	Alexandria Twp	storage	85.8	4531+75	SW	533	15
Hunterdon	Alexandria Twp	building	86.2	4552+03	SW	379	27

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Hunterdon	Alexandria Twp	building	86.3	4556+82	SW	2208	35
Hunterdon	Alexandria Twp	shed	87.1	4598+91	NE	69	4
Hunterdon	Alexandria Twp	shed	87.1	4600+67	NE	22	0
Hunterdon	Alexandria Twp	shed	87.1	4601+26	NE	109	44
Hunterdon	Alexandria Twp	shed	87.2	4601+52	NE	0	0
Hunterdon	Alexandria Twp	garage	87.2	4602+26	NE	107	42
Hunterdon	Alexandria Twp	openair	87.3	4609+31	NE	131	41
Hunterdon	Kingwood Twp	building	89.3	4717+49	SW	493	49
Hunterdon	Kingwood Twp	building	90.6	4784+71	NE	76	17
Hunterdon	Kingwood Twp	building	90.6	4785+49	SW	80	19
Hunterdon	Kingwood Twp	building	90.7	4788+48	NE	94	20
Hunterdon	Kingwood Twp	openair	90.7	4790+00	NE	67	22
Hunterdon	Kingwood Twp	shed	90.8	4791+79	SW	60	25
Hunterdon	Kingwood Twp	building	91.8	4848+24	NE	93	32
Hunterdon	Kingwood Twp	building	92.0	4857+34	SW	252	47
Hunterdon	Kingwood Twp	shed	93.5	4937+19	NE	107	42
Hunterdon	Kingwood Twp	shed	93.5	4937+74	NE	52	14
Hunterdon	Kingwood Twp	shed	93.5	4938+81	NE	74	9
Hunterdon	Kingwood Twp	openair	93.5	4939+37	SW	37	2
Hunterdon	Kingwood Twp	building	93.6	4939+73	NE	97	32
Hunterdon	Kingwood Twp	garage	93.8	4952+05	SW	2068	0
Hunterdon	Kingwood Twp	shed	93.8	4952+78	SW	1942	0
Hunterdon	Kingwood Twp	building	93.8	4953+00	SW	1968	0
Hunterdon	Kingwood Twp	garage	93.8	4953+77	SW	1859	0
Hunterdon	Kingwood Twp	building	93.8	4953+91	SW	1774	0
Hunterdon	Kingwood Twp	shed	93.8	4953+94	SW	1662	0
Hunterdon	Kingwood Twp	shed	93.8	4954+07	SW	1764	0
Hunterdon	Delaware Twp	shed	94.6	4994+48	SW	0	0
Hunterdon	Delaware Twp	building	94.6	4995+49	NE	108	14

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Hunterdon	Delaware Twp	building	95.2	5026+25	NE	63	13
Hunterdon	Delaware Twp	building	95.6	5048+05	NE	114	49
Hunterdon	Delaware Twp	shed	95.6	5049+01	NE	96	31
Hunterdon	Delaware Twp	shed	95.6	5049+43	NE	67	2
Hunterdon	Delaware Twp	building	96.7	5103+59	NE	164	49
Hunterdon	Delaware Twp	building	96.8	5109+36	NE	59	21
Hunterdon	Delaware Twp	building	96.8	5111+08	NE	49	12
Hunterdon	Delaware Twp	shed	96.8	5111+27	NE	78	41
Hunterdon	Delaware Twp	shed	96.8	5111+46	NE	91	38
Hunterdon	Delaware Twp	shed	97.3	5135+67	NE	51	0
Hunterdon	Delaware Twp	shed	97.3	5137+03	NE	76	11
Hunterdon	Delaware Twp	shed	97.3	5137+28	NE	65	5
Hunterdon	Delaware Twp	building	97.6	5154+49	NE	141	26
Hunterdon	Delaware Twp	building	97.7	5156+87	NE	87	17
Hunterdon	Delaware Twp	building	99.5	5252+22	SW	727	30
Hunterdon	West Amwell Twp	shed	100.2	5288+49	SW	93	33
Hunterdon	West Amwell Twp	shed	100.2	5289+58	NE	60	0
Hunterdon	West Amwell Twp	openair	101.1	5335+66	SW	153	38
Hunterdon	West Amwell Twp	building	101.1	5336+11	SW	140	25
Hunterdon	West Amwell Twp	shed	101.1	5336+17	SW	121	6
Hunterdon	West Amwell Twp	shed	101.1	5336+40	SW	122	7
Hunterdon	West Amwell Twp	storage	101.1	5336+45	SW	106	0
Hunterdon	West Amwell Twp	building	101.1	5337+63	NE	247	38
Hunterdon	West Amwell Twp	building	101.1	5340+37	NE	248	15
Hunterdon	West Amwell Twp	building	102.7	5422+93	SW	122	17
Hunterdon	West Amwell Twp	shed	102.9	5433+09	NE	72	42
Hunterdon	West Amwell Twp	building	103.5	5463+70	SW	104	19
Mercer	Hopewell Twp	shed	107.0	5650+89	SW	15	0
Mercer	Hopewell Twp	building	109.1	5760+31	SW	966	17

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Mercer	Hopewell Twp	building	109.1	5761+21	SW	743	0
Mercer	Hopewell Twp	shed	109.1	5761+88	SW	952	0
Mercer	Hopewell Twp	shed	109.1	5761+96	SW	938	0
Mercer	Hopewell Twp	building	109.3	5770+56	SW	588	0
Mercer	Hopewell Twp	building	109.3	5772+06	SW	954	31
Mercer	Hopewell Twp	building	109.5	5781+75	SW	46	1
Mercer	Hopewell Twp	shed	109.6	5788+54	NE	401	37
Mercer	Hopewell Twp	shed	109.6	5789+00	NE	478	32
Mercer	Hopewell Twp	openair	110.4	5829+35	SW	62	37
Mercer	Hopewell Twp	building	110.4	5829+94	SW	176	27
Mercer	Hopewell Twp	storage	110.4	5830+39	SW	268	39
Mercer	Hopewell Twp	building	110.4	5831+67	SW	43	18
Mercer	Hopewell Twp	gathering	110.5	5834+16	NE	185	46
Mercer	Hopewell Twp	building	110.5	5836+24	SW	64	21
Mercer	Hopewell Twp	building	111.7	5900+27	NE	217	41
Lower Hudson							
Mercer	Hopewell Twp	shed	111.8	5902+24	NE	184	13
Mercer	Hopewell Twp	building	111.8	5903+06	SW	41	6
Mercer	Hopewell Twp	shed	111.8	5903+22	NE	149	35
Mercer	Hopewell Twp	garage	111.8	5903+28	NE	63	0
Mercer	Hopewell Twp	building	111.8	5903+73	NE	66	1
Mercer	Hopewell Twp	building	111.9	5905+89	NE	65	0
Mercer	Hopewell Twp	building	111.9	5906+71	SW	66	16
Mercer	Hopewell Twp	shed	111.9	5907+49	SW	112	27
Mercer	Hopewell Twp	shed	111.9	5908+28	NE	85	17
Mercer	Hopewell Twp	shed	111.9	5909+07	NE	89	24
Mercer	Hopewell Twp	openair	111.9	5909+56	NE	109	44
Mercer	Hopewell Twp	shed	112.5	5938+33	SE	101	11
Mercer	Hopewell Twp	shed	112.6	5943+58	NW	79	28

State/Facility/ River Basin/County	Municipality	Description	Approximate Mile Post	Station	Direction	Distance from Centerline (ft)	Distance from Workspace (ft)
Mercer	Hopewell Twp	shed	112.7	5953+14	NW	170	12
Mercer	Hopewell Twp	shed	112.9	5959+80	SW	144	30
Mercer	Hopewell Twp	building	113.2	5976+58	SE	93	33
Mercer	Hopewell Twp	building	113.8	6008+78	SW	78	18
Mercer	Hopewell Twp	gathering	113.8	6011+10	SW	403	16
Gilbert Lateral							
Upper Delaware							
Hunterdon	Holland Twp	gathering	0.4	19+01	NW	170	1
Lambertville Lateral							
Upper Delaware							
Hunterdon	West Amwell Twp	shed	0.2	11+40	NW	39	4
Hunterdon	West Amwell Twp	building	1.4	75+76	SE	1091	44

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8.3.3 Existing Residential, Commercial, and Industrial Area Effects and Mitigation

PennEast land agents and contractors will coordinate with property owners throughout the construction process to minimize disruption and to maintain access to residences, commercial establishments, industrial areas and other buildings. Prior to construction, PennEast will provide landowners with as much notice as possible, but not less than 24 hours prior to activities unless otherwise specified in specific landowner easement agreements. The names and addresses of all landowners crossed by the Projects have been filed in a confidential document with the FERC (see Appendix F).

To address traffic issues, the selected contractor for the Project will develop a plan in conjunction with local public safety officials. In general, there will be limited short-term impacts during the construction time period, and no long-term permanent impacts.

As discussed in Resource Report 1, the Project will be seperated into spreads and construction personnel will be dispersed along the mileage in each of these spreads. Contractors will be starting at off peak time frames on or about 6:00 a.m. each morning and therefore will not affect the levels of service (LOS) on area roadways. Contractors will typically work 12 hour days during construction season which will place their departure time outside of peak hours as well. Delivery routes and schedules will be timed to minimize impacts to area residents.

Construction will be conducted in a series of phases over the pipeline alignment which reduces the number of individuals at any one specific location at any one time. A survey crew will stake and mark out limits of work. This will be followed by an environmental crew with signage. A clearing crew will then remove necessary vegetation. As discussed in Resource Report 1, this will be followed by grading, then trenching, pipe stringing, welding, inspection, pipe laying, backfilling, topsoil placement, aeration, liming and seeding and restoration. Over the length of the pipeline all of these events can be occurring almost simultaneously.

During construction, effects on existing residences and commercial and industrial areas adjacent to the pipeline may include noise and dust from construction and equipment and temporary visual effects from removal of vegetation and excavation of soils. Certain trees, shrubs, dense herbaceous growth, and other obstructions may be cleared or removed from the construction ROW. Following completion of the construction of the Project, properties will be fully restored in accordance with agreements between PennEast and the landowner.

For residences located within 50 feet of the construction work areas as listed in Table 8.3-1, residential mitigation measures required by FERC will be implemented. These measures include:

- Reduce the construction ROW width in order to maintain a minimum of 25 feet between the residence and the construction work area for a distance of 100 feet on either side of the residence.
- Install safety fencing along the edge of the construction work area adjacent to residences for a distance of 100 feet on either side of the residence.
- Preserve as many trees as possible on residential properties.
- Trim tree branches on the working side to allow for safe operation and passage of construction equipment. Vegetation removed will be disposed of as negotiated with the landowner.
- Restore or replace lawns and landscaping to pre-construction conditions.
- Repair as necessary wall and other structures within the construction work area as negotiated with the landowner.
- Segregating topsoil where appropriate or as negotiated with the landowner.
- Maintain utility service during construction activities.

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- Construct only during daylight hours, except where special conditions dictate.
- Clean up and backfill the area immediately after pipeline installation.
- Re-vegetate at the first seasonal opportunity.

Site-specific residential construction plans will be developed for any residences located within 25 feet of the construction work area and will be included in PennEast's application anticipated to be filed in September 2015.

8.3.4 Existing Agricultural Areas

As discussed in Section 8.2 (Land Use), approximately 544.9 acres of agricultural land will be within the temporary ROW and 263.3 acres will be in the permanent ROW. Of these lands, approximately 6.0 acres of agricultural land will remain permanently impacted and removed from production due to the construction and operation of the associated above ground facilities and permanent access roads. To minimize overall impacts to agricultural areas and address landowner concerns expressed through public comments received by FERC and through discussions with landowners during the survey process, PennEast is developing an Agricultural Impact Minimization Plan in consultation with the New Jersey Department of Agriculture and local soil conservation districts which will be included in its application filing anticipated in September, 2015.

To the extent possible, PennEast will maintain landowner access to fields and other agricultural facilities during construction. Prior to the construction of the pipeline, PennEast will provide each landowner, landowner's designee and/or tenant: the name, telephone number and mailing address of the Company's representative assigned to that geographic area and responsible for the liaison activities on behalf of the Company. This pipeline company representative shall be the contact person both during construction and operational related activities. PennEast will respond promptly to any landowner and/or tenant issues or concerns both during construction and long-term operational activities. Prior to construction, PennEast will provide landowners and tenant farmers of active agricultural lands with as much advance notice as possible, but not less than 24 hours prior to entry.

In agricultural lands, the pipeline will be constructed with a minimum cover of 4 feet. During construction, temporary fencing will be provided as necessary to restrict access to active work areas by livestock until there is adequate vegetative cover over the work area. PennEast will identify black cherry trees located on the right-of-way near active livestock use areas during the construction plan development. Black cherry tree vegetation is toxic to livestock when wilted and will not be stockpiled in areas accessible to livestock. During the clearing phase, such vegetation will be disposed of in a manner that prevents contact with livestock. In order to minimize impacts to agricultural land, topsoil will be stripped to a depth of up to 12 inches and segregated away from subsoil to prevent mixing of soils in either the full work area or in the trench and subsoil storage area, unless the landowner or land management agency specifically approves otherwise. Full right-of-way topsoil stripping will avoid issues such as topsoil mixing from deep rutting and topsoil compaction. Topsoil will be stored in a windrow parallel to the pipeline trench in such a manner that it will not become intermixed with subsoil materials.

During the restoration phases of the Project, topsoil will be replaced. To avoid compaction and rutting, the subsoil will be plowed prior to replacing the segregated topsoil. During placement, topsoil and subsoil will be tested for compaction at regular intervals and compared to similar soil types in undisturbed areas to approximate preconstruction conditions. The entire right-of-way will then be disked. PennEast will utilize penetrometers or other appropriate devices to conduct the tests and will maintain detailed records of the test results. Additional plowing or tilling will be performed if further compaction occurs from subsequent construction and cleanup activities. Plowing/ripping and disking

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will be done at a time when the soil is dry enough for normal tillage operations to occur on undisturbed farmland adjacent to the areas to be ripped.

Following construction, all agricultural land will be properly restored and returned to pre-Project contours in accordance with FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and FERC's Wetland and Waterbody Construction and Mitigation Procedures (FERC Plan and Procedures). Additionally, PennEast will provide landowners with contact information to enable them to request certain land leveling activities should uneven settling or surface drainage problems develop. PennEast will provide such land leveling efforts within 45 days of such landowner requests weather and access permitting and to the extent such efforts do not violate any governmental agency permits or approvals. All fencing and gates removed for the installation of the pipeline shall be replaced or installed according to the landowner's specifications.

PennEast will employ third party environmental inspectors to monitor all construction and restoration activities to maintain compliance with all erosion and sedimentation (E&S) plans, FERC Order conditions, other environmental permits and approvals and environmental requirements in landowner agreements. Active croplands temporarily disturbed by the proposed Project activities are expected to return to their original condition following the completion of the construction of the Project.

Following construction, pipeline operation will not prohibit the use of the proposed Project ROW for agricultural purposes, or the use of heavy farm equipment within the permanent ROW. Therefore, Project related impacts to agricultural areas along the pipeline route will be limited to the Project construction period and the time required for vegetative regrowth after construction is completed.

PennEast will work with farmers to measure both pre-and post-construction crop yields until such time as yields have reached pre-construction levels. PennEast will compensate farmers for impacts to crop yields caused by the Project and will work diligently to eliminate the impact. Agricultural lands will be restored using approved, modern mitigation techniques designed to reestablish pre-existing productive use of the agricultural lands, which is typically within 3 years following Project completion.

8.3.4.1 Irrigation and Agricultural Drain Tiles

PennEast will work with landowners to identify any drain tiles or irrigation systems present within the construction work areas and develop avoidance and mitigation measures should any be encountered during construction. Existing drain tiles within the area of disturbance will be checked for damage. Should drain tiles become damaged during construction, they will be repaired by qualified drain tile specialists and monitored post construction to ensure repairs are properly functioning.

8.3.4.2 Specialty Crop Areas

Specialty crops areas were identified using aerial photography and the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Cropland Data Layer (USDA-NASS, 2014) and are summarized in Table 8.3-4. Specialty crops crossed by the Project include triticale, fruits and vegetables, and other miscellaneous crops. No sugar maple stands, areas used for timber production, or tree farms are crossed by the Project. The pipeline crosses a landscaping nursery located near MP 67.8 where an approximately 1.5 acre area that is used to grow trees/shrubs will be affected by the construction of the Project. PennEast will continue to identify specialty crop areas as field surveys progress, and through continued discussions with landowners. PennEast will attempt to minimize effects on specialty crops through avoidance; construction techniques for agricultural lands are described in Section 8.3.4 above and Resource Report 1.

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Table 8.3-4
Specialty Agricultural Areas Crossed by the Pipeline Facilities

State/Facility/ County	Municipality	Crop Type	Begin Mile Post	End Mile Post	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pennsylvania						
PennEast Mainline Route Pipeline						
Upper Susquehanna						
Luzerne	--	None	--	--	--	--
Upper Delaware						
Carbon	--	None	--	--	--	--
Northampton	Moore Twp	Triticale	56.1	56.1	0.1	0
Northampton	East Allen	Triticale	60.0	60.1	0.5	0.3
Northampton	East Allen	Triticale	60.2	60.2	0.2	0
Bucks	--	None	--	--	--	--
Hellertown 24-inch Lateral						
Upper Delaware						
Northampton	--	None	--	--		
New Jersey						
PennEast Mainline Route Pipeline						
Upper Delaware						
Hunterdon	Delaware	Miscellaneous Fruits &Vegetables	96.1	96.1	0.1	0.1
Mercer County	--	None	--		--	--
Gilbert 12-inch Lateral						
Upper Delaware						
Hunterdon	--	None	--		--	--
Lambertville 36-inch Lateral						
Upper Delaware						
Hunterdon	--	None	--		--	

Data Source: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) Cropland Data Layer (USDA-NASS, 2014) and 2013 Aerial Photographs. Adjustments were made to the 2014 USDA-NASS Cropland Data Layer based on manual review of high-resolution 2013 aerial photography and information gathered during field surveys conducted in 2014 and 2015.

8.3.4.3 Organic Farming

PennEast reviewed public comments received by FERC and performed a search of certified organic farms within the Project area using publicly available information including databases maintained by Pennsylvania Certified Organic, the New Jersey Department of Agriculture, and the USDA (New Jersey Department of Agriculture, 2015; Pennsylvania Certified Organic, 2014; USDA, 2015). The USDA National Organic Program (NOP) oversees USDA-accredited certifying agents and their

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certification of organic production and handling of operations and only certified operations may sell, label, or represent their product as organic unless exempt or excluded from certification.

In Pennsylvania, no certified organic will be crossed by or abut the proposed Project. In New Jersey, one USDA certified organic farm (Gravity Hill Farm) was identified adjacent to proposed MP 105.5. PennEast will avoid impacts to this farm by utilizing HDD technology to drill under forested lands located adjacent to the farm, and bore pits will be located greater than 1,500 feet from the property boundary. Therefore, no impacts are anticipated to occur to known or certified organic farms as a result of the Project.

PennEast will continue to work with landowners to identify areas designated as certified organic farms. Should organic farms be identified within the Project area, PennEast will specify construction, restoration, and vegetation management techniques to be used on these lands that will address the specific needs and requirements of organic farms in order to maintain certifications in accordance with the Agricultural Impact Minimization Plan to be included in PennEast's application anticipated to be filed in September, 2015.

8.4 Public Land, Recreation, and Other Designated Areas

This section discusses public land, recreation areas, conservation areas, and other areas designated as having special land use crossed by or located within the vicinity of the Project. PennEast identified these areas by reviewing publiclypublicly available websites and databases of federal, state, and local agencies; public websites; and other sources of publiclypublicly available information. Additional information was obtained for these areas through consultations with the relevant federal, state, or local agencies (see Appendix G); reviewing aerial photographs and maps of the Project area; a title search of lands crossed by the Project facilities, and through field surveys conducted in 2014 and 2015. Summaries of consultations with relevant federal, state, and local agencies is provided below, and a comprehensive table summarizing agency communications will be included in PennEast's application anticipated to be filed in September, 2015.

8.4.1 Public or Conservation Land

Public lands include lands managed by federal, state, county, local agencies, or public conservation agencies. Table 8.4-1 presents a summary of all public lands and public conserved lands crossed by the Project facilities by approximate MP, length of crossing, and acreage affected by construction and operation of the Project Facilities. Approximately 16.3 miles of public lands and public lands with conservation easements will be crossed by the Project. Of these lands, a total of 288.4 acres will be affected during the construction of the Project (temporary ROW, ATWS, and permanent ROW) and 122.5 acres will be located in the permanent Project ROW. Consultations with various federal, state, and local agencies are ongoing and summarized below, and correspondence letters are provided in Appendix G.

8.4.1.1 Federal Lands

Communications with Federal Agencies are ongoing. Site specific crossing plans will be provided in September 2015 filing.

Pennsylvania

Francis E. Walter Dam

The PennEast pipeline crosses a reservoir and recreational area associated with the Francis E. Walter Dam between MPs 23.0 and 23.1 for an approximate crossing length of 825.7 feet where the Project crosses the Lehigh River in Luzerne and Carbon Counties, PA. Approximately 1.9 acres of lands

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associated with the Francis E. Walter Dam will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 0.9 acres will be located in the permanent ROW. Two separate land parcels are owned by the United States Government and United States Army Corp of Engineers (USACE) at the proposed crossing location. Pursuant to Section 14 of the Rivers and Harbors Act and codified in U.S. Code Title 33 Section 408, PennEast will submit a written request for approval to the USACE to construct the Project on these properties. The Francis E. Walter Dam is a 1,800-acre project consisting of an 80-acre reservoir and recreational area. No USACE operated recreational facilities are present, however, a boat launch area exists and the site is open to picnicking, hiking, and fishing (USACE, 2014a). The entire portion of the PennEast pipeline that crosses lands associated with the Francis E. Walter Dam is co-located within an existing product pipeline ROW owned by Buckeye Partner, LP; therefore, minimal impacts to Francis E. Walter Dam are anticipated as a result of the Project.

PennEast met with representatives from USACE on October 30, 2014 and July 16, 2105 regarding the proposed crossing and the Section 408 determination process. PennEast will continue to work with USACE to identify suitable measures to minimize disturbance to the recreational area and its visitors.

Beltzville State Park

The PennEast pipeline crosses Beltzville State Park and portions of Beltzville Lake between MPs 43.1 and 44.1 for an approximate crossing length of 3,497.7 feet in Carbon County, PA. Approximately 10.1 acres of lands associated with Beltzville State Park will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 5.6 acres will be located in the permanent ROW. Beltzville State Park is a cooperative effort of the USACE, Pennsylvania Department of Conservation and Natural Resources (PADCNR), and Pennsylvania Game Commission (PGC); the Project will cross land owned by the USACE. The USACE operates and maintains the dam while recreation is managed by PADCNR under a lease agreement with the Pennsylvania Bureau of State Parks (USACE, 2014b). PennEast will request a Section 408 determination to construct the Project under Beltzville Lake. Beltzville State Park is a 3,002 acre park located at the foothills of the Pocono Mountains. The park is situated around the 949 acre Beltzville Lake and hosts 15 miles of hiking trails, 2.5 miles of mountain biking trails, and is open to a range of recreational activities including swimming, boating, fishing, hinting, cross country-skiing, and water-skiing. The location of the crossing was chosen such that it is situated on the east side of the park away from recreational facilities, such as beach houses and food concession areas. The Project will cross the Christman, Cove Ridge, and Falls Trails, along with the Waterfall area and Wild Creek cove. The impacts to the trails will be temporary during construction and all trails will be restored to their original condition following construction activities. In order to minimize the impacts to these highly used recreational areas, PennEast will keep a 300-foot. recreational and aesthetic buffer around these areas, and adhere to any vegetation management requests of PADCNR. The mitigation and minimization plan that will be developed in conjunction with the PADCNR will be designed to not restrict visitor access.

PennEast met with the USACE on October 30, 2014 and July 16, 2015 to discuss the proposed crossing and the Section 408 determination process. PennEast will continue to consult with USACE and PADCNR to identify suitable measures to minimize disturbance to recreational areas and visitors.

Appalachian National Scenic Trail

The PennEast pipeline crosses the Appalachian Trail near MP 51.2 in Carbon County, PA. The Appalachian Trail is a roughly 2,180 mile continuous public hiking trail that extends from Georgia to Maine passing through 14 states along the Appalachian mountain range. The Appalachian Trail was completed in 1937 and is a unit of the National Park System, but is managed under a unique partnership between public and private entities including the National Park Service (NPS), the United States Department of Agriculture Forest Service, numerous state agencies, the Appalachian Trail Conservancy (ATC), and 31 local clubs to mark and maintain the trail (ATC, 2015).

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The Appalachian Trail extends across the entire length of Carbon, Northampton, and neighboring counties making the crossing of this feature unavoidable by the PennEast pipeline. Since the filing in March, approximately 2 miles of the proposed alignment has been rerouted to cross the Appalachian Trail 2 miles to the west, which addresses concerns related to the crossing. Through coordination with the NPS, the Appalachian Trail, the PGC and private stakeholders, PennEast has identified a suitable location for the crossing of the Appalachian Trail that will avoid crossing lands owned by the NPS. PennEast will bore under the Appalachian Trail and no tree clearing will occur over the pipeline within 150-feet of the trail. Therefore, no impacts to the Appalachian Trail are anticipated to occur as a result of the construction of the Project.

PennEast will develop a site-specific crossing plan in coordination with NPS and other stakeholders for the crossing of the Appalachian National Scenic Trail, and the crossing plan will be included in PennEast's application anticipated to be filed in September 2015.

New Jersey

No federal lands are crossed by or located with 0.25 miles of the Project facilities in New Jersey.

8.4.1.2 State-Managed Lands

Table 8.4-1 presents a summary of all state lands crossed by the Project and provides details on the location of the crossing by MP, length of crossing, and summary of land affected by construction and operation of the Project facilities.

Pennsylvania

State parks and state forests in PA are managed by the PADCNR. State forests are managed by the Bureau of Forestry, which is a subdivision of PADCNR, while state game lands are managed by the PGC. PennEast met with representatives from PADCNR on November, 4, 2014 and the PGC on September 24, 2014 to discuss survey on state managed lands and the process for obtaining ROW agreements to cross state parks, forests, and game lands. Throughout the routing process, PennEast made every attempt to avoid or minimize the impact to State Forest, Park and Game Lands through co-location. This extensive alternatives analysis is described in detail in Resource Report 10. Although there will be temporary impacts and potential disruption during construction, following pipeline installation all activities and accesses currently available to the public will be returned to its original state. The ROW topography will be restored to pre-construction conditions and be vegetated with grass and plant species that are native to the area and tree growth within the temporary work space areas will be allowed to re-vegetate naturally. PennEast is prepared to take the appropriate measures to minimize the amount of restrictions to visitor access during construction and after completion there will be nothing that will prevent public access to or normal state administration of the State-Owned Lands. Consultation with PADCNR and PGC is ongoing and collaboration on the development of an appropriate mitigation and minimization plan for State-Owned Lands has been proposed.

Pennsylvania State Parks

Frances Slocum State Park

The PennEast pipeline crosses Frances Slocum State Park approximately between MPs 2.1 and 2.4 for an approximate crossing length of 1,702.3 feet in Luzerne County, PA. Approximately 5.3 acres of lands associated with Francis Slocum State Park will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 2.0 acres will be located in the permanent ROW. Table 8.4-1 presents a summary of all state owned lands crossed by the Project associated with Frances Slocum State Park and provides details on the location of the crossing by MP, length of crossing, and summary of land affected by construction and operation of the Project facilities.

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Frances Slocum State Park is a 1,035 acre park which contains a 165-acre lake that is popular for boating and fishing, and home to many species of wildlife. Recreational opportunities at the park include hiking, mountain biking, picnicking, swimming, boating, fishing, hunting, ice fishing, and camping. The park is host to 13 miles of hiking trails and the Patrick J. Solano Environmental Education Center (PADCNR, 2015a).

The pipeline crosses Frances Slocum on the northwest edge of the park away from the lake and any recreational facilities. The pipeline crosses adjacent to portions of the Maconaquah Trail; a highly used mountain bike trail. Impacts to the trail will be temporary during construction and it will be restored to their original condition at the completion of the Project. PennEast will work with PADCNR to develop a construction plan that addresses trail access.

PennEast is consulting with and PADCNR regarding the proposed crossing and will identify suitable measures to minimize disturbance to recreational areas and visitors.

Hickory Run State Park

The PennEast pipeline crosses Hickory Run State Park approximately between MPs 29.1 and 33.5 for an approximate crossing length of 14,970.4 feet in Carbon County, PA. Approximately 49.6 acres of lands associated with Hickory Run State Park will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 24.3 acres will be located in the permanent ROW. Table 8.4-1 presents a summary of all state owned lands crossed by the Project associated with Hickory Run State Park and provides details on the location of the crossing by MP, length of crossing, and summary of land affected by construction and operation of the Project facilities.

Hickory Run State Park is a 15,990-acre park with over 40 miles of hiking trails, three state parks natural areas, the Boulder Field National Natural Landmark, and numerous trout streams (PADCNR, 2015b). The park is host to a large picnic area and campground. Recreational activities within the park include hiking, swimming, fishing, hunting, disc golf, orienteering, cross-county skiing, snowmobiling, and ice skating.

The entire portion of the PennEast pipeline that crosses Hickory Run State Park is co-located with an existing product pipeline. Therefore, only minor impacts to the park are anticipated as a result of the Project. The pipeline will not cross any hiking trails or recreational areas. The pipeline will cross lands adjacent to the Mud Swamp Natural Area located in the southeast corner of the park, and the Hickory Run Boulder Field located to the west of MP 29.5. No visual or aesthetic impacts are anticipated to occur to these areas due to the co-location of the pipeline with the existing utility, but in order to assure this, PennEast will maintain a 300-foot buffer from the Boulder Field and limit tree removal. Due to its distance from the proposed route, visitor access to the Boulder Field will not be affected.

PennEast is consulting with PADCNR regarding the proposed crossing and will identify suitable measures to minimize disturbance to recreational areas and visitors.

Beltzville State Park

As described in Section 8.4.1.1 (Federal Lands), Beltzville State Park is a cooperative effort of the USACE, PADCNR, and PGC. However, the Project does not cross any state owned lands in this park. A description of the park and Project crossing is presented in Section 8.4.1.1 (Federal Lands) above.

Delaware Canal State Park

The PennEast pipeline crosses Delaware Canal State Park near MP 77.4 for an approximate crossing length of 185.5 feet in Bucks County, PA. Approximately 0.2 acre of lands associated with Delaware Canal State Park will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 0.2 acre will be located in the permanent ROW. Table 8.4-1 presents a summary of all state owned lands crossed by the Project associated with Delaware Canal State Park

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and provides details on the location of the crossing by MP, length of crossing, and summary of land affected by construction and operation of the Project facilities.

The Delaware Canal State Park parallels the Delaware River between Easton and Bristol along the 60-mile historic towpath. The park includes a 90-acre pond, and many miles of shoreline and river islands (PADCNR, 2015c). An HDD is being utilized to cross the Delaware River and the surrounding park, which negates the potential for permanent impacts. In order to assure this, both pre-boring and post-boring canal and canal structure condition reports will be prepared by a qualified independent company and approved by PADCNR for 1 mile north and 1 mile south of the crossing site. Equipment staging areas, entrance and exit points, and depth of bore will be presented and discussed with PADCNR State Park Manager prior to permitting and construction.

PennEast is consulting with and PADCNR regarding the proposed crossing and will identify suitable measures to minimize disturbance to recreational areas and visitors.

Pennsylvania State Game Lands

State Game Land No. 91

State Game Land No. 91 is crossed by the Project beginning at MP 15.7 in Luzerne County, PA, for a length of approximately 10,193 feet. Approximately 44.9 acres of lands associated with State Game Land No. 91 will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 16.9 acres will be located in the permanent ROW. The Project does not cross any existing trails (PGC, 2014). The Project route is co-located with an existing pipeline ROW; therefore, only minor permanent impacts to forests within State Game Land No. 91 are anticipated as a result of tree clearing for the Project.

State Game Land No. 40

State Game Land No. 40 is crossed by the Project beginning at MP 24.9 in Carbon County, PA, for a length of approximately 5,006.4 feet. Approximately 13.7 acres of lands associated with State Game Land No. 40 will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 5.7 acres will be located in the permanent ROW. The Project route is co-located with an existing pipeline ROW; therefore, only minor impacts to State Game Land No. 40 are anticipated as a result of tree clearing for the Project.

State Game Land No. 129

State Game Land No. 129 is crossed by the Project beginning at MP 29.9 in Carbon County, PA, for a length of approximately 2,509.5 feet. Approximately 5.5 acres of lands associated with State Game Land No. 129 will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 2.9 acres will be located in the permanent ROW. The Project does not cross any existing trails (PGC, 2014). The Project route is co-located with an existing pipeline ROW; therefore, only minor impacts to State Game Land No. 129 are anticipated as a result of tree clearing for the Project.

State Game Land No. 168

State Game Land No. 168 is crossed by the Project beginning at MP 53.1in Carbon and Northampton Counties, PA, for a length of approximately 912.5 feet. Approximately 4.1 acres of lands associated with State Game Land No. 168 will be affected by the construction of the project (temporary ROW, ATWS, permanent ROW) and 1.6 acres will be located in the permanent ROW. The Project route will have impacts to State Game Land No. 168 as a result of tree clearing for the Project route.

Pennsylvania State Forest

Weiser State Forest, Penn Forest Tract

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The Penn Forest Tract of Weiser State Forest is crossed by the Project beginning at MP 36.4 in Carbon County, PA for a length of approximately 3,525.0 feet. Approximately 10.7 acres of lands associated with Weiser State Forest will be affected by the construction of the Project (temporary ROW, ATWS, permanent ROW) and 4.0 acres will be located in the permanent ROW. PennEast will apply the appropriate Aesthetic Management Zone setbacks in order to minimize impacts to connectivity and aesthetics of the area. The Project is co-located with a transmission line ROW for a majority of the crossing through the Penn Forest Tract. The Project alignment is co-located with an existing transmission line ROW for the majority of the crossing; therefore, only minor impacts associated with tree clearing in Weiser State Forest are anticipated as a result of the Project. Since unauthorized use of ROW corridors by off-road vehicles is a constant struggle to enforce on State managed lands, PennEast will work with PADCNR to develop a gating or boulder system that will prevent unauthorized vehicle access, but will not impede pedestrian traffic.

New Jersey

PennEast has identified numerous parcels owned by the New Jersey Department of Environmental Protection (NJDEP) that will be crossed by the Project facilities. Other NJDEP lands associated with the Green Acres program will also be crossed by the Project. Consultation with NJDEP is ongoing and correspondence letters are provided in Appendix G.

8.4.1.3 County and Municipal Lands

Table 8.4-1 also includes a summary of county and municipal lands crossed by the Project and provides details on the location of the crossing by MP, length of crossing, and summary of land affected by construction and operation of the Project facilities. Examples of county lands include parcels owned by the Luzerne County Redevelopment Authority (LCRA), which were acquired to improve the existing land uses, and parcels owned by Lehigh County and Mercer County, which were acquired to increase preserved lands in these counties. Examples of municipal lands include parcels that provide protection to public water supply reservoirs (i.e., the Bethlehem Authority lands in Penn Forest Township) and parcels that were obtained to increase preserved lands in the townships (i.e., Easton City in PA and Holland Township in NJ).

8.4.1.4 Land Conservation Programs

PennEast has performed an extensive title search and consulted with federal, state, county, and local agencies to determine existing easements on properties located within the Project Area. This search has identified a number of properties that are crossed by the Project that are encumbered by easements.

To the extent possible, PennEast has minimized impacts to conservation areas by co-locating the Project facilities with existing utility ROWs. Table 8.4-2 summarizes the lands crossed by the Project that are encumbered by private conservation easements and presents them by parcel tax ID, MP, ownership, managing agency and site name, type of easement, length of crossing, and lands affected by both the temporary construction ROW and permanent ROW. Examples of these private conserved lands include lands managed by specific land conservancies such as The Nature Conservancy lands in Penn Forest and Towamensing Townships, Natural Lands Trust properties in Bear Creek Township, and Hunterdon Land Trust in Kingwood Township. Other private conserved lands are associated with state (i.e., New Jersey Conservation Foundation (NJCF)), county (i.e., Carbon County open space and Northampton County agricultural easements), and municipal funding (i.e., West Amwell and Hopewell Townships NJ). Approximately 12.5 miles of private lands with conservation easements will be crossed by the Project. Of these lands, a total of 224.2 acres will be affected by temporary construction (temporary ROW, ATWS, permanent ROW) and 84.4 acres will be located in the permanent Project ROW.

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Table 8.4-1
Federal, State, County, Municipal Lands, and Public Conservation Areas crossed by the Project Facilities

State/Facility/County	Municipality	Tax-ID	Begin MP	End MP	Type of Area/Name of Associated Area	Land Ownership/Land Management	Leased/Owned	Approximate Crossing Length (feet)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pennsylvania										
PennEast Mainline Route Pipeline										
Upper Susquehanna										
Luzerne	Kingston	35-D9-00A-016-000	2.1	2.4	State owned land/ Frances Slocum	General State Authority	TBD	1,702.3	5.3	2.0
Luzerne	West Wyoming	66-E10-00A-00A-000	5.6	5.6	County owned land	Luzerne County Redevelopment Authority	TBD	141.2	0.4	0.2
Luzerne	Jenkins	33-E11-00A-0A1-000	7.3	7.3	County owned land	Luzerne County Redevelopment Authority	TBD	71.6	0.2	0.1
Upper Delaware							TBD			
Luzerne	Bear Creek	04-I13-00A-001-000	15.7	17.7	State owned land/ State Game Land area No. 91	Pennsylvania Commonwealth	TBD	10,193.0	44.9	16.9
Luzerne	Bear Creek	04-M13-00A-05A-000	21.6	23.0	State owned land	Pennsylvania Commonwealth	TBD	7,360.2	18.8	8.4
Luzerne	Bear Creek	04-M13-00A-001-000	23.0	23.0	Federally owned land/Francis E. Walter Dam	US Army Corps Of Engineers	TBD	297.0	0.7	0.3
						Subtotal		**19,765.4**	**70.3**	**27.9**
Carbon	Kidder	58-20-A1.01USA	23.0	23.1	Federally owned land/Francis E. Walter Dam	US Government	TBD	528.7	1.2	0.6
Carbon	Kidder	45-20-A11	24.9	25.8	State owned land/ State Game Land No. 40	Pennsylvania Commonwealth	TBD	5,006.4	13.7	5.7
Carbon	Kidder	47-21-A1	29.1	29.9	State owned land/ Hickory Run State Park	Pennsylvania Commonwealth	TBD	3,933.2	9.8	5.0
Carbon	Kidder	33-21-B2	29.9	30.3	State owned land/ State Game Land No. 129	Pennsylvania Commonwealth	TBD	2,509.5	5.5	2.9
Carbon	Kidder	34-21-A4	30.4	31.2	State owned land/ Hickory Run State Park	Pennsylvania Commonwealth	TBD	4,146.5	10.2	5.3
Carbon	Kidder	34-21-A3	31.2	31.3	State owned land/ Hickory Run State Park	Pennsylvania Commonwealth	TBD	440.6	1.1	0.5
Carbon	Penn Forest	35-21-A4	32.7	33.5	State owned land/ Hickory Run State Park	Pennsylvania Commonwealth	TBD	3,940.6	22.9	10.6
Carbon	Penn Forest	37-51-A10	36.4	37.1	State owned land/ Weiser State Forest	Pennsylvania Commonwealth, Dept Of Forests & Waters	TBD	3,525.0	10.7	4.0
Carbon	Penn Forest	37-51-A7	37.1	37.5	Municipal owned land	Bethlehem Authority	TBD	2,209.6	7.7	2.5
Carbon	Penn Forest	37-51-A6INLIEU	37.5	37.8	Municipal owned land	Bethlehem Authority	TBD	1,256.0	15.4	6.2
Carbon	Penn Forest	37-51-A1	38.5	38.8	Municipal owned land	Bethlehem Authority	TBD	1,076.7	3.3	1.2

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State/Facility/County	Municipality	Tax-ID	Begin MP	End MP	Type of Area/Name of Associated Area	Land Ownership/Land Management	Leased/Owned	Approximate Crossing Length (feet)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Carbon	Penn Forest	38-51-A4INLIEU	38.8	39.7	Municipal owned land	Bethlehem Authority	TBD	4,778.3	12.6	5.5
Carbon	Towamensing	15-56-A18.04USA	43.1	43.5	Federally owned land/Beltzville State Park	USA	TBD	2,277.2	8.6	4.2
Carbon	Towamensing	15-56-A33USA	43.8	43.9	Federally owned land/Beltzville State Park	USA	TBD	149.3	0.2	0.2
Carbon	Towamensing	15-56-A34USA	43.9	44.0	Federally owned land/Beltzville State Park	US Army Corps Of Engineers	TBD	594.8	0.7	0.7
Carbon	Towamensing	15-56-A11.01USA	44.0	44.1	Federally owned land/Beltzville State Park	USA	TBD	476.4	0.5	0.5
Carbon	Towamensing	15-56-A11	44.1	44.5	Municipal owned land	Bethlehem Authority	TBD	2,010.0	8.0	2.3
						Subtotal		**38,858.8**	**132.4**	**58.0**
Northampton	Moore	G4-1-17	53.1	53.3	State owned land/ State Game Land No. 168	Pennsylvania Commonwealth	TBD	912.5	4.1	1.6
Northampton	Moore	J5-10-9	58.2	58.2	Municipal owned land	Bath Borough Authority	TBD	138.5	0.4	0.2
Northampton	Bethlehem	M8-2-3	68.3	68.3	State owned land	Pennsylvania Commonwealth	TBD	75.6	0.3	0.1
Northampton	Bethlehem	M8-2-3C	68.5	68.9	State owned land	Pennsylvania Commonwealth	TBD	1,858.6	5.5	2.1
Northampton	Bethlehem	M8-9-15B	69.2	69.4	Township owned land	Bethlehem Township	TBD	1,208.4	3.3	1.4
Northampton	Bethlehem	M8-9-15	69.4	69.6	State owned land	Pennsylvania Commonwealth	TBD	1,083.1	3.5	1.2
Northampton	Bethlehem	M8-11-2	70.3	70.3	Township owned land	Bethlehem Township	TBD	75.9	0.3	0.1
Northampton	Bethlehem	N8-5-1B	70.8	70.8	Township owned land	Bethlehem Township	TBD	147.2	0.2	0.2
Northampton	Bethlehem	N8-7-5A-1A	70.8	70.8	State owned land	Pennsylvania Commonwealth	TBD	114.6	0.1	0.1
Northampton	Bethlehem	N8-8-3	70.8	70.9	Municipal owned land	Easton City	TBD	516.0	0.6	0.6
						Subtotal		**6,130.5**	**18.3**	**7.6**
Bucks	Riegelsville	38-006-215	77.4	77.4	State owned land/ Delaware Canal State Park	Pennsylvania Commonwealth Del River / Div Canal	TBD	77.4	0.1	0.1
Bucks	Durham	11-005-133	77.4	77.4	State owned land/ Delaware Canal State Park	Pennsylvania Commonwealth	TBD	108.1	0.1	0.1
						Subtotal		**185.5**	**0.2**	**0.2**
Hellertown 24-inch Lateral										
Upper Delaware										
None										
New Jersey										
PennEast Mainline Route Pipeline										
Upper Delaware										

State/Facility/County	Municipality	Tax-ID	Begin MP	End MP	Type of Area/Name of Associated Area	Land Ownership/Land Management	Leased/Owned	Approximate Crossing Length (feet)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Hunterdon	Holland	1015-22-90	80.3	80.4	Township owned land	Township Of Holland	TBD	224.0	0.5	0.3
Hunterdon	Holland	1015-22-62.01	80.4	80.5	State owned land	State of New Jersey- DEP	TBD	454.3	1.2	0.5
Hunterdon	Holland	1015-22-61	80.5	80.7	State owned land	State of New Jersey- DEP	TBD	1,050.9	3.1	1.2
Hunterdon	Holland	1015-22-58.01	80.9	81.1	State owned land	State of New Jersey- DEP	TBD	987.1	4.1	1.1
Hunterdon	Holland	1015-22-56	81.1	81.4	State owned land	State of New Jersey- DEP	TBD	1,642.1	4.4	1.9
Hunterdon	Kingwood	1016-24-8	92.0	92.4	State owned land	State of NJ Department of Environmental Protection	TBD	1,893.4	5.4	2.2
Hunterdon	West Amwell	1026-28-7	102.8	102.9	State owned land	State of New Jersey- DEP	TBD	261.6	0.5	0.3
						Subtotal		**6,513.4**	**19.2**	**7.5**
Mercer	Hopewell	1106-59-13.01	105.2	105.5	County owned land	County Of Mercer	TBD	1,729.6	2.4	2.0
Mercer	Hopewell	1106-60-5	105.5	106.0	County owned land	County Of Mercer	TBD	2,523.4	13.0	5.9
Mercer	Hopewell	1106-60-48	106.0	106.3	County/Township owned land	Township Of Hopewell/ County Of Mercer	TBD	1,677.1	4.4	1.9
Mercer	Hopewell	1106-60-4	106.5	106.5	Township owned land	Township Of Hopewell	TBD	204.4	0.4	0.2
Mercer	Hopewell	1106-60-29.03	106.8	107.3	State owned land	State Of NJ Environ Protection	TBD	2,203.7	6.4	2.5
Mercer	Hopewell	1106-60-28	107.3	107.6	State/County owned land	NJ Dep & County of Mercer	TBD	1,727.8	5.6	2.0
Mercer	Hopewell	1106-92-9	109.9	110.0	Township owned land	Township Of Hopewell	TBD	840.3	5.6	2.4
Mercer	Hopewell	1106-92-5	110.3	110.6	Township owned land	Township Of Hopewell	TBD	1,613.0	3.2	1.9
Mercer	Hopewell	1106-91-3.12	111.2	111.3	Township owned land	Township Of Hopewell	TBD	648.6	2.3	0.7
Lower Hudson										
Mercer	Hopewell	1106-85-3	112.0	112.3	Township owned land	Township Of Hopewell	TBD	1,603.3	4.5	1.8
						Subtotal		**14,771.3**	**48.0**	**21.3**
Gilbert 12-inch Lateral										
Upper Delaware										
None										
Lambertville 36-inch Lateral										
Upper Delaware										
None										
						Project Total		**86,224.9**	**288.4**	**122.5**

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

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Table 8.4-2
Private Conservation Easements Crossed by the Project Facilities

State/Facility/ County	Municipality	Tax-ID	Begin MP	End MP	Land Owner	Managing Agency/Site Name	Easement Type	Approximate Crossing Length (ft)	Land Affected during Construction	Land Affected during Operation
Pennsylvania										
PennEast Mainline Route Pipeline										
Upper Delaware										
Luzerne	Bear Creek	04-H12-00A-041-000	14.78	14.78	The Trust for Public Land	The Trust for Public Land	Conservation	0.0	0.0	0.0
Luzerne	Bear Creek	04-I12-00A-002-000	14.78	15.74	Unknown Landowner	The Trust for Public Land	Unknown	5095.6	13.8	5.8
							Subtotal	**5095.6**	**13.8**	**5.8**
Carbon	Penn Forest	37-51-A7	37.10	37.51	Private	The Nature Conservancy	Conservation	2209.6	7.7	2.5
Carbon	Penn Forest	37-51-A6INLIEU	37.51	37.75	Private	The Nature Conservancy	Conservation	1256.0	15.4	6.2
Carbon	Penn Forest	37-51-A1	38.55	38.75	Private	The Nature Conservancy	Conservation	1076.7	3.3	1.2
Carbon	Penn Forest	38-51-A4INLIEU	38.75	39.66	Private	The Nature Conservancy	Conservation	4778.3	12.6	5.5
Carbon	Towamensing	26-56-A35	41.70	42.01	Private	The Nature Conservancy	Conservation	1604.4	13.8	5.4
Carbon	Towamensing	15-56-A11	44.13	44.51	Private	The Nature Conservancy	Conservation	1984.3	8.0	2.3
Carbon	Towamensing	16-56-A73.02A	45.73	45.74	Jointly Owned	The Trust for Public Land	Unknown	55.8	0.1	0.1
Carbon	Towamensing	16-56-A74	45.74	46.01	Jointly Owned	The Trust for Public Land	Open Space	1374.6	4.8	1.7
Carbon	Towamensing	6-56-A14.02	46.03	46.03	Jointly Owned	The Trust for Public Land	Unknown	15.8	0.0	0.0
							Subtotal	**14355.6**	**65.8**	**24.8**
Northampton	Upper Nazareth	K7-14-5	63.33	63.63	Private	The Trust for Public Land	Open Space/Northampton County Agricultural Easement K7 14 5	1583.5	5.4	1.8
Northampton	Lower Nazareth	K7-23-1A	65.42	65.42	Private	The Trust for Public Land	Unknown	0.0	0.0	0.0
Northampton	Lower Nazareth	K7-23-2	65.42	65.47	Private	The Trust for Public Land	Open Space/ Northampton County Agricultural Easement 14	285.4	1.0	0.3
Northampton	Lower Nazareth	L7-3-3	65.52	65.52	Private	The Trust for Public Land	Unknown	0.0	0.0	0.0
Northampton	Lower Nazareth	L7-3-5	65.52	65.77	Private	The Trust for Public Land	Open Space/ Northampton County Agricultural Easement 20	1317.9	4.5	1.5
							Subtotal	**3186.9**	**10.9**	**3.7**
New Jersey										
PennEast Mainline Route Pipeline										
Upper Delaware										
Hunterdon	Holland	1015-21-18.01	78.71	78.85	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	744.7	2.2	1.0

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State/Facility/ County	Municipality	Tax-ID	Begin MP	End MP	Land Owner	Managing Agency/Site Name	Easement Type	Approximate Crossing Length (ft)	Land Affected during Construction	Land Affected during Operation
Hunterdon	Holland	1015-20-9	79.50	79.71	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	1116.7	3.5	1.3
Hunterdon	Holland	1015-20-12	79.71	79.71	Private	Conservation Biology Institute	Unknown	5.1	0.0	0.0
Hunterdon	Holland	1015-22-47	79.96	80.21	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	1319.6	4.1	1.5
Hunterdon	Holland	1015-15-3.01	82.28	82.28	Private	Conservation Biology Institute	Unknown	13.6	0.1	0.0
Hunterdon	Holland	1015-15-3	82.28	82.64	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	1873.8	5.5	2.2
Hunterdon	Holland	1015-25-30	84.24	84.24	Private	Conservation Biology Institute	Unknown	0.0	0.0	0.0
Hunterdon	Holland	1015-25-59	84.24	84.74	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	2633.3	8.5	3.0
Hunterdon	Holland	1015-25-59	84.24	84.74	Unknown Landowner	The Trust for Public Land	Agricultural, Farmland Preserved	2633.3	8.5	3.0
Hunterdon	Holland	1015-25-60	84.74	84.74	Unknown Landowner	The Trust for Public Land	Agricultural, Farmland Preserved	11.1	0.0	0.0
Hunterdon	Holland	1015-25-60	84.74	84.74	Private	Ducks Unlimited	Agricultural, Farmland Preserved	11.1	0.0	0.0
Hunterdon	Holland	1015-25-60	84.74	84.74	Unknown Landowner	The Trust for Public Land	Agricultural, Farmland Preserved	11.1	0.0	0.0
Hunterdon	Holland	1015-25-60	84.74	84.74	Private	Ducks Unlimited	Agricultural, Farmland Preserved	11.1	0.0	0.0
Hunterdon	Holland	1015-25-90	85.30	85.30	Private	Ducks Unlimited	Unknown	24.5	0.0	0.0
Hunterdon	Alexandria	1001-18-9	85.52	85.96	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	2289.1	12.2	4.4
Hunterdon	Alexandria	1001-19-27	87.52	87.53	Unknown Landowner	Conservation Biology Institute	Conservation	20.9	0.0	0.0
Hunterdon	Alexandria	1001-19-27	87.52	87.53	Unknown Landowner	Conservation Biology Institute	Conservation	20.9	0.0	0.0
Hunterdon	Alexandria	1001-19-27	87.52	87.53	Unknown Landowner	Conservation Biology Institute	Conservation	20.9	0.0	0.0
Hunterdon	Kingwood	1016-5.01-2	87.53	87.54	Unknown Landowner	Conservation Biology Institute	Unknown	71.2	0.1	0.1
Hunterdon	Kingwood	1016-12-1	88.84	88.84	Private	Conservation Biology Institute	Unknown	0.2	0.0	0.0
Hunterdon	Kingwood	1016-12-19	88.84	89.05	Private	Conservation Biology Institute	Agricultural	1108.0	2.8	1.3
Hunterdon	Kingwood	1016-24-13	92.61	92.80	Unknown Landowner	The Trust for Public Land	Unknown	970.3	2.7	1.1
Hunterdon	Kingwood	1016-24-14.01	92.80	92.90	Unknown Landowner	The Trust for Public Land	Unknown	532.7	1.8	0.6
Hunterdon	Kingwood	1016-24-14.01	92.80	92.90	Unknown Landowner	The Trust for Public Land	Unknown	532.7	1.8	0.6
Hunterdon	Kingwood	1016-36-10	94.20	94.20	Private	Conservation Biology Institute	Unknown	17.7	0.0	0.0
Hunterdon	Kingwood	1016-36-11	94.20	94.26	Private	Conservation Biology Institute	Agricultural	265.3	0.8	0.3
Hunterdon	Delaware	1007-19-37	94.26	94.57	Private	Conservation Biology Institute	Agricultural, Farmland Preserved	1679.8	5.0	1.9
Hunterdon	Delaware	1007-19-25.04	94.74	94.82	Private	Conservation Biology Institute	Agricultural Easement	425.8	1.1	0.5
Hunterdon	Delaware	1007-19-21	94.82	95.01	Private	Conservation Biology Institute	Agricultural	1000.8	6.2	2.6

State/Facility/ County	Municipality	Tax-ID	Begin MP	End MP	Land Owner	Managing Agency/Site Name	Easement Type	Approximate Crossing Length (ft)	Land Affected during Construction	Land Affected during Operation
							Easement			
Hunterdon	Delaware	1007-19-21	94.82	95.01	Private	Conservation Biology Institute	Agricultural Easement	1000.8	6.2	2.6
Hunterdon	Delaware	1007-31-10	95.32	95.69	Private	Conservation Biology Institute	Unknown	1967.7	0.0	0.0
Hunterdon	Delaware	1007-31-10	95.32	95.69	Private	Conservation Biology Institute	Unknown	1967.7	0.0	0.0
Hunterdon	Delaware	1007-31-4	95.69	95.96	Private	Conservation Biology Institute	Farmland Easement	1429.2	3.8	1.6
Hunterdon	Delaware	1007-31-4	95.69	95.96	Private	Conservation Biology Institute	Farmland Easement	1429.2	3.8	1.6
Hunterdon	Delaware	1007-31-3	95.97	96.27	Private	Conservation Biology Institute	Agricultural Easement	1626.7	5.4	1.9
Hunterdon	Delaware	1007-32-33	96.28	96.52	Unknown Landowner	Ducks Unlimited	Unknown	1230.4	3.6	1.4
Hunterdon	Delaware	1007-60-12	98.50	98.93	Private	Conservation Biology Institute	Agricultural	2247.4	6.2	2.6
Hunterdon	Delaware	1007-62-4	99.87	100.06	Private	Conservation Biology Institute	Conservation Easement	1034.6	3.5	1.2
Hunterdon	Delaware	1007-62-5	100.06	100.10	Private	Conservation Biology Institute	Unknown	185.2	0.6	0.2
Hunterdon	Delaware	1007-62-5	100.06	100.10	Private	Conservation Biology Institute	Unknown	185.2	0.6	0.2
Hunterdon	West Amwell	1026-17-4	102.15	102.31	Private	Conservation Biology Institute	Agricultural	844.1	3.2	1.0
Hunterdon	West Amwell	1026-16-3	102.64	102.70	Unknown Landowner	Conservation Biology Institute	Conservation	310.8	1.0	0.4
							Subtotal	**34824.0**	**105.0**	**40.3**
Mercer	Hopewell	1106-59-4	104.75	105.02	Private	Ducks Unlimited	Conservation	1409.1	5.3	1.6
Mercer	Hopewell	1106-59-4	104.75	105.02	Private	Ducks Unlimited	Conservation	1409.1	5.3	1.6
Mercer	Hopewell	1106-60-29.03	107.27	107.27	Non-Governmental Organization	Conservation Biology Institute	Unknown	2.7	0.0	0.0
Mercer	Hopewell	1106-60-28	107.27	107.57	Non-Governmental Organization	Conservation Biology Institute	Conservation	1620.7	5.4	1.9
Mercer	Hopewell	1106-62-3	108.62	108.63	Unknown Landowner	Ducks Unlimited	Unknown	64.3	0.1	0.1
Mercer	Hopewell	1106-62-24	108.77	109.54	Private	Ducks Unlimited	Conservation	4037.3	12.6	4.6
							Subtotal	**8543.3**	**28.8**	**9.8**
							Project Total	**66,005.4**	**224.2**	**84.4**

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8.4.2 Natural, Recreational, or Scenic Areas

No registered natural landmarks or wilderness areas designated under the Wilderness Act will be crossed or located within 0.25 mile of the Project (NPS, 2012; Wilderness.net, 2015). The Hickory Run Boulder Field located within Hickory Run State Park is listed as a National Natural Landmark; however, it is separated from the project by approximately 0.5 mile of dense forest/woodland. Additionally, the Project is co-located with an existing product pipeline for the entire crossing through Hickory Run State Park. Therefore, no impacts to visual or aesthetic resources are anticipated in this area as a result of the Project. No scenic byways are crossed by the Project in PA (PADCED, 2015) or in New Jersey (NJDOT, 2011).

8.4.2.1 Private Recreational and Special Use Areas

PennEast has reviewed the Project area using publicly available databases and 2013 aerial photography to identify any recreational and other designated special use areas located within a quarter mile of the Project facilities to address comments received from FERC. These areas include campgrounds, golf courses, race tracks, quarries, churches, and other recreational areas. Additional private recreational and special use areas were identified during open houses held in November 2014, FERC's scoping meetings held in February 2015, and through comments received by FERC. A total of 29 private recreational and special use areas were identified within a quarter mile of the Project facilities. Of those 29 areas, both temporary and permanent impacts will occur to three areas including the Blue Mountain Ski Area, Calvary Baptist Church, and Curlis Lake Woods (see Table 8.4-3 below). PennEast is consulting with the affected landowners to identify suitable measures to minimize disturbance to recreational and special use areas and their visitors which will be addressed in ROW agreements.

Table 8.4-3
Private Recreational and Special Use Areas Crossed by or Located within 0.25 Mile of the Project Facilities

State/Facility/ County	Municipality	Nearest MP	Approx. Distance From Project Facilities	Special Use Area Type	Name of Special Use Area	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pennsylvania							
PennEast Mainline Pipeline							
Luzerne	Wyoming Boro	6.7	0.3 miles	School	Tenth Street Elementary School	--	--
Luzerne	Plains Twp	8.2	453 feet	Recreational Facility	Baseball field	--	--
Luzerne	Laflin Boro	9.7	1175 feet	Recreational Facility	Baseball field	--	--
Carbon	Kidder Twp	27.5	0.7 miles	Park	Mosey Wood Pond	--	--
Carbon	Kidder Twp	29.0	1.0 miles	Park	Lake Harmony Big Boulder Lake	--	--
Carbon	Kidder Twp	30.1	1.0 miles	Recreational Facility	Jack Frost Ski Area	--	--
Carbon	Kidder Twp	31.9	550 feet	Religious Institution	St. Paul's Lutheran Church	--	--
Carbon	Kidder Twp	32.8	1.1 miles	Park	Boulder Field Natural Area in Hickory Run State Park	--	--
Carbon	Kidder Twp	32.8	1.1 miles	Park	Mud Swamp Natural Area in Hickory Run State Park	--	--
Carbon	Lower Towamensing	49.4	Project Intersects Property/Area	Recreational Facility	Blue Mountain Ski Area	16.8	12.2
Northampton	Lower Nazareth Twp	66.9-67.5	0.02 miles	Park	Louse W. Moore County Park	--	--
Northampton	Bethlehem Twp	67.3	0.1 miles	Park	Matson's Woods	--	--
Northampton	Easton	67.9	Project Intersects Property/Area	Religious Institution	Calvary Baptist Church	1.8	0.9
Bucks	Williams Twp	73.8	0.15 miles	Park/Recreational Facility	Hexenkopf Rock	--	--

State/Facility/ County	Municipality	Nearest MP	Approx. Distance From Project Facilities	Special Use Area Type	Name of Special Use Area	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Hellertown 24-inch Lateral							
Northhampton	Hellertown	1.0	1270 feet	Recreational Facility	Woodland Hills Country Club	--	--
Northampton	Hellertown	2.1	14 miles	Farm	Brook Hollow Farm	--	--
New Jersey							
PennEast Mainline Pipeline							
Hunterdon	West Amwell Twp	100.2	1160 feet	Park	Titus Property (Park land)	--	--
Hunterdon	West Amwell Twp	103.4	880 feet	Park/Recreational Facility	Hewitt Park/Baseball Fields	--	--
Mercer	Hopewell Twp	104.4	654 feet	Park/Recreational Facility	Belle Mountain Ski	--	--
Mercer	Hopewell Twp	104.7	278 feet	Park	Mercer County Park Parcel	--	--
Mercer	Hopewell Twp	105.2	0.3 miles	Farm	Howell living farm	--	--
Mercer	Hopewell Twp	105.6	653 feet	Park	Mercer County Park Parcel	--	--
Mercer	Hopewell Twp	107.2-108.2	0.5 miles	Park	Washington Crossing Park	--	--
Mercer	Hopewell Twp	110.4	199 feet	Park/Recreational Facility	Hopewell Township Park/Baseball Fields	--	--
Mercer	Hopewell Twp	113.3	Project Intersects Property/Area	Park	Curlis Lake Woods	0.5	0.1
Mercer	Hopewell Twp	113.85	0.4 miles	Park	Mercer Meadows	--	--
Gilbert Lateral							
Hunterdon		0.36	60 feet	Recreational Facility	Baseball field	--	--

State/Facility/ County	Municipality	Nearest MP	Approx. Distance From Project Facilities	Special Use Area Type	Name of Special Use Area	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Lambertville Lateral							
Hunterdon		0.5	1016 feet	Park	Titus Property (Park land)	--	--

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8.4.2.2 Historical Areas

Cultural resources surveys to identify state and local historical or culturally significant sites are currently underway in PA and NJ, as documented in Resource Report 4. Archaeological and historic architectural survey plans were developed in consultation with the Pennsylvania Historical and Museum Commission (PHMC) and the New Jersey Historic Preservation Office (NJHPO) and are being carried out in compliance with their recommendations.

Background research determined there are 10 National Register of Historic Places (NRHP) -listed or eligible historic architectural properties within the study corridor in PA and nine in NJ. To date, six new archaeological sites have been identified within the permanent or temporary ROW in PA and none have been identified in NJ. There are 25 previously documented architectural history properties within the study corridor in PA:

- one is a National Historic Landmark (NHL),
- two are listed in the NRHP,
- six are eligible for listing in the NRHP,
- one was eligible for listing in the NRHP but has since been demolished, and
- five are not eligible for listing in the NRHP

An additional 10 resources were previously surveyed, but their NRHP eligibility is undetermined. There are nine previously documented architectural history properties within the study corridor NJ. Of those nine:

- two are listed in the NRHP,
- six are eligible for listing in the NRHP, and
- one was eligible for listing in the NRHP but has since been demolished

To date, 48 new architectural resources that are over 50 years of age and are intersected by the permanent or temporary ROW have been identified in PA and 14 in NJ. The National Register of Historic Places eligibility of these new resources has not yet been determined. Details on cultural resource surveys and their findings are presented in Resource Report 4.

8.4.2.3 Bicycle PA Routes

Bicycle PA routes are statewide bike routes designed by experienced bicyclists that follow existing roadways (PA Commutes, 2015). The PennEast pipeline will cross three roadways associated with Bicycle PA Routes including:

- PA Highway 2038/Meadow Run Road (PA Bicycle Route L) near MP 17.8;
- PA Highway 534 (PA Bicycle Route V) near MP 32.2; and
- PA Highway 903 (PA Bicycle Route V) near MP 33.5.

Direct bore crossing methods will be used at these locations; therefore, no impacts are anticipated to occur to the PA Bicycle Routes as a result of the Project. Roadways crossed by the Project and crossing methods are summarized in Table 1.5-3 of Resource Report 1.

8.4.2.4 National Wild and Scenic Rivers System

The PennEast pipeline route was carefully chosen such that no sections of river crossed by or located within 0.25 miles of the Project are included in the National Wild and Scenic River System (NWSRS, 2015) or are designated as PA Scenic Rivers (PADCNR, 2015e.)

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Outside of the Project corridor, a portion of the Lehigh River located to the southwest of the Project and downstream of the Francis E. Walter Dam near milepost 23.0 is designated as a Pennsylvania Scenic River. Additionally, portions of the Delaware River beyond 0.25 miles to the north and south of the Project where it crosses the Delaware River near milepost 77.5 are included in the National Wild and Scenic River System.

Details on the crossing methods for waterbodies is located in Section 1.5.2 Specialized Construction Methods in Resource Report 1.

8.4.2.5 Landfills and Hazardous Waste Sites

PennEast reviewed publicly available federal, state, and local agency websites and databases to identify landfills, hazardous waste sites, or other known contaminated waste sites in the vicinity of the proposed Project. Additionally, on behalf of PennEast, Environmental Data Resources Inc. (a database research company) has conducted a review of federal and state government databases to identify additional potentially contaminated sites that may not have been uncovered during the initial search.

Based on the review, no landfills have been identified within the Project area in PA (PADEP, 2015a) or NJ (NJDEP, 2014).

A search of contaminated sites identified 26 locations with potential contamination within a quarter mile of the Project (USEPA, 2015; NJDEP, 2014; EDR 2015). Thirteen of the sites are located in PA and 13 are located in NJ. Of these sites, only five of the parcels will be crossed by or located within the construction work area. These include Encor Coatings Inc. at MP 62.7, Columbia Gas Transmission LLC at MP HL-2.1, United Reform Church at MP 89.2, Hopewell Township DOP at MP 110.6, and Texas Eastern Transmission LP at MP LL-1.44.

Table 8.4-3 below summarizes the results of known hazardous waste sites located within the 400-foot survey corridor of the Project facilities. Additional information is located in Section 2.2.5 Potential for Contaminated Groundwater of Resource Report 2. PennEast does not anticipate any potential concerns associated with hazardous materials during construction and operation of the Project facilities. Communications are ongoing with regulatory agencies regarding these sites. Any undocumented sites that are found during the surveys or construction process will be avoided, or addressed in accordance with applicable regulations and the Spill Prevention and Pollution Control Plans.

Table 8.4-4
Hazardous Waste Sites within 0.25 Miles of the Project Facilities

Site Name	Nearest Milepost	Site Address	Database	Distance from Project Workspace (feet)	Direction from Workspace to Site
Pennsylvania					
PennEast Mainline Route Pipeline					
Carl Klevinski Property	3.0	507 Carverton Rd	PA UNREG LTANKS	434.0	West
Pennsylvania State Police Lab	6.5	475 Wyoming Avenue, Wyoming PA, 18644	RCRA-CESQG	1061.5	East
Northampton Fuel Supply	7.3	1775 River Rd., Pittston, PA	RCRA-SQG, FINDS	280.0	East
Syno Res	8.4	16 Clark St	PA UNREG LTANKS	1088.0	South
PPL Martins Creek LLC/Jenkins CTG	9.2	Market St, Village of Laflin, Laflin PA	PA EFacts, ICIS	110.0	Northeast
WWTP-PA American Water Co.	11.7	Jumper Rd, Wilkes Barre, PA, 18702	PA AST	73.1	West
Lawns By George Inc	60.6	8730 Shady Rd	PALRCL	168.0	North
Skrapits Concrete Moore Township	60.6	80 Moorestown Rd	PALUST	596.2	North
Steel Management Services	62.6	3045 Bath Pike, Nazareth, PA 18064	ICIS, RCRA-SQG	587.4	Northeast
Encor Coatings Inc.	62.7	Route 248, Bath, PA	ICIS, NCDB, PA EFacts, TRIS	Within Workspace	Within Workspace
American Tube	64.2	603 Gremar Rd, Nazareth, PA 18064	TRIS	922.9	Southwest
Everson Tesla Inc	64.4	615 Daniels Rd	RCRA-SQG	111.0	South
Hellertown 24-inch Lateral					
Columbia Gas Trans Hellertown LLC	HL - 2.1	2425 Easton Rd, Hellertown, PA 18055	FINDS, RCRA-SQG	Within Workspace	Within Workspace

Site Name	Nearest Milepost	Site Address	Database	Distance from Project Workspace (feet)	Direction from Workspace to Site
New Jersey					
PennEast Mainline Route Pipeline					
Corrugated Paper Group Inc	77.6	623 Rieglesville Rd, Holland Twp, NJ	RCRA-SQG, NY Manifest	160.0	South
United Reform Church	89.2	97 Horseshoe Bend Rd, Frenchtown, NJ 08825	RCRA-LQG, NJEMS	Within Workspace	Within Workspace
Breen Color Concentrates Inc.	101.2	11 Kari Dr, Lambertville, NJ 08530	TRIS, ICIS, RCRA, NJEMS	863.3	East
The Hill Water Treatment Plant	102.8	756 Brunswick Pk, Lambertville, NJ 08530	RCRA-LQG, NJEMS	312.4	East
Belle Mt Ski Area	104.3	17 Valley Rd., Lambertville, NJ	KCSNJ	851.3	South
Hopewell Township DOP	110.6	203 Washington Crossing	NJLUST, NJ HIST HWS, NJ HIST LF	Within Workspace	Within Workspace
Circle Cleaners	112.5	2568 Route 31, Pennington, NJ	RCRA-CESQG	105.0	Northwest
Lukoil #57703	112.5	2558 Pennington Rd	KCSNJ	172.3	Northwest
Pennington BP	112.5	226 RT 31 S	KCSNJ	726.8	Northwest
Pennington Circle NJ 004	112.5	2551 RTE 31 & Pennington Cir	KCSNJ	72.68	Northwest
Transcontinental Gas Pipeline Pennington M&R	113.85	Blackwell Road	NJEMS	38.0	West
Gilbert 12-inch Lateral					
Sithe NJ Holdings/ Reliant Energy Gilbert Power Plant	0.36	315 Riegelsville Rd.	CORRACTS, RCRA-TSDF	385.0	Within Workspace
Lambertville 36-inch Lateral					
Texas Eastern Transmission LP	LL - 1.44	1325 Route 179 & RT 29, Lambertville, NJ	RCRA-LQG, PADS	Within Workspace	Within Workspace

Site Name	Nearest Milepost	Site Address	Database	Distance from Project Workspace (feet)	Direction from Workspace to Site

Key:
CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.
CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time
CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity
FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act]and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.
ICIS: The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.
KCSNJ: The Known Contaminated Sites in NJ report is produced by NJDEP in response to N.J.S.A. 58:10-23.16-17 that requires preparation of a list of sites affected by hazardous substances. It also satisfies the Site Remediation Program's obligations under the NJ New Residential Construction Off-Site Conditions Disclosure Act (N.J.S.A 46:3C1 et seq.).
PALUST/NJLUST: A listing of regulated Underground Storage Tanks that have reported leaking and a cleanup is underway.
NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act).
NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.
NJ BROWNFIELDS: Brownfields are identified as former or current commercial or industrial use sites that are presently vacant or underutilized, on which there is suspected to have been a discharge of a contamination to the soil or groundwater at concentrations greater than applicable cleanup criteria.
NJEMS: NJEMS Sites are points representing sites regulated by NJDEP under one or more regulatory permitting or enforcement programs, or sites that are otherwise of some interest to a NJDEP program. Program interests included in NJEMS are: Air, Communications Center, Discharge Prevention, Exams and Licensing, Fish Game and Wildlife, Green Acres, Hazardous Waste, Lab Certification, Land Use, Landscape Irrigation, Parks and Forestry, Pesticides, Pinelands, Planning, Radiation, Right-to-Know, Site Remediation, Soil Conservation, Solid Waste, TCPA, Water Quality, Water Supply, and

Site Name	Nearest Milepost	Site Address	Database	Distance from Project Workspace (feet)	Direction from Workspace to Site
Watershed Management. NJ HIST LF: Old or non-permitted solid waste facilities/landfills that are not included in the current solid waste facilities/landfills database. NJ HIST HWS: The Known Contaminated Sites in NJ report is a municipal listing of sites where contamination of soil and/or ground water is confirmed at levels greater than the applicable cleanup criteria or standards. Remedial activities are underway or required at the sites with an on-site source(s) of contamination and at locations where the source(s) of contamination is unknown. Sites with completed remedial work that require engineering and/or institutional controls have reporting measures in place to ensure the effectiveness of past actions, and some include maintenance and/or monitoring NY Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. PA-AST: Listing of Pennsylvania Regulated Aboveground Storage Tanks. Registered Aboveground Storage Tanks. PADS: The PCB Activity Database identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify the United States Environmental Protection Agency of such activities. The source of this database is the U.S. EPA. PA EFACTS: The Department's eFACTS (Environment, Facility, Application, Compliance Tracking System) database (formerly known as the Foundation for Information eXchange (FIX)) is a Department-wide database that provides a holistic view of the clients and sites (including facilities) that DEP regulates. PALRCL: Pennsylvania Land Recycling Cleanup Locations. The goals of the Land Recycling Program are to encourage public sector cleanup of contaminated, vacant or otherwise underutilized properties and return them to productive use. PA UNREG LTANKS: Leaking storage tank cases from unregulated storage tanks. RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. TRIS: Toxic Chemical Release Inventory System. Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313. TSCA: The Toxic Substances Control Act identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. The United States Environmental Protection Agency has no current plan to update and/or re-issue this database.					

Site Name	Nearest Milepost	Site Address	Database	Distance from Project Workspace (feet)	Direction from Workspace to Site

Sources:
EDR, 2015; PADEP, 2015; NJDEP, 2014

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8.4.3 Coastal Zone Management Areas

The proposed Project is not located within a Coastal Zone Management Area in PA (PADEP, 2105c) or New Jersey (NJDEP, 2007).

8.4.4 Agency and Landowner Consultation

Section 1.7 (Agency and Public Consultations and Required Authorizations) of Resource Report 1 provides an overview of the agency outreach and public participation process for the Project and identifies dates and locations of open houses and agency meetings. Also included in Section 1.7 of Resource Report 1 is a description of PennEast's community outreach program. Consultations with various federal, state, and local agencies are ongoing, and correspondence letters are provided in Appendix G.

8.5 Impacts and Mitigation

The PennEast Pipeline will be installed within a new pipeline easement area. Most impacts to land uses crossed by the Project will be temporary and related to construction activities. Land affected by temporary construction activities will be allowed to revert back to pre-construction conditions. Areas required for the operational ROW, new access roads, and above ground facilities will be permanently impacted. Construction of the Project is anticipated to result in the temporary disturbance of approximately 1489.8 acres for the pipeline construction ROW, above ground facilities, access roads, contractor yards and pipe yards, and extra work/staging areas. Permanent impacts resulting from the operational ROW, above ground facilities, access roads, contractor yards and pipe yards, and extra work/staging areas are anticipated to affect approximately 945.9 acres.

8.5.1 Agricultural Land

Construction of the Project will temporarily impact 544.9 acres of agricultural land. Approximately 263.5 acres of agricultural land will be located in the permanent Project ROW. Additionally, based on soil classifications, 592.4 acres of areas classified as prime farmland or farmland of statewide importance will be located in the temporary ROW, and approximately 357.7 acres of areas classified as prime farmland or farmland of statewide importance will be located within the permanent ROW. Since pipeline operation will not prohibit the use of the Project ROW for agricultural purposes, Project related impacts to agricultural areas along the pipeline route will be limited to the Project construction period and the time required for vegetative regrowth after construction is completed. Details on mitigation measures that will be used to reduce impacts from pipeline construction and operation are discussed in more detail in Section 8.3.4.

8.5.2 Forest and Woodland

Construction of the proposed Project will temporarily affect approximately 749.1 acres of forested land. Approximately 590.5 acres of forested land will be located in the permanent Project ROW. These values include the clearing of the entire 50-foot wide permanent ROW, however, only the management of the 30-foot wide cleared operational ROW in upland forests and 10-foot wide cleared operational ROW in wetlands will require the permanent removal of trees in these forested areas. Areas where tree clearing will occur have been previously logged and disturbed.

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8.5.3 Open Land

Construction of the Project will temporarily affect approximately 77.3 acres of open land. Approximately 53.9 acres of open land will be located in the permanent Project ROW. There will be no permanent impacts or land use change to the majority of open areas once construction is complete, as these areas will be allowed to revert back to their original land use.

8.5.4 Residential Land, Industrial, and Commercial Land

Construction of the Project will temporarily affect approximately 60.1 acres of residential, industrial, and commercial land. Approximately 11.1 acres of residential land will be located within the permanent Project ROW, and 23.3 acres of Industrial and Commercial Land will be located in the permanent ROW. Following completion of the Project, properties will be fully restored in accordance with agreements between PennEast and the landowner. Details on mitigation measures that will be used to reduce impacts from pipeline construction and operation are discussed in more detail in Section 8.3.3

8.5.5 Open Water

Construction of the proposed Project will temporarily affect 58.4 acres of land designated as open water, and 3.6 acres of land designated as open water will be located within the permanent Project ROW. Details on mitigation measures that will be used to reduce impacts to waterbodies from pipeline construction and operation are discussed in more detail in Resource Report 2.

8.6 Visual Resources

PennEast has minimized impacts to visual resources from construction of the pipeline segments by proposing to co-locate the pipeline with existing pipeline ROWs to the extent practical. Approximately 43.1 miles or 36 percent of the total length of the pipeline is proposed to be co-located with existing utility ROWs.

Construction of the Project route and facilities will result in temporary impacts to visual and/or aesthetic resources due to the construction equipment and activities necessary for constructing the pipeline and associated facilities, as well as soil disturbance. Potential permanent impacts include removal of trees from the 30-foot permanent operational ROW. Construction impacts will be mitigated through stabilization and re-vegetation of the ROW; additional mitigation techniques could include the planting of vegetation to serve as a visual screen along roadways, trails, and in residential areas as needed. PennEast will coordinate with state, local and federal agencies and landowners for development of the re-vegetation plan.

The Project will not have any visual impact on any federal or state listed visually sensitive areas, such as scenic roads, rivers, or natural landmarks as these features are not present in the Project area. The section of the Delaware River crossed by the Project is not designated as a scenic river, and the proposed pipeline crossing is located in an industrial area along the Delaware River to minimize any visual impacts to the scenic portions of the river. The section of the Appalachian Trail crossed by the Project does not link to any smaller trail loops popular for daily users (ATC 2014), and PennEast is coordinating with the NPS and PGC to develop a crossing plan and identify suitable measures to minimize disturbance to the trail and its visitors. PennEast will bore under the Appalachian Trail, and no tree clearing will occur within 150-feet of the trail.

Visual impacts to historic resources are being considered as part of the cultural resources studies addressed in Resource Report 4. There is potential for the PennEast pipeline to impact parcels containing above-ground, historic architectural resources including buildings, structures, historic

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districts, and landscapes that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Background research determined there to be 10 NRHP-listed or eligible historic architectural properties within the study corridor in PA and nine in NJ. To date, historic architectural survey efforts have identified 48 new architectural resources over 50 years of age that are intersected by the permanent or temporary ROW in PA and 14 in NJ. The NRHP-eligibility of these new resources has not yet been determined.

Parcels with NRHP-listed or eligible resources may be physically and visually impacted by the construction of a pipeline in the form of tree cutting and other alterations to the landscape and by the construction of above-ground pipeline facilities such as temporary and permanent workspaces, ancillary above-ground infrastructure (including compressor stations, mainline block valves, and interconnects), and access roads. Studies to address potential visual impacts to historic architectural resources are ongoing and final determinations will be established through consultation with the PHMC and the NJHPO when final design details of the facilities are available.

The compressor station in Carbon County, PA, will be located in previously logged, disturbed forest. The retention of trees and shrubs around the perimeter of the proposed compressor station site will provide sufficient cover to avoid any visual impacts.

8.7 Applications for Rights-of-Way and Other Land Use

PennEast is coordinating with the appropriate federal agencies to develop right-of-way agreements on federal land crossed by the Project facilities. PennEast will include documentation in its application anticipated to be filed in September 2015.

8.8 Cumulative Impacts

The anticipated cumulative impacts of the proposed Project on land use are addressed in the following section. The Projected cumulative impacts are based on impact assessment, input from federal, state and local agencies, and public input received at open houses held in November 2014 as well as FERC's scoping meetings held in February 2015.

The Project was designed to avoid or minimize impacts to land use wherever possible. PennEast has co-located the construction ROW adjacent to or in proximity to existing ROWs to the greatest extent practical (e.g., gas pipeline, transmission line, or product pipeline). Approximately 43.1 miles or 36 percent of the total length of the pipeline is proposed to be co-located with existing utility ROWs. In total, the construction of the Project will result in the conversion of 439 acres of forest or woodland to open land. Impacts to agricultural, open, residential, industrial, and commercial lands, or wetland and waterbody land uses will primarily be temporary during construction only. Landowners will be allowed to continue agricultural production along the ROW post-construction with some restrictions.

Visual impacts associated with the Project have been evaluated, minimized, and avoided wherever possible. PennEast has minimized impacts to visual resources from construction of the pipeline segments by proposing to co-locate the pipeline with existing pipeline ROWs to the extent practical. The Project will not have any visual impact on any federal or state listed visually sensitive areas, such as scenic roads, rivers, or natural landmarks as these features are not present in the Project area. Construction of the Project route and facilities will result in temporary impacts to visual and/or aesthetic resources due to the construction equipment and activities necessary for constructing the pipeline and associated facilities, as well as soil disturbance. Construction impacts will be mitigated through stabilization and re-vegetation of the ROW; additional mitigation techniques could include the planting of vegetation to serve as a visual screen along roadways, trails, and in residential areas as needed

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PennEast is coordinating with the applicable county planning commissions and other agencies to identify proposed development projects in the Project area. Additionally, a cumulative impact analysis is being conducted to identify and describe the potential effects attributable to the proposed PennEast Project. The cumulative impact analysis was developed in accordance with the National Environmental Policy Act (NEPA) and addresses the Council on Environmental Quality (CEQ) guidelines (CEQ, 1979) based on recent court rulings, and is included in Section 1.4 of Resource Report 1. Taking into account all past, present, and likely future impacts, the cumulative impacts to land use are currently expected to be minimal. Therefore, at this time there are no reasonable and foreseeable future impacts to land use arising from the Project.

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PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

RESOURCE REPORT 9

Air and Noise Quality

FERC Docket No. PF15-1-000

Revised Draft

July 2015

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Resource Report 9 – Air and Noise Quality
FERC Environmental Checklist

PART 380-APPENDIX A MINIMUM FILING REQUIREMENTS FOR ENVIRONMENTAL REPORTS	COMPANY COMPLIANCE OR INAPPLICABILITY OF REQUIREMENT
☐ Describe existing air quality in the vicinity of the Project. (§380.12 (k) (1))	Sections 9.1.1.1 and Table 9.1-2
☐ Quantify the existing noise levels (day-night sound level (L_{dn}) and other applicable noise parameters) at noise-sensitive areas and at other areas covered by relevant state and local noise ordinances. (§380.12 (k) (2))	Sections 9.2.2
☐ Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO_x) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the Project. (§380.12 (k) (3))	Tables 9.1-3 and 9.1-4, Sections 9.1.2.3 and 9.1.3.3, and Appendix L
☐ Describe the existing and proposed 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. (§380.12 (k) (4))	Sections 9.0, 9.1.2.3, and 9.1.3.3
☐ Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building or enclosure. (§380.12 (k) (4))	Section 9.2.4; Figure 9.2-1, Tables 9.2-6 and 9.2-7
☐ Identify any applicable state or local noise regulations. (§380.12 (k) (4))	Section 9.2.2
☐ 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. (§380.12 (k) (4))	Sections 9.2.3 and 9.2.4; Tables 9.2-6 and 9.2-7, and Appendix L

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9.0 AIR AND NOISE QUALITY

PennEast Pipeline Company, LLC (PennEast) has prepared this Resource Report to support its application to the Federal Energy Regulatory Commission (FERC or Commission) for a certificate of public convenience and necessity (Certificate) for the PennEast Pipeline Project (PennEast Project or Project). PennEast designed its Project to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production area in northeastern Pennsylvania (PA) to growing natural gas markets in eastern PA, southeastern PA, New Jersey (NJ) and surrounding states with the capability of providing approximately 1.0 MMDth/day of year-round natural gas transportation service.

The Project consists of the following primary components:

- The PennEast pipeline will be an approximately 113.8-mile long new pipeline starting in Luzerne County, PA and extending to Mercer County, NJ. PA counties traversed include Luzerne, Carbon, Northampton, and Bucks. The Project traverses Hunterdon and Mercer Counties in the NJ portion.
- The 24-inch Hellertown Lateral will be an approximately 2.1-mile new pipeline in Northampton County, PA.
- The 12-inch Gilbert Lateral will be an approximately 0.3-mile new pipeline in Hunterdon County, New Jersey.
- The 36-inch Lambertville Lateral will be an approximately 1.4-mile new pipeline in Hunterdon County, NJ.
- One (1) new compressor station in PA; and
- Various associated aboveground facilities including interconnects, launchers, receivers, and mainline block valves to support the pipeline system.

The Project will be rated for a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig). Figure 1.2-1 in Resource Report 1 provides a Project Overview Map showing the locations of the proposed pipeline route and associated facilities. A detailed discussion of the Project route selection and alternatives analysis is contained in Resource Report 10.

9.1 Air Quality

An overview of federal and state air quality regulations is provided below, followed by a discussion of the Project's potential air quality impacts from construction and operation.

9.1.1 Regulatory Overview

The new stationary source facilities that will be constructed as part of the PennEast Project are subject to both federal and state air quality regulations that limit air emissions as well as the impact of those emissions on ambient air quality. The following discusses the federal and state regulations that apply to the Project.

Air emissions associated with Project construction will be from temporary activities and will be evaluated per the general conformity rule in the Clean Air Act (CAA). For operational emissions, the proposed PennEast Compressor Station will need to comply with the applicable federal and PA air permitting requirements. As described later in this section, based on the proposed emission sources and estimated annual potential air emissions, the compressor station can be permitted under PA's Plan Approval and State-Only Operating Permit program. This means the station will operate in accordance with a PA issued air operating permit for a non-major source.

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Applicable federal air quality standards for the compressor station are primarily contained in 40 C.F.R. Parts 50, 51, 52, 60, and 63. In addition, PA and NJ have air quality regulations controlling air pollution in Title 25, Article III ("Air Resources") of the PA Code (25 Pa. Code 121 through 145) and in Title 7, Chapters 27, 27A, 27B and 27C of the New Jersey Administrative Code (NJAC), respectively. Stationary source permitting is required in PA for the compressor station in Carbon County and a natural gas line heater at the UGI-Leh/TCO interconnect station in Northampton County. Stationary source permitting will be required in NJ for five (5) natural-gas fired line heaters located at the three (3) interconnect stations in Hunterdon and Mercer counties. The proposed compressor station and natural gas heater at the UGI-Leh/TCO interconnect station will be subject to applicable Pa. Code Title 25 rules. The five (5) natural gas line heaters in NJ will be subject to applicable NJAC 7:27 Subchapters 3, 5, 8, 9, 19, and 25. The following sections briefly discuss a subset of these requirements that have been evaluated for applicability to the Project.

9.1.1.1 National Ambient Air Quality Standards and Attainment Designation

The Clean Air Act (CAA) of 1970 required the U.S. Environmental Protection Agency (USEPA) to establish ambient ceilings for certain compounds based upon the identifiable effects the compounds may have on the public health and welfare. Subsequently, the USEPA promulgated regulations that set National Ambient Air Quality Standards (NAAQS) for six (6) principal pollutants, which are called "criteria pollutants" are as follows: ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and particulate matter (divided by particle size into standards for inhalable particulate matter 10 microns and smaller [PM_{10}] and fine particulate matter 2.5 microns and smaller [$PM_{2.5}$]).

Two classes of ambient air quality standards have been established: (1) primary standards defining levels of air quality that the USEPA has judged as necessary to protect public health and (2) secondary standards defining levels for protecting soils, vegetation, wildlife, and other aspects of public welfare.

The NAAQS are subject to periodic review and revised or new standards are promulgated over time. Table 9.1-1 presents a summary of the NAAQS in place at the time this Resource Report 9 was filed. Also pursuant to the 1970 Clean Air Act, states were required to delineate Air Quality Control Regions (AQCRs) and to adopt State Implementation Plans (SIPs) to provide for attainment of the NAAQS as expeditiously as practical, within certain time limits. The 1977 Clean Air Act Amendments, in Section 107, required the USEPA and states to identify by category those AQCRs (or portions thereof) meeting and not meeting the NAAQS. Areas meeting the NAAQS are termed "attainment areas", and areas not meeting the NAAQS are termed "non-attainment areas." Areas that have insufficient data to make a determination of attainment or non-attainment are unclassified or are not designated but are treated as being attainment areas for permitting purposes.

The attainment designation of an area is made on a pollutant-by-pollutant basis, and for each established standard. The attainment status of the region, in addition to the projected emission rates of a stationary source, determines the regulatory review process for each stationary source project. Table 9.1-2 summarizes the attainment status for the Project sites. This table considers that the Project will occur within the following states and counties:

- PA: Luzerne, Carbon, Northampton, Bucks
- NJ: Hunterdon, Mercer.

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Table 9.1-1
National and State Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS	
		Primary	Secondary
Sulfur Dioxide	Annual [10]	0.03 ppm	--
	24-hour [1]	365 μg/m^3	--
	3-hour[2]	--	1,300 μg/m^3
	1-hour [1]	0.075 ppm	--
PM_{10}	24-hour [2, 10]	0.14 ppm	--
	24-hour [3]	150 μg/m^3	same
$PM_{2.5}$	Annual [4]	12 μg/m^3	15 μg/m^3
	24-hour [5]	35 μg/m^3	same
Nitrogen Dioxide	Annual	0.053 ppm	same
	1-hour [6]	100 ppb	none
Carbon Monoxide	8-hour [2]	9 ppm	none
	1-hour [2]	35 ppm	none
Ozone	8-hour[7,8]	0.075 ppm	same
	8-hour[7,8]	0.075 ppm	same
Lead	Quarterly Average [11]	1.5μg/m^3	same
	Rolling 3-month average [11] (2008)	0.15μg/m^3	same

ppm = parts per million, μg/m^3 = micrograms per cubic meter

1 To attain this (2010) standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.
2 Not to be exceeded more than once per year.
3 Not to be exceeded more than once per year on average over 3 years.
4 Annual mean, averaged over three years
5 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 μg/m^3 (effective December 17, 2006).
6 To attain this standard, the 3-year average of the 98th percentile of the daily maximum concentrations at each monitor within an area must not exceed 0.100 ppm.
7 This ozone standard became effective May 27, 2008. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.
8 The previous ozone standard was promulgated in 1997 and remained in place until USEPA revoked it when the 2008 Ozone standard became effective JULY 6, 2015 (Federal Register, 80 FR 12263, March 6, 2015)
9 The 1971 Annual and 24-hour Sulfur dioxide standards were revoked except for non-attainment areas of the 2010 Sulfur dioxide standards and these 1971 standards remain in effect until one year after and area is designated attainment for the 2010 standards. The Muskingum River, OH Area, located in part of Morgan County is designated a Non-Attainment Area for the 2010 Sulfur dioxide standard.
10 Current Lead standard was signed October 15, 2008. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Table 9.1-2
Attainment Status for Project Sites

Project Component	Location (Town/County)	AQCR[1]	Attainment/ Unclassifiable	Non-attainment
Pipeline Spread 1 (complete) Pipeline Spread 2 (partial)	Luzerne, PA – *Dallas, West Wyoming, Wyoming, Jenkins, Bear Creek, Plains, Kingston*	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2,	-
Pipeline Spread 2 Kidder Compressor Station Pipeline Spread 2 (partial)	Carbon, PA – *Kidder, Penn Forest, Towamensing, Lower Towamensing*	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2,	Marginal for Ozone 8-Hour 2008[2]
Pipeline Spread 2 (partial) Pipeline Spread 3 (partial)	Northampton, PA – *Moore, Upper Nazareth, Lower Nazareth, East Allen, Bethlehem, Lower Saucon, Williams*	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, SO_2	Moderate for $PM_{2.5}$ 2006. Marginal for Ozone and 8-Hour 2008[2]
Pipeline Spread 3 (partial)	Bucks, PA – *Durham, Riegelsville*	Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware)	CO, NO_X, Pb, PM_{10}, SO_2	Marginal for 8-hr Ozone 2008[2]. Moderate for $PM_{2.5}$ 1997. Moderate for $PM_{2.5}$ 2006.
Pipeline Spread 3 (partial) Pipeline Spread 4 (partial)	Hunterdon, NJ – *Holland, Alexandria, Kingwood, Delaware, West Amwell*	Northeast PA-Upper Delaware Valley Interstate Air Quality Control Region	CO, NO_X, Pb, PM_{10}, SO_2	Marginal for 8-hour Ozone 2008[2].
Pipeline Spread 4 (partial)	Mercer, NJ – *Hopewell*	Metropolitan Philadelphia Interstate Air Quality Control Region (PA-NJ-Delaware)	CO, NO_X, Pb, PM_{10}, $PM_{2.5}$, SO_2	Marginal for 8-hour Ozone 2008[2].

Source: 40 CFR 81.339,
1 AQCR = Air Quality Control Region (Title 40: Protection of Environment Part 81, Subpart B - Designation of Air Quality Control Regions)
2 For NSR purposes, all Project sites in PA and NJ are subject to moderate ozone non-attainment as both states are within the Ozone Transport Region (OTR). In December 9, 2013, the nine member states of the Ozone Transport Commission petitioned EPA under § 176A of the Clean Air Act to add a group of nine upwind states – including Indiana and Ohio – to the OTR.

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9.1.1.2 Applicable Air Regulatory Requirements

New Source Review

Pre-construction air permitting programs that regulate the construction of new stationary sources of air pollution are commonly referred to as New Source Review (NSR). NSR can be divided into two groups: major NSR and minor NSR.

Major NSR includes two programs: Prevention of Significant Deterioration (PSD) and Nonattainment NSR (NNSR). Both major NSR programs are established at the federal level and typically implemented by state or local permitting body with US EPA review when these local authorities are either delegated jurisdiction by EPA or have EPA-approved SIP programs.

Minor NSR permits are issued by the state or local permitting authority facilities with potential emissions that are less than the major source thresholds. The Pennsylvania Department of Environmental Protection (PADEP) and New Jersey Department of Environmental Protection (NJDEP) are federally authorized to implement both NSR permitting programs, and each state has EPA-approved SIP programs for non-attainment criteria pollutants. The major and minor NSR permitting requirements are described below along with the regulations issued by PADEP for facilities such as the PennEast Compressor Station and by NJDEP for natural gas line heaters. Projects can be subject to both PSD and NNSR for different pollutants.

NNSR applies to new major sources and major modifications resulting in emissions of nonattainment pollutants located in nonattainment areas. NNSR provisions for PA are specified in Title 25, Article III, Pa. Code 127 Subchapter E. Based on its location within the Ozone Transport Region (OTR)[1], which is classified as moderate nonattainment for ozone, the proposed PennEast compressor station must be evaluated for NNSR applicability for ozone. This means that special NNSR permitting requirements would apply if the potential operational emissions from the compressor station of the ozone precursor pollutants NO_x and VOC exceed the major source thresholds of 100 and 50 tons per year, respectively. As presented in section 9.1.2 below, the estimated pollutant emission quantities for Project's stationary sources are a below these thresholds.

PSD applies to new major sources and major modifications located in attainment areas. PSD provisions for PA are specified in Title 25, Article III, Pa. Code 127 Subchapter D; however, PA has ratified the federal PSD program promulgated under 40 CFR 52.21. The purpose of PSD, as the name implies, is to prevent significant degradation of air quality in NAAQS attainment areas. Major source thresholds, expressed in tons of a specified pollutant per year, determine whether an emission source or facility is subject to PSD regulations or not.

As presented in Section 9.1.2, the compressor station is the largest stationary source of project GHG emissions with an estimated annual total of 177,852 metric tons (MT) of carbon dioxide equivalents (CO_2e). However, following the June 23, 2014 U.S. Supreme Court decision (UARG v. EPA. No. 12–1146 (States 2014)), stationary sources of air emissions are not major sources due solely to GHG emissions.

For the Project's stationary sources, the potential emissions of PSD-regulated pollutants will be less than the PSD major source thresholds; therefore, PSD will not be applicable to the proposed PennEast Compressor Station or associated natural gas line heaters. As noted above, NNSR is not applicable. As a result of having potential air emissions less than these applicable major source thresholds, as

[1] See note 2 of Table 9.1-2 for information about the OTR.

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demonstrated in Table 9.1-3a, the compressor station is eligible for coverage under PA's Plan Approval and State-Only Operating Permit program and the natural gas (line) heaters will require General Operating Permits[2] as they meet the applicability requirements in NJAC 7:27-8.2(c). The potential-to-emit from the natural gas line heaters are below all applicable major source thresholds and will require general operating permits in accordance with NJAC 7:27-22.14. (See details below at: State Minor Source Permit Program and Stationary Source Requirements).

9.1.1.3 New Source Performance Standards

The EPA has promulgated New Source Performance Standards (NSPS) based on specific emission source categories, which are organized in subparts of 40 CFR Part 60. Depending upon the type of emission source, and applicable subpart, these standards may include emission limits, work practice standards and requirements for monitoring, recordkeeping and reporting. NSPS apply to new, modified or reconstructed stationary sources that meet criteria established in 40 CFR 60.

The Project includes the following equipment:

Compressor Station

- Three (3) natural gas turbine-driven Solar Mars 90 units rated at 13,220 hp each under ISO conditions (39,660 total ISO hp). To allow for variation in size, modelling was conducted on three (3) Solar Mars 100 units under ISO conditions with 47,700 hp
- One (1) new Natural Gas-fired Caterpillar G3516 LE rated at 1,462 hp, or a Caterpillar C32 Generator Set rated at 1,340 hp emergency engine-generator;
- Various small storage tanks (for condensate/pipeline liquids, waste liquid, lubricating oil, etc.)
- And a gas heater at rated at 1.5 MMBTU/hr

Interconnect Stations

- Natural gas line heaters:
  - one (1) rated at 16.1 MMBTU/hr at the UGI-LEH and TCO Interconnects in PA)
  - Two (2) rated at 6.6 to 6.7 MMBTU/hr at the Gilbert and Etown Interconnects in NJ
  - Three (3) nominally rated at 50 MMBTU/hr in NJ at the Algonquin, TETCO, and Transco Interconnects
- Various small storage tanks (for gas filter receivers pipeline liquids, waste liquid, lubricating oil, etc.)

Subpart KKKK details Standards of Performance for Stationary Combustion Turbines, and applies to stationary gas turbines which are constructed, modified or reconstructed after February 18, 2005, and which have a heat input at peak load greater than or equal to 10 MMBtu/hr based on the higher heating value (HHV) of the fuel fired. The new proposed gas turbines exceed this threshold and will be subject to and compliant with Subpart KKKK.

The Solar Mars 100 combustion turbines will each have a heat input at ISO conditions of approximately 117.6 MMBtu/hr HHV. Subpart KKKK establishes emission limits for combustion

[2] PA's Plan Approval, State-Only Operating Permit program, and General Operating Permits are all part of the commonwealth's program to issue minor (non-major) air permits to construct/install and operate regulated stationary sources.

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turbines including those with rated capacities at peak load under ISO conditions greater than 50 MMBtu/hr HHV and less than or equal to 850 MMBtu/hr HHV. These limitations are as follows:

- NO_x: limit of 25 parts per million (ppm), dry volume basis (ppmvd), corrected to 15% oxygen, or 150 nanograms per Joule (ng/J) (which is approximately 1.2 pounds per megawatt-hour [lb/MWh] of useful output). Additionally, Subpart KKKK specifies a NO_x limit of 150 ppmvd at 15% O_2 or 1,100 ng/J (approximately 8.7 lb/MWh) for turbine operate at temperatures less than 0°F and for turbine operating loads less than 75 percent of peak load.
- SO_2: limit of 110 ng/J (approximately 0.90 lb/MWh) gross output or potential emissions of 0.060 pounds per million British thermal units heat input [lb/MMBtu]

The proposed new combustion turbines manufactured by Solar Turbines will be equipped with advance dry low emission NO_x (DLE) emissions controls, which Solar Turbines has trademarked as SoLoNOx™ pollution prevention system. These controls reduce the NO_x and peak combustion temperatures and controls CO and VOC emissions through the use of a lean, premixed air/fuel mixture and advanced emissions controls. The DLE system is effective at steady state turbine loads from approximately 50% to 100% of full load and ambient air inlet temperatures above 0°F. Compliance with the NO_x emission limit will be demonstrated through performance tests as required under 40 CFR 60.4340. Compliance with the SO_2 limit will be demonstrated through the use of pipeline quality natural gas per 40 CFR 60.4365(a).

Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) applies to stationary spark ignition engine manufacturers as well as owners and operators. For natural gas fired emergency engines manufactured after January 1, 2009, the limits applicable to engines greater than 130 hp are as follows:

- For NO_x, the limit is 2.0 grams per horsepower-hour (g/hp-hr) or 160 ppmvd at 15 percent O_2;
- For CO, the limit is 4.0 grams per horsepower-hour (g/hp-hr) or 540 ppmvd at 15 percent O_2; and
- For VOC, the limit is 1.0 g/hp-hr at 86 ppmvd at 15 percent O_2.

The emergency engine will be rated over 1,000 hp, as such, the limits of Subpart JJJJ will apply. The selected engines will comply with these emission limits with the use of appropriate controls.

Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) applies to steam generating units with a maximum rating equal to or greater than 10 MMBtu/hr but less than 100 MMBtu/hr and are constructed, modified or reconstructed after June 9, 1989. According to 40 CFR 60.41C – Definitions, a steam generating unit is defined as a device that combusts any fuel and produces steam or heats water or any heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in the subpart.

The proposed natural gas line heaters do not meet the definition of steam-generating unit, therefore Subpart Dc does not apply.

Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution, 40 CFR 60.5360 to 60.5499) applies to facilities that commence construction after August 23, 2011 and establishes emission standards for control of VOCs and SO_2. Applicability of Subpart OOOO is described at 40 CFR 60.5365. The facilities in the Project are all in the natural gas transmission segment; therefore, the only paragraph under this section that applies is 60.5365(e) which could apply to storage vessels (a tank or other vessel that contains an accumulation of condensate/pipeline liquids).

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Because the facility is comprised of a centrifugal compressor with dry gas seals, Subpart OOOO provisions pertaining to centrifugal compressors using wet seals do not apply (60.5365(b)). Wet seal systems require that VOC emissions be reduced by 95% or greater but this control requirement does not apply to centrifugal compressors with dry gas seals.

Any new individual storage vessel that has the potential to emit 6 tpy or more of VOCs in various industry segments, including the natural gas transmission and storage segment, is subject to Subpart OOOO per 40 C.F.R. §60.5365(e). None of the proposed storage vessels will have potential VOC emissions that approach 6 tpy. Any new vessels will be either small in capacity or contain a low vapor pressure material such as lubricating oils. Based on the Subpart OOOO applicability provisions, as specified in 40 C.F.R. §60.5365, Subpart OOOO applicability is not triggered by the proposed sources associated with the Project.

The Project proposes small gas filter receiver tanks to receive and store materials captured and removed from gas filters. Gas filters are devices for capturing and removing mechanical and liquid impurities in the pipeline quality natural gas. They are proposed to be installed at the compressor station and at each interconnect. The collected impurities are often referred to as pipeline liquids. A total of eight (8) 200-gallon gas filter receiver tanks are specified for the Project. Because the natural gas entering the pipeline will be required to meet pipeline natural gas quality and purity specifications, it will contain little to no contaminants or liquids. Gas filters are installed as a safety measure to protect sensitive system components such as compressors and meters from particles and other trace contaminants, such as compressor lubricating oils or residual materials, that may be introduced by pipeline cleaning and inspection operations. The gas filters are also redundant protection against the potential that some of the upstream gas processing experiences an upset and small amount of off-spec gas would somehow get in the line and make it past the gas filters at the entry to the gas transmission pipeline. Limited quantities of pipeline liquids are expected to accumulate in the gas filter receiver tanks.

Based on size, these gas filter receiver tanks would be exempt from air permitting in NJ because they will be less than the size threshold of 2,000 gallon under NJAC 7:27-8.2(c)(9) for stationary storage tanks storing “a mixture of VOCs having a vapor pressure or sum of partial pressures of 0.02 pounds per square inch absolute (1.0 millimeters of mercury) or greater at standard conditions”. In PA, the need for a Plan Approval for the gas filter receiver tanks will be confirmed using the PADEP’s Request for Determination process. If plan approvals are needed, they will be obtained accordingly.

The Subpart OOOO NSPS rules may be revised during 2015. The EPA published a Fact Sheet on January 14, 2015 titled “EPA’S Strategy for Reducing Methane and Ozone-Forming Pollution from the Oil and Natural Gas Industry”. The White House simultaneously released a related Fact Sheet announcing planned action to cut methane emissions from the oil and gas sector by 40 – 45 percent from 2012 levels by 2025. The bulk of these proposed initiatives focuses on the upstream natural gas production segment; but, some of the proposed actions would apply to the transmission segment, such as enhanced leak monitoring with application of emerging technologies. It is expected that a proposed rule will be issued in the summer of 2015 and a final rule will follow in 2016. While it is difficult to predict the specific requirements of future rulemaking, if the revised rule provisions regulate any portion of the Project, the Project will comply with the applicable new requirements.

9.1.1.4 National Emission Standards for Hazardous Air Pollutants

The EPA has promulgated National Emission Standards for Hazardous Air Pollutants (NESHAPs) based on specific industrial and emission source categories. NESHAP applicability also depends on the major and area source designation of the facility in terms of Hazardous Air Pollutants (HAPs). A major source of HAPs is a facility that has the potential to emit 10 tpy or more of a single HAP, or 25 tpy or more of a combination of HAPs. Facilities that have potentials less than these are classified as

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area sources. Depending upon the specific variables of the facility (including major/area status) the applicable standards may include employing control devices (emission limits), work practice standards, and requirements for monitoring, recordkeeping and reporting.

NESHAPs promulgated under 40 CFR 63. Subpart HHH (National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities) and Subpart YYYY (National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines) apply to facilities that are major sources of hazardous air pollutants (HAP) emissions. The proposed PennEast Compressor Station will be an area source of HAPs, therefore Subpart HHH and YYYY do not apply. 40 CFR 63 ZZZZ (National Emission Standards for Hazardous Air Pollutants from Stationary Reciprocating Internal Combustion Engines) is applicable to the proposed emergency engine; however, because the facility is an area source for HAPs and the engine is new, Subpart ZZZZ requirements will be met by complying with NSPS JJJJ requirements for natural gas engines as described above.

9.1.1.5 State Minor Source Permit Program and Stationary Source Requirements

Compressor Station

Obtaining an air permit in PA is a two part process. First, a Plan Approval application (essentially a preconstruction permit application) must be submitted to PADEP in order to obtain permission to begin construction. Once a plan approval application is approved, and the new (or modified) emission sources or facility is built, an operating permit must be obtained.

In PA, the installation of new air emission sources at the proposed PennEast Compressor Station will require preconstruction approval under 25 Pa. Code Chapter 127 (Construction, Modification, Reactivation and Operation of Sources). This chapter establishes the state air permitting program for both major (PSD, NNSR and Title V) and non-major emission sources.

Given that the proposed PennEast Compressor Station has potential emissions below all applicable major source thresholds for criteria pollutants and HAPs, a Plan Approval application for a State-Only Operating Permit will be submitted for PADEP review and approval. Chapter 127 Subchapter A establishes the general requirements to control new sources of air emission to the maximum extent, consistent with the Best Available Technology (BAT) and issuance of the plan approvals for new sources. Subchapter B describes requirements for plan approvals and lists applicable exemptions. For example, 25 Pa. Code 127.14 summarizes a list of exemptions, which includes space heaters which heat by direct heat transfer (127.14(5)).

Chapter 123 of the 25 Pa. Code details the Standards for Contaminants of various emissions. Chapter 123.1-2 contains standards fugitive emissions, Chapter 123.11-14 for Particulate Matter, Chapter 123.21-25 for Sulfur Compounds, Chapter 123.31 for Odor Emissions, Chapter 123.41-46 for Visible Emissions and Chapter 123.51-121 for Nitrogen Compound Emissions and NO_x Allowance Requirements.

Chapter 124 summarizes the requirements for National Emission Standards for Hazardous Air Pollutants. PA has adopted the federal standards codified in 40 CFR 63 and incorporates them into the PA Code by reference.

Chapter 122 summarizes the requirements for National Standards of Performance for New Stationary Sources. PA has adopted the federal standards codified in 40 CFR 60, and similarly, incorporates them into the PA Code by reference.

Natural Gas Line Heaters

The five (5) natural gas line heaters at the three (3) interconnect stations in Hunterdon and Mercer County, NJ will require air permits as they meet the applicability requirements of "commercial fuel

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burning equipment" having a maximum heat input greater than one (1) MMBtu/hr described in NJAC 7:27-8.2(c). However, the potential-to-emit from each of the natural gas line heaters are below all applicable major source thresholds. PennEast (or the designated owner/operator) will have the option to apply for general permits (either GP-009A or GP-018) in accordance with NJAC 7:27-22.14, or seek individual Subchapter 8 preconstruction air permits for the line heaters. In NJ, a General Permit is a pre-approved air permit and certificate which applies to a specific class of emission sources. By issuing a General Permit, the NJDEP indicates that it approves the activities authorized by the General Permit, provided that the owner or operator of the source registers with the Department and meets the requirements of the General Permit. If a source belongs to a class of sources which qualify for a General Permit and the owner or operator of the source registers for the General Permit, the registration satisfies the requirements of NJAC 7:27-8.3 for an air permit and certificate.

The natural gas line heater at the UGI-LEH/TCO interconnect in PA would also emit below major source thresholds and would be subject to permitting under a General Plan Approval and/or General Operating Permit "Small Gas and No. 2 Oil Fired Combustion Units (GP – 1)" in accordance with 25 Pa. Code Chapter 127.514 and 127.611. The PA General Permit program is similar to NJ's.

9.1.1.6 Mandatory Reporting of Greenhouse Gases

40 CFR 98 Subpart W – "Petroleum and Natural Gas Systems" applies to onshore natural gas transmission compression facilities. If such a facility emits 25,000 metric tons or more of CO2 equivalent per year then the facility is required to report CO_2, CH_4 and N_2O emissions associated with the venting of the centrifugal compressor or storage tanks, as well as equipment leaks, blowdown vents, in addition to other processes, in accordance with 40 CFR 98.232(e)(1-7).

The facility will exceed the thresholds as laid out in§98.231 and will therefore report applicable GHG emissions in accordance with 40 CFR 98 Subpart W.

9.1.2 PennEast Project Operational Emissions

This section provides information about the estimated emissions of the operation of the Project. This includes emissions from the stationary combustion sources at the compressor and interconnect stations as well as fugitive leaks and venting emissions of the above ground facilities such as valves, flanges, and control actuators and the below grade pipeline.

The various Potentials-to-Emit (PTEs) from the compressor station are provided in Table 9.1-3a for criteria pollutants, GHGs, total HAPs and formaldehyde. GHGs are provided for informational purposes only. Table 9.1-3a includes emissions of VOC and GHG that are attributable to equipment leaks, which are non-stack fugitive emissions, and venting (i.e. blowdowns). Although they are non-stack emissions, they are included in the total PTE. The compressor station natural gas heaters and emergency generator are also included in the PTE calculations.

The emissions calculations details are provided in the air permit application in Appendix L1.

Emissions associated with an estimated 48 startup and shutdown events of the combustion turbines are included in the total Compressor emissions. Due to the short duration of startup and shutdown events, and because of the period of non-operational time between each shutdown and subsequent startup, the potentially greater emissions associated with the shutdown and startup event are generally offset in practice by the absence of emissions during the non-operational time such that these events are self-correcting from the perspective of annual emissions. That is, in practice, the emissions are greatest if the unit operates for 8,760 hours per year and as such overall PTE is based on this assumption.

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Table 9.1-3a
Compressor Station Operational Phase Emissions

Air Sources	Pollutant (tons per year)								
	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC[a]	GHG[b]	CH_2O[c]	Total HAPs[d]
Compressors (Turbines)	87.42	96.16	5.46	24.08	24.08	6.890	176,627	3.87	4.14
Emergency Generator	3.62	1.69	0.05	-	-	0.074	313	-	-
Natural Gas Heaters	0.64	0.54	0.00	0.05	0.05	0.049	769	0.00	0.01
Equipment Leaks						0.003	96		
Equipment Vents						0.006	47		
Total	**91.69**	**98.39**	**5.52**	**24.13**	**24.13**	**7.021**	**177,852**	**3.87**	**4.15**

[a] VOC – non-methane/ethane volatile organic compounds
[b] GHG – as carbon dioxide equivalents (CO_2e); provided for informational purposes only
[c] CH_2O = formaldehyde, the primary HAP emitted from combustion turbines
[d] HAPs – as aggregated total HAPs
PTE = potential to emit

Emissions associated with the natural gas line heaters at the two (2) interconnect stations in PA and six (6) in NJ are quantified in Table 9.1-3b. Subtotals for PA and NJ are included. This table also presents the estimated fugitive and venting emissions of natural gas for the valves, flanges and actuators. T[3]he basis and details of these estimates are presented in Appendix L3. Estimates of leak emissions are based on standard EPA factors for VOC and CH4. Estimates of natural gas venting from pneumatic valve actuators is based on the actuator piton volume and forecasts of the number of cycles per year.

Table 9.1-3b also includes estimates of the fugitive leaks from the pipeline. The emissions are estimated using the traditionally accepted leak factor of 1.55 standard cubic foot of natural gas per day per mile of pipeline (scfd/mile).[4]. This factor has been questioned by some commenters who refer to recent information from the Pipeline and Hazardous Materials Safety Administration (PHMSA). In a December 10, 2012 PHMSA report titled "LEAK DETECTION STUDY – DTPH56-11-D-000001", the reported incident data for more than two years in the 2010 to 2012 timeframe for over 300,000 miles of natural gas transmission lines are discussed. Using data from this report, a five times greater factor than 1.555 scfd/mile might be inferred. Using information from 92 reported incidents involving a leak or rupture occurring in a pipe body or pipe seam, an emission factor of 7.66 scfd/mile can be calculated for this limited 918 day period. However, due to the relatively low contribution of fugitive

[3] US EPA. Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017, November 1995, at: http://www.epa.gov/ttnchie1/efdocs/equiplks.pdf (referenced July 2015).
[4] US EPA, Table 2-7 - 2011 Data and Calculated Methane Potential Leak Emissions for the Natural Gas Processing and Natural Gas Transmissions Segments on page 22 of the EPA document titled "Oil and Natural Gas Sector Leaks, Report for Oil and Natural Gas Sector Leaks, Review Panel, JULY 2014.

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pipeline leaks to the total project GHG emissions, even if the 7.66 scfd/mile factor is considered the project emission would only increase buy about 140 tons per year of CO2e. This represents only about a 0.05% increase of the Project's estimated total annual GHG emissions.

Commenters have raised several concerns related to pipeline fugitive leaks. Responses to some of these concerns are presented here; however in this context, it must be understood that the Project will be designed and operated to avoid and prevent leaks of natural gas. Leak detection and monitoring technology will be employed and maintained as a means to assure safe, reliable, and efficient delivery of the clean natural gas fuel to the customers of the Project. Leaks represent a loss of the Project's product, and major leaks or incidents that would require shutdown and repair to the pipeline would reduce Project revenues and increase costs. In addition, the Pipeline will comply with environmental, safety and transportation regulations of the US DOT, DOE, EPA as well as FERC licensing and applicable local permitting. All of these factors mean that leaks from the Project are expected to be minimized and very well controlled.

Another concern was that pipeline methane leaks would contribute to ground-level ozone. Volatile Organic Compounds (or VOC) are one of the main air contaminants that contribute to ground-level ozone pollution. This is due to the photochemical reactivity of many VOCs that breakdown in sunlight and thereby react with oxygen molecules (O_2) to create and ozone (O_3). According to scientific research, methane and ethane, which make up more than 99.99 percent of natural gas, exhibit negligible photochemical reactivity. This is confirmed by the definition of VOC at 40 CFR 51.100 paragraph (s) where methane and ethane are specifically excluded from being regulated as VOC due to exhibiting negligible photochemical reactivity. As shown in Table 9.1-3b, the minor amount of VOC contained in natural gas means that the is estimated emissions would be less than 0.005 tons per year, which is an insignificant amount.

Some commenters raised concerns regarding potential arsenic contained in the native soils and geology and how these may interact with pipeline methane leaks. This concern will be addressed in a focused arsenic risk assessment to be provided with the application that is anticipated to be filed in September, 2015.

Table 9.1-3b
Pipeline Operational Phase Emissions

Air Sources	Pollutant (tons per year)								
	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC[a]	GHG[b]	CH_2O[c]	Total HAPs[d]
UGI-LEH/TCO Interconnect Natural Gas Line Heater	5.53	4.65	0.04	0.42	0.42	0.30	6,606	0.004	0.10
PA Pipeline Fugitive Leaks						0.003	24		
PA Interconnect Fugitives/Vents	-	-	-	-	-	0.49	3,834	-	-
PA Pipeline Total	5.53	4.65	0.04	0.42	0.42	0.80	10,464	0.00	0.10
Total Natural Gas Line Heaters in NJ	56.13	47.15	0.41	4.27	4.27	3.09	67,045	0.042	1.06
NJ Pipeline						0.001	11		

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Fugitive Leaks									
NJ Interconnect Fugitives/Vents	-	-	-	-	-	1.93	15,336	-	-
NJ Pipeline Total	56.1	47.2	0.41	4.27	4.27	5.02	82,392	0.04	1.06

[a] VOC – non-methane/ethane volatile organic compounds
[b] GHG – as carbon dioxide equivalents (CO_2e); provided for informational purposes only
[c] CH_2O – formaldehyde, the primary HAP emitted from combustion turbines
[d] HAPs – as aggregated total HAPs
PTE = potential to emit

A summary of the annual operating emissions of the compressor station and pipeline segments in PA and NJ are presented in Table 9.1-3c.

Table 9.1-3c
Project Operational Total PTE

Air Sources	Pollutant (tons per year)						GHG[b]	CH_2O[c]	Total HAPs[d]
	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC[a]			
Compressor Station Operations	91.69	98.39	5.52	24.13	24.13	7.02	177,852.30	3.87	4.15
PA Pipeline Total	5.53	4.65	0.04	0.42	0.42	0.80	10,464.18	0.00	0.10
NJ Pipeline Total	56.13	47.15	0.41	4.27	4.27	5.02	82,392.21	0.04	1.06
Project Total Operational	**153.35**	**150.19**	**5.97**	**28.81**	**28.81**	**12.83**	**270,708.69**	**3.92**	**5.32**

[a] VOC – non-methane/ethane volatile organic compounds
[b] GHG – as carbon dioxide equivalents (CO_2e); provided for informational purposes only
[c] CH_2O = formaldehyde, the primary HAP emitted from combustion turbines
[d] HAPs – as aggregated total HAPs
PTE = potential to emit

9.1.3 Construction Generated Air Emissions

Construction of the Project components will result in temporary emissions from construction equipment fuel combustion and fugitive particulate matter resulting from vehicle roadway travel and earthmoving and construction activities. Construction equipment will include earth-moving equipment (i.e. backhoes, bulldozers), skid loaders, pipe bending and handling, welding rigs, trucks and other mobile sources. These equipment may be powered either by diesel or gasoline engines and will contribute to overall construction emissions of NOx, CO, VOCs, PM 10 and PM2.5, SO2 and small amounts of air toxics (HAPs). A listing of the types, size and number of planned equipment is included in Appendix L-2.

Moreover, construction activities will generate temporary emissions of fugitive dust due to earth disturbances, land clearing, grading, excavation and vehicle traffic on both paved and unpaved roads.

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The amount of fugitive dust generated will be a function of the specific construction activities, silt and moisture content of the soil, frequency of precipitation during construction activities, vehicle traffic and type, and roadway characteristics. Fugitive dust emissions increase with higher silt content in the soil, and decrease with moisture content, as water acts as a suppressant.

The emission factors used for fugitive dust emission estimates are based on an EPA reference document "Estimating Particulate Matter Emissions from Construction Operations" prepared by Eastern Research Group, Inc., September 30, 1999 (EPA Contract 68-D7-0068). The values and recommendations from Section 5.6, Roadway Construction Emissions were used because heavy duty road construction is similar in nature to the pipeline construction. A project-specific dry silt factor was developed based on soil data from a Surface Texture Report presented in RR7. The assumptions, data and emissions factors used to estimate the emissions from construction activities are provided in Appendix L along with a more comprehensive list of construction equipment and associated emissions.

Dust suppression measures will be proactively implemented on an as needed basis to protect workers and the general public, as well as property, from the associated air pollution and nuisances that may be caused by the generation of fugitive dust emissions. A draft dust control plan is provided in Appendix L5. The decision to implement dust suppression is generally not based on a specific threshold, but on a visual determination of need, or based on anticipated or existing atmospheric or weather conditions (i.e. dry, windy conditions) and compliance with local ordinances for control of fugitive dust emissions. As such, dust suppression measures will be implemented when necessary to control fugitive dust emissions that would otherwise be conveyed off the site and result in a nuisance or disturbance for workers, members of the public, or nearby properties.

Dust suppression by water spray is a recommended control method for open, uncontained sources of particulate matter emissions. PennEast will also implement dust suppression by water spray as necessary on unpaved roads. A particulate matter control efficiency of 50% is included in the estimate of fugitive dust emissions from unpaved roads.

The quantity of fugitive dust emissions generated from construction activities is proportional to the area of the land being disturbed and to the level of construction activity. The size of the proposed PennEast Compressor Station construction area is approximately 24 acres which will be disturbed for approximately a 6 month construction period. Approximately 1610 acres of disturbance are estimated for pipeline construction activities including the pipeline construction corridor, the contractor work area (pipe yards) and access roads. The emissions are based on an assumption of 6.5 months of dust emitting construction activities for the pipeline and 3 months of dust emission activity at the pipe yards.

Even though the construction of the pipeline spreads may occur over a calendar period of 8 months, the sequence of task specific construction crews will work from one end to the other of a spread in 3 to 4 months each. Emissions estimates assume 16 weeks of activity for each crew. The crew phasing is planned such that there will be approximately 6.5 months of dust generation activity over the entire length of the spread.

Likewise, the temporary Project pipe yards are planned to be occupied for 16 months; but the only activities where dust would be generated from construction are the 1.5 to 2 months needed to grade and prep the yard by installing a stone working base, and then a 1 month period at the end to remove the stone and restore the site. In between, dust generated from off-road travel is accounted for in the vehicle unpaved road travel estimates, and the pipe yards are planned to be dormant for a 4 month period as well. While the construction and remediation related activities that would cause the estimated emission would occur over two calendar years, the emissions were assumed to occur within one year. This assumption would tend to overestimate the fugitive dust emissions during the construction year.

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Emissions of NO_x, CO, PM_{10}, $PM_{2.5}$, SO_2, VOCs, GHGs and HAPs from construction equipment engines used during Project construction have been estimated based on the anticipated types of non-road and on-road equipment and their estimated levels of use. Emission factors for diesel and gasoline on-road vehicles were obtained using EPA's MOVES2010b model (EPA, 2013).

Emission factors for diesel and gasoline non-road equipment engines were obtained using EPA's NONROAD model documentation (EPA, 2008). Emission factors using Tier 2 diesel engine standards conservatively have been assumed to apply to construction equipment engines during the construction period, and do not reflect the anticipated phasing-in of more stringent emissions standards. Ultra-low sulfur diesel use was assumed for both the non-road and on-road diesel vehicles. The emission estimates by major construction activities are presented in Table 9.1-4. The assumptions, data and emissions factors used to estimate the emissions from construction activities are provided in Appendix L along with a more comprehensive list of construction equipment and associated emissions.

Table 9.1-4
Project Facility and Pipeline Construction Activity Combined Emissions

Project Total Emissions	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Diesel Non-Road Equipment Totals	107	46	11	4.8	4.7	0.29	32,466	0.63
Diesel and Gas On-Road	5.0	22.8	2.53	0.29	0.17	0.03	1,690	0.18
Construction Activity Fugitive Dust	-	-	-	1,580	237	-	-	-
Roadway Fugitive Dust	-	-	-	132	21	-	-	-
Comp. Station Construction Sub-Total	12	6	1	9	21	0.02	1,681	0.05
Total	**124**	**75**	**15**	**1,727**	**284**	**0.33**	**35,837**	**0.85**

9.1.4 Cumulative Impacts

The anticipated cumulative air quality impacts of the proposed Project are addressed in this section. The projected cumulative impacts in areas affected by the Project are based on impact assessment, input from federal, state, and county agencies and public input received at open houses.

The primary air quality impacts from operations of the Project are related to the new compressor station and associated combustion turbines in PA (Kidder Township, Carbon County). The emissions from this facility are below CAA significance levels, and as such are not expected to have a cumulative significant air quality impact within the localized areas of the Project. The associated Plan Approval applications that will be submitted following the station will determine that the compressors (turbines) will be operated with emissions that represent Best Available Technology (BAT) for minimizing emissions.

Because of construction activities, the Project has been designed to minimize temporary impacts to air quality wherever possible. The operation of heavy construction equipment and its associated exhaust would increase diesel exhaust emissions and would suspend fugitive dust and other construction related particles in the air. The volume of dust emitted will vary depending on the level of activity, specific construction techniques, soil characterizations, and weather conditions. These temporary impacts will be minimized by requirements that the contractor keep machinery adequately maintained and operating. Construction dust and particles would be reduced by implementing fugitive dust control measures (water suppression).

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PennEast is in coordination with the applicable county planning commissions and other agencies to identify proposed development projects in the Project area. A more accurate analysis for cumulative impacts on air resources will be included in a later version.

9.1.5 General Conformity

The General Conformity Rule (the Rule in this section) establishes conformity in coordination with and as part of the National Environmental Policy Act of 1969 (NEPA) process. The 1990 amendments to the CAA require federal agencies to conform to SIPs in non-attainment areas. SIPs are state air quality plans that specify regulations that provide for the implementation, maintenance, and enforcement of the NAAQS and include emission limitations and control measures to attain and maintain the NAAQS. Federal agencies are required to determine if proposed actions conform to the applicable SIP. The Rule affects air pollution emissions associated with actions that are federally funded, licensed, permitted, or approved and ensures that emissions do not contribute to air quality degradation or prevent the achievement of state and federal air quality goals. The purpose of the Rule is to ensure that federal agencies consult with state and local air quality agencies so that these regulatory entities are aware of the expected impacts of the federal action and therefore can include expected emissions in their SIP emissions budget.

USEPA developed two conformity regulations relating to transportation and non-transportation projects. Transportation projects are governed by the "transportation conformity" regulations (40 CFR 51 and 93). Non-transportation projects are governed by the "general conformity" regulations (40 CFR 6, 51, and 93) described in the final rule for Determining Conformity of General Federal Actions to State or Federal Implementation Plans. Since the proposed Project is a non-transportation project, the general conformity rule applies. Note that the General Conformity Review process is not necessary for a new source or existing source modification that is subject to air permitting under NSR. This is because if a project goes through the NSR approval process, the agency having jurisdiction has confirmed the project will comply with and conform to the Clean Air Act and any related SIPs.

9.1.5.1 General Conformity Process

The process to determine conformity for a proposed action involves two distinct steps: applicability and determination. A determination is only required if an evaluation confirms that the Rule is applicable to a project. The first step, an applicability evaluation, is required for any action that is federally funded, licensed, permitted, or approved where the total direct and indirect emissions for criteria pollutants in a non-attainment or maintenance area exceed the rates listed specified in 40 CFR 93.153(b)(1) and (2). If Project emissions are estimated to exceed these rates, or if the emissions are determined to be regionally significant, a General Conformity Determination is required as the second step. The proposed action is considered regionally significant if the total direct and indirect emissions for any criteria pollutant represent 10 percent or more of a non-attainment or maintenance area emission inventory for that pollutant.

If the Conformity Rule is determined to be applicable for the proposed action, an evaluation must be performed to determine whether the action conforms to the SIP. Positive conformity can be shown through state emission budgets, emission offsets, air quality models, or any combination of these.

9.1.5.2 General Conformity Applicability

The General Conformity Rule applies only to federal actions occurring in air quality regions designated as being in non-attainment for the NAAQS or attainment areas subject to maintenance plans (maintenance areas). Federal actions occurring in attainment areas are not subject to the conformity rules. In addition, a General Conformity evaluation is not required for proposed actions

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that fall under an NSR Program or Operating Permit Program. As noted earlier, the compressor station and natural gas heater Project elements will obtain Plan Approvals or General Permits, so there operational emissions are not included in the Conformity analysis below.

The entire pipeline is within the Ozone Transport Region and considered non-attainment for ozone, and Northampton County, PA, is designated non-attainment for PM2.5. However, for the specific purpose of general conformity, areas that were designated as non-attainment for the revoked 1979 1-hour and 1997 8-hour ozone NAAQS are no longer considered non-attainment for the purpose of general conformity (EPA notice 80 FR 12263).

Table 9.1-2 above summarizes the attainment status for the Project areas and shows that a General Conformity evaluation is required for all counties where the pipeline is proposed. The proposed Project spans six counties and two states with differing attainment status for various pollutants. Luzerne County, PA is attainment for all pollutants. Carbon County, PA is marginal non-attainment for the 2008 Ozone standard; Northampton County, PA is moderate non-attainment for $PM_{2.5}$ (2006); marginal non-attainment for the 2008 8-hour Ozone standard; Bucks County, PA is marginal non-attainment for the 8-hour (2008) Ozone standard; Hunterdon County, NJ is considered marginal for the 8-hour (2008) Ozone standard, and Mercer County, NJ is considered marginal for the 8-hour (2008) Ozone standard.

Table 9.1-5 compares the estimated construction emissions from the specific Project elements to the General Conformity "De Minimis" Rates for Non-Attainment Areas (40 CFR 93.153). The anticipated emissions due to Project construction activities are less than the General Conformity "De Minimis" Rates for Non-Attainment Areas. Therefore, a general conformity determination is not required.

Table 9.1-5
General Conformity Determination

Project Component	Location (County, State)	County Non-Attainment Pollutants[1,2]	Construction Emissions (tons)	General Conformity "De Minimis" Rates for Non-Attainment Areas	General Conformity Determination Required? (Yes/No)
23.1	Luzerne, PA	O_3	27.7 tons NOx 3.5 tons VOC	100 tpy NOx 50 tpy VOC	No
28.2 miles of pipeline, Compressor Station	Carbon, PA	O_3	34.2 tons NOx 3.7 tons VOC	100 tpy NOx 50 tpy VOC	No
24.8 miles of pipeline, 2.1 miles of lateral	Northampton, PA	O_3, $PM_{2.5}$	61 tons $PM_{2.5}$ 22.1 tons NOx 2.8 tons VOC	100 tpy $PM_{2.5}$ 100 tpy NOx 50 tpy VOC	No
1.7 miles of pipeline	Bucks, PA	O_3	1.4 tons NOx 0.2 tons VOC	100 tpy NOx 50 tpy VOC	No
26.6 miles of pipeline, 1.9 miles of lateral	Hunterdon, NJ	O_3	20.4 tons NOx 2.6tons VOC	100 tpy NOx 50 tpy VOC	No

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9.6 miles of pipeline	Mercer, NJ	O_3	6.8 tons NOx 0.85 tons VOC	100 tpy NOx 50 tpy VOC	No

Notes:

1 Marginal or Moderate Non-Attainment for the 2008 8-hour Ozone standard
2 Moderate Non-Attainment for the 1997 and/or 2006 $PM_{2.5}$ Standards

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9.2 Noise Quality

9.2.1 Acoustical Background

Table 9.2-1 provides a glossary of acoustical terminology and concepts that are used in this discussion of project noise quality and any potential impacts to the affected environment. Also, to help provide the reader context on how loud or quiet a particular decibel level may be, Figure 9.2-1 presents a list of typical sound sources.

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Figure 9.2-1
Sound Levels of Typical Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: Caltrans, 2009.

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Table 9.2-1
Definitions of Acoustical Terms

Term	Definition
Noise	Whether something is perceived as a noise event is influenced by the type of sound, the perceived importance of the sound, and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs and the sensitivity of the listener.
Sound	For purposes of this analysis, is a physical phenomenon generated by vibrations that result in waves that travel through a medium, such as air, and result in auditory perception by the human brain.
Frequency	Sound frequency is measured in Hertz (Hz), which is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. When the drum skin vibrates 100 times per second it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the best human ear.
Amplitude or Level	Is measured in decibels (dB) using a logarithmic scale. A sound level of zero dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above approximately 110 dB begin to be felt inside the human ear as discomfort and eventually pain at 120 dB and higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about one to two dB. A three to five dB change is readily perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if decreasing by 10 dB, halving) of the sound's loudness.
Sound pressure	Sound level is usually expressed by reference to a known standard. This report refers to sound pressure level (SPL or Lp). In expressing sound pressure on a logarithmic scale, the sound pressure is compared to a reference value of 20 micropascals (µPa). Lp depends not only on the power of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source.
A-weighting	Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment do not consist of a single frequency and instead are composed of a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects the typical frequency-dependent sensitivity of average healthy human hearing. This is called "A-weighting," and the decibel level measured is referred to as dBA. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA "curve" of decibel adjustment per octave band center frequency (OBCF) from a "flat" or unweighted SPL.
Equivalent sound level	Although sound level value may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from

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Term	Definition
	distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor, Leq, may be used to describe sound that is changing in level. Leq is the energy-average dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the acoustic energy contained in the fluctuating sound level measured.
L_{max} and L_{min}	Additionally, it is often desirable to know the range of amplitudes for the noise source(s) under study. This is typically accomplished by reporting the Lmax and Lmin indicators that represent the root mean square (RMS) maximum and minimum noise levels during a given monitoring interval. The Lmin value obtained for a particular monitoring location is often called the "noise floor."
Statistical sound values	To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. These are the noise levels exceeded during 10, 50, and 90 percent of a stated time interval, respectively. Sound levels associated with L10 typically describe transient or short-term events, while levels associated with L90 describe the "steady state" (or most prevalent) background noise conditions.
Day-night sound level	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 from hourly Leq values, with the Leq values for the nighttime period (10 p.m. to 7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime sounds.

9.2.2 Existing Noise Levels

Consistent with FERC guidance for the quantification of the affected sound environment, existing outdoor ambient sound levels were estimated at pre-existing nearest noise-sensitive areas (NSAs) in proximity of planned HDD crossings. Existing outdoor ambient sound levels were measured at pre-existing NSAs nearest to the proposed site for the new Kidder compressor station.

9.2.2.1 Methodology for Baseline Estimates

The Federal Transit Administration (FTA) offers guidance in its *Transit Noise and Vibration Impact Assessment* (FTA, 2006) report for coarsely estimating existing ambient sound level at a receiver location based on proximity to surface transportation noise sources. With this reference information, an L_{dn} value for a receiver location may then be estimated by logarithmically adding the acoustical contributions of these nearest noise sources based on the following expression:

$$L_{dn,est} = 10*LOG(10^{\wedge(Ldn,rail/10)} + 10^{\wedge(Ldn,free/10)} + 10^{\wedge(Ldn,hwy/10)} + 10^{\wedge(Ldn,strt/10)} + 10^{\wedge(Ldn,ind/10)})$$

that is composed of the following terms:

$L_{dn,rail} = 75 - 16.6*LOG(d_{rcvrR}/30)$; where d_{rcvrR} is the distance (feet) between the nearest rail and the receiver;

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$L_{dn,free}$ = 75 – 16.6*LOG(d_{rcvrH}/50); where d_{rcvrF} is the distance (feet) between the nearest freeway (a.k.a., Interstate highway) and the receiver;

$L_{dn,hwy}$ = 70 – 16.6*LOG(d_{rcvrH}/50); where d_{rcvrH} is the distance (feet) between the nearest state highway and the receiver;

$L_{dn,strt}$ = 60 – 16.6*LOG(d_{rcvrS}/50); where d_{rcvrS} is the distance (feet) between the nearest collector street (i.e., an inter-community road, not a drive within a residential subdivision or neighborhood that a residential parcel adjoins) and the receiver; and,

$L_{dn,ind}$ = 55 – 20*LOG((400+d_{rcvrI})/400); where d_{rcvrI} is the distance (feet) between the nearest power plant or other large industrial facility (e.g., quarry, factory, airport) and the receiver.

The first four of these expression terms for the sources are based on Table 5-7 from the aforementioned FTA report. Assumptions for the rail reference value include the following:

- An average of two (2) locomotives and a mix of twenty-five (25) freight and passenger cars per train;
- Average speed of 40 mph;
- Four train pass-bys per day, at most; and,
- Reference horn sound exposure level (SEL) of 113 dBA at 50 feet, freight locomotive propulsion SEL of 97 dBA at 50 feet, and freight car SEL of 100 dBA at 50 feet—all per Federal Railroad Administration (FRA) High-Speed Ground Transportation Noise and Vibration Impact Assessment (FRA, 2012), Appendix E.

The expression for estimating industrial noise presumes that the facility complies with a 55 dBA L_{dn} at a noise-sensitive receiver in the far field (minimum 400 feet distance), which would generally be consistent with EPA guidelines that specifically address issues of community noise. These guidelines, contained in a report that is commonly referred to as the "levels document" (EPA 1974), are goals for noise levels affecting residential land use of L_{dn} < 55 dBA for exterior levels and L_{dn} < 45 dBA for interior levels. The U.S. Department of Housing and Urban Development Noise Guidebook Chapter 2 (24 CFR Section 51.101(a)(8)) also recommends that exterior areas of frequent human use follow the EPA guideline of 55 dBA L_{dn}.

9.2.2.2 Predicted Baseline Estimates at NSA near HDD Sites

Estimated existing Ldn values at NSA nearest to the proposed HDD entry and exit sites are presented in Table 9.2-2.

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Table 9.2-2
Estimated Existing Day-night Sound Level (L_{dn}) at NSA nearest to HDD Sites

HDD Crossing	Nearest NSA GPS Coordinates (Lat./Lon.)	Nearest NSA GPS Street Address	Estimated Existing Ambient Noise Level (L_{dn}, dBA)
Union Street	41.277052, -75.817038	140 Union St., Hudson, PA 18705-3921	67
Union Street	41.276213, -75.81136	17 Ridgewood Rd., Plains, PA 18702-7110	57
U.S. Hwy 81	41.276213, -75.81136	17 Ridgewood Rd., Plains, PA 18702-7110	57
U.S. Hwy 81	41.264502, -75.803678	301-326 Eagle Ct., Wilkes-Barre, PA 18711	50
Wild Creek	40.891315, -75.563672	6875 Pohopoco Dr., Lehighton, PA 18235-6354	52
Wild Creek	40.888183, -75.5516899	665 Twin Flower Cir., Kunkletown, PA 18058	42
Pohopoco Stream	40.886268, -75.55026	545 Twin Flower Cir., Kunkletown, PA 18058	45
Pohopoco Stream	40.8855099, -75.548993	445 Twin Flower Cir., Kunkletown, PA 18058	45
St. Lukes	40.653326, -75.289981	2220 Emrick Blvd., Bethlehem, PA 18020	63
St. Lukes	40.655984, -75.283638	4696 Concord Cir Easton, PA 18045	51
Lehigh River	40.6501038, -75.2885342	1872 St. Luke's Boulevard, Easton, PA 18045	59
Lehigh River	40.635174, -75.274858	2778 Redington?	64
Interstate 78	40.631830, -75.280367	? Abandoned?	60
Interstate 78	40.629862, -75.273751	4287 Lower Saucon Rd., Hellertown, PA 18055	57
Delaware River	40.586189, -75.194332	1503? Easton Rd., Riegelsville, PA 18077	59
Delaware River	40.582952, -75.188856	622 Riegelsville Rd., Milford, NJ 08848-1894	58
St. Hwy. 519	40.580788, -75.120239	100 Spring Garden Rd., Milford, NJ 08848-1896	48
St. Hwy. 519	40.581126, -75.106789	310 Milford Warren Glen Rd., Milford, NJ 08848-1874	53
Pleasant Valley Rd.	40.336475, -74.901790	87-99 Valley Rd., Lambertville, NJ 08530	52
Pleasant Valley Rd.	40.336244, -74.897726	78 Pleasant Valley Rd., Hopewell Township, NJ 08560	56
Wash. Cross. Penn. Rd.	40.311850, -74.816059	Hopewell Township, NJ Sports Center?	53
Wash. Cross. Penn. Rd.	40.304926, -74.812513	461 Scotch Rd., Titusville, NJ 08560-1402	56
Railroad	40.308924, -74.799915	109 Wash. Cross. Penn. Rd., Pennington, NJ 08534-0000	56
Railroad	40.305967, -74.796164	1653 Reed Rd., Pennington, NJ 08534-5004	55

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9.2.2.3 Baseline Field Measurement Survey

Sound pressure level measurements were conducted from JULY 22 through JULY 24, 2015 in the vicinity of the proposed CS site to collect noise data at representative nearest NSAs to characterize and quantify the existing pre-Project ambient outdoor sound environment. Two (2) unattended long-term ("LT", 48-hour duration) and nineteen (19) attended short-term ("ST", 15-20 minutes duration each) measurements were conducted. The ST measurements were conducted at a set of four (4) locations, with multiple measurements performed at each one to capture data representative of different times of day (e.g., morning, afternoon, and night).

The sound level measurements were conducted with Larson-Davis (LD) sound level meters (SLM), rated by the American National Standards Institute (ANSI) as Type 1 (LD Model 820, Serial Numbers [SN] 1651, 1652, 1736). The SLM microphones were fitted with standard 3.5-inch diameter open-cell foam windscreens and positioned roughly 4 to 5 feet (approximately 1.5 meters) above grade to simulate the average height of the human ear above ground level. The microphones were also placed at least 10 feet (3 meters) from any acoustically reflecting surfaces. The SLMs were set to use a slow time-response and the A-weighting scale. SLM calibration was field-checked before and after each measurement period with an acoustic calibrator (LD Model 200, SN 5789). Where not already described, sound level measurements performed for this field survey were conducted in accordance with applicable portions of International Organization for Standardization (ISO 1996a, b, and c) standards.

A summary of the sound level measurement data and associated meteorological conditions are presented in Table 9.2-3. The LT hourly L_{eq} noise level detail is presented in Appendix L-4. Field notes from the outdoor ambient sound level survey appear in Appendix L-4. Please refer to Appendix L-4 for a presentation of photographs that document SLM installation associated with the measurement locations shown on Figure 9.2-2 and briefly described as follows.

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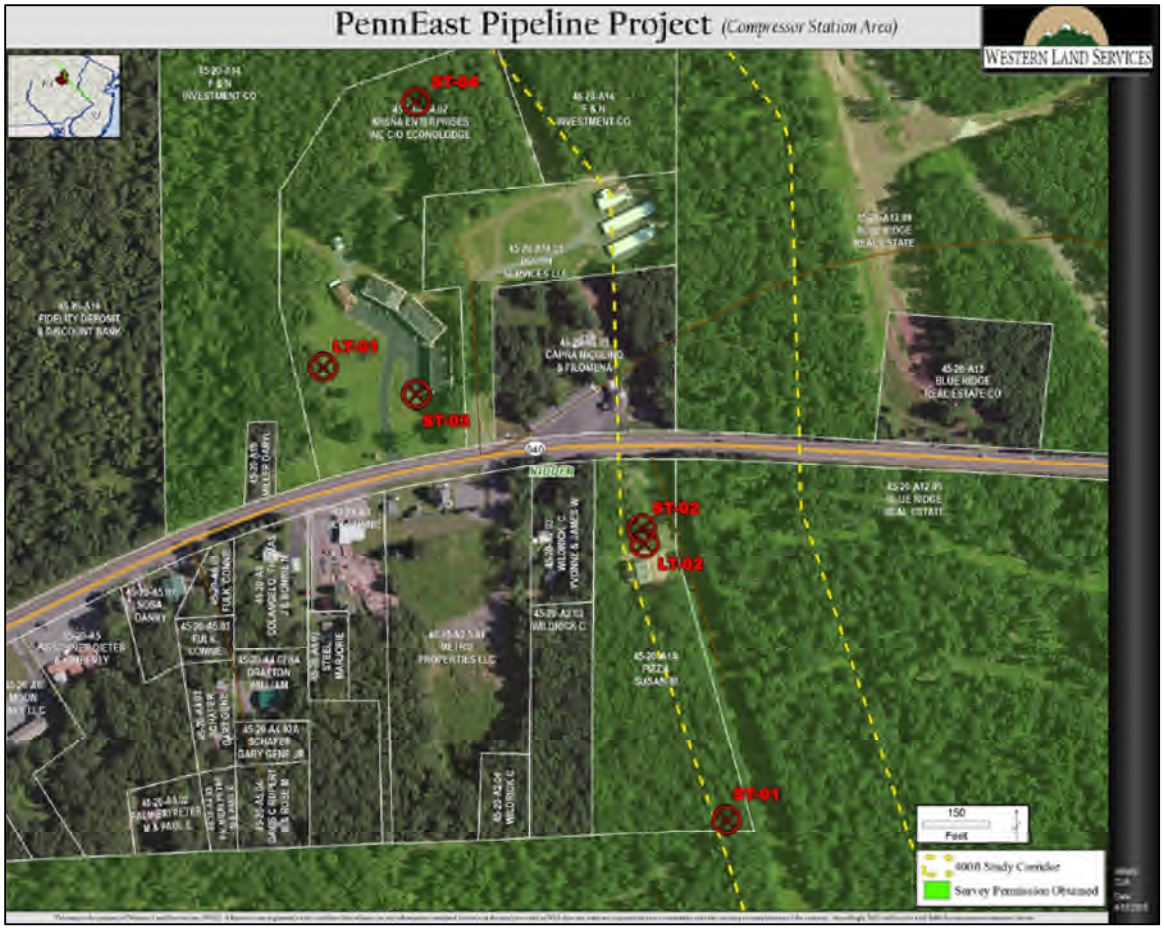

Figure 9.2-2

Existing Outdoor Ambient Sound Level Measurement Locations

LT1 (Lat.: 41°05.312, Lon.: -75°39.956) – A long-term (48-hour) sound level measurement was conducted on the southwestern side of the Econolodge commercial property, approximately 250 feet north of Route 940, with an LD Model 820 SLM. The audible noise sources perceived during monitor setup and disassembly at this location were road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds, frogs and insects.

LT2 (Lat.: 41°05.253, Lon.: -75°39.801) – A long-term (48-hour) sound level measurement was conducted on the northern side of the Susan M. Pizza residence, approximately 210 feet south of Route 940 and approximately 50 feet north of the property's residential building facade, with an LD Model 820 SLM. The audible noise sources perceived during monitor setup and disassembly at this location were road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds and insects.

ST1 (Lat.: 41°05.144, Lon.: -75°39.752) – A set of short-term sound level measurements were conducted at the southern end of the Susan M. Pizza residence, approximately 780 feet south of Route, with an LD Model 820 SLM. The perceived audible noise sources included road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds and insects.

ST2 (Lat.: 41°05.254, Lon.: -75°39.798) – A set of short-term sound level measurements were conducted approximately 20 feet north of the LT2 sound level monitoring position. The perceived

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audible noise sources included road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds and insects.

ST3 (Lat.; 41°05.303, Lon.: -75°39.911) – A set of short-term sound level measurements were conducted approximately 150 feet north of Route 940 at the southernmost end of the Econolodge parking area. The perceived audible noise sources included road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds and insects.

ST4 (Lat.: 41°05.413, Lon.: -75°39.913) – A set of short-term sound level measurements were conducted approximately 750 feet north of Route 940, near the northern end of the Econolodge property. The perceived audible noise sources included road vehicle traffic noise from Interstate-80, rustling tree leaves, and the natural sounds of birds and insects.

Table 9.2-3
Summary of Existing Outdoor Ambient Sound Level Measurement Results

Site ID	Date(s)	Start Time (hh:mm)	End Time (hh:mm)	L_{eq}	L_{max}	L_{min}	L_{90}	L_{dn}	T (^{o}F)	RH (%)	Wind Speed (mph) & Dir.
LT1	4/22/15 to 4/23/15	10:15	10:15	54	78	36	46	58	52	51	4-6 / N
	4/23/15 to 4/24/15	10:25	10:25	51	80	35	42	56	36	63	10 / N
LT2	4/22/15 to 4/23/15	10:40	10:40	53	78	35	44	59	56	54	3-6 / N
	4/23/15 to 4/24/15	10:40	10:40	53	79	33	41	58	36	79	4-6 / N
ST1	4/22/2015	11:13:00	11:31:00	53	61	50	52	-	56	49	2-3 / E
	4/22/2015	19:12:00	19:28:00	48	53	43	45	-	48	64	2-4 / E
	4/23/2015	10:54:00	11:13:00	48	57	42	46	-	42	68	4-6 / E
	4/23/2015	18:53:00	19:09:00	44	57	39	41	-	38	58	2-4 / S
ST2	4/22/2015	11:38:00	11:55:00	53	64	47	50	-	55	57	2-3 / N
	4/22/2015	19:33:00	19:50:00	51	64	41	44	-	47	64	2-4 / N
	4/23/2015	10:29:00	10:48:00	51	61	40	44	-	37	79	4-10 / N
	4/23/2015	19:14:00	19:31:00	49	61	36	41	-	38	58	2-4 / S
	4/23/2015	22:55:00	23:11:00	52	70	33	36	-	34	57	0 / NA
ST3	4/22/2015	12:04:00	12:21:00	58	71	46	50	-	56	58	6-8 / N
	4/22/2015	20:29:00	20:45:00	55	66	48	50	-	46	64	3-5 / S
	4/23/2015	11:52:00	12:08:00	59	71	44	49	-	47	60	4-10 / S
	4/23/2015	20:03:00	20:19:00	54	66	41	43	-	36	61	4-6 / S
	4/23/2015	23:41:00	23:57:00	54	73	37	39	-	34	57	2-3 / S
ST4	4/22/2015	12:35:00	12:55:00	51	62	45	49	-	56	58	6-8 / N
	4/22/2015	20:01:00	20:16:00	44	58	39	42	-	50	65	2-4 / N
	4/23/2015	11:26:00	11:45:00	47	58	41	44	-	41	67	4-6 / N
	4/23/2015	19:38:00	19:53:00	42	50	36	39	-	37	64	2-3 / S

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Site ID	Date(s)	Start Time (hh:mm)	End Time (hh:mm)	L_{eq}	L_{max}	L_{min}	L_{90}	L_{dn}	T (^{o}F)	RH (%)	Wind Speed (mph) & Dir.
	4/23/2015	23:18:00	23:36:00	40	53	34	37	-	34	57	2-3 / S

NOTES:
1. LT = Long Term, ST = Short Term, Ldn = Day-Night Average Noise Level, RH = Relative Humidity.
2. Indicated Temperature, RH, and Wind Speed values were measured when the meter was setup.

9.2.3 Applicable Noise Regulations and Ordinances

FERC noise analysis guidelines require that any applicable state or local noise regulations be identified. It is further required to specify how the proposed facility will meet the applicable regulations. After an online search, applicable noise regulations were found and are summarized in Table 9.2-4:

Table 9.2-4
Summary of Applicable Noise Regulations

Regulatory Agency	Applicable Noise Regulations and Comments
Federal Energy Regulatory Commission (FERC)	55 dBA L_{dn} at nearest Noise Sensitive Area (NSA)
State of New Jersey	New Jersey Administrative Code, Title 7, Chapter 29, subdivision 1-1 and 1-2 (noise limits for industrial facilities)
Kidder Township, PA	Municipal Code, Chapter 121-4. Loud, unnecessary or unusual noise prohibited.
Frenchtown, NJ	Police Regulations, Chapter 3-1.2(l) and (m). (construction and industrial facilities) Police Regulations, Chapter 3-1.4. (permits for noisemaking activities)

9.2.3.1 Federal

Under 18 Code of Federal Regulations (CFR) 380.12(k)(4)(v)(A) (2006), FERC requires the submission of Resource Report 9 (RR9) and specifies that 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 55 dBA day-night average sound level (Ldn) at any preexisting NSA (e.g., residential land use, school, church, hospital or other qualifying NSA type). This FERC threshold applies to both noise from construction activities and post-construction facility operations.

9.2.3.2 State

As shown in Table 9.2-5, the New Jersey Administrative Code (NJAC) provides the following noise emission limits from industrial facilities with respect to receiving residential properties.

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Table 9.2-5
State of New Jersey Daytime and Nighttime Noise Thresholds

Noise Type	Unweighted Noise Level Thresholds, per Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	dBA
Continuous airborne sound, daytime (7 a.m. to 10 p.m.)	96	82	74	67	63	60	57	55	53	65
Continuous airborne sound, nighttime (10 p.m. to 7 a.m.)	86	71	61	53	48	45	42	40	38	50

While the Table 9.2-5 noise thresholds may apply to temporary HDD and pipeline construction noise, the FERC threshold of 55 dBA L_{dn} would (on the basis of its implication of no more than 49 dBA L_{eq} for each hour for a continuous noise source) be considered more stringent.

9.2.3.3 Local

Kidder Township, PA, the jurisdiction within which the compressor station site is being considered, has the following relevant qualitative noise regulation:

"It shall be unlawful for any person to make, continue or cause to be made or continued any loud, unnecessary or unusual noise or any noise which either annoys disturbs, injures or endangers the comfort, repose, health, peace or safety of others, within the limits of Kidder Township, Pennsylvania."

As this noise prohibition is not quantified, this noise analysis assumes the FERC threshold of 55 dBA L_{dn} applies, and that compliance with such application would satisfy this local standard.

In Frenchtown, NJ, municipal regulations have set limits on construction activity hours that are expected to apply to pipeline construction noise emission as received by nearby NSA in the jurisdiction.

"No person shall operate or permit to be operated any tool or equipment used in construction, drilling or demolition work between the hours of 8:00 p.m. and 7:00 a.m. the following day on weekdays or at any time on Sundays or legal holidays, such that the sound therefrom creates unreasonable noise across a residential real property boundary or in a noise-sensitive area."

The municipal regulations also provide a permit application process if the above prohibition is not expected to be met.

9.2.4 Project Noise Analysis

9.2.4.1 Analysis Methodology

9.2.4.1.1 Compressor Station Operations

For purposes of analysis transparency, the project compressor station operational noise was evaluated with an Excel-based noise prediction technique that uses expressions from the ISO 9613-2:1996 outdoor noise propagation calculation standard—the same industry-accepted standard utilized by commercially-available sound propagation modeling programs such as Cadna/A—and oft-referenced

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texts such as *Noise & Vibration Control Engineering* (Beranek & Ver, 1992). The Excel-based prediction model incorporates the following input parameters and assumptions:

A. Table 9.2-6 presents a list of operational noise sources considered, including anticipated quantities of equipment types and octave band center frequency (OBCF) sound levels for each equipment type as provided by the indicated reference or as estimated from industry-accepted formula and empirical data (Bies & Hansen, 1996). There are three (3) compressor turbines under consideration at this time, and each is a Solar Turbines Model Mars 100 rated at 15,214 horsepower (HP) full-load output power. Although subsequent submittals may include expansions or refinements to this list, we believe the major noise-producing elements are conservatively represented at this time.

Table 9.2-6
Summary of Anticipated Equipment Sound Power Levels (dB) - Kidder Compressor Station

Equipment Sound Source Type	Qty	Unattenuated, Unweighted Sound Power Level (L_w), Octave Band Center Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	dBA
NGL Cooler	3	97	103	102	99	94	91	84	80	74	97
Lube Oil Cooler	3	109	116	113	106	101	98	94	90	85	105
Turbine Air Inlet (unsilenced)	3	117	123	129	130	131	133	136	165	157	167
Turbine Exhaust (unsilenced)	3	127	131	129	132	136	131	123	113	103	136
Turbine Package (unenclosed)	3	111	110	116	116	119	117	126	124	119	130
Ventilation Duct (unsilenced)	3	109	108	114	109	110	108	116	113	108	119
Fuel Gas Meter Skid	1	96	85	82	75	82	83	93	90	88	97
Fuel Gas Heater	1	84	88	93	85	94	97	98	101	91	105

NOTES: L_w shown is the aggregate value for quantity of units of indicated equipment type.

B. Because the nearest pre-existing NSA is at least 2,150 feet distant from the proposed compressor station site location, and this distance is larger than the distances between individually-considered compressor station noise sources, the sources are assumed to share the same acoustic origin point (approximated as the geographic center of the compressor building).

C. Sound propagation with increasing distance, otherwise known as geometric divergence, can be expressed in dB per Equation 7 from ISO 9613-2:1996 as follows:

$$A_{\text{div}} = \left[20\log\left(\frac{d}{d_0}\right) + 8 \right]$$

where d is the distance between source and receiver in meters, and d_0 is a reference distance of one meter. The 8 dB constant assumes hemispherical spreading, rather than spherical spreading.

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D. Atmospheric absorption is an attenuation factor, based on a site temperature of 10 degrees Celsius and 70 percent relative humidity, described by the following equation (Beranek & Ver, 1992):

$$A_{\text{atm,band}} = \frac{r}{1000}\left[0.2 + 3.6\left(\frac{f_{\text{band}}}{1\text{kHz}}\right) + 0.36\left(\frac{f_{\text{band}}}{1\text{kHz}}\right)^2\right]$$

where r is the distance between source and receiver in meters, and f_{band} is the octave band center frequency.

E. Ground absorption is handled per Equation 10 from ISO 9613-2:1996, shown below, assuming the Project site and its surroundings are relatively porous (and thus, acoustically absorptive to some degree)—as one would expect to describe the predominant surrounding landscape and its vegetative cover.

$$A_{\text{gr}} = 4.8 - \left(\frac{2h_{\text{m}}}{d}\right)\left[17 + \left(\frac{300}{d}\right)\right] \geq 0\text{dB}$$

where h_{m} is mean height of the sound path between source and receiver, and d is the distance between source and receiver in meters. Since the average human listener will be 1.5 meters above grade, and the average height of the compressor station noise sources above grade might reasonably be considered 4.5 meters, h_{m} is expected to be 3.

F. The attenuative effects of terrain and topography are not included. This "billiard table" approach simplifies the Excel model considerably, but neglects (and by doing so, should yield more conservative estimated sound levels at receivers) the potential noise reduction that intervening natural geographic features might offer. Since the Project area and its vicinity are relatively flat, terrain influence is expected to be negligible.

G. Modeled meteorological effects will be considered similar to CONservation of Clean Air & Water in Europe (CONCAWE) Category 4 ("CAT-4"), which can be interpreted to mean calm conditions (i.e., little or no wind). This meteorological category, of which there are six in total, depends on parameters such as wind speed and "Pasquill" classes of atmospheric stability that influence sound propagation with distance and have been experimentally determined by Manning (Bies & Hansen, 1996).

H. Piping noise radiation is sufficiently attenuated by external lagging or underground position, so that its contribution to the prediction is negligible.

I. The compressor station runs continuously and at full power, 24 hours per day.

Some of the sources of noise listed in Table 9.2-6 are enclosed within the structure of the compressor building. Table 9.2-7 presents the components of a calculated net noise reduction (NR) estimate for such a building that measures 175 feet x 70 feet in plan and has an assumed mean interior height of 20 feet. This NR estimate considers factors such as building geometry, the acoustical transmission loss (TL) of typical wall construction for such a facility, and wall radiation according to a method found in the *Electrical Power Plant Environmental Noise Guide* (Edison Electric Institute, 1984).

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Table 9.2-7
Summary of Anticipated Compressor Station Noise Reduction Features - Kidder Compressor Station

Description	dB at Octave Band Center Frequency (OBCF, Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	Notes
Compressor Bldg. Noise Reduction (NR):										
A. Building geometry factor	15	15	15	15	15	15	15	15	15	I
B. Wall transmission loss (TL)	1	7	13	17	26	33	36	47	47	II
C. Wall radiation	25	25	25	25	25	25	25	25	25	III
Net Compressor Bldg. NR	-3	3	9	13	22	29	32	43	43	IV
Turbine Inlet Silencer	0	1	4	7	26	43	52	60	55	V
Turbine Inlet Filters	2	4	8	9	13	26	27	27	33	VI
Turbine Exhaust Silencer	3	5	10	21	32	37	39	38	34	VII
Turbine Enclosure	-9	-3	6	9	14	13	24	25	25	VIII

NOTES:
I. Edison Electric Institute (EEI), Electric Power Plant Environmental Noise Guide (EPPENG), Vol. I, 2nd ed., Table 6.2, ~245,000 ft^3 bldg (175'x70'x20').
II. North American Insulation Manufacturers Association (NAIMA) MB315, R13 faced 202-96 insulation over girts (STC 29, OITC 20); assume roof offers comparable STC/OITC.
III. EPPENG, Equation 6.4, ~3,400 ft^2 wall (175'x70'x20').
IV. Arithmetic sum = A+B-C+6, per EPPENG, Equation 6.1.
V. Solar Turbines PIB 252, rev. 2, 2015, Mars 100..
VI. *Ibid*, , pulse-cleaning updraft.
VII. *Ibid*, .
VIII. *Ibid*, enclosed and unenclosed package L_W.

Key assumptions for the compressor building NR estimate include as follows:

- Equipment roll-up doors and personnel access doors are closed during nominal compressor operation and feature sufficient sound insulation in their design and installation so that they do not compromise the net compressor building NR shown in Table 9.2-7.
- Ridge vents or other means of building heat dissipation or other HVAC systems feature sufficient sound insulation and air path sound attenuation in their design and installation so that they do not compromise the net compressor building NR shown in Table 9.2-7.
- The ceiling construction features sound insulation properties that enable an outdoor-indoor transmission class (OITC) rating that is no less than 5 dB of the building wall OITC.

Table 9.2-7 also lists silencers and other means of noise reduction that are anticipated to be applied to specific CS site sound sources. Table 9.2-8 presents attenuated source sound levels for equipment listed in Table 9.2-6, representing the effect of applying noise reduction techniques shown in Table 9.2-7.

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Table 9.2-8
Summary of Anticipated Attenuated Compressor Station Operation Noise Sources - Kidder Compressor Station

Equipment Sound Source Type	Qty	Attenuated, Unweighted Sound Power Level (L_w), Octave Band Center Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	dBA
NGL Cooler	97	103	102	99	94	91	84	80	74	97	97
Lube Oil Cooler	109	116	113	106	101	98	94	90	85	105	109
Turbine Air Inlet (unsilenced)	115	118	117	114	92	64	57	78	69	107	115
Turbine Exhaust (silenced)	124	126	119	111	104	94	84	75	69	108	124
Turbine Package (enclosed)	123	110	101	94	83	75	70	56	51	92	123
Ventilation Duct (silenced)	3	109	106	107	98	94	89	95	93	92	101
Fuel Gas Meter Skid	1	96	85	82	75	82	83	93	90	88	97
Fuel Gas Heater	1	84	88	93	85	94	97	98	101	91	105

NOTES: L_w shown is the aggregate value for quantity of units of indicated equipment type.

9.2.4.1.2 Construction

Construction of the Project will include construction at the proposed CS site, pipeline construction along the proposed route, and HDD operations. Typical construction activities, including site preparation to final grading, is expected to last several months at the CS site and several weeks at a particular pipeline route segment. Depending on the extent of the crossing and other factors, HDD operations can occur over a continuous 24-hour period. During any of these three categories of activities, a varying number of construction equipment and personnel will be in the area of a given construction site or zone, resulting in varying levels of construction noise. The following subsections detail the techniques for predicting construction noise using currently anticipated rosters of equipment and expected hours of operation.

9.2.4.1.2.1 Compressor Station

Table 9.2-9 presents a list of expected equipment and vehicles to be involved in the construction of the CS. Prediction of L_p at an NSA resulting from CS construction applies the same sound propagation algorithms and assumptions (B through G) as shown in Section 9.2.4.1.1.

Table 9.2-9
Compressor Station Construction Noise Sources

Offroad and On-Road Construction Equipment/Vehicle Types	Utilization (%)	Rated Power (HP)	Quantity of Equipment/Vehicles Onsite	Reference Sound Contribution (dBA, L_p at 1m)
Welding Rig	50%	35	9	112

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8,000 Lb All-Terrain Fork Truck	50%	100	1	107
D-7 LGP Caterpillar or Equivalent	50%	240	2	114
325 Caterpillar or Equivalent	50%	180	2	112
330 Caterpillar with Vacuworks & Shoes	50%	270	3	116
Cat Rubber Tire Backhoe	50%	100	3	111
583 Caterpillar Pipelayer	50%	347	1	112
594 Caterpillar Pipelayer	50%	385	1	113
300 Ton Hydraulic Crane	50%	296	1	111
60 Ton Mantis	50%	240	1	111
Power Generator	50%	35	1	102
Pick Up (SITE Supervision & Inspection)	50%	200	10	120
Pick Up (Operator Pick Ups)	50%	200	6	118
One Ton Truck w/ Tools	50%	300	3	116

Additionally, and for purposes of this analysis, the following assumptions and parameters apply:

- Construction occurs up to a 10-hour shift and only within daytime hours (7 a.m. to 10 p.m.).
- The reference sound level for each construction equipment or vehicle type is based on its rated engine power per the following expression (Beranek & Ver, 1992):

$$L_p \text{ at 1 meter distance} = 99+10*LOG(HP*0.746) - 8$$

- "Utilization" refers to the cumulative duration in a given time period (e.g., hour) that the equipment or vehicle is actually operating and/or moving at full engine power. While usually expressed as a percentage and varying with equipment or vehicle type, this analysis has conservatively assumed 50% for all.

9.2.4.1.2.2 HDD

Noise emission from HDD activity is estimated by applying the same methodology and assumptions (B through G) as described in Section 9.2.4.1.1 for CS operations noise. The acoustic emission point discussed in assumption B is now the geographic center of the HDD entry or exit equipment pit, depending on which is being studied in the analysis. Reference sound power levels (L_w) are assumed to be similar to those as reported by Burge & Kitech (2009) and appearing in Table 9.2-10.

Table 9.2-10
Aggregate Horizontal Directional Drilling Equipment Reference Sound Levels

Sound Source Location	Unweighted Sound Power Level (L_w) per Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	dBA
HDD entry site equipment	118	115	112	114	112	109	108	106	98	115
HDD exit site equipment	110	108	105	102	100	98	95	92	88	103

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9.2.4.1.2.3 Pipeline Construction

Noise emission from pipeline construction activity is estimated by applying the same methodology and assumptions (B through G) as described in Section 9.2.4.1.1 for CS operations noise. The acoustic emission point discussed in assumption B is now the geographic center of the pipeline construction activity along the pipeline ROW. Table 9.2-11 presents a list of expected quantities (and rated engine HP) of equipment and vehicles to be involved in the construction of the Project pipeline along spread #1. Construction equipment and vehicles anticipated for spreads #2, #3 and #4 are similar.

The three aforementioned additional prediction parameters applied to prediction of CS construction noise (i.e., with respect to daily construction shift duration [10 hours during the daytime], estimation of reference equipment/vehicle noise levels and utilization percentage) are also applied to pipeline construction activity noise. This analysis also assumes that the activities shown in Table 9.2-11 are sequential.

Table 9.2-11
Pipeline Construction Noise Sources – Quantities by Activity, Spread 1

Offroad and On-Road Construction Equipment/Vehicle Types	HP	O/H	Mob.	Maint.	Clear & Grade	Ditch & Pad	Erosion Control	Waterbody	String & Bend	Lay & Weld	Coat	Lower & Backfill	Road Bore	Tie-In	H-Test	Clean-up
Chipper	440	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Compressors	50	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
3" & 6" Pumps	40	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0
Booster Pump	40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Low Head	40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Hydro Mulcher	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hydro Seeder	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Welding Rigs	35	0	2	2	0	0	0	4	0	20	0	4	4	0	2	0
Fuel / Grease Combo	400	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mechanic Rig	400	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Dump Truck	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Fuel truck	400	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Grease Truck	400	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Water Truck	400	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0

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416 BH/LDR	68	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Forklift	68	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Bush Hog	68	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Hydro Ax	100	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Skid Truck	100	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Auger Backfiller	180	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Rockpicker	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
966 Loader	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14 Grader	240	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Skidder	150	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Ditch Witch	150	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Boring Machine	150	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
John Henry	175	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0
Bender 32-42"	235	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Sideboom 583	235	0	1	0	0	0	0	2	0	2	1	3	2	4	1	0
D7 Tack Rig	240	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
D8 Dozer w/ Winch	300	0	1	0	4	2	0	0	0	0	0	0	2	4	1	3
D8 Dozer w/ Ripper	300	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
345 Backhoe	345	0	0	0	2	3	0	1	0	0	0	2	2	4	0	3
345 Hammer	345	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Sideboom 594	385	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Vac Lift	385	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Ozzie 300	400	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Trencher	400	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Padder Hoe	400	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
365 Backhoe	400	0	0	0	0	3	0	1	0	0	0	2	0	0	1	3
Bus	300	0	0	0	1	1	0	1	1	1	0	1	2	0	1	1
Parts Van	200	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0
Pick Up	200	8	0	1	7	10	4	5	4	4	2	5	8	12	6	14
D8 Tow	300	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2 Ton Flatbed	300	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0

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Float & Truck	300	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0
Lowboy & Truck	300	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0
Pole Trailer & Truck	300	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0

9.2.4.2 Analysis Results

9.2.4.2.1 Operation Noise Analysis

9.2.4.2.1.1 Effects on NSAs

Table 9.2-12 present the predicted aggregate compressor station operation noise and estimated ambient noise increment at two nearest representative NSAs to the CS site, the general layout and surrounding area for which is shown in Figures 9.2-3.

Estimated existing ambient noise levels, calculated with the same technique described in Section 9.2.2.1 for estimating existing outdoor ambient noise levels nearest to HDD sites, are presented in Tables 9.2-12 along with the measured L_{dn} ranges for the two NSAs as appearing in Table 9.2-3. The measured existing outdoor ambient SPL measurements for these two NSAs are about 6 dBA greater than the estimated L_{dn} values. This difference is expected as the following acoustical contributors to the outdoor ambient sound levels were not reflected in the L_{dn} value estimation methodology:

- Wind-driven tree leaf rustling and other natural sounds (birdsong, insect noise, dog barks, etc.);
- Nearby aviation traffic (civil, commercial and military);
- Commercial or residential noise-producing activities (e.g., landscaping);
- Temporary, short-term usage of portable (a.k.a., hand-held) power tools or other construction activities; and,
- Building pumps, generators, HVAC and other electro-mechanical systems and equipment.

Using the measured existing outdoor ambient sound levels at these two NSAs, which are already experiencing L_{dn} values that are higher than the FERC 55 dBA L_{dn} threshold, Table 9.2-12 shows that the predicted CS noise will be less than the FERC threshold and is not anticipated to cause a significant increase in the existing ambient outdoor sound level. Therefore, as a result of new compressor station operation at the proposed site under calm or wind-neutral meteorological conditions, no noise impact to NSAs is expected.

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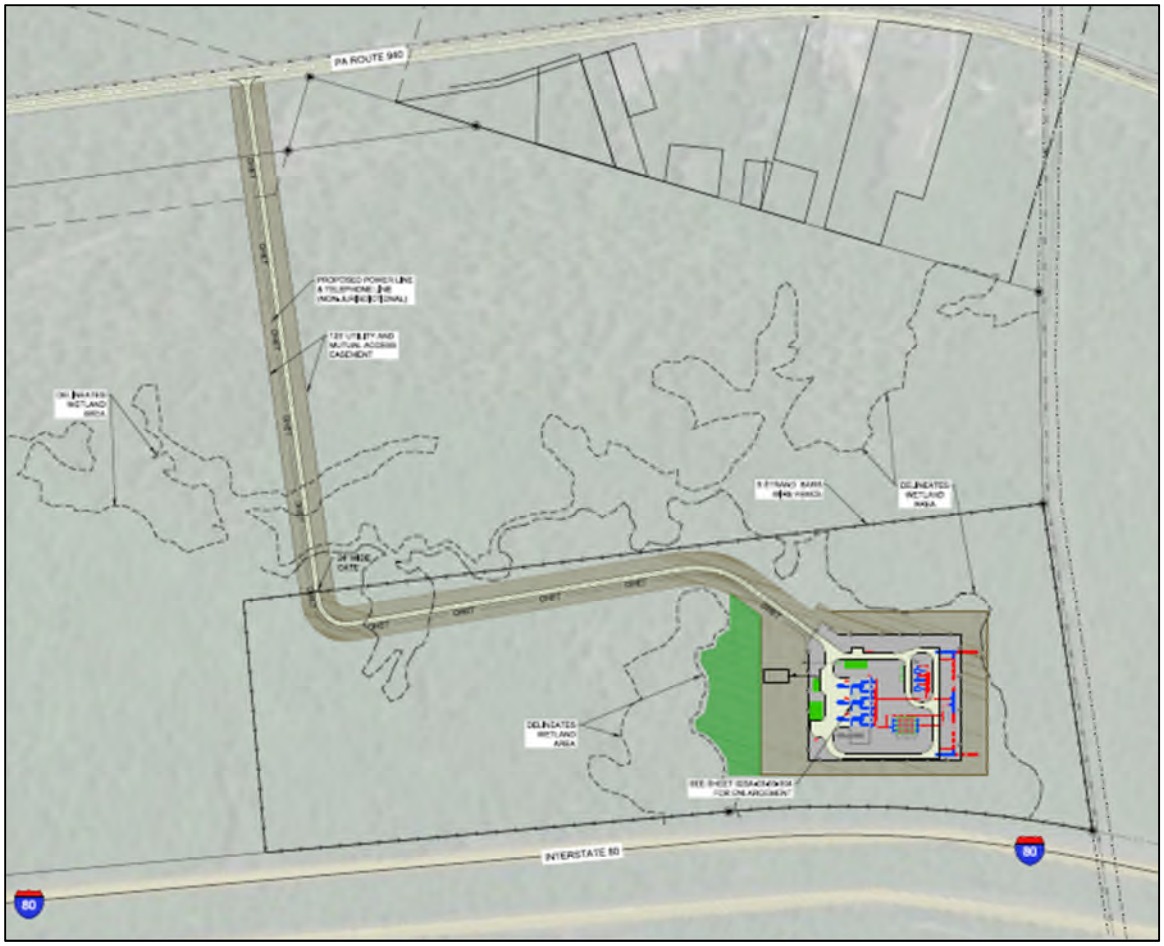

Figure 9.2-3
General Area Layout around the Compressor Station

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Table 9.2-12
Summary of Noise Quality Analysis - Kidder Compressor Station

Nearby NSAs	Distance and Direction of NSA from Comp. Building	Estimated Baseline Ambient Noise Level (dBA, L_{dn})	Measured Baseline Ambient Noise Level (dBA, L_{dn})	Estimated Sound Contribution (dBA, L_{dn}) of the Compressor Building	Total Estimated Ambient Sound Level (dBA, L_{dn}) after Installation of the Compressor Building	Change in Ambient Level (dBA, L_{dn})
Econolodge (LT1)	2,650' north	50	56-58	48	57-58	0-1
Pizza Residence (LT2)	2,150' north	53	58-59	50	59-60	1

The nearest Jack Frost National Golf Club ("Golf Course") fairway is at least 2,900' distant from the CS site, so CS operation noise levels would be expected to be compliant with the FERC threshold at that location (and more distant ones associated with the Golf Course) as well.

9.2.4.3 Effects on Wildlife

Human-generated noise is known to affect animals in a range of ways, from annoyance, to chronic stress, to hearing loss. Noise may directly affect reproductive physiology or energetic consumption as individuals incur energetic costs or lose mating or foraging opportunities by repeatedly reacting to or avoiding noise. Animals may also be forced to retreat from favorable habitat to avoid aversive anthropogenic noise levels. Though the direct effects of noise on wildlife may be the most obvious, noise may also have indirect effects on population dynamics through changes in habitat use, foraging, predator avoidance, courtship and mating, reproduction and parental care, and possibly local patterns of wildlife movement. Excessive or persistent noise may also affect mortality rates of adults by causing hearing loss, a serious hazard in predator-prey interactions. Other effects of noise on wildlife are likely to be subtler, such as those affecting intra-specific and inter-specific communication. In species that rely on acoustic communication, anthropogenic noise may adversely affect individual behavior by making signal detection difficult and thus altering the dynamic interaction between the producers and perceivers of communicative signals (Larkin 1997).

However, it cannot always be assumed that human-generated noise will necessarily have a negative effect. One reason is that, although natural environments can be quiet, natural noise (e.g., high winds, rainfall, thunderclaps) is part of the natural world and adaptations to a noisy environment predate modern-day noises generated by humans.

In addition, habituation of animals to their environment is also a significant factor in assessing effects of noise. The definition of habituation is "the elimination of the organism's response to often recurring, biologically irrelevant stimuli without impairment of its reaction to others." Habituation is ubiquitous in the animal kingdom. No study takes place without subjects habituating to their natural or experimental environments to some degree. More predictable sources of disturbance can lead to greater apparent habituation in field situations than less predictable ones. Situations in which similar noise-producing activities occur in the same habitat at frequent intervals may affect locally breeding wildlife less than less-frequent or less-predictable activities. One might therefore classify two types of effects as follows:

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- Acute – otherwise known as a "startle" response to infrequent and/or unfamiliar noise; and
- Chronic – response to frequently occurring noise that may interfere with daily behaviors or activities.

For example, White and Thurow reported that ferruginous hawks and other similar species will tolerate considerable noise—about 80 dBA—close to their nests if they are familiar with it, especially if humans are not visible or otherwise obviously associated with the noise (AMEC Americas Limited, 2005).

Research on the potential effects of noise and vibration on wildlife continues to develop, showing that these effects can vary with species, settings, seasons, and other parameters that remain undiscovered or require better understanding. Recent studies suggest that certain species either adapt when their environment becomes noisier, or the masking of normal acoustical cues seems to challenge both prey and predator in what one might call with relatively equal measure. For other species, avoidance of a noisy environment is considered a conservation benefit. Examples of each of these findings, in like order, are as follows:

- "Our study suggests that ground squirrels may be able to cope with turbines and their associated acoustic noise through behavioral modifications in a predatory context… The fact that California ground squirrels appear to be able to adjust their behavior appropriately to cope with the presence of turbines is not surprising since S. beecheyi has demonstrated its ability to live in a variety of habitats under a variety of anthropogenic modifications (Marsh, 1998)." (Rabin, 2005)
- "A 5 dB increase in background sound level (in the frequency band of the acoustic signal) means prey species could experience a 45% reduction in the distance at which they can hear a predator approaching, and predators that hunt using acoustic cues might experience a 70% reduction in search area. Similar calculations apply to animal communication." (Barber, 2009)
- "Interestingly, the reluctance of bats to forage in very noisy environments potentially also brings about conservation benefits. If bats indeed allocate little foraging time to noisy highway margins and highways themselves, the number of potential traffic casualties (Kiefer et al., 1994; Lesinski, 2007) could be reduced." (Schaub, 2008)

Because Table 9.2-12 indicates that the anticipated outdoor ambient noise increment resulting from nominal operation of the Kidder CS will be only 1 dBA or less (a barely detectable difference by human hearing standards) at distances from the facility that are comparable to those of the nearest NSA, one might reasonably conclude that the variety of fauna in the vicinity already habituated to existing sources of natural and man-made noise (e.g., I-80 traffic) and are unlikely to be adversely affected.

9.2.4.4 Construction Noise Analysis

9.2.4.4.1 Compressor Station

Tables 9.2-13 present the predicted aggregate CS construction noise and estimated ambient noise increment at each of two nearest representative NSAs to the CS site.

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Table 9.2-13
Predicted Construction Noise - Kidder Compressor Station

Nearby NSAs	Distance and Direction of NSA from Comp. Building	Estimated Baseline Ambient Noise Level (dBA, L_{dn})	Measured Baseline Ambient Noise Level (dBA, L_{dn})	Estimated Sound Contribution (dBA, L_{dn}) of Construction Noise	Total Estimated Ambient Sound Level (dBA, L_{dn})	Change in Ambient Level (dBA, L_{dn})
Econolodge (LT1)	2,650' south	50	56-58	56	59-60	2-3
Pizza Residence (LT2)	2,150' south	53	58-59	59	62	3-4

Estimates of aggregate construction noise range from 1-4 dBA L_{dn} higher than the FERC threshold, so mitigation is anticipated to help lower and keep these temporary activity noise emission levels compliant.

9.2.4.4.2 Pipeline

Table 9.2-14 presents the estimated L_{dn} associated with each construction activity at a variety of receiver-to-source distances.

Table 9.2-14
Predicted Pipeline Construction Noise (dBA, L_{dn}) by Activity Type at Screening Distances

Distance (feet) between Activity Center and Receiver	O/H	Mob.	Maint.	Clear & Grade	Ditch & Pad	Erosion Control	Waterbody	String & Bend	Lay & Weld	Coat	Lower & Backfill	Road Bore	Tie-In	H-Test	Clean-up
3,300	47	52	52	54	55	46	51	52	52	45	52	52	53	50	54
1,650	55	59	59	61	63	54	59	59	59	52	59	59	61	57	62
825	61	66	66	68	69	61	66	66	66	59	66	66	67	64	69

At a distance of approximately 3,300 feet, noise from all activities is expected to comply with the FERC 55 dBA L_{dn} threshold; thus, any potential pre-existing NSA beyond this distance would not be expected to be impacted. For NSAs that are closer to the construction activity, mitigation may be needed depending on the construction activity type. Note that all of these activities are temporary in nature, due to the geographic progression of pipeline completion with respect to an NSA.

Depending on listener proximity to the project ROW experiencing activity, pipeline construction noise may also be audible to recreationists enjoying hunting, hiking and other allowable activities within Hickory Run State Park ("HRSP"). Similarly, pipeline construction noise may also be audible to visitors within the eastern end of Beltzville State Park ("BSP"). By way of notices posted on existing information sources for HRSP and BSP, potential visitors to and employees of these two parks could be advised of anticipated construction periods and thus minimize the likelihood of unexpected annoyance that the pipeline construction noise might cause.

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9.2.4.4.3 HDD

Table 9.2-15 presents the estimated L_{dn} associated with each nearest NSA identified at each HDD crossing entry and exit site.

Table 9.2-15
Estimated HDD Noise Level (L_{dn}) at NSA nearest to HDD Crossings

HDD Crossing	Distances (feet) to HDD Entry / Exit	Nearest NSA GPS Street Address	Estimated Existing Ambient Noise Level (L_{dn}, dBA)	Estimated HDD Noise Level (L_{dn}, dBA)	Total Estimated Ambient Sound Level (dBA, L_{dn})	Change in Ambient Level (dBA, L_{dn})
Union Street	650 / 1,500	140 Union St., Hudson, PA 18705-3921	67	62	68	1
Union Street	2,300 / 280	17 Ridgewood Rd., Plains, PA 18702-7110	57	59	61	4
U.S. Hwy 81	3,800 / 1,970	17 Ridgewood Rd., Plains, PA 18702-7110	57	44	57	0
U.S. Hwy 81	1,330 / 3,000	301-326 Eagle Ct., Wilkes-Barre, PA 18711	50	55	56	6
Wild Creek	3,000 / 840	6875 Pohopoco Dr., Lehighton, PA 18235-6354	52	49	53	2
Wild Creek	1,885 / 3,700	665 Twin Flower Cir., Kunkletown, PA 18058	42	51	52	9
Pohopoco Stream	1,685 / 1,750	545 Twin Flower Cir., Kunkletown, PA 18058	45	52	53	8
Pohopoco Stream	1,950 / 1,095	445 Twin Flower Cir., Kunkletown, PA 18058	45	51	52	7
St. Lukes	955 / 1,380	2220 Emrick Blvd., Bethlehem, PA 18020	63	58	65	1
St. Lukes	1,500 / 1,095	4696 Concord Cir Easton, PA 18045	51	54	56	5
Lehigh River	5,280 / 2,000	1872 St. Luke's Boulevard, Easton, PA 18045	59	41	59	0
Lehigh River	1,450 / 4,500	2778 Redington?	64	54	64	0
Interstate 78	260 / 2,150	? Abandoned?	60	72	72	12
Interstate 78	1,900 / 235	4287 Lower Saucon Rd., Hellertown, PA 18055	57	61	62	5
Delaware River	1,890 / 1,150	1503? Easton Rd., Riegelsville, PA 18077	59	52	60	1

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Delaware River	215 / 2,600	622 Riegelsville Rd., Milford, NJ 08848-1894	58	74	74	16
St. Hwy. 519	1,370 / 3,400	100 Spring Garden Rd., Milford, NJ 08848-1896	48	54	55	7
St. Hwy. 519	480 / 2,300	310 Milford Warren Glen Rd., Milford, NJ 08848-1874	53	65	65	13
Pleasant Valley Rd.	555 / 1,800	87-99 Valley Rd., Lambertville, NJ 08530	52	64	64	12
Pleasant Valley Rd.	890 / 1,650	78 Pleasant Valley Rd., Hopewell Township, NJ 08560	56	59	61	5
Wash. Cross. Penn. Rd.	1,800 / 630	Hopewell Township, NJ Sports Center?	53	54	56	4
Wash. Cross. Penn. Rd.	980 / 3,100	461 Scotch Rd., Titusville, NJ 08560-1402	56	58	60	4
Railroad	1,500 / 955	109 Wash. Cross. Penn. Rd., Pennington, NJ 08534-0000	56	54	58	2
Railroad	305 / 1,600	1653 Reed Rd., Pennington, NJ 08534-5004	55	70	70	15

As shown in Table 9.2-15, the predicted HDD noise may exceed the FERC threshold of 55 dBA L_{dn} at some NSA, and its acoustical contribution to the sound environment at some of the indicated nearest NSA may also temporarily raise the existing ambient outdoor sound level by as much as 16 dBA L_{dn}. At such NSA experiencing HDD noise that exceeds 55 dBA L_{dn}, mitigation is anticipated.

9.2.4.5 Construction Noise Effects on Wildlife

As described in Section 9.2.4.2.1, fauna in the vicinity of the CS site have likely developed a degree of habituation to man-made sources (both stationary and transportation-related) of noise that allow them to live in the area. The same observation could be said of fauna and their habitats in the geographic vicinity of the entire project ROW, which crosses both urbanized and rural settings. Temporary construction activities from the project would generally resemble those, including surface transportation infrastructure among others (residential and commercial building projects) that have developed the project vicinity over the years from primarily forested wilderness and agricultural land uses to rural residential and suburban land uses. Thus, temporary noise associated with construction of the CS site and pipeline (including HDD crossings) is unlikely to have a durable significant impact on wildlife that may inhabit the project vicinity.

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9.2.5 Project Vibration Analysis

9.2.5.1 Operation

The Solar Turbines Model Mars 100 turbines expected to be installed at the new Kidder CS site are typically engineered and designed to operate with very low levels of vibration, thus helping to ensure nominal operation over the system's design life. According to available specification literature, each Mars 100 turbine-compressor system features microprocessor controls that include vibration level monitoring by way of velocity transducer type proximity probes.

This analysis assumes the installed turbines are operating normally, and the natural gas they compress is conveyed through piping systems that have been designed, engineered, installed and properly maintained to comply with appropriate industry regulations, standards and guidance with respect to maximum flow rates and minimization of turbulence and other adverse fluid phenomena that might cause undue vibration. Under these conditions that influence vibration generation at the source, perceptible vibration from CS operation at the nearest NSAs (LT1 and LT2) is not anticipated due to ground-borne attenuation that would occur naturally with distance through the existing variety of geologic strata and soils that are present.

9.2.5.2 Construction

To support an assertion of no significant expected vibration effects from construction activities (either generated at the CS site vicinity, or by pipeline and HDD construction processes along the pipeline ROW), one can perform a calculation of vibration prediction for a sample piece of construction equipment.

Determining vibration effects requires a comparison of predicted vibration levels with established criteria at a sensitive location, or at a distance from the vibration source at which a predicted level would just exceed the criteria. According to FTA guidance, the threshold for residences (or other land uses where people may sleep) is 72 VdB of vibration velocity (L_v). Also according to FTA, a large bulldozer (representing the kind of construction equipment anticipated at a project site) can exhibit 87 VdB at a distance of 25 feet (d_{ref}).

Using the following expression to estimate VdB from the sample large bulldozer at a potential NSA, one can calculate that beyond a distance of 80 feet (d_R), vibration would be below the FTA guidance threshold.

$$L_v \text{ (at } d_R) = L_v \text{ (at } d_{ref}) - 30*\text{LOG}[d_R/d_{ref}]$$

Since most (if not all) potential NSA should be further than 80 feet away from the nearest construction site, construction vibration is not expected to cause a significant impact.

9.2.6 Mitigation

9.2.6.1 Operation

The proposed CS has been sited and preliminarily designed to result in predicted operation noise levels that are compliant with the 55 dBA L_{dn} FERC threshold for noise attributable to its operation at the nearest identified NSA. Hence, no mitigation is needed.

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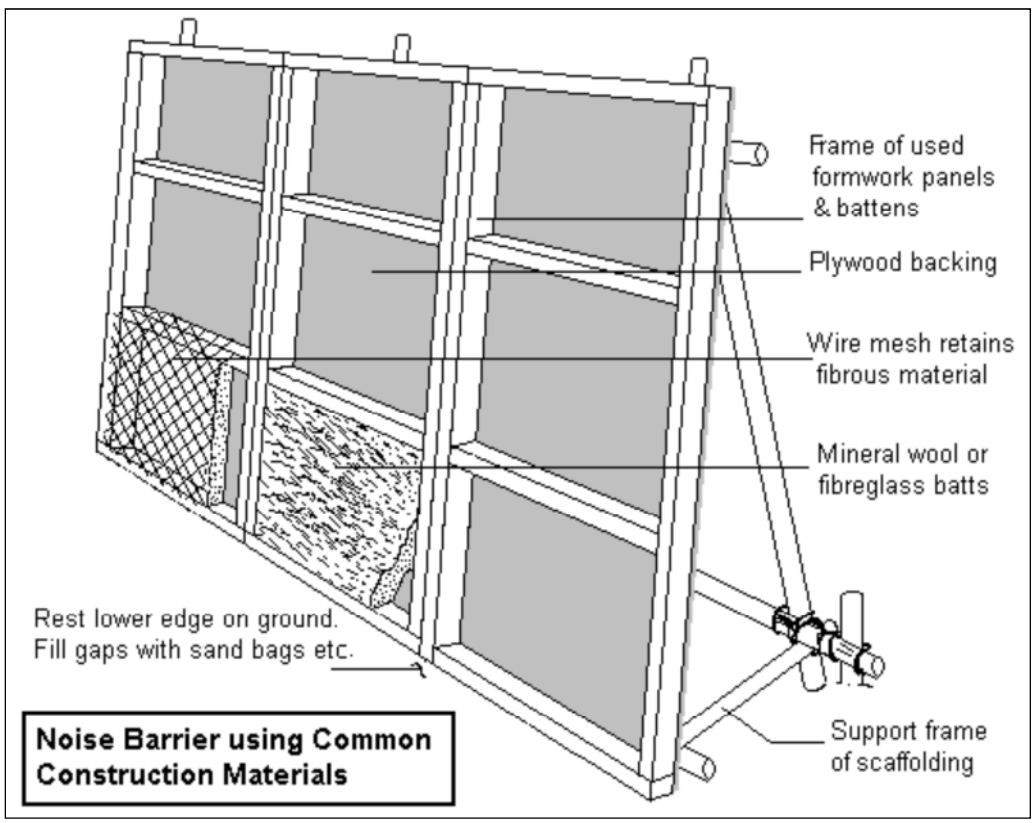
9.2.6.2 Construction

9.1.1.1.1 Compressor Station

As presented by Table 9.2-13 , CS site construction noise is anticipated to exceed the FERC threshold of 55 dBA L_{dn} without mitigation. Hence, PennEast will evaluate and implement mitigation measures as necessary, which could include the following techniques:

- Stationary noise sources, such as generators and air compressors, will be placed away from NSAs to the farthest extent practical. As feasible, non-noise-producing mobile equipment such as trailers will be placed between noise sources and sensitive receivers. If such trailers or similar obstacles are used, to minimize flanking underneath or through vertical gaps, PennEast will cover the openings with at least ½-inch thick plywood, hay bales or other sufficiently dense material.
- If there is not sufficient space to create a noise barrier using the non-noise-producing equipment in use at an active construction site, Penn East may also construct temporary noise barriers using appropriately thick wooden panel walls (at least ½-inch thick) built high enough to block the line-of-sight from the dominant construction noise source(s) to the NSA. Refer to Figure 9.2-4 for a sample illustration. Such barriers could, depending on factors such as barrier height, barrier length, and distance between the barrier and the noise-producing equipment or activity, reduce construction noise by 5 to 10 dBA at nearby NSA locations. Alternately, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity, resembling the sample shown in Figure 9.2-5.



Source: Eaton, Construction Noise, 2000

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Figure 9.2-4
Temporary Noise Barrier using Common Construction Site Materials

Figure 9.2-5
Sample Site-Erected Curtain-type Noise Barrier

9.2.6.2.1 Pipeline

As predicted by Table 9.2-14, pipeline construction noise is anticipated to exceed the FERC threshold of 55 dBA L_{dn} at potential NSA that are less than 3,100 feet away from the acoustical center of construction activity. Hence, for NSA that may be within this 3,100-foot screening distance, PennEast will evaluate and implement mitigation measures as necessary, which would resemble those described in Section 9.2.6.2.1.

9.2.6.2.2 HDD

As predicted by Table 9.2-15, HDD noise is anticipated to exceed the FERC threshold of 55 dBA L_{dn} at some of the identified nearest NSAs. Hence, for these specific NSA, PennEast will evaluate and implement mitigation measures as necessary, which would resemble those described in Section 9.2.6.2.1. Additionally, due to the relative short duration of HDD activity (i.e., usually up to only several days duration, in contrast to what are typically weeks associated with conventional pipeline construction activity that may be near an NSA), PennEast will also consider—on a case-by-case basis—offering compensation to the occupant(s) of an NSA towards provision of temporary hotel accommodations during the HDD activity. In other words, rather than mitigate the noise at the source or along its transmission path to the NSA, it may be more practical to temporarily relocate the receiver(s) so that they are not exposed to the source of potential annoyance.

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9.3 References

9.3.1 Air Quality

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PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

RESOURCE REPORT 10

Alternatives

FERC Docket No. PF15-1-000

Revised Draft

July 2015

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Resource Report 10 – Alternatives
FERC Environmental Checklist

Part 380-Appendix A Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
☐ Address the "no action" alternative. (§380.12 (l)(1)).	Section 10.1
☐ For large project, address the effect of energy conservation or energy alternatives to the project. (§380.12 (l)(1)).	Sections 10.1.1, and 10.1.2
☐ Identify system alternatives considered during the identification of the project and provide the rationale for rejecting each alternative. (§380.12 (l)(1)).	Section 10.2
☐ 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. (§380.12 (l)(2)(ii)).	Section 10.3
☐ 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. (§380.12 (l)(2)(ii)).	Section 10.4

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10.0 ALTERNATIVES

PennEast Pipeline Company, LLC (PennEast) has prepared this Resource Report to support its application to the Federal Energy Regulatory Commission (FERC or Commission) for a certificate of public convenience and necessity (Certificate) for the Project. PennEast designed its Project to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production area in northeastern Pennsylvania (PA) to growing natural gas markets in northeastern PA, southeastern PA, New Jersey (NJ) and surrounding states with the capability of providing approximately 1.0 MMDth/day of year-round natural gas transportation service.

This Resource Report focuses on the Project facilities and locations that PennEast selected as of July, 2015.

The Project consists of the following primary components:

- 113.8 miles of new 36-inch diameter mainline pipeline extending from Dallas Township in Luzerne County, PA to Hopewell Township in Mercer County, NJ;
- 2.1-miles of new 24-inch diameter lateral near Hellertown, Northampton County, PA to transport gas to an interconnection with Columbia Gas Transmission, LLC (Columbia Gas) and UGI Utilities, Inc. (UGI Utilities);
- 0.3-miles of new 12-inch diameter lateral near Holland Township, Hunterdon County, NJ to transport gas to Pivotal Utility Holdings, Inc. (d/b/a Elizabethtown Gas) (Elizabethtown Gas) and NRG REMA, LLC's Gilbert Power Station;
- 1.4-miles of new 36-inch diameter lateral in West Amwell Township, Hunterdon County, NJ to transport gas to an interconnection with Algonquin Gas Transmission, LLC (Algonquin) and Texas Eastern Transmission, LP (Texas Eastern);
- One new compressor station in Carbon County, PA; and
- Various associated aboveground facilities including interconnects, launchers, receivers, and mainline block valves to support the pipeline system.

The PennEast Pipeline Project (PennEast Project or Project) will be rated for a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig). Figure 1.2-1 in Resource Report 1 provides a Project Overview Map showing the locations of the proposed pipeline route and associated facilities. This Resource Report discusses the alternatives identified and evaluated during the development of the Project and effects on the desired benefits of the Project.

Four principal types of alternatives are evaluated in the following sections:

- No-action alternative;
- System alternatives;
- Route alternatives; and
- Aboveground site alternatives.

PennEast designed the Project to reflect both customer need and siting requirements. Initially, PennEast identified a potential market need for the transportation of 800,000 dekatherms per day (Dth/d) of new natural gas supply to its customers in eastern PA, NJ and surrounding states. PennEast held an open season between August 11, 2014, and August 29, 2014. Following the open season, PennEast has executed precedent agreements with 12 shippers for 990,000 Dth/day of capacity. As a result of this increased demand, PennEast resized the proposed mainline pipeline from 30-inch to 36-inch.

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PennEast evaluated the Project's siting options using a variety of criteria, including environmental and stakeholder impacts, economic benefits and costs, Project timing, operational parameters and engineering and technological parameters. The primary objective in evaluating alternatives for siting was to avoid, minimize, and, if necessary, mitigate adverse effects while satisfying the customer need discussed above. A Critical Issues Analysis (CIA) was conducted as an initial step in assessing the feasibility of the overall Project. This assessment focused on a Project initiation point at an existing pipeline facility in Luzerne County, Pennsylvania at Energy Transfer Partners, L.P.'s (formerly known as Regency Energy Partners LP) (Regency) Wyoming Pipeline interconnect to an end point in Mercer County, New Jersey at an interconnect with Transcontinental Gas Pipeline Company, LLC (Transco). PennEast identified two preliminary routes through the initial screening.

Initially, PennEast estimated that the proposed Project would be approximately 100 miles in length with a study corridor of 400 feet in width. For the initial CIA, PennEast performed a desktop analysis across an area of consideration approximately one-half mile in width along the corridors. This allowed PennEast to get a clear understanding of potential engineering and environmental constraints within the Project area and the expanded geography encompassed the necessary area for access roadways and staging areas.

Desktop Analysis

For the Pennsylvania portions of the Project, PennEast utilized resources such as the PA Spatial Data Access, PA GIS and Mapping Directory and the PA DCNR map viewer. These geospatial information clearinghouses allowed PennEast to gather relevant GIS data and filter on over 1000 data categories. Similarly, for the New Jersey portions of the Project, PennEast utilized resources such as the New Jersey Geographic Information Network (NJGIN) and the i-Map NJ DEP application. Table 10-1 provides an overview of the data resources that were used for desktop analysis.

PennEast exported data from various geospatial repositories and mapping applications into a kmz file for it to review with internal software such as Google® Earth. In addition, PennEast assigned mile posts to the pipeline from the Transco interconnect in Luzerne County, Pennsylvania to the terminus at Transco in Mercer County, New Jersey. Mile postings were to the nearest tenth of a mile and facilitated the tabulation and analysis of critical issues.

Table 10-1
Data Resources for Desktop Analysis

Airports (NJDOT)	NJ Farmland Preservation Program (State Agriculture Development Committee)
Cemeteries (USGS GNIS)	NJ Listed Historic Districts (NJDEP)
Churches (USGS GNIS)	NJ Wellhead Protection Areas (Tiers 1, 2, 3)
Classification Exception Areas (NJ) (NJDEP)	NJ Surface Water Quality Standards (SWQS) (NJDEP)
Coal Mines (PA) (PADEP)	NJ Wetlands (NJDEP)
Commercial Hazardous Waste Operations (PADEP)	NRHP Building (National Register Information System - NRHP)
Core Habitat (Western Pennsylvania Conservancy [WPC] Pennsylvania Natural Heritage Program [PNHP])	NRHP Structure (NRIS - NRHP)
County Boundaries	National Wetlands Inventory (NWI) Wetlands (PA) (USFWS, NWI)

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Critical Environmental and Historic Sites (NJ)	Open Space or State Park (NJDEP Open Space (State, County, Cross-Acceptance) and D&R Greenway Land Trust)
Delaware and Raritan Canal Commission Review Zones (NJDEP)	PA State Forests (PADCNR, 2013)
Exceptional Value or High Quality Waters (PA) (PADEP, PSU)	PA State Gamelands (PADCNR, 2013)
Explore PA Trails (Aug. 2013) (PA DCNR)	Parcels
Farmland Preservation (PSU Agricultural Security Areas)	Provisional species of concern sites (WPC PNHP)
FEMA 100-yr Flood Zone (FEMA)	Public Supply Wells (NJDEP)
Federal Highway Administration (FHA) National Bridge Inventory NBI Bridges (Structurally Deficient or Functionally Obsolete)	Railroads (PA) (PADCNR)
Highlands Preservation Areas (New Jersey Highlands Water Protection and Planning Council)	Schools (USGS GNIS)
Highlands Preservation Sewer Service Areas (NJDEP)	NJ Schools (NJOIT – OGIS, 2003)
Historic Properties (NJ) (NJDEP, NRIS - NRHP)	State Parks (PA) (PADCNR, 2013)
Karst/Sinkholes (PA) (Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey [PaGS])	Supporting Landscape (WPC PNHP)
Known Contaminated Sites (NJDEP)	PA Streams Chapter 93 Designated Use Warm Water Fishes Waters (PA) (PADEP, PSU)
LiDAR slopes >30%	Waterbodies (PA) (NHD)
Municipality Boundaries (New Jersey Office of Information Technology, Office of Geographic Information Systems [NJOIT – OGIS], 2010)	Wells (PA) (PAGWIS) (NJDEP)
Platts POWERmap® existing transmission, gas, and product utility lines	

The geospatial data was used to formulate alternatives as described in Section 10.3. In addition, PennEast utilized this data to identify engineering constraints and key permits and approvals that would be required.

10.1 No-Action Alternative

The no-action alternative would result in not constructing the PennEast Project, and would therefore not meet the Project shippers' need for the firm transportation capacity commencing on November 1, 2017 as reflected in their commitments in the precedent agreements. Accordingly, this option would have adverse consequences on the markets they serve.

The no-action alternative would avoid the temporary environmental impacts associated with the Project. However, the Project shippers, and local distribution companies would likely pursue alternate natural gas transportation projects that could potentially result in equal or greater environmental

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impacts. Potential examples of these impacts include the construction of additional or greenfield natural gas pipeline facilities in other locations, dependence on alternate higher emission fuel sources, such as coal or oil, and increased demand for already limited electrical resources.

The 2013-2014 winter season demonstrated that there were constraints in the Mid-Atlantic supply system, evidenced by the dramatic regional price impacts described in Figure 1.1-2 of Resource Report 1. The lack of a new pipeline with access to supply sources in Pennsylvania will continue to create dramatic seasonal pricing fluctuations in Pennsylvania and New Jersey with higher gas and electric rates and potential for energy shortages during peak demand, resulting in threats to business continuity, public safety and national security. While the extreme pricing events of the 2013-2014 winter were not as significant in the 2014-2015 winter for a number of external factors, such as lower oil prices, the sustained difference between natural gas prices in the northeast Pennsylvania production region and the market regions served by the Project were significant and lasted longer. This is shown in Figure 1.1-3 of Resource Report 1.

Given the Project shippers' need for additional pipeline capacity, the potential benefit to regional economic growth from the proposed Project, and the potential for significant increase in regional air emissions or similar or greater environmental impacts resulting from an alternate natural gas transportation project if the PennEast Project was not constructed, no further analysis of this alternative was conducted. Therefore, the no-action alternative is not considered a viable alternative to the proposed action, because it would not accomplish the stated Project purpose and need to provide the volumes of natural gas transportation service to the expanding mid-Atlantic market in an efficient, safe, reliable, and environmentally sound manner.

10.1.1 Energy Conservation

The energy conservation alternatives discussed in this section will not meet the needs of the Project shippers in the proposed timeline and, therefore, are not preferable to the proposed action. However, together with increased supply of natural gas, energy conservation will continue to contribute to meeting the overall future energy needs of the marketplace.

The use of the energy conservation alternative for meeting the demands of PennEast's customers includes the following potential results:

- Potential for improvements in energy conservation in the residential, commercial, and industrial sectors, beyond the current energy conservation measures already being practiced; and
- Potential for increasing the efficiency of the existing natural gas transmission systems through system optimization, which includes the use of load management techniques at both the end-use consumer and utility level and the identification and elimination of bottlenecks in the existing gas transmission system that decrease the effective capacity of the system.

Energy conservation has been successful in some areas, and it continues to be encouraged in the residential, commercial, and industrial sectors. However, natural gas continues to be considered the preferred non-renewable fuel because of its inherent clean-burning properties and, because it is produced and abundant in North America, it reduces reliance on foreign-produced oil. The implementation of air quality legislation enhances fuel conservation in numerous energy use sectors. In many cases, legislation encourages the use of natural gas over other more environmentally taxing fuels, such as oil and coal. Increases in population and commercial and industrial uses of natural gas have contributed to the increased demand for natural gas.

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The Project will help to increase the efficiency of the current natural gas transmission system by reducing bottlenecks in the system. Furthermore, this is primarily a market-driven project that is designed to provide a pipeline transportation solution to Marcellus Shale production. Programs designed to encourage fuel conservation are unlikely to eliminate the need to construct new pipeline infrastructure to serve this emerging production area.

In summary, natural gas demand in the marketplace is continuing to grow despite programs designed to encourage fuel conservation. Conservation alone will not address the growing demand for natural gas in the relevant markets in the Project timeframe. Fuel conservation should continue to be an ongoing alternative used in concert with the development of additional, more efficient natural gas transportation and distribution systems. The modifications proposed by the Project can be considered steps to accomplishing this part of the energy conservation alternative.

10.1.2 Energy Alternatives

The alternative energy sources discussed in this section would not meet the Project needs and, therefore, would not be preferable to the proposed action. Alternative energy sources used together with natural gas could contribute to meeting the overall future energy needs of the marketplace.

Potential alternative energy sources include coal, oil, nuclear energy, liquefied natural gas (LNG), and electricity generated from these sources, as well as electricity generated from renewable sources such as solar, wind, and geothermal energy. Coal, although an available option, does not burn as cleanly as natural gas, and its use may contribute to the formation/pollution associated with acid rain unless costly air pollution controls are applied to coal-burning power plants. Area states have stringent air quality regulations and thresholds for stack emissions, fugitive emissions, and particulate handling that likely preclude coal as a viable option.

Much of the oil consumed in the United States is produced and purchased from overseas sources. Therefore, the use of additional foreign oil supplies to meet future energy demands in the expanding mid-Atlantic markets could further increase the reliance on overseas crude petroleum and petroleum products. This could subsequently increase the potential economic and national security risks in the event of an emergency or a supply curtailment. Moreover, if new or expanded refineries were required to process the crude oil, various additional environmental problems could result (e.g., air pollution, visual intrusion, and noise). Much of the region's oil supply is transported by rail, which is statistically not as safe as natural gas transported by pipeline.

Although nuclear power is seen by some as a means of reducing GHG emissions, other stakeholders are concerned with the environmental and regulatory challenges concerning safety and security, the disposal of toxic materials, and alternations to hydrological/biological systems would need to be addressed before any new nuclear power generation facilities could be constructed. As a result, proposals and any subsequent plans to construct new or expand existing plants in the northeast would likely involve prolonged review periods that would not meet the objectives of the projects. For these reasons, nuclear power is not currently a practicable alternative to PennEast's Project and was eliminated from further review.

LNG is a developing energy alternative in the northeast. Several LNG facilities are being proposed as a means of addressing some of the energy needs in New England, New Jersey, and New York. However, many of these projects are still in the developmental stages, and the timing for these projects to receive approvals and be constructed does not address the current purpose and need of the Project. An LNG system alternative would not only require the construction of a liquefaction and vaporization facility, but also transportation of the necessary volume of LNG to the delivery point by truck or train using existing road and railways. Given the requirement for the construction of two new facilities as

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well as the number of truck and train trips that would be required on a continuous basis, the transportation of the required amount of natural gas is not preferable to the proposed Project.

Wind, geothermal, and solar power have not yet been developed in the eastern U.S. for large-scale application, partly because the energy sources associated with these forms of power are reliable in only certain parts of the country (such as solar and wind) or generally are not available (geothermal).These forms of energy, which usually are converted to electricity, may not substitute easily for natural gas in equipment and processes designed for using natural gas. In addition, once converted, the electricity must be transported to the consumer, which may require the addition of new power lines. Moreover, land required for wind and solar is considerably greater, and the vast majority required cannot be restored to its prior use in the same way that land used for natural gas pipelines can be restored. Given the pace of development for these resources in the eastern U.S., they will not meet the future demand for energy in the Project timeframe. Therefore, these particular alternative energy sources do not represent viable options for replacing the natural gas that will be supplied by the Project.

To address concerns voiced during public outreach, additional detail has been provided for the comparison of the cost, footprint and energy produced between PennEast and a similar investment in solar and wind projects has been assessed using current Department of Energy and project data.

Solar

Table 10.1-1
Agua Caliente Solar Project

	Agua Caliente Solar Project	PennEast Pipeline
Investment	$967 million	$1 billion
Footprint	2300 acres	832.6 acres
Temporary Jobs	400	2875
Energy Equivalence	56,000 homes/year	4.7 million homes/year

Table 10.1-2
Desert Sunlight Solar Farm

	Desert Sunlight Solar Farm	PennEast Pipeline
Investment	$1.46 billion	$1 billion
Footprint	3800 acres	832.6 acres
Temporary Jobs	550	2875
Energy Equivalence	100,000 homes/year	4.7 million homes/year

Table 10.1-3
California Valley Solar Ranch

	Desert Sunlight Solar Farm	PennEast Pipeline
Investment	$1.24 billion	$1 billion
Footprint	1966 acres	832.6 acres
Temporary Jobs	350	2875
Energy Equivalence	42,700 homes/year	4.7 million homes/year

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Wind

Table 10.1-4
Waymart Wind Energy Center

	Waymart Wind Energy Center	PennEast Pipeline
Investment	$2.3 billion (to date)	$1 billion
Footprint	858 acres	832.6 acres
Temporary Jobs	-	2875
Energy Equivalence	22,000 homes/year	4.7 million homes/year

10.2 System Alternatives

PennEast investigated a number of system alternatives to the Proposed Project which are discussed below.

10.2.1 Transco Leidy Line Loop

PennEast considered a loop of Transco's Leidy Line pipeline system as a system alternative to the proposed Project. A loop of Transco's Leidy Line could access the same production region that the PennEast Project accesses. However, the Transco Leidy Line does not offer the same access to specific delivery point locations provided by the PennEast Project.

PennEast will offer direct delivery to UGI Central Penn Gas, Inc. and UGI Utilities, Inc., both in Pennsylvania, as well as the Gilbert Electric Generating Station and Elizabethtown Gas, both in New Jersey, that cannot be made by utilizing the Transco system. PennEast's proposed route is also uniquely capable of providing an interconnection with both Algonquin Gas Transmission, LLC (Algonquin) and Texas Eastern Transmission, LP (Texas Eastern) at one location, which will provide supply for growing markets served by each transmission system in the capacity constrained northeast. Because the Transco Leidy Line cannot make these direct deliveries to UGI Central Penn Gas, Inc., UGI Utilities, Inc., Gilbert Electric Generating Station and Elizabethtown Gas and Transco does not access Algonquin and Texas Eastern at one location, any Transco system alternative does not satisfy the purpose and need of the PennEast Project. In addition, if Transco were to loop its Leidy Line pipeline system as an alternative to the Project, there would not be an additional new pipeline in the region to deliver production from the nearby production region to the markets to be served by the Project, providing a further reason why this system alternative does not satisfy the purpose and need of the Project.

In addition to the foregoing, a loop of Transco's Leidy Line is not a viable alternative in light of the current circumstances and the environmental impact associated with constructing the facilities. PennEast has performed an analysis of an alternative involving a loop of Transco's Leidy Line. PennEast agrees with Transco's own statement where it indicates that the existing line cannot be expanded: "The existing Transco pipeline system is extremely capacity constrained in New Jersey and Southern Pennsylvania, operating in very densely populated areas. […]because of encroachment of residential and commercial structures along the Transco system, certain areas would be nearly impossible to loop and would require other greenfield portions to be constructed, further increasing the overall impact of the project" (Transco Atlantic Sunrise FAQ at http://atlanticsunriseexpansion.com/get-the-facts/get-the-facts). Encroachment is severe in both Pennsylvania and New Jersey, which would result in a considerable amount of greenfield construction.

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Table 10.2-1 provides a Critical Issues Analysis for PennEast's "Transco Leidy Line Alternative" (Figure 10.2-1).

Table 10.2-1Transco Leidy Line Alternative

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	59.07	54.30	113.37
Municipalities Crossed (#) [2]	16	11	27
Stream Crossings (Total as NHD streams) [3]	60	90	150
PA EV Cold Water Fishes (EV-CWF, Total)[4]	4	NA	4
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	25	NA	25
PA Cold Water Fishes (CWF, Total) [4]	16	NA	16
PA Warm Water Fishes (WWF, Total) [4]	2	NA	2
PA Trout Stocking Stream (TST, Total) [4]	0	NA	0
PA Naturally Producing Trout Waters (from EV) [5]	2	NA	2
PA Naturally Producing Trout Waters (from HQ) [5]	5	NA	5
PA Naturally Producing Trout Waters (from CWF)[5]	4	NA	4
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	13	NA	13
NJDEP SWQS Category 1 Streams	NA	18	18
DRBC Wild and Scenic River Crossings	1 (Lower Delaware River)	1 (Musconetcong River)	2
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	100	190	290
Wetland Crossings (of the Center Line) [6]	27	60	87
Total number of NHD waterbodies within 200' of line [7]	36	20	56
Total Acreage of NHD waterbodies within 200' of line [7]	57	6	63
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	0	0
Wind Turbines (USGS) within 200' of line	0	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	124	NA	124
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	450	565	1015
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	120	NA	120
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	705	NA	705
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	0	0

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	30	30
Known Contaminated Sites (NJ) within 200' of line	NA	4	4
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	38	38
Potential NRHP Cultural Resources (unrestricted) within 200' of line	3	7	10
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	0	0
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	353	353
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	5	5
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	62	62
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	316	316
Approx. Acreage of State Parks (PA) within 200' of line	6	NA	6
Approx. Acreage of State Forests (PA) within 200' of line	0	NA	0
Approx. Acreage of State Gamel Lands (PA) within 200' of line	154	NA	154
Length of PA Trails within 200' of line (miles) [10]	0.43	NA	0.43
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	NA	NA	NA
Total Acreage of Preserved Farmland within 200' of line [11]	NA	195	195
Railroad Crossings (Status Unknown) [12]	8	0	8
Road Crossings [13]	42	60	102
Bridge Crossings within 200' of line (all) [14]	2	0	2
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	2	0	2
Product Pipeline Crossings [16]	1	1	2
Existing Gas Pipeline Crossings [16]	NA	NA	NA
Transmission line Crossings [16]	18	7	25
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	0	NA	0

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CIA Items	Pennsylvania	New Jersey	Total Project
Coal Mines (PA) within 200' of line (DCNR)	1 (Pioneer Aggregates Poppel 1 & 2 Mine)	NA	1
Approx. Acreage of Slopes > 30% within 200' of line	NA	NA	NA
Total Acreage of 400' Corridor	2865	2052	5501
Percent of Total 400' Corridor that is wetland	3.5%	9.3 %	12.8%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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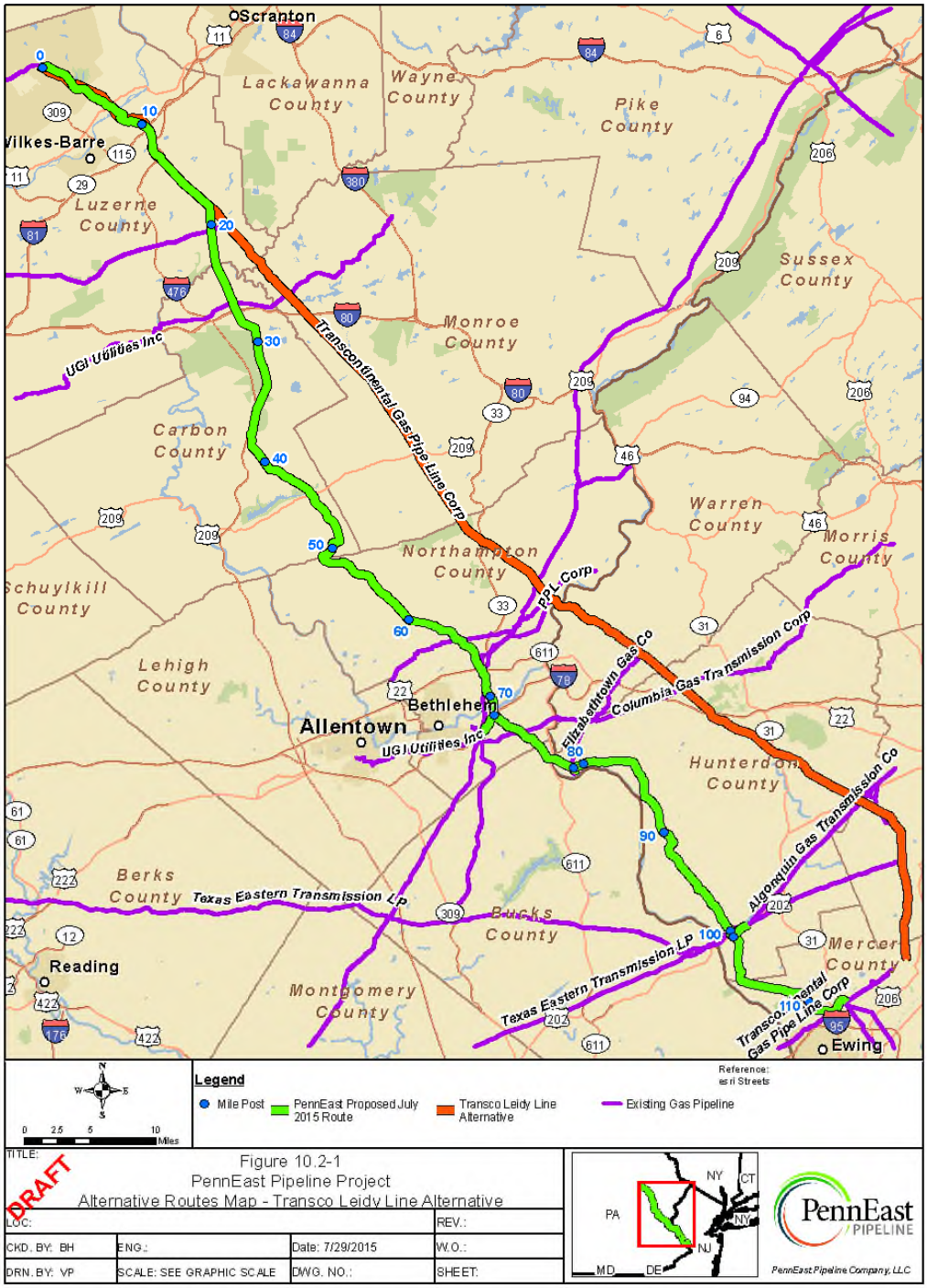
Figure 10.2-1
PennEast Pipeline Project Alternative Routes Map – Transco Leidy Line Alternative Route



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10.2.2 Columbia Gas

Columbia Gas lacks the capability to receive gas in the production region in which PennEast's receipt points will be located. In order to access the same production region that the PennEast Project will access and to deliver the production at all the same delivery points that PennEast proposes for the PennEast Project, Columbia Gas would be required to construct greenfield pipeline facilities nearly identical to the facilities that comprise the PennEast Project. Accordingly, Columbia Gas does not provide an alternative to the Project.

10.2.3 Texas Eastern

Texas Eastern lacks the capability to receive gas in the production region in which PennEast's receipt points will be located. In order to access the same production region that the PennEast Project will access and to deliver the production at all the same delivery points that PennEast proposes for the Project, Texas Eastern would be required to construct greenfield pipeline facilities nearly identical to the facilities that comprise the PennEast Project. Accordingly, Texas Eastern does not provide an alternative to the Project.

10.3 Pipeline Route Key Alternatives and Pipeline Deviations

PennEast carefully examined existing utility corridors (natural gas, liquid pipeline, electric transmission, water, and sewer) to identify potential areas where the proposed pipeline could parallel or be co-located within existing maintained right-of-ways. This assessment found that some of these rights-of-way had been encroached upon by residential and commercial development resulting in inadequate area for the staging and construction of an additional pipeline between the existing facilities and the neighboring developments. Where environmental impacts were not greater, PennEast has aligned the Project with as many existing utility corridors as possible, while ensuring a Project that can be safely constructed and operated.

PennEast worked with engineering and design to avoid and/or minimize potential direct impacts to environmental resources. The proposed construction work area has been reduced at wetland crossings to minimize impacts wherever feasible. In addition, right-of-way agents have worked and continue to work with individual landowners to avoid sensitive features on properties and address their concerns. The following sections address the key alternatives assessment and the more significant adjustments that have occurred.

10.3.1 Key Alternatives

Since the Project was initiated in the spring of 2014, eight key alternative routes have been reviewed and evaluated using a Critical Issues Analysis. These alternatives include:

1. Original Route
2. Alternative 1 to Original Route with Elizabethtown Gas (ETG) spur
3. Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)
4. Transco Leidy Line Alternative
5. Preferred Route November 2014
6. Preferred Route January 2015
7. Preferred Route March 2015
8. Proposed July 2015 Route

Table 10.3-1 provides a summary of pipeline length and study corridor acreage.

Table 10.3-1
Summary of Key Alternatives

	Original Route	Alternative 1 to Original Route with ETG Spur	Alternative 2 to Original Route with NJ Loop (Initial Preferred Route)	Transco Leidy Line Alternative	Preferred Alternative Route – Nov. 2014	Preferred Alternative Route – Jan. 2015	Preferred Alternative Route – Mar. 2015	Proposed July 2015 Route
Pipeline Length (Miles)	104.9	104.9	105.5	113.4	110.9	114.0	114.7	117.6
400-Foot Study Corridor Acreage	5086	5087	5118	5501	5380	5521	5554	5707

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Table 10.3-2
Critical Issues Analysis for the PennEast Project Alternatives

CIA Items	Original Route	Alternative 1 – Original Route with ETG Spur	Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)	Transco Alternative Route	Preferred Alternative Route – November 2014	Preferred Alternative Route – January 2015	Preferred Alternative Route – March 2015	Proposed July 2015 Route
Length of Lateral (miles)	0	0	0	0	2.1	2.1	2.1	3.8
Length (Miles) [1]	104.9	104.9	105.5	113.4	110.9	114	114.7	117.6
Municipalities Crossed (#) [2]	29	27	28	27	28	27	27	29
Stream Crossings (Total as NHD streams) [3]	165	161	165	150	157	124	123	116
PA EV Cold Water Fishes (EV-CWF, Total)[4]	11	11	4	4	4	4	4	5
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	27	28	28	25	24	21	22	22
PA Cold Water Fishes (CWF, Total) [4]	29	25	21	16	28	30	31	28
PA Warm Water Fishes (WWF, Total) [4]	3	4	3	2	5	3	2	3
PA Trout Stocking Stream (TST, Total) [4]	4	5	0	0	0	0	0	0
PA Naturally Producing Trout Waters (from EV) [5]	2	2	2	2	3	3	3	4
PA Naturally Producing Trout Waters (from HQ) [5]	12	12	11	5	9	8	8	9
PA Naturally Producing Trout Waters (from CWF)[5]	7	6	7	4	7	7	7	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	32	31	50	13	42	2	3	1
NJDEP SWQS Category 1 Streams	14	19	31	18	30	33	33	31
DRBC Wild and Scenic River Crossings	Lower Delaware River	Lower Delaware River	0	Lower Delaware River	0	0	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	207	141	212	290	259	233	223	160
Wetland Crossings (of the Center Line) [6]	104	75	123	87	146	109	103	47

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CIA Items	Original Route	Alternative 1 – Original Route with ETG Spur	Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)	Transco Alternative Route	Preferred Alternative Route – November 2014	Preferred Alternative Route – January 2015	Preferred Alternative Route – March 2015	Proposed July 2015 Route
Total number of NHD waterbodies within 200' of line [7]	44	42	38	56	42	41	32	26
Total Acreage of NHD waterbodies within 200' of line [7]	38	15	14	63	35	38	37	34
Total # Wells (PAGWIS and NJDEP) within 200' of line	1	0	1	0	1	1	1	1
Wind Turbines (USGS) within 200' of line	0	0	0	0	1	1	1	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	522	520	383	124	327	327	288	330
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	657	741	1075	1015	1105	1063	1095	1202
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	348	382	182	120	236	221	223	222
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	654	681	647	705	1043	1088	833	1191
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	3	3	0	3	22	34	32
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	26	21	19	30	20	52	52	17
Known Contaminated Sites (NJ) within 200' of line	0	0	0	4	1	0	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0	0	0	0	0	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	41	36	50	38	53	11	11	11

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CIA Items	Original Route	Alternative 1 – Original Route with ETG Spur	Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)	Transco Alternative Route	Preferred Alternative Route – November 2014	Preferred Alternative Route – January 2015	Preferred Alternative Route – March 2015	Proposed July 2015 Route
Potential NRHP Cultural Resources (unrestricted) within 200' of line	12	13	16	10	18	19	19	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	29	0	0	0	0	NA	NA	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	599	606	669	0	669	1041	1046	1039
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	2 (Saint Joseph Cemetery in Plains Twp., Fishery School in Kidder Twp.)	0	0	0	0	0	0	4
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0	0	353	0	0	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0	0	5	0	0	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	46	38	38	62	18	88	89	91
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	114	125	164	316	180	258	255	184
Approx. Acreage of State Parks (PA) within 200' of line	227	231	230	6	231	231	231	232
Approx. Acreage of State Forests (PA) within 200' of line	0	0	0	0	35	35	35	34
Approx. Acreage of State Game Lands (PA) within 200' of line	429	402	402	154	212	212	239	289
Length of PA Trails within 200' of line (miles) [10]	0	0	2.24	0.43	1.42	1.52	1.28	2
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	213	222	201	NA	223	195	178	175
Total Acreage of Preserved Farmland within 200' of line [11]	339	396	516	293	513	452	512	559
Railroad Crossings (Status Unknown) [12]	9	8	8	8	9	9	15	15

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CIA Items	Original Route	Alternative 1 – Original Route with ETG Spur	Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)	Transco Alternative Route	Preferred Alternative Route – November 2014	Preferred Alternative Route – January 2015	Preferred Alternative Route – March 2015	Proposed July 2015 Route
Road Crossings [13]	175	172	160	174	150	162	165	251
Bridge Crossings within 200' of line (all) [14]	3	3	2	2	2	1	1	1
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	2	2	2	1	1	1	0
Product Pipeline Crossings [16]	2	2	2	2	10	10	10	6
Existing Gas Pipeline Crossings [16]	11	12	13	NA	12	20	17	21
Transmission line Crossings [16]	21	26	31	25	27	43	49	47
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	167	172	194	0	197	194	171	175
Coal Mines (PA) within 200' of line (DCNR)	0	0	0	1 (Pioneer Aggregates Poppel 1 & 2 Mine)	0	0	0	0
Approx. Acreage of Slopes > 30% within 200' of line	266	245	267	NA	150	156	161	167
Total Acreage of 400' Corridor	5086	5087	5118	5501	5380	5521	5554	5700
Percent of Total 400' Corridor that is wetland	10.40%	7.00%	9.70%	9.10%	10.90%	9.30%	8.70%	6.3%

Notes:
[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral
[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets
[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline
[4] Penn State Streams Chapter 93 Designated Use
[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories
[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands
[7] NHD waterbodies includes only lakes and ponds and not stream areas
[8] Churches, schools, and cemetery counts are based on USGS GNIS
[9] NJDEP Open Space (State, County, Cross-Acceptance)
[10] PA DCNR and Rails-to-Trails Conservancy
[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program
[12] PennDOT County Rail lines NJDOT Rail Network
[13] PennDOT State and Local roads; NJDOT Road Network
[14] Federal Highway Administration National Bridge Inventory
[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO
[16] Platts POWERmap®

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10.3.1.1 Original Route

The proposed PennEast Project alignment, or the "Original Route," was designed to bring locally produced Marcellus Shale gas from UGI's supply point in northeastern Pennsylvania, through 29 municipalities, to its Transco Trenton-Woodbury interconnect in Mercer County, New Jersey, allowing it to serve customers in metropolitan East Coast markets. PennEast considered multiple factors when evaluating potential alignments. The Original Route was aligned to avoid standing structures, densely populated areas and planned development projects thereby minimizing the potential cumulative impacts of the pipeline. The Original Route had a centerline of 104.9 miles and crossed 165 streams. 214 acres of wetlands fell within 200 feet of the line, which equated to 11.1% of the total 400-foot corridor being considered a wetland.

Table 10.3-3 provides a Critical Issues Analysis for PennEast's "Original Route."

Table 10.3-3
Original Route

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	84.67	20.24	104.91
Municipalities Crossed (#) [2]	24	5	29
Stream Crossings (Total as NHD streams) [3]	106	59	165
PA EV Cold Water Fishes (EV-CWF, Total)[4]	11	NA	11
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	27	NA	27
PA Cold Water Fishes (CWF, Total) [4]	29	NA	29
PA Warm Water Fishes (WWF, Total) [4]	3	NA	3
PA Trout Stocking Stream (TST, Total) [4]	4	NA	4
PA Naturally Producing Trout Waters (from EV) [5]	2	NA	2
PA Naturally Producing Trout Waters (from HQ) [5]	12	NA	12
PA Naturally Producing Trout Waters (from CWF)[5]	7	NA	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	32	41	73
NJDEP SWQS Category 1 Streams	NA	14	14
DRBC Wild and Scenic River Crossings	Lower Delaware River		1
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	139	75	214
Wetland Crossings (of the Center Line) [6]	44	25	69
Total number of NHD waterbodies within 200' of line [7]	33	11	44
Total Acreage of NHD waterbodies within 200' of line [7]	31	7	38
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1
Wind Turbines (USGS) within 200' of line	0	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	522	NA	522

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	312	345	657
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	348	NA	348
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	654	NA	654
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	0	0
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	26	26
Known Contaminated Sites (NJ) within 200' of line	NA	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	41	41
Potential NRHP Cultural Resources (unrestricted) within 200' of line	7	5	12
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	29	29
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	599	599
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	2	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	46	46
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	41	41
Approx. Acreage of State Parks (PA) within 200' of line	227	NA	227
Approx. Acreage of State Forests (PA) within 200' of line	0	NA	0
Approx. Acreage of State Game Lands (PA) within 200' of line	429	NA	429
Length of PA Trails within 200' of line (miles) [10]	NA	NA	NA
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	147	66	213
Total Acreage of Preserved Farmland within 200' of line [11]	148	190	190
Railroad Crossings (Status Unknown) [12]	9	0	9

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CIA Items	Pennsylvania	New Jersey	Total Project
Road Crossings [13]	141	34	175
Bridge Crossings within 200' of line (all) [14]	0	3	3
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	1	1
Product Pipeline Crossings [16]	1	1	2
Existing Gas Pipeline Crossings [16]	10	1	11
Transmission line Crossings [16]	18	3	21
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	167	NA	167
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	253	13	266
Total Acreage of 400' Corridor	4104	982	5086
Percent of Total 400' Corridor that is wetland	3.4%	7.0%	10.4%

Notes:
[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral
[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets
[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline
[4] Penn State Streams Chapter 93 Designated Use
[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories
[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands
[7] NHD waterbodies includes only lakes and ponds and not stream areas
[8] Churches, schools, and cemetery counts are based on USGS GNIS
[9] NJDEP Open Space (State, County, Cross-Acceptance)
[10] PA DCNR and Rails-to-Trails Conservancy
[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program
[12] PennDOT County Rail lines NJDOT Rail Network
[13] PennDOT State and Local roads; NJDOT Road Network
[14] Federal Highway Administration National Bridge Inventory
[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO
[16] Platts POWERmap®

10.3.1.2 Alternative 1 to Original Route with ETG spur

PennEast's Original Route was reviewed to make an analysis of potential critical (environmental) issues, permitting requirements, and risks. A desktop analysis, utilizing multiple applications specific to both Pennsylvania and New Jersey, was performed in order to evaluate areas of potential impact. PennEast also conducted an aerial reconnaissance of the study corridor on May 20, 2014 to identify potential critical issues and risks, including stream and river crossings. The overflight allowed for a clearer understanding of possible engineering and environmental constraints. Following the aerial reconnaissance, site visits were performed at publically accessible, potential road and stream crossings as well as other critical areas along the proposed alignment. Both the aerial and ground

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reconnaissance highlighted areas of potential concern and allowed for further investigation into solutions, such as reroutes. The areas that were focused on in the reconnaissance included:

- Private and public roads, railroads, bridges and trail crossings;
- Road crossings;
- Waterbody crossings;
- Clearing requirements;
- Land Use;
- Socio-Economic Issues;
- Commercial and Industrial Areas; and
- Infrastructure

The findings of the aerial and ground reconnaissance were integrated and used to propose modifications that were incorporated into Alternative 1 to Original Route with ETG spur.

Alternative 1 to Original Route with ETG spur was preferable to the Original Route because it would result in fewer impacts to various resources. Specifically, Alternative 1 Route reduced the total acreage of State Game Lands (PA) within 200 feet of the centerline by 27 acres and also avoided 58 acres of wetlands within 200 feet of the centerline that would have been affected by the Original Route.

Table 10.3-4 provides a Critical Issues Analysis for PennEast's "Alternative 1 – Original Route with ETG Spur." Figure 10.3-1shows the segment of this alternative between approximate MP 75 and 96 as compared with the "Original Route".

Table 10.3-4
Alternative 1 – Original Route with ETG Spur

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	84.53	20.37	104.90
Municipalities Crossed (#) [2]	22	5	27
Stream Crossings (Total as NHD streams) [3]	104	57	161
PA EV Cold Water Fishes (EV-CWF, Total)[4]	11	NA	11
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	28	NA	28
PA Cold Water Fishes (CWF, Total) [4]	25	NA	25
PA Warm Water Fishes (WWF, Total) [4]	4	NA	4
PA Trout Stocking Stream (TST, Total) [4]	5	NA	5
PA Naturally Producing Trout Waters (from EV) [5]	2	NA	2
PA Naturally Producing Trout Waters (from HQ) [5]	12	NA	12
PA Naturally Producing Trout Waters (from CWF)[5]	6	NA	6
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	31	NA	31
NJDEP SWQS Category 1 Streams	NA	19	19
DRBC Wild and Scenic River Crossings	Lower Delaware River		1
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	94	47	141

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CIA Items	Pennsylvania	New Jersey	Total Project
Wetland Crossings (of the Center Line) [6]	42	33	75
Total number of NHD waterbodies within 200' of line [7]	29	13	42
Total Acreage of NHD waterbodies within 200' of line [7]	14	1	15
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	0	0
Wind Turbines (USGS) within 200' of line	0	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	520	NA	520
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	329	412	741
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	382	NA	382
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	681	NA	681
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	3	3
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	21	21
Known Contaminated Sites (NJ) within 200' of line	NA	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	36	36
Potential NRHP Cultural Resources (unrestricted) within 200' of line	8	5	13
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	606	606
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	38	38
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	125	125
Approx. Acreage of State Parks (PA) within 200' of line	231	NA	231
Approx. Acreage of State Forests (PA) within 200' of line	0	NA	0

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of State Game Lands (PA) within 200' of line	402	NA	402
Length of PA Trails within 200' of line (miles) [10]	NA	NA	NA
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	164	58	222
Total Acreage of Preserved Farmland within 200' of line [11]	204	192	192
Railroad Crossings (Status Unknown) [12]	8	0	8
Road Crossings [13]	139	33	172
Bridge Crossings within 200' of line (all) [14]	3	0	3
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	2	0	2
Product Pipeline Crossings [16]	1	1	2
Existing Gas Pipeline Crossings [16]	10	2	12
Transmission line Crossings [16]	22	4	26
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	172	NA	172
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	208	38	245
Total Acreage of 400' Corridor	4096	990	5087
Percent of Total 400' Corridor that is wetland	2.3%	4.8%	7.1%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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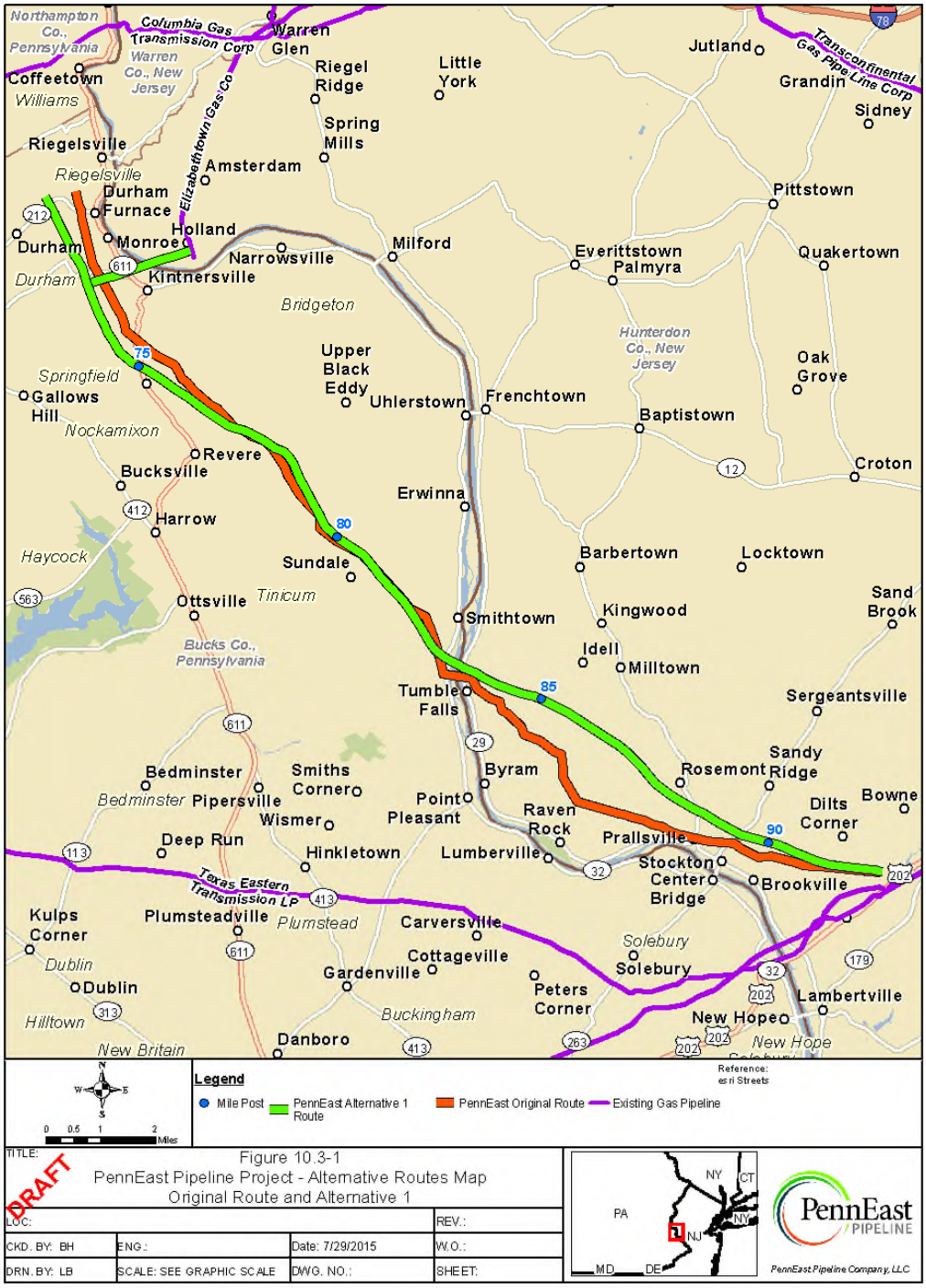
Figure 10.3-1
PennEast Pipeline Project Alternative Routes Map – Original Route and Alternative 1



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10.3.1.3 Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)

PennEast conducted further analysis of environmental constraints, resulting in Alternative 2 to Original Route with NJ Loop (Initial Preferred Route). In order to reduce potential environmental impacts related to the ETG Spur, PennEast eliminated the Alternative 1 to Original Route with ETG spur. This elimination avoids the pipeline crossing the Delaware River a second time. Along with exclusion of the ETG Spur, Alternative 2 to Original Route with NJ Loop shifts the alignment from MP 70 to MP 90 from Bucks County, Pennsylvania to Hunterdon County, New Jersey. This would allow the pipeline to make all desired interconnections. Alternative 2 to Original Route with NJ Loop (Initial Preferred Route) is preferable to Alternative 1 to Original Route with ETG spur because it traversed less densely populated areas, reducing both temporary and permanent impacts. Further, because of the topography, and based on aerial imagery, it is estimated that Alternative 1 would result in greater impacts to wetlands and waterbodies.

Table 10.3-5 provides a Critical Issues Analysis for PennEast's "Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)."

Table 10.3-5
Alternative 2 – Original Route with NJ Loop (Preferred Alternative Route)

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	72.17	33.37	105.54
Municipalities Crossed (#) [2]	21	7	28
Stream Crossings (Total as NHD streams) [3]	106	59	165
PA EV Cold Water Fishes (EV-CWF, Total)[4]	4	NA	4
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	28	NA	28
PA Cold Water Fishes (CWF, Total) [4]	21	NA	21
PA Warm Water Fishes (WWF, Total) [4]	3	NA	3
PA Trout Stocking Stream (TST, Total) [4]	0	NA	0
PA Naturally Producing Trout Waters (from EV) [5]	2	NA	2
PA Naturally Producing Trout Waters (from HQ) [5]	11	NA	11
PA Naturally Producing Trout Waters (from CWF)[5]	7	NA	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	50	NA	50
NJDEP SWQS Category 1 Streams	NA	31	31
DRBC Wild and Scenic River Crossings	0	0	10
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	102	110	212
Wetland Crossings (of the Center Line) [6]	57	66	105
Total number of NHD waterbodies within 200' of line [7]	27	11	38
Total Acreage of NHD waterbodies within 200' of line [7]	13	1	14
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1
Wind Turbines (USGS) within 200' of line	0	0	0

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	383	NA	383
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	329	746	1075
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	182	NA	182
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	647	NA	647
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	3	3
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	19	19
Known Contaminated Sites (NJ) within 200' of line	NA	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	50	50
Potential NRHP Cultural Resources (unrestricted) within 200' of line	8	8	16
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	669	669
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	38	38
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	164	164
Approx. Acreage of State Parks (PA) within 200' of line	230	NA	230
Approx. Acreage of State Forests (PA) within 200' of line	0	NA	0
Approx. Acreage of State Game Lands (PA) within 200' of line	402	NA	402
Length of PA Trails within 200' of line (miles) [10]	2.24	NA	2.24
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	126	76	202
Total Acreage of Preserved Farmland within 200' of line [11]	90	426	516

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CIA Items	Pennsylvania	New Jersey	Total Project
Railroad Crossings (Status Unknown) [12]	8	0	8
Road Crossings [13]	116	44	160
Bridge Crossings within 200' of line (all) [14]	2	0	2
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	2	0	2
Product Pipeline Crossings [16]	1	1	2
Existing Gas Pipeline Crossings [16]	10	3	13
Transmission line Crossings [16]	19	12	31
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	194	NA	194
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	168	99	267
Total Acreage of 400' Corridor	3499	1619	5118
Percent of Total 400' Corridor that is wetland	2.9%	6.8%	9.7%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

[17] Slopes based USGS 30 meter DEM

10.3.1.4 Preferred Alternative Route November 2014

Along Alternative 2 Route, reroutes were considered that incorporated co-location. Along the alignment, the centerline was shifted to co-locate with various utility right-of-ways, including gas pipeline and electric transmission. Co-location reduces the amount of clearing and environmental impacts and concentrates them into a smaller area. Between MP 10 and MP 20, which is an area that the pipeline navigates Pennsylvania State Game Lands, the alignment was moved to co-locate with Transco's pipeline. This not only decreased the amount of new permanent right-of-way required

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throughout the entire route, but also reduced the cumulative land use impacts of the corridor. Other significant co-location segments fall between MP 20 and MP 40. Right-of-way agents have been working with individual landowners to avoid sensitive features on properties, which allows the November 2014 Preferred Route to take into account all of these features, as well as cultural resources that have been discovered through surveying. Multiple cultural resources, including sites with both historic and prehistoric components have been located throughout the proposed route, and appropriate reroutes have been applied. The November 2014 Preferred Route also includes the addition of the Hellertown 24-inch Lateral. This lateral permits another interconnect into the PennEast pipeline.

Table 10.3-6 provides a Critical Issues Analysis for PennEast's "Preferred Alternative Route – Revised November 2014." Figure 10.3-2 shows the segment of this alternative between approximate MP 10 and 37 as compared with the Original Route. Figure 10.3-3 shows the segment of this alternative between approximate MP 48 and 51 as compared with the Original Route.

Table 10.3-6
Preferred Alternative Route – Revised November 2014

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	76.98	33.96	110.94
Municipalities Crossed (#) [2]	21	7	28
Stream Crossings (Total as NHD streams) [3]	103	54	157
PA EV Cold Water Fishes (EV-CWF, Total)[4]	4	NA	4
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	24	NA	24
PA Cold Water Fishes (CWF, Total) [4]	28	NA	28
PA Warm Water Fishes (WWF, Total) [4]	5	NA	5
PA Trout Stocking Stream (TST, Total) [4]	0	NA	0
PA Naturally Producing Trout Waters (from EV) [5]	3	NA	3
PA Naturally Producing Trout Waters (from HQ) [5]	9	NA	9
PA Naturally Producing Trout Waters (from CWF)[5]	7	NA	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	42	NA	42
NJDEP SWQS Category 1 Streams	NA	30	30
DRBC Wild and Scenic River Crossings	0	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	143	117	260
Wetland Crossings (of the Center Line) [6]	81	65	146
Total number of NHD waterbodies within 200' of line [7]	32	10	42
Total Acreage of NHD waterbodies within 200' of line [7]	34	1	35
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1
Wind Turbines (USGS) within 200' of line	1	0	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	327	NA	327

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	356	749	1105
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	236	NA	236
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	1043	NA	1043
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	3	3
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	20	20
Known Contaminated Sites (NJ) within 200' of line	NA	1	1
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	53	53
Potential NRHP Cultural Resources (unrestricted) within 200' of line	10	8	18
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	669	669
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	18	18
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	180	180
Approx. Acreage of State Parks (PA) within 200' of line	231	NA	231
Approx. Acreage of State Forests (PA) within 200' of line	35	NA	35
Approx. Acreage of State Game Lands (PA) within 200' of line	212	NA	212
Length of PA Trails within 200' of line (miles) [10]	1.42	NA	1.42
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	140	82	223
Total Acreage of Preserved Farmland within 200' of line [11]	115	398	513
Railroad Crossings (Status Unknown) [12]	9	0	9

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CIA Items	Pennsylvania	New Jersey	Total Project
Road Crossings [13]	105	45	150
Bridge Crossings within 200' of line (all) [14]	1	1	2
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	0	1
Product Pipeline Crossings [16]	9	1	10
Existing Gas Pipeline Crossings [16]	9	3	12
Transmission line Crossings [16]	17	10	27
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	197	NA	197
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	113	37	NA
Total Acreage of 400' Corridor	3733	1647	5380
Percent of Total 400' Corridor that is wetland	3.8%	7.1%	10.9%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-2
PennEast Pipeline Project Alternative Routes Map – Original Route and Preferred Route
November 2014

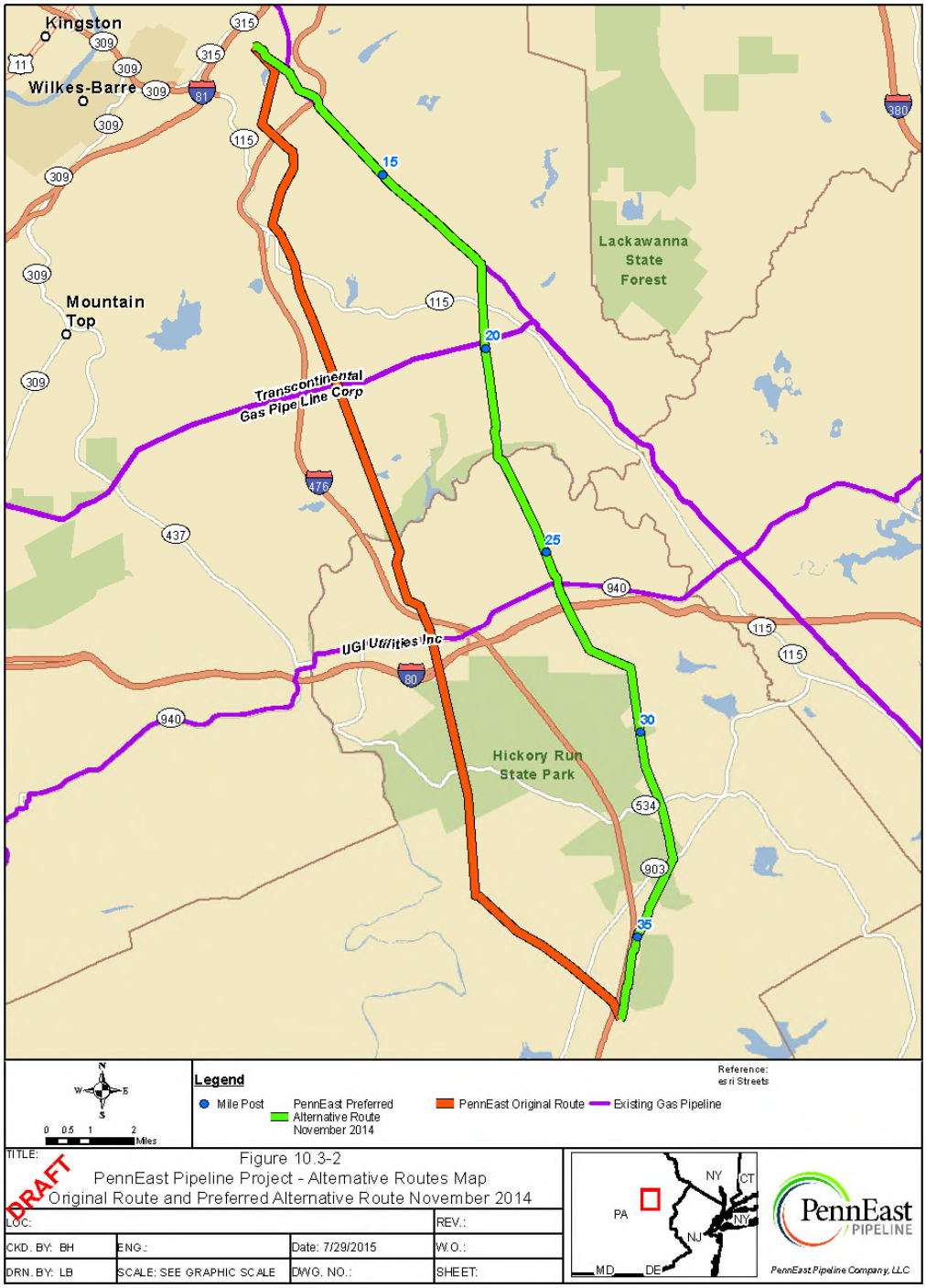

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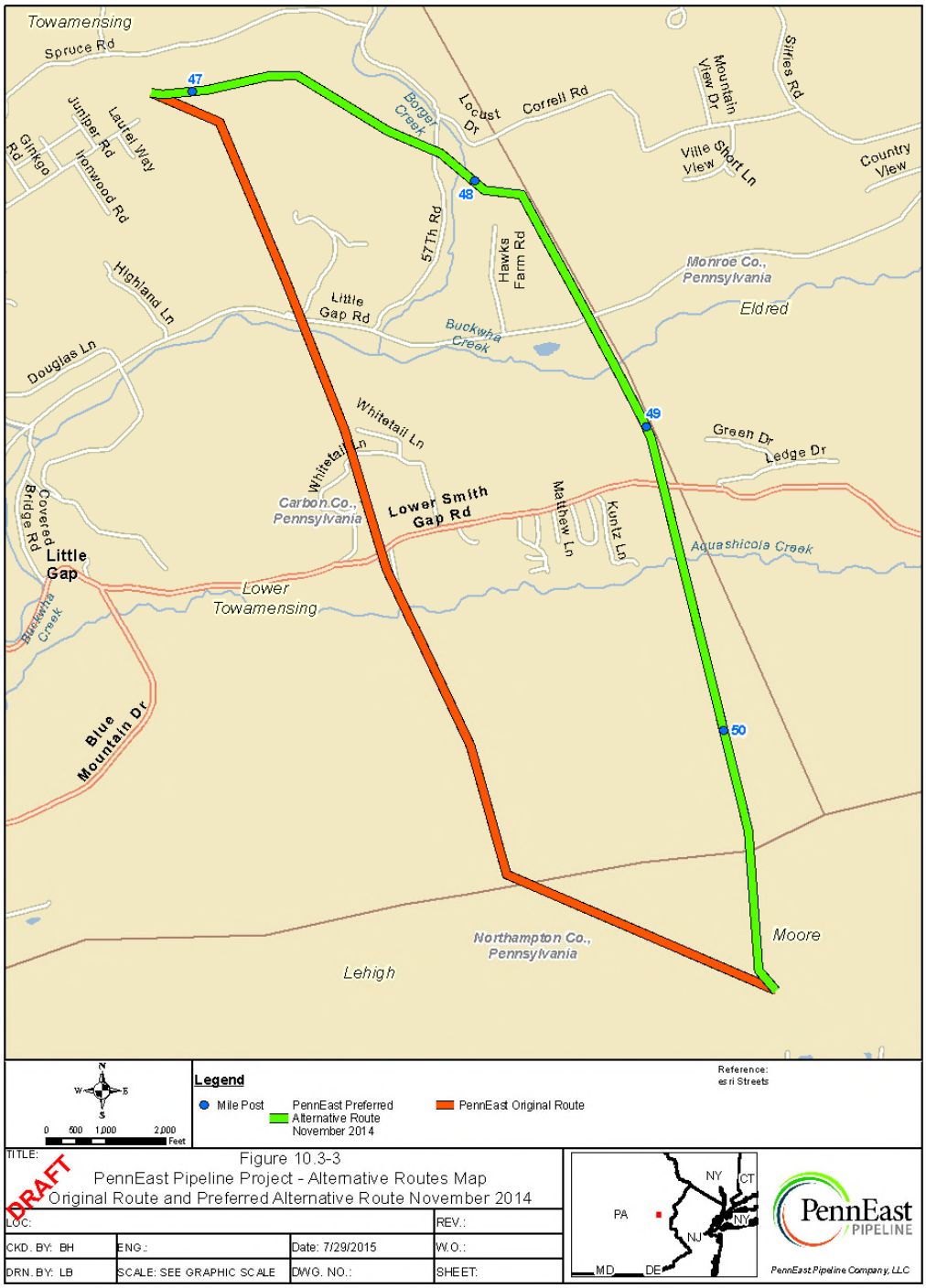
Figure 10.3-3
PennEast Pipeline Project Alternative Routes Map – Original Route and Preferred Route
November 2014



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10.3.1.5 Preferred Alternative Route January 2015

Since PennEast filed its initial draft Resource Reports 1 and 10 with FERC in November 2014, PennEast considered a number of alternatives based on input from local, county and township officials. PennEast also took into account numerous comments and concerns from individual landowners and members of the general public that were raised during Open Houses that were held by PennEast in November 2014. PennEast also made necessary adjustments to the route to account for engineering, environmental, and land use constraints that were identified during the environmental survey process. Most significantly, in New Jersey the route was shifted for approximately 21 miles, from MP 90 (approximate) to the southern project terminus near Pennington, Mercer County, NJ (MP 110). This new route followed existing power line rights-of-way in an effort to maximize co-location opportunities. With the new route in NJ, the overall Project route increased in co-location from approximately 29% to 45%. The reroute in NJ necessitated a 1.3-mile, 36-inch lateral near Lambertville, NJ to transport gas to interconnections with Algonquin and Texas Eastern. In Pennsylvania, the route was shifted for approximately 2.5 miles to the north side of State Route 33 near Bethlehem, PA to accommodate future expansion plans of the St. Luke's Hospital complex.

Table 10.3-7 provides a Critical Issues Analysis for PennEast's "Preferred Alternative Route – Revised January 2015.

Table 10.3-7
Preferred Alternative Route – Revised January 2015

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	76.62	37.39	114.0
Municipalities Crossed (#) [2]	21	6	27
Stream Crossings (Total as NHD streams) [3]	60	64	124
PA EV Cold Water Fishes (EV-CWF, Total)[4]	4	NA	4
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	21	NA	21
PA Cold Water Fishes (CWF, Total) [4]	30	NA	30
PA Warm Water Fishes (WWF, Total) [4]	3	NA	3
PA Trout Stocking Stream (TST, Total) [4]	0	NA	0
PA Naturally Producing Trout Waters (from EV) [5]	3	NA	3
PA Naturally Producing Trout Waters (from HQ) [5]	8	NA	8
PA Naturally Producing Trout Waters (from CWF)[5]	7	NA	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	2	NA	2
NJDEP SWQS Category 1 Streams	NA	33	33
DRBC Wild and Scenic River Crossings	0	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	127	107	233
Wetland Crossings (of the Center Line) [6]	55	54	109
Total number of NHD waterbodies within 200' of line [7]	33	8	41
Total Acreage of NHD waterbodies within 200' of line [7]	36	2	38

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CIA Items	Pennsylvania	New Jersey	Total Project
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1
Wind Turbines (USGS) within 200' of line	1	0	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	327	NA	327
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	354	709	1063
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	221	NA	221
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	1088	NA	1088
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	22	22
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	52	52
Known Contaminated Sites (NJ) within 200' of line	NA	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	11	11
Potential NRHP Cultural Resources (unrestricted) within 200' of line	10	9	19
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	1041	1041
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	88	88
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	258	258
Approx. Acreage of State Parks (PA) within 200' of line	231	NA	231
Approx. Acreage of State Forests (PA) within 200' of line	35	NA	35
Approx. Acreage of State Game Lands (PA) within 200' of line	212	NA	212
Length of PA Trails within 200' of line (miles) [10]	1.52	NA	1.52

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CIA Items	Pennsylvania	New Jersey	Total Project
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	135	61	195
Total Acreage of Preserved Farmland within 200' of line [11]	115	337	452
Railroad Crossings (Status Unknown) [12]	9	0	9
Road Crossings [13]	113	49	162
Bridge Crossings within 200' of line (all) [14]	1	0	1
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	0	1
Product Pipeline Crossings [16]	9	1	10
Existing Gas Pipeline Crossings [16]	14	6	20
Transmission line Crossings [16]	18	25	43
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	194	NA	194
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	111	45	156
Total Acreage of 400' Corridor	3709	1812	5521
Percent of Total 400' Corridor that is wetland	3.4%	5.9%	9.3%

Notes:
[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral
[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets
[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline
[4] Penn State Streams Chapter 93 Designated Use
[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories
[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands
[7] NHD waterbodies includes only lakes and ponds and not stream areas
[8] Churches, schools, and cemetery counts are based on USGS GNIS
[9] NJDEP Open Space (State, County, Cross-Acceptance)
[10] PA DCNR and Rails-to-Trails Conservancy
[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program
[12] PennDOT County Rail lines NJDOT Rail Network
[13] PennDOT State and Local roads; NJDOT Road Network
[14] Federal Highway Administration National Bridge Inventory
[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO
[16] Platts POWERmap®

10.3.1.6 Preferred Alternative Route March 2015

Following feedback from FERC's scoping meetings held in February 2015 and numerous conversations with landowners, state and local agencies, and other various stakeholders, PennEast

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revised and refined various portions of the preferred alternative route in March 2015. The most significant variations to the route were related to the location of the crossing of the Bethlehem Authority water supply mainline (MP 44 and MP 45), Appalachian Trail crossing (between MP 46 and MP 55), and accommodating future subdivision and housing development plans. Additional field data gained during environmental surveys helped make smaller adjustments related to environmental constraints and individual discussions with landowners. With the new route alignment, an additional interconnect was needed for the Gilbert Power Generation facility in Holland Township, New Jersey, which is fed by a small lateral (12 inches in diameter) to supply natural gas to the facility. The previously located interconnection with Elizabethtown Gas was relocated so that both interconnects can be co-located within the power station's industrial property to minimize additional above-ground impacts.

Table 10.3-8 provides a Critical Issues Analysis for PennEast's "Preferred Alternative Route – Revised March 2015.

Table 10.3-8
Preferred Alternative Route – Revised March 2015

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	76.75	37.96	114.7
Municipalities Crossed (#) [2]	21	6	27
Stream Crossings (Total as NHD streams) [3]	62	61	123
PA EV Cold Water Fishes (EV-CWF, Total)[4]	4	NA	4
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	22	NA	22
PA Cold Water Fishes (CWF, Total) [4]	31	NA	31
PA Warm Water Fishes (WWF, Total) [4]	2	NA	2
PA Trout Stocking Stream (TST, Total) [4]	0	NA	0
PA Naturally Producing Trout Waters (from EV) [5]	3	NA	3
PA Naturally Producing Trout Waters (from HQ) [5]	8	NA	8
PA Naturally Producing Trout Waters (from CWF)[5]	7	NA	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	3	NA	3
NJDEP SWQS Category 1 Streams	NA	33	33
DRBC Wild and Scenic River Crossings	0	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	123	100	223
Wetland Crossings (of the Center Line) [6]	50	53	103
Total number of NHD waterbodies within 200' of line [7]	24	8	32
Total Acreage of NHD waterbodies within 200' of line [7]	35	2	37
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1
Wind Turbines (USGS) within 200' of line	1	0	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	288	NA	288

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	355	740	1095
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	223	NA	223
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	833	NA	833
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	NA	34	34
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	NA	52	52
Known Contaminated Sites (NJ) within 200' of line	NA	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	NA	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	NA	11	11
Potential NRHP Cultural Resources (unrestricted) within 200' of line	10	9	19
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	NA	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	NA	1046	1046
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	NA	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	NA	89	89
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	NA	255	255
Approx. Acreage of State Parks (PA) within 200' of line	231	NA	231
Approx. Acreage of State Forests (PA) within 200' of line	35	NA	35
Approx. Acreage of State Game Lands (PA) within 200' of line	239	NA	239
Length of PA Trails within 200' of line (miles) [10]	1.28	NA	1.28
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	120	58	178
Total Acreage of Preserved Farmland within 200' of line [11]	166	346	512
Railroad Crossings (Status Unknown) [12]	15	0	15

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CIA Items	Pennsylvania	New Jersey	Total Project
Road Crossings [13]	114	51	165
Bridge Crossings within 200' of line (all) [14]	1	0	1
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	0	1
Product Pipeline Crossings [16]	9	1	10
Existing Gas Pipeline Crossings [16]	11	6	17
Transmission line Crossings [16]	19	30	49
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	171	NA	171
Coal Mines (PA) within 200' of line (DCNR)	0	NA	0
Approx. Acreage of Slopes > 30% within 200' of line	114	47	161
Total Acreage of 400' Corridor	3715	1838	5554
Percent of Total 400' Corridor that is wetland	3.3%	5.4%	8.7%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

10.3.1.7 Proposed July 2015 Route

Since the draft Resource Report filing in April 2015, PennEast has continued to evaluate potential alternatives to the proposed pipeline alignment based on comments received during the formal Scoping process, ongoing dialogue with federal, state, regional and local agencies, land owners, and the results of field surveys and engineering analyses.

Over the past three months, there has been a significant effort to adjust the alignment within the 400 foot survey corridor to avoid and/or minimize impacts to wetlands and waterbodies, cultural resources, preserved agricultural lands and sensitive habitats. In Pennsylvania, two major reroutes and more than 40 minor reroutes have been evaluated.

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The major reroutes include an alternative route for crossing the Appalachian Trail and nearby PA State Game Land No. 168 in Carbon and Northampton Counties, PA (MP 48.9-53.6), and a realignment to avoid active quarrying operations near Wilkes-Barre, Luzerne County, PA (MP 8.4-12.3). The reroute associated with the Appalachian Trail includes a new delivery interconnection with UGI Central Penn Gas, Inc. This new delivery point is shown as the "Blue Mountain Interconnect" in Resource Report 1 and corresponding mapping. These new alternatives and reroutes have gone through the same detailed assessment as those assessed in the April 2015 filing.

Table 10.3-9 provides a Critical Issues Analysis for PennEast's Proposed July 2015 Route.

Table 10.3-9
Proposed July 2015 Route

CIA Items	Pennsylvania	New Jersey	Total Project
Length (Miles) [1]	77.4	40.2	117.6
Municipalities Crossed (#) [2]	23	6	29
Stream Crossings (Total as NHD streams) [3]	59	57	116
PA EV Cold Water Fishes (EV-CWF, Total)[4]	5	N/A	5
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	22	N/A	22
PA Cold Water Fishes (CWF, Total) [4]	28	N/A	28
PA Warm Water Fishes (WWF, Total) [4]	3	N/A	3
PA Trout Stocking Stream (TST, Total) [4]	0	N/A	0
PA Naturally Producing Trout Waters (from EV) [5]	4	N/A	4
PA Naturally Producing Trout Waters (from HQ) [5]	9	N/A	9
PA Naturally Producing Trout Waters (from CWF)[5]	7	N/A	7
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	1	N/A	1
NJDEP SWQS Category 1 Streams	N/A	31	31
DRBC Wild and Scenic River Crossings	0	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	84	76	160
Wetland Crossings (of the Center Line) [6]	45	2	47
Total number of NHD waterbodies within 200' of line [7]	18	8	26
Total Acreage of NHD waterbodies within 200' of line [7]	33	2	34
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1	1

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CIA Items	Pennsylvania	New Jersey	Total Project
Wind Turbines (USGS) within 200' of line	1	0	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	330	N/A	330
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	471	731	1202
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	222	N/A	222
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	1191	N/A	1191
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	N/A	32	32
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	N/A	17	17
Known Contaminated Sites (NJ) within 200' of line	N/A	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	N/A	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	N/A	11	11
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	N/A	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	N/A	1039	1039
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	4	0	4
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	N/A	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	N/A	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	N/A	91	91
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	N/A	184	184

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CIA Items	Pennsylvania	New Jersey	Total Project
Approx. Acreage of State Parks (PA) within 200' of line	232	N/A	232
Approx. Acreage of State Forests (PA) within 200' of line	34	N/A	34
Approx. Acreage of State Game Lands (PA) within 200' of line	289	N/A	289
Length of PA Trails within 200' of line (miles) [10]	2	N/A	2
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	135	40	175
Total Acreage of Preserved Farmland within 200' of line [11]	167	392	559
Railroad Crossings (Status Unknown) [12]	15	0	15
Road Crossings [13]	174	77	251
Bridge Crossings within 200' of line (all) [14]	0	1	1
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	0	0
Product Pipeline Crossings [16]	4	2	6
Existing Gas Pipeline Crossings [16]	13	8	21
Transmission line Crossings [16]	31	16	47
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	175	N/A	175
Coal Mines (PA) within 200' of line (DCNR)	0	N/A	0
Approx. Acreage of Slopes > 30% within 200' of line	124	43	167
Total Acreage of 400' Corridor	3855	1845	5700

Notes:
[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral
[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets
[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline
[4] Penn State Streams Chapter 93 Designated Use
[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories
[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands
[7] NHD waterbodies includes only lakes and ponds and not stream areas
[8] Churches, schools, and cemetery counts are based on USGS GNIS
[9] NJDEP Open Space (State, County, Cross-Acceptance)
[10] PA DCNR and Rails-to-Trails Conservancy
[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

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CIA Items	Pennsylvania	New Jersey	Total Project
[12] PennDOT County Rail lines NJDOT Rail Network			
[13] PennDOT State and Local roads; NJDOT Road Network			
[14] Federal Highway Administration National Bridge Inventory			
[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO			
[16] Platts POWERmap®			

Table 10.3-10 provides a Critical Issues Analysis for approximate MP 75-97 of the Proposed July 2015 Route compared to the corresponding segment of the Original Route. Figure 10.3-4 shows the segment of this alternative between approximate MP 75 and 97 as compared with the Original Route. This information is being provided in response to FERC comments received on the April 2015 Draft Filing.

Table 10.3-10
Critical Issues Analysis for MP 75-97 of the Proposed July 2015 Route and Corresponding Segment of the Original Route

CIA Items	Original Route	Proposed July 2015 Route
Length (Miles) [1]	18.97	19.51
Municipalities Crossed (#) [2]	6	4
Stream Crossings (Total as NHD streams) [3]	32	32
PA EV Cold Water Fishes (EV-CWF, Total)[4]	7	N/A
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	0	N/A
PA Cold Water Fishes (CWF, Total) [4]	4	N/A
PA Warm Water Fishes (WWF, Total) [4]	1	N/A
PA Trout Stocking Stream (TST, Total) [4]	4	N/A
PA Naturally Producing Trout Waters (from EV) [5]	1	N/A
PA Naturally Producing Trout Waters (from HQ) [5]	0	N/A
PA Naturally Producing Trout Waters (from CWF)[5]	1	N/A
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	16	N/A
NJDEP SWQS Category 1 Streams	3	21
DRBC Wild and Scenic River Crossings	1	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	45.2	58.5
Wetland Crossings (of the Center Line) [6]	18	26
Total number of NHD waterbodies within 200' of line [7]	4	3
Total Acreage of NHD waterbodies within 200' of line [7]	0.5	0.2
Total # Wells (PAGWIS and NJDEP) within 200' of line	1	1
Wind Turbines (USGS) within 200' of line	0	0

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CIA Items	Original Route	Proposed July 2015 Route
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	123.8	0
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	-	-
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	162.9	0
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	22.6	0
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	13.9
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	3.9	2
Known Contaminated Sites (NJ) within 200' of line	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	21.8	11.2
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	28.8	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	258.9	256.9
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	16.0	0
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	27.5	12.7
Approx. Acreage of State Parks (PA) within 200' of line	0.7	0
Approx. Acreage of State Forests (PA) within 200' of line	0	0
Approx. Acreage of State Game Lands (PA) within 200' of line	0	0
Length of PA Trails within 200' of line (miles) [10]	0.2	0
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	12.7	26.5
Total Acreage of Preserved Farmland within 200' of line [11]	117.9	275.3

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CIA Items	Original Route	Proposed July 2015 Route
Railroad Crossings (Status Unknown) [12]	0	0
Road Crossings [13]	38	20
Bridge Crossings within 200' of line (all) [14]	1	0
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	0
Product Pipeline Crossings [16]	2	2
Existing Gas Pipeline Crossings [16]	0	2
Transmission line Crossings [16]	8	14
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	1	0
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	40.5	34.9
Total Acreage of 400' Corridor	919.5	945.9
Percent of Total 400' Corridor that is wetland	5%	6%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-4
PennEast Pipeline Project Alternative Routes Map – Original Route and Proposed July 2015 Route

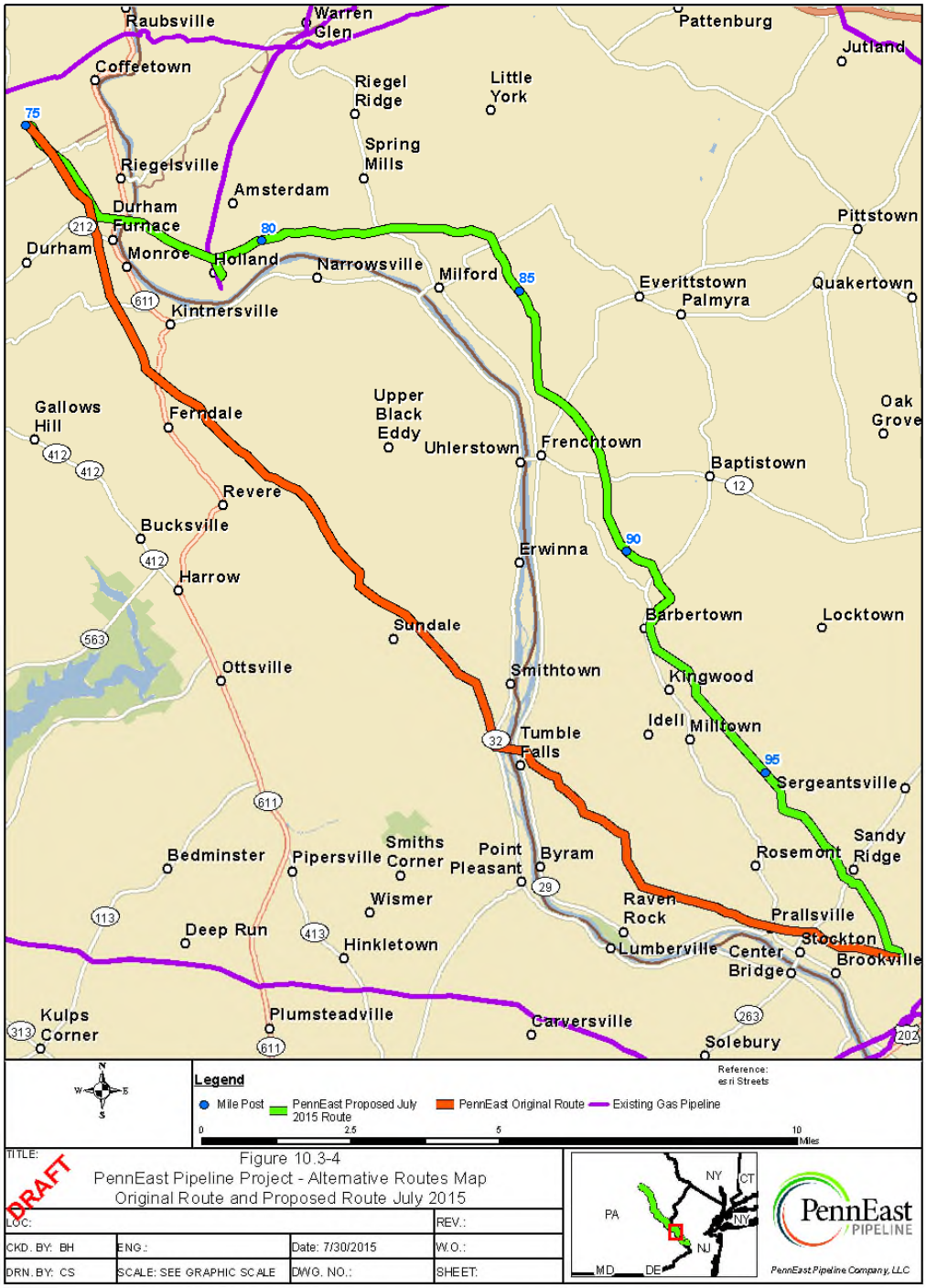

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Table 10.3-11 provides a Critical Issues Analysis for MP 97-110 of the Proposed July 2015 Route compared to the corresponding segment of the Original Route. Figure 10.3-5 shows the segment of this alternative between approximate MP 97 and 110 as compared with the Original Route. This information is being provided in response to FERC comments received on the April 2015 Draft Filing.

Table 10.3-11
Critical Issues Analysis for MP 97-110 of the Proposed July 2015 Route and Corresponding Segment of the Original Route

CIA Items	Original Route	Preferred Route July 2015
Length (Miles) [1]	13.2	12.97
Municipalities Crossed (#) [2]	3	3
Stream Crossings (Total as NHD streams) [3]	26	20
PA EV Cold Water Fishes (EV-CWF, Total)[4]	N/A	N/A
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	N/A	N/A
PA Cold Water Fishes (CWF, Total) [4]	N/A	N/A
PA Warm Water Fishes (WWF, Total) [4]	N/A	N/A
PA Trout Stocking Stream (TST, Total) [4]	N/A	N/A
PA Naturally Producing Trout Waters (from EV) [5]	N/A	N/A
PA Naturally Producing Trout Waters (from HQ) [5]	N/A	N/A
PA Naturally Producing Trout Waters (from CWF)[5]	N/A	N/A
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	N/A	N/A
NJDEP SWQS Category 1 Streams	11	8
DRBC Wild and Scenic River Crossings	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	39.8	13.6
Wetland Crossings (of the Center Line) [6]	23	8
Total number of NHD waterbodies within 200' of line [7]	7	4
Total Acreage of NHD waterbodies within 200' of line [7]	6.7	0.6
Total # Wells (PAGWIS and NJDEP) within 200' of line	1	0
Wind Turbines (USGS) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	0	0
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	-	-
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	0	66.2
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	0	0

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CIA Items	Original Route	Preferred Route July 2015
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	18.5
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	21.7	15.3
Known Contaminated Sites (NJ) within 200' of line	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	18.9	0
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	340	628.7
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	40.5	56.8
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	13.7	24.4
Approx. Acreage of State Parks (PA) within 200' of line	0	0
Approx. Acreage of State Forests (PA) within 200' of line	0	0
Approx. Acreage of State Game Lands (PA) within 200' of line	0	0
Length of PA Trails within 200' of line (miles) [10]	0	0
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	54.8	12.9
Total Acreage of Preserved Farmland within 200' of line [11]	132.6	87.8
Railroad Crossings (Status Unknown) [12]	0	0
Road Crossings [13]	23	19
Bridge Crossings within 200' of line (all) [14]	2	1
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	0
Product Pipeline Crossings [16]	0	0

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CIA Items	Original Route	Preferred Route July 2015
Existing Gas Pipeline Crossings [16]	3	4
Transmission line Crossings [16]	5	10
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	0	0
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	1.6	8.1
Total Acreage of 400' Corridor	639.5	628.7
Percent of Total 400' Corridor that is wetland	6%	2%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-5
PennEast Pipeline Project Alternative Routes Map – Original Route and Proposed July 2015 Route

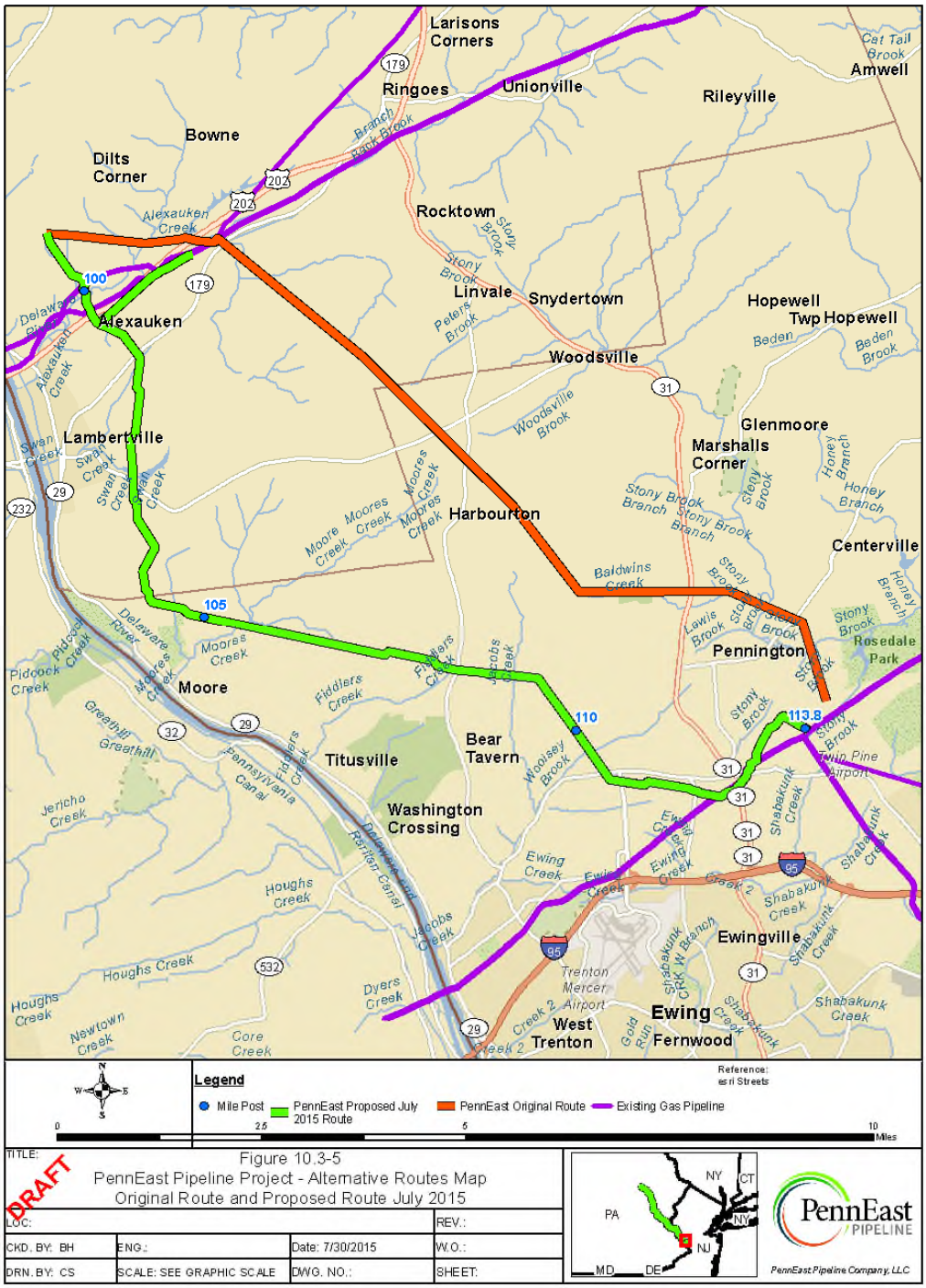

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Figure 10.3-6
Preferred Alternative Route Overview Map

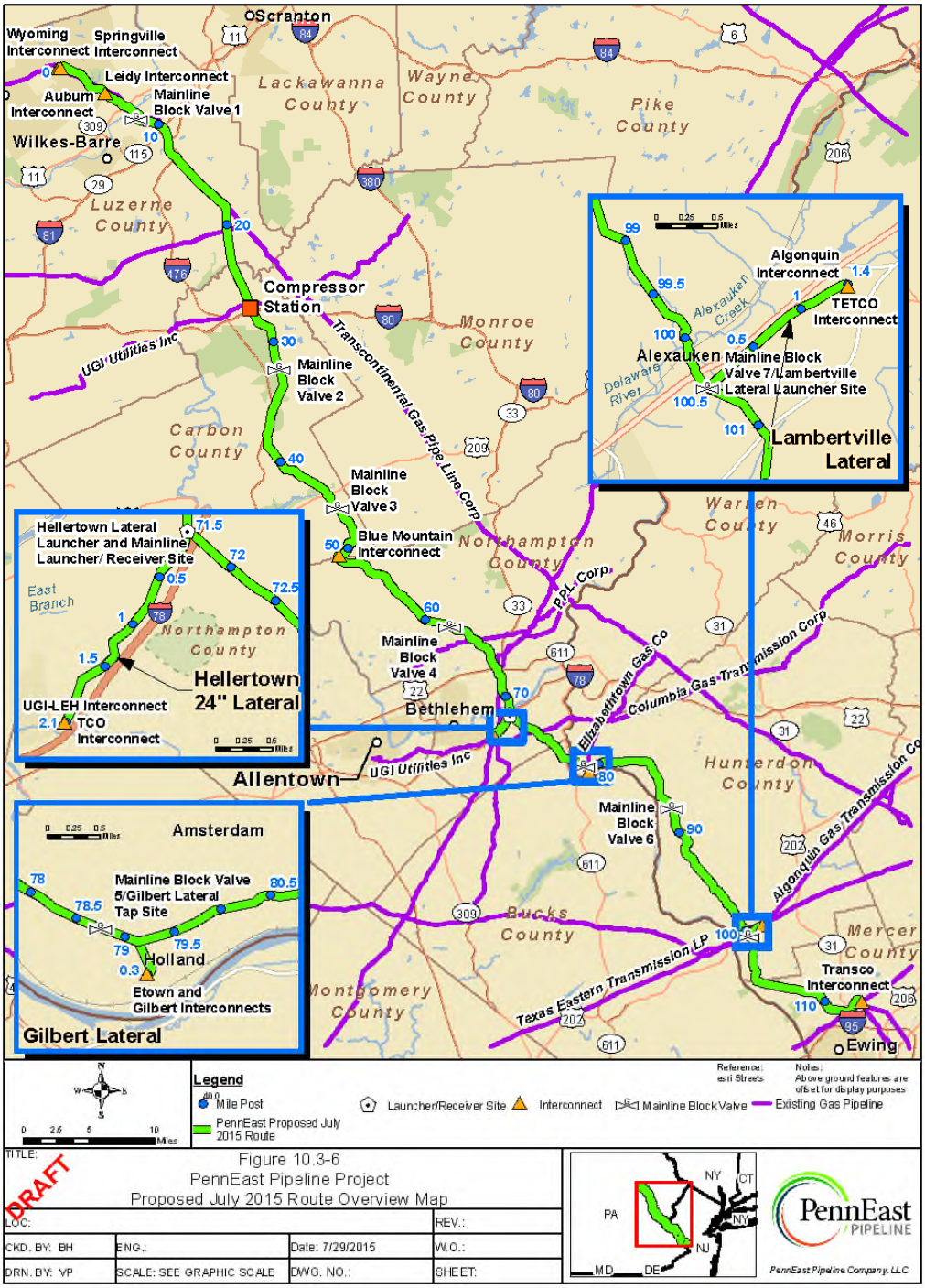

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Figure 10.3-7
PennEast Pipeline Project Alternative Routes Map – Original Route

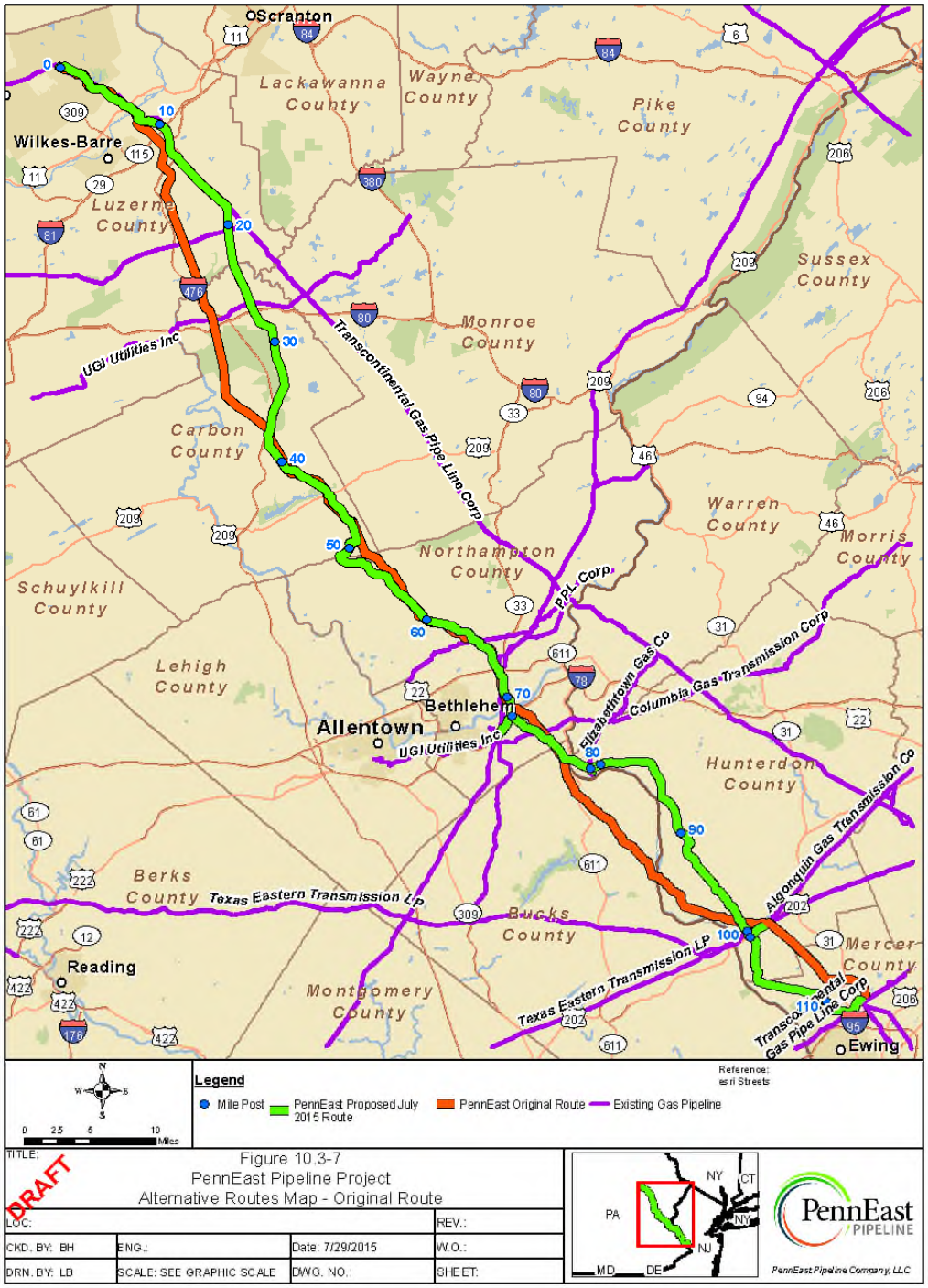

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Figure 10.3-8
PennEast Pipeline Project Alternative Routes Map – Alternative 1 Route

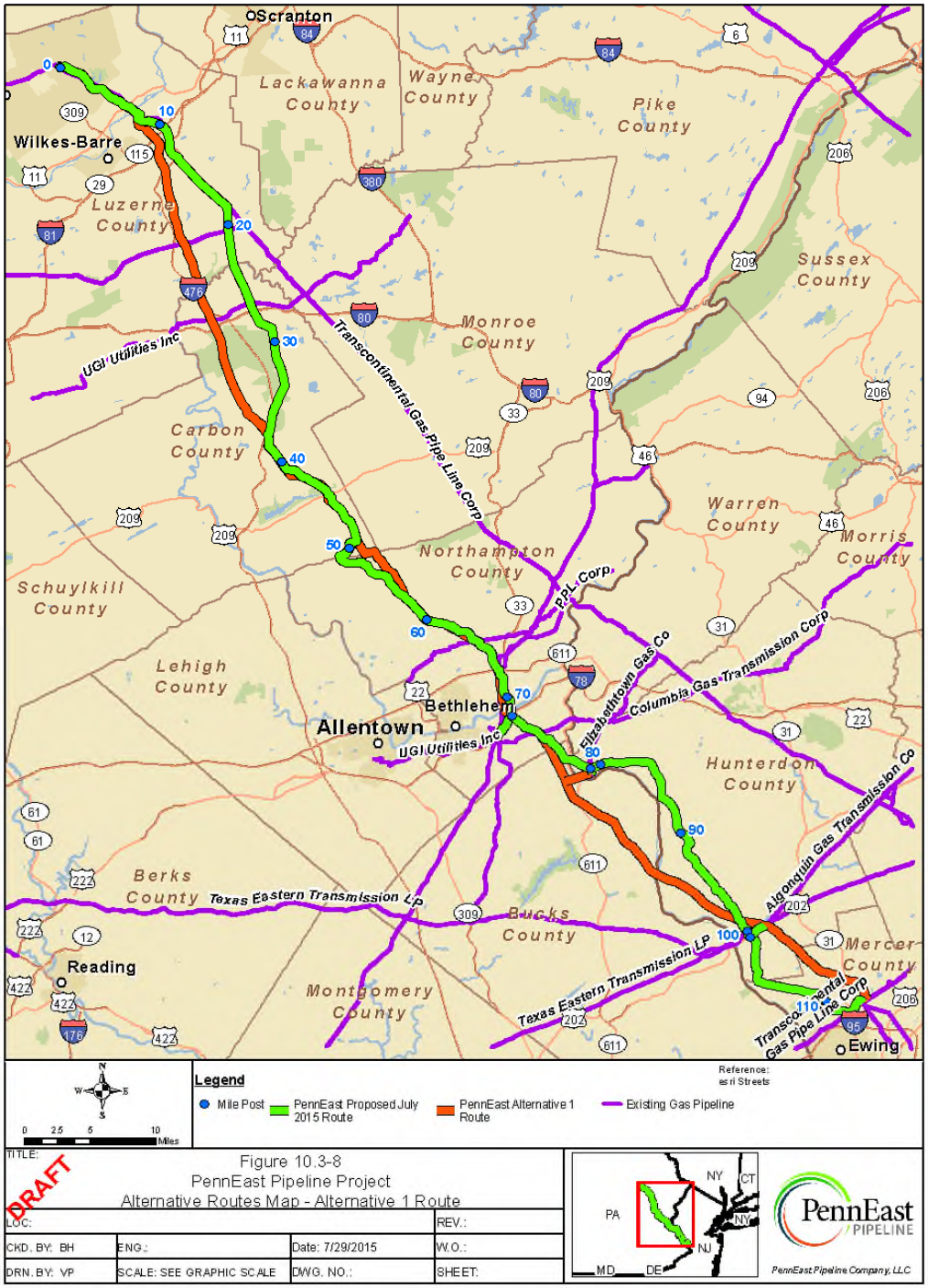

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Figure 10.3-9
PennEast Pipeline Project Alternative Routes Map – Alternative 2 Route

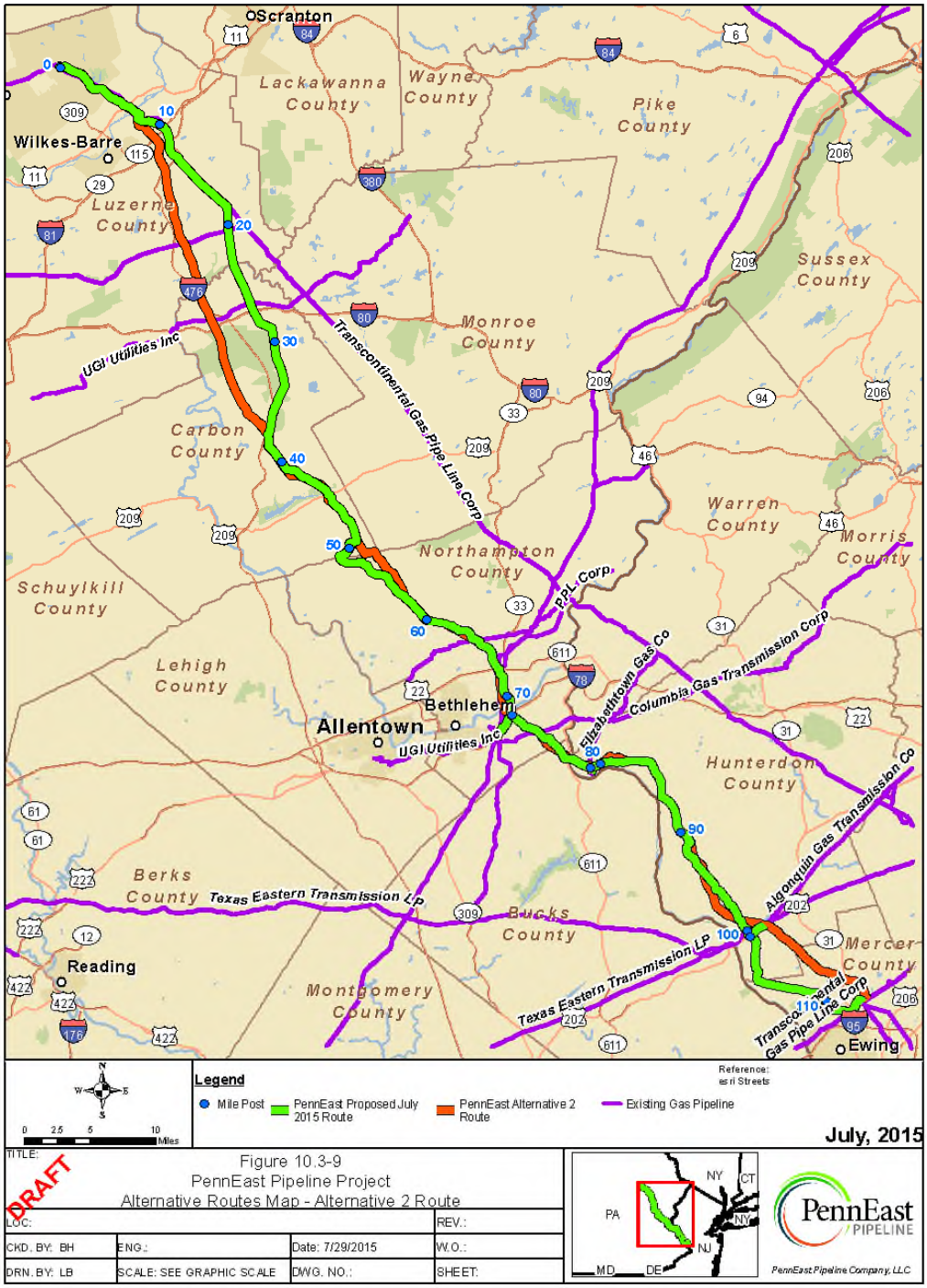

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Figure 10.3-10
PennEast Pipeline Project Alternative Routes Map - Preferred Alternative Route
November 2014

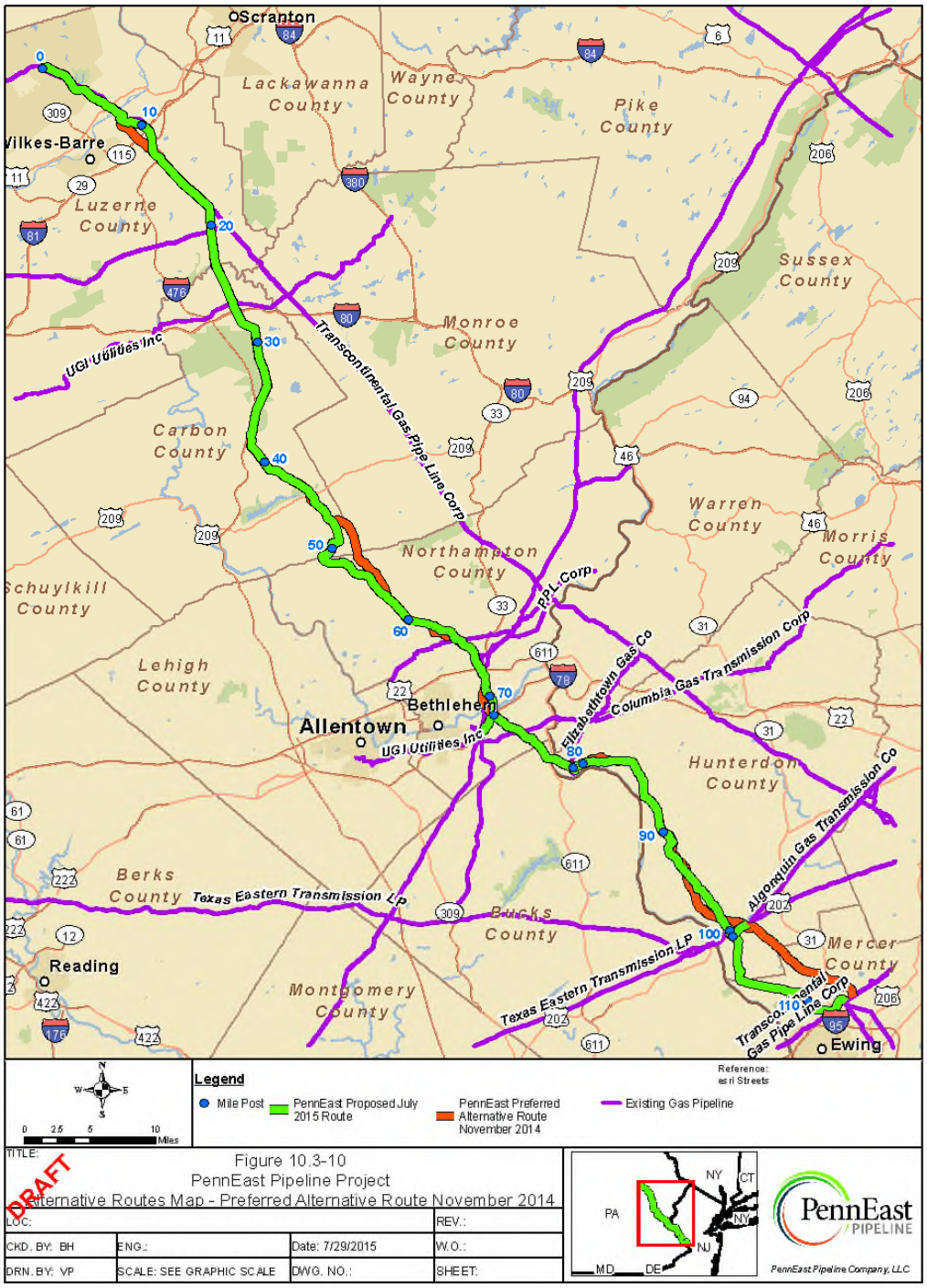

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Figure 10.3-11
PennEast Pipeline Project Alternative Routes Map - Preferred Alternative Route January 2015

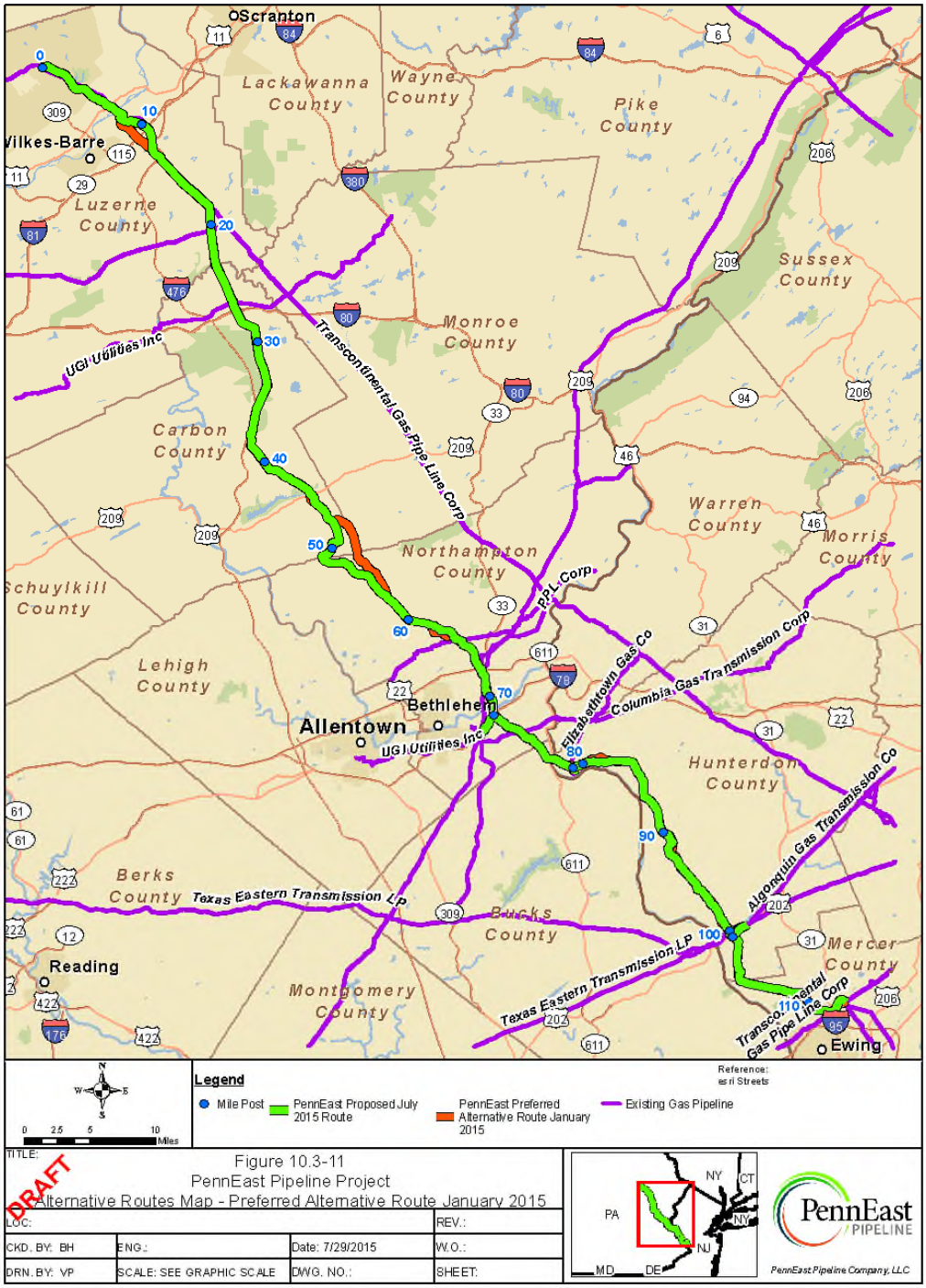

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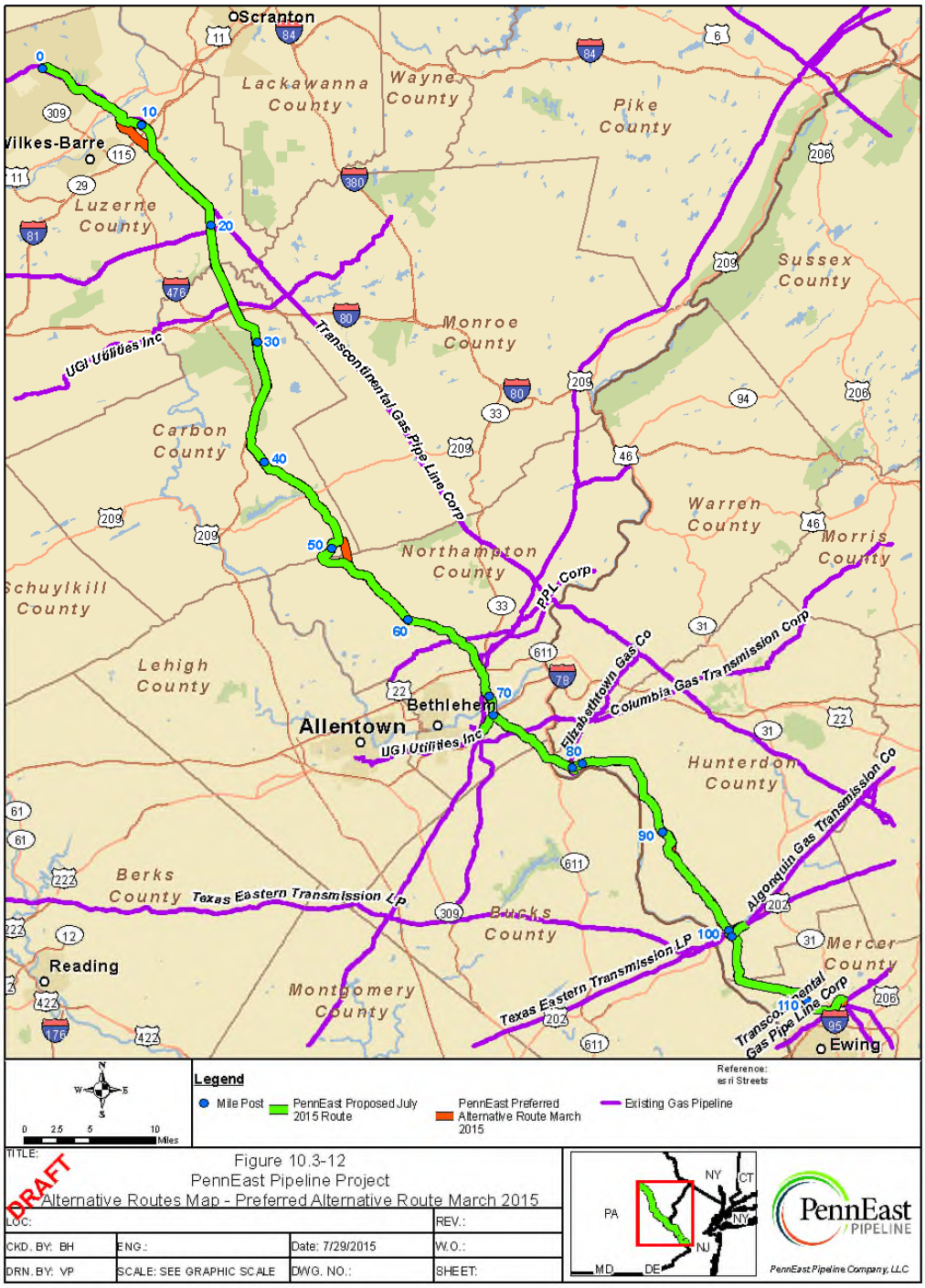
Figure 10.3-12

PennEast Pipeline Project Alternative Routes Map – Preferred Alternative Route March 2015



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10.3.2 Pipeline Deviations

A range of deviations to the proposed route have been examined to date and are continuing to be developed as survey access and additional engineering and environmental information becomes available. Table 10.3-12 presents a summary of the major route adjustments that were adopted during PennEast's alternatives analysis and are contributing components to the Key Alternatives described in Section 10.3.1 above. Table 10.3-18 presents a summary of the minor adjustments to the proposed route that were adopted or considered and the justification for the changes. Appendix P includes details on the alternative assessment for the Proposed Route, Alternatives Rejected (the variations requested, evaluated and rejected) and Prior Alternatives (the segments of the prior alternative that was superseded by the variation adopted into the Proposed Route). Although there are several iterations of alternatives and deviations that have been considered, PennEast will endeavor to reformat for continuity of the naming convention, Appendix P for the September 2015 filing.

Table 10.3-12
Summary of Pipeline Major Reroutes

Facility	MP Range	Reroute Type	Description	Route Alternative	Implementation Date
PennEast Mainline Route Major Reroute 1	1-104.9	Constructability/ Environmental	Avoided potential critical issues through aerial reconnaissance and desktop analysis	Alternative to Original Route with ETG Spur	Initial Planning
PennEast Mainline Route Major Reroute 2	70.0-90.0	Constructability/ Environmental	●Excludes ETG spur eliminating a second crossing of the Delaware River ●Route shifted North ●Refined route for interconnects	Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)	Initial Planning
PennEast Mainline Route Major Reroute 3	10.8-37.1	Environmental	Co-location with Transco and Buckeye Pipeline through PAGC Lands	Preferred Route November 2014	24-Oct-14
PennEast Mainline Route Major Reroute 4	90.2-108.9	Agency Consultations	Co-location with power line through Mercer County, NJ	Preferred Route January 2015	14-Jan-15
PennEast Mainline Route Major Reroute 5	46.8-52.3	Landowner Request	Avoids Federal Land located on Appalachian Trail	Preferred Route March 2015	30-Mar-15

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Table 10.3-13 provides a Critical Issues Analysis for PennEast's Major Reroute 1: MP 1-104.9 of the "Alternative to Original Route with ETG Spur" compared to the entirety (MP 1-113.8) of the "Original Route". Figure 10.3-13 shows the "Alternative to Original Route with ETG Spur" between approximate MP 1-104.9 as compared with the "Original Route".

Table 10.3-13
Critical Issues Analysis for the PennEast Major Reroute 1

CIA Items	Original Route	Alternative to Original Route with ETG Spur
Length (Miles) [1]	104.9	104.9
Municipalities Crossed (#) [2]	29	27
Stream Crossings (Total as NHD streams) [3]	165	161
PA EV Cold Water Fishes (EV-CWF, Total)[4]	11	11
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	27	28
PA Cold Water Fishes (CWF, Total) [4]	29	25
PA Warm Water Fishes (WWF, Total) [4]	3	4
PA Trout Stocking Stream (TST, Total) [4]	4	5
PA Naturally Producing Trout Waters (from EV) [5]	2	2
PA Naturally Producing Trout Waters (from HQ) [5]	12	12
PA Naturally Producing Trout Waters (from CWF)[5]	7	6
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	32	31
NJDEP SWQS Category 1 Streams	14	19
DRBC Wild and Scenic River Crossings	Lower Delaware River	Lower Delaware River
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	207	141
Wetland Crossings (of the Center Line) [6]	104	75
Total number of NHD waterbodies within 200' of line [7]	44	42
Total Acreage of NHD waterbodies within 200' of line [7]	38	15
Total # Wells (PAGWIS and NJDEP) within 200' of line	1	0
Wind Turbines (USGS) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	522	520
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	657	741
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	348	382
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	654	681

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CIA Items	Original Route	Alternative to Original Route with ETG Spur
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	3
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	26	21
Known Contaminated Sites (NJ) within 200' of line	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	41	36
Potential NRHP Cultural Resources (unrestricted) within 200' of line	12	13
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	29	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	599	606
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	2 (Saint Joseph Cemetery in Plains Twp., Fishery School in Kidder Twp.)	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	46	38
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	114	125
Approx. Acreage of State Parks (PA) within 200' of line	227	231
Approx. Acreage of State Forests (PA) within 200' of line	0	0
Approx. Acreage of State Game Lands (PA) within 200' of line	429	402
Length of PA Trails within 200' of line (miles) [10]	0	0
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	213	222
Total Acreage of Preserved Farmland within 200' of line [11]	339	396
Railroad Crossings (Status Unknown) [12]	9	8
Road Crossings [13]	175	172
Bridge Crossings within 200' of line (all) [14]	3	3

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CIA Items	Original Route	Alternative to Original Route with ETG Spur
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	1	2
Product Pipeline Crossings [16]	2	2
Existing Gas Pipeline Crossings [16]	11	12
Transmission line Crossings [16]	21	26
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	167	172
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	266	245
Total Acreage of 400' Corridor	5086	5087
Percent of Total 400' Corridor that is wetland	10.4%	7.0%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-13
PennEast Pipeline Project Alternative Routes Map – Major Reroute 1

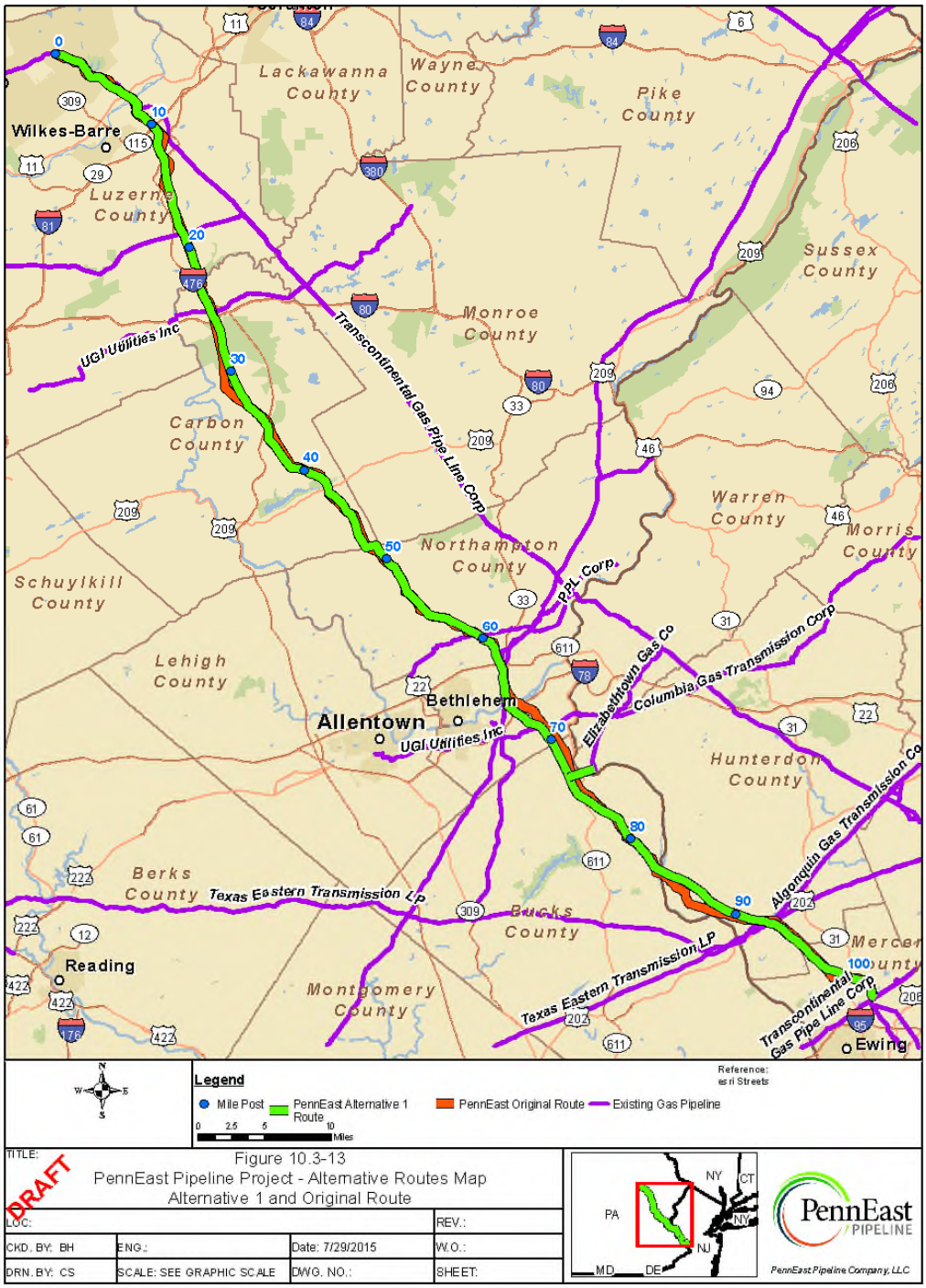

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Table 10.3-14 provides a Critical Issues Analysis for PennEast's Major Reroute 2: MP 70.0-90.0 of the "Alternative 2 – Original Route with NJ Loop (Initial Preferred Route" compared to the corresponding segment of the "Original Route". Figure 10.3-14 shows the "Alternative 2 – Original Route with NJ Loop (Initial Preferred Route" between approximate MP 70.0-90.0 as compared with the "Original Route".

Table 10.3-14
Critical Issues Analysis for the PennEast Major Reroute 2

CIA Items	Original Route	Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)
Length (Miles) [1]	15.5	20.0
Municipalities Crossed (#) [2]	6	7
Stream Crossings (Total as NHD streams) [3]	22	41
PA EV Cold Water Fishes (EV-CWF, Total)[4]	0	0
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	0	0
PA Cold Water Fishes (CWF, Total) [4]	4	0
PA Warm Water Fishes (WWF, Total) [4]	1	1
PA Trout Stocking Stream (TST, Total) [4]	4	0
PA Naturally Producing Trout Waters (from EV) [5]	1	0
PA Naturally Producing Trout Waters (from HQ) [5]	0	0
PA Naturally Producing Trout Waters (from CWF)[5]	1	0
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	13	40
NJDEP SWQS Category 1 Streams	0	28
DRBC Wild and Scenic River Crossings	Lower Delaware River	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	20.5	85.1
Wetland Crossings (of the Center Line) [6]	13	50
Total number of NHD waterbodies within 200' of line [7]	0	0
Total Acreage of NHD waterbodies within 200' of line [7]	0.5	0.2
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	1
Wind Turbines (USGS) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	123.8	0
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	-	-

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CIA Items	Original Route	Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	162.9	0
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	112.9	58
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	3.2
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	1.7	1.9
Known Contaminated Sites (NJ) within 200' of line	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	0	11.3
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	8.5	199.9
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	0	0
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	1.5	25.7
Approx. Acreage of State Parks (PA) within 200' of line	0.7	0.7
Approx. Acreage of State Forests (PA) within 200' of line	0	0
Approx. Acreage of State Game Lands (PA) within 200' of line	0	0
Length of PA Trails within 200' of line (miles) [10]	0.2	0.2
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	7.3	49.8
Total Acreage of Preserved Farmland within 200' of line [11]	66.1	215.5

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CIA Items	Original Route	Alternative 2 – Original Route with NJ Loop (Initial Preferred Route)
Railroad Crossings (Status Unknown) [12]	0	0
Road Crossings [13]	34	27
Bridge Crossings within 200' of line (all) [14]	0	0
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	0
Product Pipeline Crossings [16]	2	2
Existing Gas Pipeline Crossings [16]	0	2
Transmission line Crossings [16]	10	15
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	16	33
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	36.6	39.9
Total Acreage of 400' Corridor	750.4	969.4
Percent of Total 400' Corridor that is wetland	2.7%	8.8%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-14
PennEast Pipeline Project Alternative Routes Map – Major Reroute 2

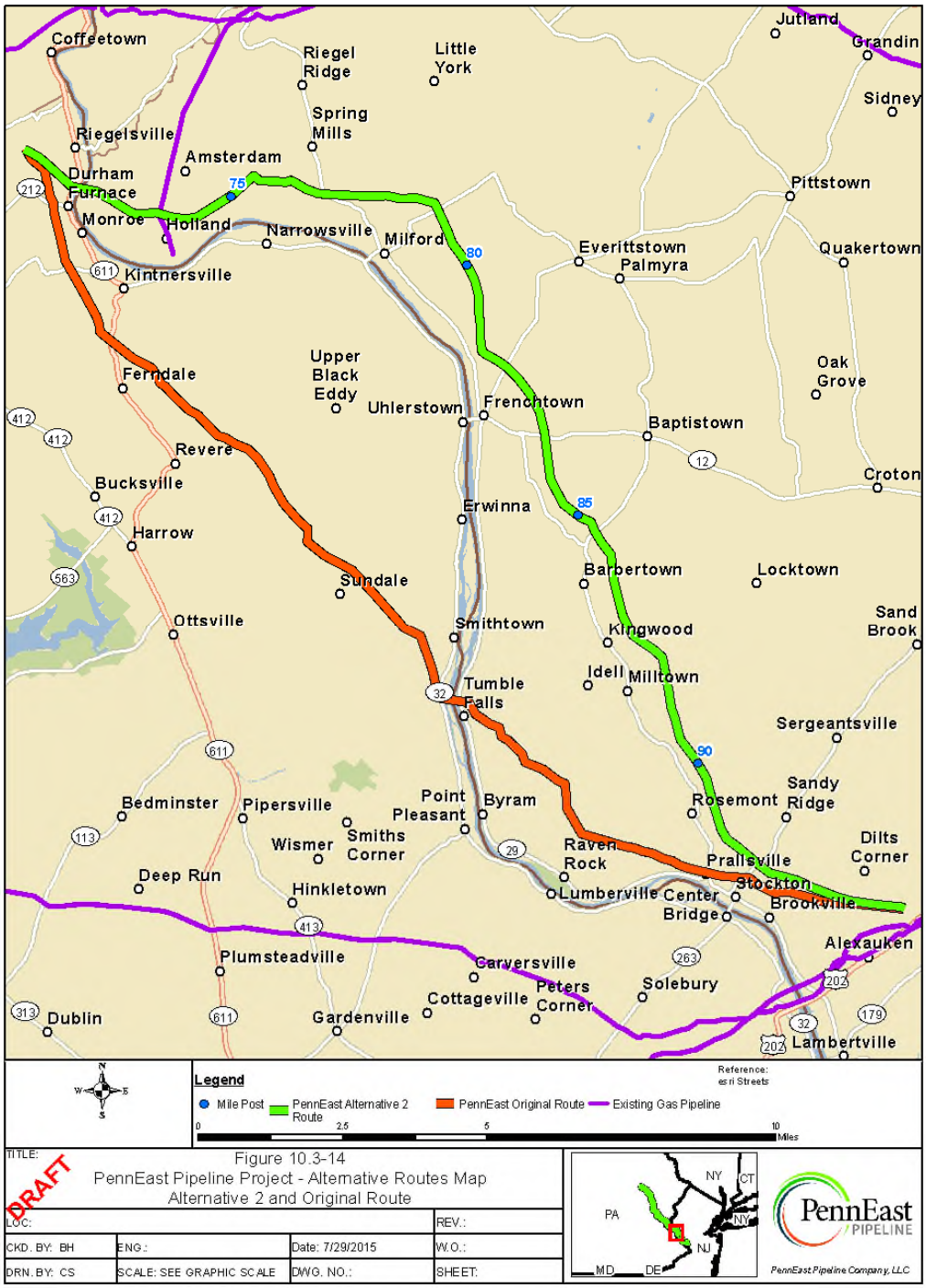

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Table 10.3-15 provides a Critical Issues Analysis for PennEast's Major Reroute 3: MP 10.8-37.1 of the "Preferred Route November 2014" compared to the corresponding segment of the "Original Route". Figure 10.3-15 shows the "Preferred Route November 2014" between approximate MP 10.8-37.1 as compared with the "Original Route".

Table 10.3-15
Critical Issues Analysis for the PennEast Major Reroute 3

CIA Items	Original Route	Preferred Route November 2015
Length (Miles) [1]	25.5	26.3
Municipalities Crossed (#) [2]	4	4
Stream Crossings (Total as NHD streams) [3]	25	17
PA EV Cold Water Fishes (EV-CWF, Total)[4]	0	0
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	18	13
PA Cold Water Fishes (CWF, Total) [4]	3	2
PA Warm Water Fishes (WWF, Total) [4]	0	0
PA Trout Stocking Stream (TST, Total) [4]	0	0
PA Naturally Producing Trout Waters (from EV) [5]	1	1
PA Naturally Producing Trout Waters (from HQ) [5]	9	5
PA Naturally Producing Trout Waters (from CWF)[5]	1	0
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	4	2
NJDEP SWQS Category 1 Streams	N/A	N/A
DRBC Wild and Scenic River Crossings	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	29.5	49.8
Wetland Crossings (of the Center Line) [6]	11	13
Total number of NHD waterbodies within 200' of line [7]	7	3
Total Acreage of NHD waterbodies within 200' of line [7]	22.1	25.7
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	0
Wind Turbines (USGS) within 200' of line	0	1
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	211.8	143.0
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	-	-
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	0	39.0
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	0	0

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CIA Items	Original Route	Preferred Route November 2015
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	N/A	N/A
Known Contaminated Sites (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	N/A	N/A
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	N/A	N/A
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	N/A	N/A
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	N/A	N/A
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	1	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	N/A	N/A
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	N/A	N/A
Approx. Acreage of State Parks (PA) within 200' of line	167.5	168.1
Approx. Acreage of State Forests (PA) within 200' of line	0	30.2
Approx. Acreage of State Game Lands (PA) within 200' of line	419.0	194.6
Length of PA Trails within 200' of line (miles) [10]	1	0.3
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	20.1	20.5
Total Acreage of Preserved Farmland within 200' of line [11]	0	0
Railroad Crossings (Status Unknown) [12]	1	1
Road Crossings [13]	36	18
Bridge Crossings within 200' of line (all) [14]	0	0
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	0
Product Pipeline Crossings [16]	2	14

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CIA Items	Original Route	Preferred Route November 2015
Existing Gas Pipeline Crossings [16]	3	5
Transmission line Crossings [16]	20	6
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	0	0
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	31.1	22.5
Total Acreage of 400' Corridor	1235.3	1274.5
Percent of Total 400' Corridor that is wetland	2.4%	3.9%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-15
PennEast Pipeline Project Alternative Routes Map – Major Reroute 3

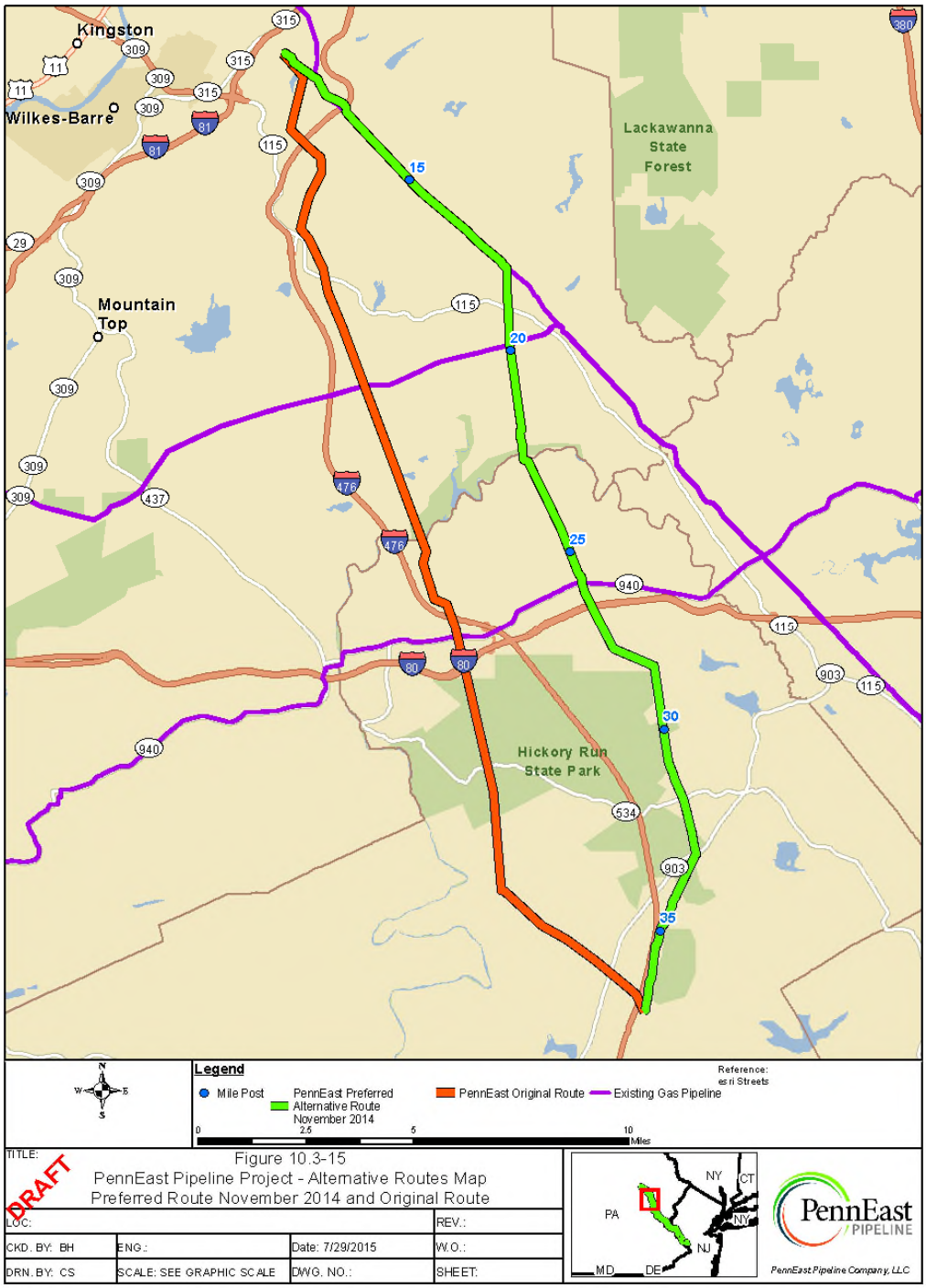

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Table 10.3-16 provides a Critical Issues Analysis for PennEast's Major Reroute 4: MP 90.2-108.9 of the "Preferred Route January 2015" compared to the corresponding segment of the "Original Route". Figure 10.3-16 shows the "Preferred Route January 2015" between approximate MP 90.2-108.9 as compared with the "Original Route".

Table 10.3-16
Critical Issues Analysis for the PennEast Major Reroute 4

CIA Items	Original Route	Preferred Route January 2015
Length (Miles) [1]	21.6	18.7
Municipalities Crossed (#) [2]	6	4
Stream Crossings (Total as NHD streams) [3]	47	31
PA EV Cold Water Fishes (EV-CWF, Total)[4]	0	N/A
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	0	N/A
PA Cold Water Fishes (CWF, Total) [4]	0	N/A
PA Warm Water Fishes (WWF, Total) [4]	1	N/A
PA Trout Stocking Stream (TST, Total) [4]	1	N/A
PA Naturally Producing Trout Waters (from EV) [5]	0	N/A
PA Naturally Producing Trout Waters (from HQ) [5]	0	N/A
PA Naturally Producing Trout Waters (from CWF)[5]	0	N/A
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	45	N/A
NJDEP SWQS Category 1 Streams	15	12
DRBC Wild and Scenic River Crossings	Lower Delaware River	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	75	41.5
Wetland Crossings (of the Center Line) [6]	47	27
Total number of NHD waterbodies within 200' of line [7]	7	3
Total Acreage of NHD waterbodies within 200' of line [7]	6.7	2.2
Total # Wells (PAGWIS and NJDEP) within 200' of line	1	0
Wind Turbines (USGS) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	0	N/A
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	N/A	N/A
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	0	64.0
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	0	N/A

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CIA Items	Original Route	Preferred Route January 2015
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	0	18.6
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	25.6	14.3
Known Contaminated Sites (NJ) within 200' of line	0	0
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	0	0
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	40.7	0
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	28.8	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	598.8	899.9
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	0	0
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	0	0
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	56.5	67.8
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	41.2	24.5
Approx. Acreage of State Parks (PA) within 200' of line	0.7	N/A
Approx. Acreage of State Forests (PA) within 200' of line	0	N/A
Approx. Acreage of State Game Lands (PA) within 200' of line	0	N/A
Length of PA Trails within 200' of line (miles) [10]	0.2	N/A
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	66.5	17.7
Total Acreage of Preserved Farmland within 200' of line [11]	188.6	169.0
Railroad Crossings (Status Unknown) [12]	0	0
Road Crossings [13]	40	28
Bridge Crossings within 200' of line (all) [14]	3	0
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	5	0
Product Pipeline Crossings [16]	0	0

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CIA Items	Original Route	Preferred Route January 2015
Existing Gas Pipeline Crossings [16]	7	4
Transmission line Crossings [16]	5	23
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	0	N/A
Coal Mines (PA) within 200' of line (DCNR)	0	N/A
Approx. Acreage of Slopes > 30% within 200' of line	22.8	10.4
Total Acreage of 400' Corridor	1046.6	905.7
Percent of Total 400' Corridor that is wetland	7.2%	4.6

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-16
PennEast Pipeline Project Alternative Routes Map – Major Reroute 4

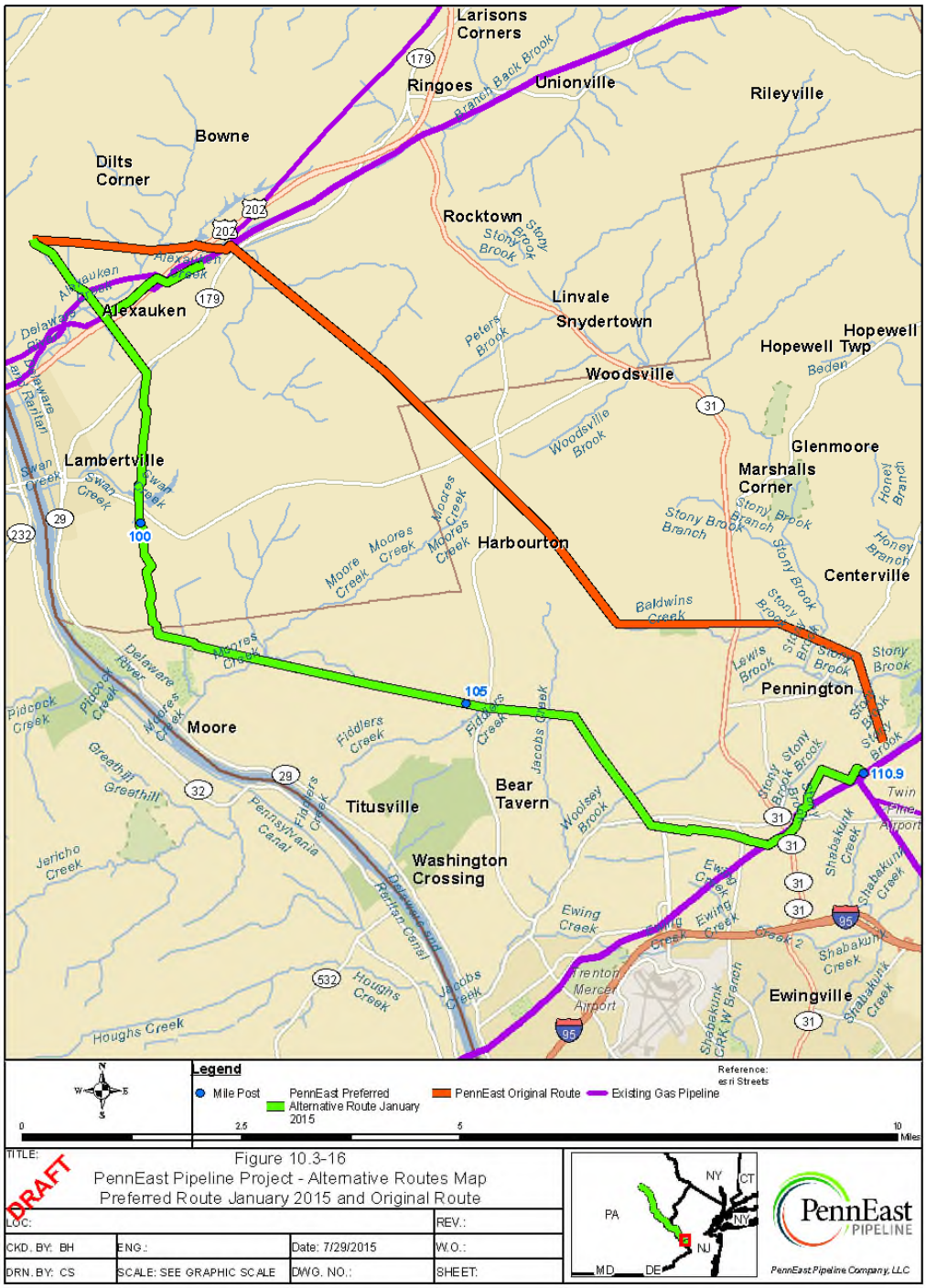

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Table 10.3-17 provides a Critical Issues Analysis for PennEast's Major Reroute 5: MP 46.8-52.3 of the "Preferred Route March 2015" compared to the corresponding segment of the "Original Route". Figure 10.3-17 shows the "Preferred Route March 2015" between approximate MP 46.8-52.3 as compared with the "Original Route".

Table 10.3-17
Critical Issues Analysis for the PennEast Major Reroute 5

CIA Items	Original Route	Preferred Route March 2015
Length (Miles) [1]	5.8	5.5
Municipalities Crossed (#) [2]	2	2
Stream Crossings (Total as NHD streams) [3]	3	4
PA EV Cold Water Fishes (EV-CWF, Total)[4]	0	0
PA HQ Cold Water Fishes (HQ-CWF, Total) [4]	1	1
PA Cold Water Fishes (CWF, Total) [4]	2	3
PA Warm Water Fishes (WWF, Total) [4]	0	0
PA Trout Stocking Stream (TST, Total) [4]	0	0
PA Naturally Producing Trout Waters (from EV) [5]	0	0
PA Naturally Producing Trout Waters (from HQ) [5]	1	1
PA Naturally Producing Trout Waters (from CWF)[5]	1	2
Other, Non-PA Chapter 93 Designated Streams (NHD streams) [4]	0	0
NJDEP SWQS Category 1 Streams	N/A	N/A
DRBC Wild and Scenic River Crossings	0	0
Total Acreage of wetlands (PA NWI and NJDEP) within 200' of line	2.6	1.8
Wetland Crossings (of the Center Line) [6]	2	2
Total number of NHD waterbodies within 200' of line [7]	1	0
Total Acreage of NHD waterbodies within 200' of line [7]	1.9	0
Total # Wells (PAGWIS and NJDEP) within 200' of line	0	0
Wind Turbines (USGS) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Core Habitat (PA) within 200' of line	36.6	20.8
Approx. Acreage of National Audubon Society Important Bird Area within 200' of line	N/A	N/A
Approx. Acreage of County Natural Heritage Inventory Provisional Species of Concern (PA) within 200' of line	0	0
Approx. Acreage of County Natural Heritage Inventory Supporting Landscape area (PA) within 200' of line	186.2	175.2

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CIA Items	Original Route	Preferred Route March 2015
Approx. Acreage of Natural Heritage Priority Sites for Rare Species and Ecological Communities (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Critical Environmental and Historic Sites (NJ) within 200' of line	N/A	N/A
Known Contaminated Sites (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Groundwater Contamination Areas (CEA) (NJ) within 200' of line	N/A	N/A
Approx. Acreage of NJDEP Tier 1 Well Head Protection Area (NJ) within 200' of line	N/A	N/A
Potential NRHP Cultural Resources (unrestricted) within 200' of line	0	0
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone A (NJ)	N/A	N/A
Approx. Acreage of Delaware and Raritan Canal Commission Review Zone B (NJ)	N/A	N/A
Total # of churches, cemeteries, schools, and parks within 200' of line [8]	0	0
Approx. Acreage of Highland Preservation Area (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Highland Preservation Sewer Service Area (NJ) within 200' of line	N/A	N/A
Approx. Acreage of Historic Properties (NJ SHPO) within 200' of line	N/A	N/A
Approx. Acreage of Open Space (State) (NJ) within 200' of line [9]	N/A	N/A
Approx. Acreage of State Parks (PA) within 200' of line	0	0
Approx. Acreage of State Forests (PA) within 200' of line	0	0
Approx. Acreage of State Game Lands (PA) within 200' of line	9.7	44.6
Length of PA Trails within 200' of line (miles) [10]	0.1	0.1
Total Acreage of 100 Year Flood Hazard areas (FEMA) within 200' of line	12.4	6.9
Total Acreage of Preserved Farmland within 200' of line [11]	1.0	34.8
Railroad Crossings (Status Unknown) [12]	1	1
Road Crossings [13]	6	5
Bridge Crossings within 200' of line (all) [14]	0	0
Bridges Structurally Deficient or Functionally Obsolete within 200' of line (from all bridges) [15]	0	0
Product Pipeline Crossings [16]	0	0

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CIA Items	Original Route	Preferred Route March 2015
Existing Gas Pipeline Crossings [16]	0	0
Transmission line Crossings [16]	3	5
Karst/Sink holes (PA) within 200' of line (DCNR Bureau of Topographic and Geologic Survey)	0	0
Coal Mines (PA) within 200' of line (DCNR)	0	0
Approx. Acreage of Slopes > 30% within 200' of line	33.5	36.3
Total Acreage of 400' Corridor	283.1	266.6
Percent of Total 400' Corridor that is wetland	0.9%	0.7%

Notes:

[1] Length of pipeline for the Transco Alternative includes a potential 12-mile lateral

[2] Municipality crossings based on the PennDOT and NJDOT boundaries data sets

[3] Stream crossings are based on the intersect of the pipeline and the 2002 National Hydrography Dataset NHD Flowline

[4] Penn State Streams Chapter 93 Designated Use

[5] Pennsylvania Fish and Boat Commission data (Oct 2013); counts should not be summed as a crossing is already counted for other categories

[6] Wetland crossing counts based on the intersect of the pipeline into a discretely mapped wetlands

[7] NHD waterbodies includes only lakes and ponds and not stream areas

[8] Churches, schools, and cemetery counts are based on USGS GNIS

[9] NJDEP Open Space (State, County, Cross-Acceptance)

[10] PA DCNR and Rails-to-Trails Conservancy

[11] PA Agricultural Security Areas and NJ Farmland Parcel Preservation Program

[12] PennDOT County Rail lines NJDOT Rail Network

[13] PennDOT State and Local roads; NJDOT Road Network

[14] Federal Highway Administration National Bridge Inventory

[15] Structurally deficient criteria defined at http://nationalbridges.com/nbiDesc.html#SDFO

[16] Platts POWERmap®

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Figure 10.3-17
PennEast Pipeline Project Alternative Routes Map – Major Reroute 5

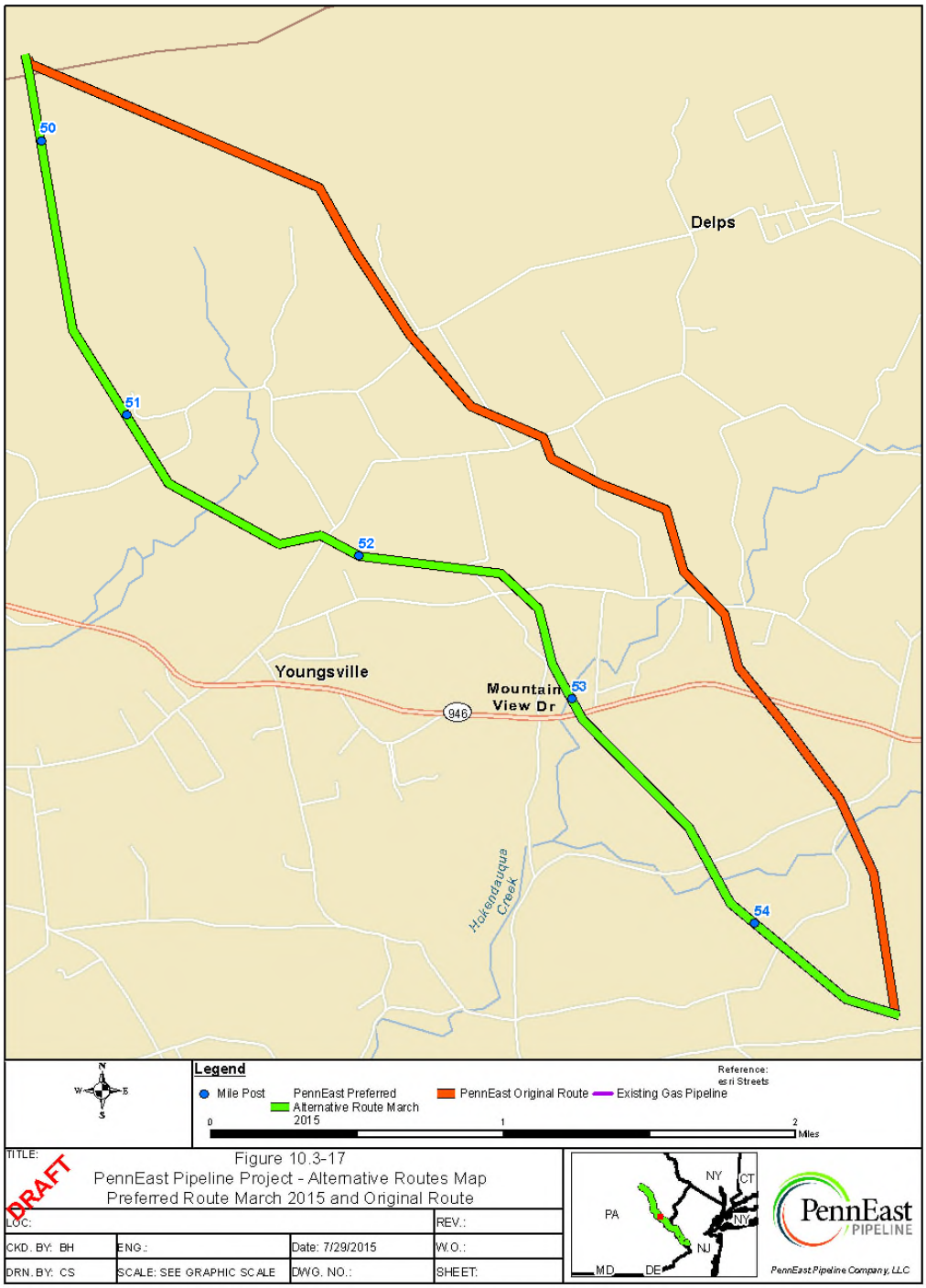

Table 10.3-18
Summary of Pipeline Minor Reroutes

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	1	59.05 – 60.55	Archaeological	●Archaeological exclusion area	Implemented	P-1
PennEast Mainline Route	2	88.35 – 89.5	Landowner	● Solar Farm built in 2013 does not show on Google Earth ● Avoids impacts to underground electrical lines.	Implemented	P-2
PennEast Mainline Route	3	72.50 – 73.85	Archaeological	●Two Archaeological exclusion areas	Implemented	P-3
PennEast Mainline Route	4	46.94 –47.01	Archaeological	●Archaeological exclusion area	Not Implemented. Negated by Route Variation No. 6H	P-4
PennEast Mainline Route	5	107.60 – 108.90	Public Officials	● Avoids Equestrian Center ● Avoids two Preserved Farm Land Properties	Implemented	P-5
PennEast Mainline Route	6A	0.00 – 0.98	Route Review	● Refined route to interconnect points ● Followed contours for construction ● Eliminated one land owner	Implemented	P-6A
PennEast Mainline Route	6B	5.05 – 5.58	Route Review	● Avoid Pond behind business ● Increase distance from cemetery	Implemented	P-6B

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast	6C	5.94 – 6.65	Route Review	● Avoid Cell Tower ● Better Creek Crossing ● Better align route with property lines	Implemented	P-6C
PennEast Mainline Route	6D	8.61 – 9.20	Route Review	● Edge of cemetery vs. through ● Closer to backs of homes in subdivision (rejected due to proximity of homes)	Not Implemented – Negated by Route Variation No. 37	P-6D
PennEast Mainline Route	6E	9.20 – 9.77	Route Review	● PI's too close to road, creek, and railroad crossing ● Original route would have bore pit in creek ● Pulled pipeline out of Casino racing warmup track	Implemented	P-6E
PennEast Mainline Route	6F	9.77 – 10.70	Route Review	● Lined up US 81 HDD ● Pulled into lay adjacent to power line corridor	Implemented	P-6F
PennEast Mainline Route	6G	40.30 –41.65	Route Review	● Avoids crossing The Woods Campground ● Avoids outdoor area causing a Class 3 ● 8 less landowners due to avoiding small subdivision	Implemented	P-6G
PennEast Mainline Route	6H	46.85 – 50.35	Route Review	● Reduces Appalachian Trail impacts ● Aligns with PA State Game Land Property Line	Implemented	P-6H
PennEast Mainline Route	7	72.70 – 73.20	Archaeological	●Archaeological exclusion area	Implemented	P-7

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	8	64.05 – 66.32	Landowner	● 265 Houses Planned in subdivision ● Subdivision details have not been released	Negated by Route Variation No. 12	P-8
PennEast Mainline Route	9	10.70 – 36.94	Environmental	●Co-locates route with Transco and Buckeye Pipelines through PA Game Lands	Implemented	P-9
PennEast Mainline Route	10	50.32 –51.50	Environmental	●Adjust route to near state game land boundary	Implemented	P-10
PennEast Mainline Route	11	60.50 –61.15	Landowner	●Routed pipeline to minimize impacts to planned land development	Implemented	P-11
PennEast Mainline Route	12	64.45 –68.70	Constructability	● Adjusted Route to co-locate with Columbia Gas ● Crosses US Hwy 33 to avoid multiple businesses ● Increases distance from St. Luke's Existing Hospital	Implemented	P-12
PennEast Mainline Route	13	7.35 – 7.36	Archaeological	● Archaeological exclusion area ● Land owner has plans for several warehouse in area	Implemented	P-13
PennEast Mainline Route	14	70.41 –71.36	Archaeological	●Archaeological exclusion area	Implemented	P-14
PennEast Mainline Route	15	66.39 –66.48	Archaeological	●Archaeological exclusion area	Implemented	P-15

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	16	61.55 –62.23	Landowner	● Rec'd notice from township on development work ● Landowner has existing plans for two warehouses	Implemented	P-16
PennEast Mainline Route	17A	74.80 –76.30	Route Review	● Avoided preserved farm land	Implemented	P-17A
PennEast Mainline Route	17B	87.85 –88.35	Route Review	● Avoided preserved farm land ● Avoided small private air strip (grass)	Implemented	P-17B
PennEast Mainline Route	17C	102.29 – 103.27	Route Review	● Avoided preserved farm land	Implemented	P-17C
PennEast Mainline Route	18	75.05 –79.41	Landowner	● Request from Railroad to consider co-locate ● Railroad is open for sale of last 3 miles (Railroad too narrow through the narrows section)	Not Implemented	P-18
PennEast Mainline Route	19	66.09 –69.91	Landowner	● Future hospital is planed near current route on prop. ● Requested using their property on east side of St. Hwy 33 ● Avoids new development on north side of Freemansburg Ave (800 housing units) ● Fixes route for US Hwy 78 HDD crossing	Implemented	P-19
PennEast Mainline Route	20A	106.15 – 106.92	Landowner	●Landowner requested routing through farm field	Negated by Route Variation No. 26	P-20A

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	20B	95.55 –108.90	Landowner	●Request for Co-location with power line through Mercer County	Negated by Route Variation No. 26	P-20B
PennEast Mainline Route	21	99.74 –100.92	Route Review	● Increase distance from School	Negated by Route Variation No. 26	P-21
PennEast Mainline Route	22	60.28 –60.62	Archaeological	●Archaeological exclusion area Minor shift of centerline to the west	Negated by Route Variation No. 42	P-22
PennEast Mainline Route	23	72.38 –73.35	Landowner	● Landowner has two springs on the hill side where pipeline is currently routed ● Site visit allowed on 11/14 - no survey crews	Not Implemented	P-23
PennEast Mainline Route	23A	72.20 –72.80	Landowner	● Landowner has two springs on the hill side where pipeline is currently routed ● Site visit allowed on 11/14 - no survey crews	Implemented	P-23A
PennEast Mainline Route	24	91.89 –92.62	Landowner	● Landowner (Kuenster & Michalenko) presented route variation on their properties in the Open House meeting in Hunterdon, NJ	Negated by Route Variation No. 26	P-24
PennEast Mainline Route	25	64.92 –65.31	Landowner	● Green Pond Subdivision presented plans ● Requires small tweak to pipeline route	Not Implemented	P-25

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	25A	64.83 –65.14	Landowner	● Green Pond Subdivision presented plans ● Church to East has plans for expansion of parking log. New baseball diamond. ● Foreign lines and septic system are in the field	Implemented	P-25A
PennEast Mainline Route and Lambertville Lateral	26	90.18 – end	Public Officials	● Meet with Mercer County about their request to co-locate with the power line to the west of Pennington ● County prefers additional open space and farm land impacts than green field ROW. ● Includes Lateral	Not Implemented	P-26
PennEast Mainline Route and Lambertville Lateral	26A	90.18 – end	Public Officials	● Meet with Mercer County about their request to co-locate with the power line to the west of Pennington ● County prefers additional open space and farm land impacts than green field ROW. ● Includes Lateral	Implemented	P-26A
PennEast Mainline Route	27	36.15 –37.49	Landowner	● Landowners request that pipeline be laid on east side of Buckeye's pump station	Not Implemented	P-27

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	28	70.32 –70.56	Landowner	● Landowners request that pipeline be laid on south side of property	Implemented	P-28
PennEast Mainline Route	29	77.83 –79.92	Landowner	●Landowner requested line be routed to south of property due to planned development	Not Implemented	P-29
PennEast Mainline Route	29A	77.83 –79.92	Landowner	●Landowner requested line be routed to south of property due to planned development	Implemented	P-29A
PennEast Mainline Route	29B	77.83 –79.92	Landowner	●Landowner requested line be routed to south of property due to planned development	Not Implemented	P-29B
PennEast Mainline Route	29C	77.83 –79.92	Landowner	●Landowner rejects approved route change. Asks for route to go along nearby power lines	Not Implemented	P-29C
PennEast Mainline Route	29D	77.83 –79.92	Landowner	●Landowner rejects approved route change. Asks for route to go along nearby power lines	Not Implemented	P-29D
PennEast Mainline Route	30	107.33 – 107.82	Landowner	● Hopewell Township Property Reroute	Not Implemented	P-30
PennEast Mainline Route	31	87.01 – 87.41	Landowner	● Landowner claimed to have plans to build a house on property	Not Implemented	P-31
PennEast Mainline Route	32	58.28-58.80	Archaeological	● Archaeological find that conflicts with FERC route	Implemented	P-32

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	33	3.25 – 3.26	Archaeological	●Archaeological exclusion area	Not Implemented	P-33
Compressor Station	34	--	Landowner	●Compressor Station relocation variation	Implemented	P-34
PennEast Mainline Route	35	66.00 –66.61	Landowner	●Hope Road Commercial Development has plans to run Hope Road through property and develop the area commercially	Not Implemented. Negated by Route Variation No. 35A	P-35
PennEast Mainline Route	35A	66.00 –66.69	Landowner	●Hope Road Commercial Development has plans to run Hope Road through property and develop the area commercially. ●This route variant crosses the PennDOT yard.	Implemented	P-35A
PennEast Mainline Route	36	59.03 –60.10	Landowner	●Mohawk Properties has plans for future quarry in this area	Implemented	P-36
PennEast Mainline Route	37	8.73 – 9.33	Landowner	●Line needs to be routed away from the quarry. Their phase 2 expansion will have that land.	Implemented	P-37
Gilbert Lateral	38	N/A	Landowner	●Route to supply the Gilbert Station	Not Implemented. Negated By Route Variation 38A	P-38
Gilbert Lateral	38A	N/A	Landowner	●Route to supply the Gilbert Station ●This route locates the side tap valve with the MLV east of Phillips rd.	Implemented	P-38A

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
Gilbert Lateral	38B	N/A	Landowner	●Route to supply the Gilbert Station ●This route locates the side tap valve with the MLV east of Phillips rd.	Not Implemented. Negated by Route Variation 38A	P-38B
Gilbert Lateral	38C	N/A	Landowner	●Route to supply the Gilbert Station ●This route locates the side tap valve to the east due to the hilly terrain	Not Implemented	P-38C
PennEast Mainline Route	39	84.03 –85.37	Scoping Meeting	●Line needs to be rerouted to avoid the 2 year impact areas for the two public water wells.	Not Implemented	P-39
PennEast Mainline Route	40	88.68 –90.04	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Larger re-route to avoid impacts to subdivision.	Not Implemented	P-40
PennEast Mainline Route	40A	88.95 –90.07	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Route along Mud Run Road through back yards of homes to avoid wetland impacts.	Not Implemented	P-40A

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	40B	88.95 –90.15	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Route through solar panels and reduce impact to the homes in the area ●Still reduces overall stream crossings and wetland impacts.	Not Implemented	P-40B
PennEast Mainline Route	40C	88.95 –90.15	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Route along Muddy Run Road and avoids wetlands ●Still reduces overall stream crossings and wetland impacts.	Not Implemented	P-40C
PennEast Mainline Route	40D	88.95 –90.15	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Route through gap in solar farm ●Still reduces overall stream crossings and wetland impacts.	Not Implemented	P-40D

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	40E	88.95 –90.15	Scoping Meeting	●Line needs to be rerouted to reduce the number of crossings of the Lockatong Creek. ●Reduces count of stream crossings to one.	Implemented	P-40E
PennEast Mainline Route	41	46.78 – 52.31	Landowner	●Line needs to be routed to avoid Federal land located on the Appalachian Trail.	Negated by Route Variation No. 41A	P-41
PennEast Mainline Route	41A	46.78 – 54.65	Landowner	●Line needs to be routed to avoid Federal land located on the Appalachian Trail.	Implemented	P-41A
PennEast Mainline Route	41B	46.78 – 54.57	Landowner	●Line needs to be routed to avoid Federal land located on the Appalachian Trail.	Negated by Route Variation No. 41A	P-41B
PennEast Mainline Route	42	59.85 –61.07	Landowner	●Retention pond and sewer irrigation is located where the proposed route was planned	Implemented	P-42
PennEast Mainline Route	43	44.06 –44.92	Landowner	●Line needs to be routed to cross the water authority tunnel where it is 230' deep	Implemented	P-43
Lambertville Lateral	44D	-0.16-1.33	Environmental	●Extend Lambertville Lateral to connect to variation 49.	Implemented	P-44D
PennEast Mainline Route	45	100.04 – 101.00	Landowner	●A newly constructed home was located near centerline at Hewitt Rd.	Not Implemented. Negated by Route Variation No. 45A	P-45

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	45A	100.04 – 101.00	Landowner	●A newly constructed home was located near centerline at Hewitt Rd.	Implemented	P-45A
PennEast Mainline Route	46	104.35 – 105.01	Environmental	●A pond was discovered on the proposed route. A reroute would reduce by a 110' waterbody crossing	Implemented	P-46
PennEast Mainline Route	47	99.10 –100.10	Constructability	●This collocated section near the dam was adjusted for constructability.	Implemented	P-47
PennEast Mainline Route	48	72.6-94	Environmental	Route variation analysis requested by FERC.	Implemented	P-48
PennEast Mainline Route	49	96.93-97.9	Environmental	●HDD design issues warrant a relocation of the creek crossing to minimize overall environmental impacts to surrounding wetlands and streams.	Implemented	P-49
PennEast Mainline Route	50	7.34-8.13	Landowner	●LO concerned with removal of Trees on adjacent property. (Abandoned Railroad).	Not Implemented	P-50
PennEast Mainline Route	50A	7.34-8.13	Landowner	●LO concerned with removal of Trees on adjacent property. (Abandoned Railroad).	Not Implemented	P-50A

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	51	8.17-11.76	Landowner	●Concerns with future quarry areas and limit to expansion.	Implemented	P-51
PennEast Mainline Route	52	58.78-59.71	Landowner	●Newly purchased property and expansion.	Implemented	P-52
PennEast Mainline Route	53	68.53-69.1	Landowner	●Newly built home on proposed permanent ROW	Implemented	P-53
PennEast Mainline Route	54	64.75-64.88	Landowner	●Development plans are in place for a new home along Green Pond Rd. ●Line placed south of tree line	Implemented	P-54
PennEast Mainline Route	55	96.06-96.55	Landowner	●Landowner requested the line be adjusted to other side of transmission line to avoid her property	Not Implemented	P-55
PennEast Mainline Route	55A	96.06-96.55	Landowner	●Landowner requested the line be adjusted to avoid her property ●This reroute also avoids the home on the Horchos property	Implemented	P-55A
PennEast Mainline Route	56	52.67-53.1	Landowner	●There are plans to construct a home on this property.	Implemented	P-56

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	57	52-52.39	Landowner	●There are plans to construct a home on this property.	Implemented	P-57
PennEast Mainline Route	58	99.77-100.7	Archaeological	● Records show this area to be culturally sensitive to Revolutionary War history	Pending	P-58
PennEast Mainline Route	59	87.97-88.54	Landowner	● Landowner claims septic system will be impacted by pipeline	Implemented	P-59
PennEast Mainline Route	60	76.67-78.84	Landowner	● Landowner requests mainline to be on edge of field.	Implemented	P-60
PennEast Mainline Route	61	68.83-76.61	Public Officials	● Public officials asking about following abandoned pipeline right-of-way	Not Implemented	P-61
PennEast Mainline Route	62	59-61	Archaeological	● Cultural Resources	Implemented	P-62
PennEast Mainline Route	63	48.3-48	Archaeological	● Cultural Resources	Implemented	P-63
PennEast Mainline Route	64	71.8-72	Archaeological	● Cultural Resources	Implemented	P-64
PennEast Mainline Route	65	48.22-50.51	Public Officials	● Issues with crossing AT on land with conservation easement for NPS	Not Implemented	P-65
PennEast Mainline Route	66	94.2-94.81	Land Issue	● Crossing of USDA easement parcel	Implemented	P-66

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	67	105.57-105.789	Land Issue	● Crossing of USDA easement parcel	Implemented	P-67
PennEast Mainline Route	68	42-42.71	Landowner	● Landowner request	Pending	P-68
PennEast Mainline Route	69	33-45.7	Environmental	● Avoid pipeline in watershed district	Pending	P-69
PennEast Mainline Route	70	110.3-110.9	Landowner	● Landowner request	Pending	P-70
PennEast Mainline Route	71	44.61-57.83	Regulatory	● Attempt to co-locate with Buckeye Pipeline/PennDOT ROW/Blue Mountain Water Park	Not Implemented	P-71
PennEast Mainline Route	72	9.58-10.39	Landowner	● Landowner request	Not Implemented	P-72
PennEast Mainline Route	73	44.61-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-73
PennEast Mainline Route	74	44.61-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-74
PennEast Mainline Route	75	44.61-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-75
PennEast Mainline Route	76	48.76-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-76
PennEast Mainline Route	77	48.76-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-77
PennEast Mainline Route	78	48.76-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-78
PennEast Mainline Route	79	48.76-51.04	Regulatory	● Avoid crossing USA-encumbered parcels	Not Implemented	P-79

Facility	Variation No.	MP Range	Reroute Type	Description	Status	Appendix
PennEast Mainline Route	80	44.61-51.04	Regulatory	• Avoid crossing USA-encumbered parcels	Not Implemented	P-80
PennEast Mainline Route	81	44.61-57.83	Regulatory	• Avoid crossing USA-encumbered parcels	Not Implemented	P-81
PennEast Mainline Route	82	44.61-57.83	Regulatory	• Avoid crossing USA-encumbered parcels	Not Implemented	P-82
PennEast Mainline Route	83	48.82-51.2	Regulatory	• Avoid crossing USA-encumbered parcels	Not Implemented	P-83
PennEast Mainline Route	84	48.82-52.20	Regulatory	• Avoid crossing USA-encumbered parcels	Implemented	P-84

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10.3.3 New Compression

As the Project has evolved, the need for compression has changed. Initially, PennEast considered a 30-inch pipeline with three compressor stations. With changes in location and pipeline coating, PennEast reduced the design to two compressor stations:

With the 30-inch pipeline internally coated at 1.0 BCFD.

- Compressor Station Option 1
  - Available (ISO) = 26,733 HP
  - (3) Taurus 70s
- Compressor Station Option 2
  - Available (ISO) = 7,224 HP
  - (2) Centaur 40s

Following this analysis, as a result of the increased demand for natural gas during the Open Season and the corresponding increase in the diameter of the pipeline from 30-inches to 36-inches, the requirements for compression changed and two compressor stations were no longer necessary.

At this time, only one compressor station is required to transport the gas from the major receipt interconnections: Transco, and gathering systems operated by Energy Transfer Partners, L.P.;, and UGI Energy Services, LLC, all in Luzerne County, PA. Major delivery interconnections include the following: UGI Utilities, Inc. and Columbia Gas, in Northampton County, PA; Elizabethtown Gas, Texas Eastern; Algonquin, and Gilbert Electric Generation facility, all in Hunterdon County, NJ; and Transco, in Mercer County, NJ.

The proposed compressor station will be located at approximately milepost 26.7 in Kidder Township, Carbon County, PA. The compressor station will include 3 Mars 90 units rated at 13,220 horsepower each under ISO conditions for a total of 39,660 total horsepower under ISO conditions. The proposed site has been environmentally surveyed and there are no cultural, historic or wetland resources that would constrain use of the approximately 40-acre site. The latitude/longitude location coordinates for the proposed compressor station site are listed in Table 1.2-4 (Resource Report 1). A complete alternative analysis for the compressor station, including maps and an environmental and engineering comparison will be added in the final Resource Report.

An alternate using electric compressors was briefly evaluated (see Appendix L) but was not assessed in detail due to the greater impacts to air quality associated with generation of electricity as well as the need for backup generation should there be a power outage.

10.4 Aboveground Facilities - Alternative Sites

A total of 17 new aboveground facilities will be necessary, including interconnect meter stations, mainline block valves, and a compressor station. With the exception of the compressor station discussed above, the other facilities will be sited within the proposed 400-foot study corridor. These facilities will be located in upland areas away from wetlands and waterbodies. In addition, they will not be sited in preserved agricultural or open space areas.

In Pennsylvania, there will be 11 above ground installations:

- Wyoming Interconnect – MP 0.0
- Springville Interconnect – MP 0.2
- Auburn and Leidy Interconnects – MP 4.6
- Mainline block valve 1 – MP 8.2
- Compressor Station – MP 26.7

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- Mainline block valve 2 – MP 32.2
- Mainline block valve 3 – MP 46.0
- Blue Mountain Interconnect – MP 50.9
- Mainline block valve 4 – MP 62.2
- Hellertown Lateral Launcher and Mainline Launcher/Receiver Site – 71.5
- TCO (Columbia Pipeline Group) and UGI-LEH Interconnects – HLMP 2.1

In New Jersey, there will be six above ground installations:

- Mainline block valve 5/Gilbert Lateral Tap Site – MP 78.8
- Mainline block valve 6 – MP 88.0
- Mainline block valve 7/Lambertville Lateral Launcher Site – MP 100.5
- Algonquin and TETCO Interconnects – LLMP 1.4
- Etown and Gilbert Interconnects – GLMP 0.3
- Transco Interconnect – 113.8

10.5 Non-PennEast System Alternatives

PennEast is not aware of any non-PennEast system alternatives that would satisfy the purpose and need of the Project. The purpose and need of the Project includes the need to satisfy the service that has been subscribed by the Project shippers under long-term firm contracts, which include multiple, unique receipt and delivery point combinations located along the PennEast system. PennEast is not aware of any other pipeline alternative that could satisfy the unique receipt and delivery point combinations subscribed under its agreements with the project shippers.

10.6 References

U.S. Department of Energy. 2012. Beyond Solyndra: How the Energy Department's Loans are Accelerating America's Transition to a Clean Energy Future. Available at: http://energy.gov/articles/beyond-solyndra-how-energy-department-s-loans-are-accelerating-america-s-transition-clean. Accessed on February 12, 2015.

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PennEast Pipeline Project

REVISED DRAFT
FERC Section 7(c) Application
Appendices A, L, & P

FERC Docket No. PF15-1-000

Volume II-B

"PUBLIC"

July 2015

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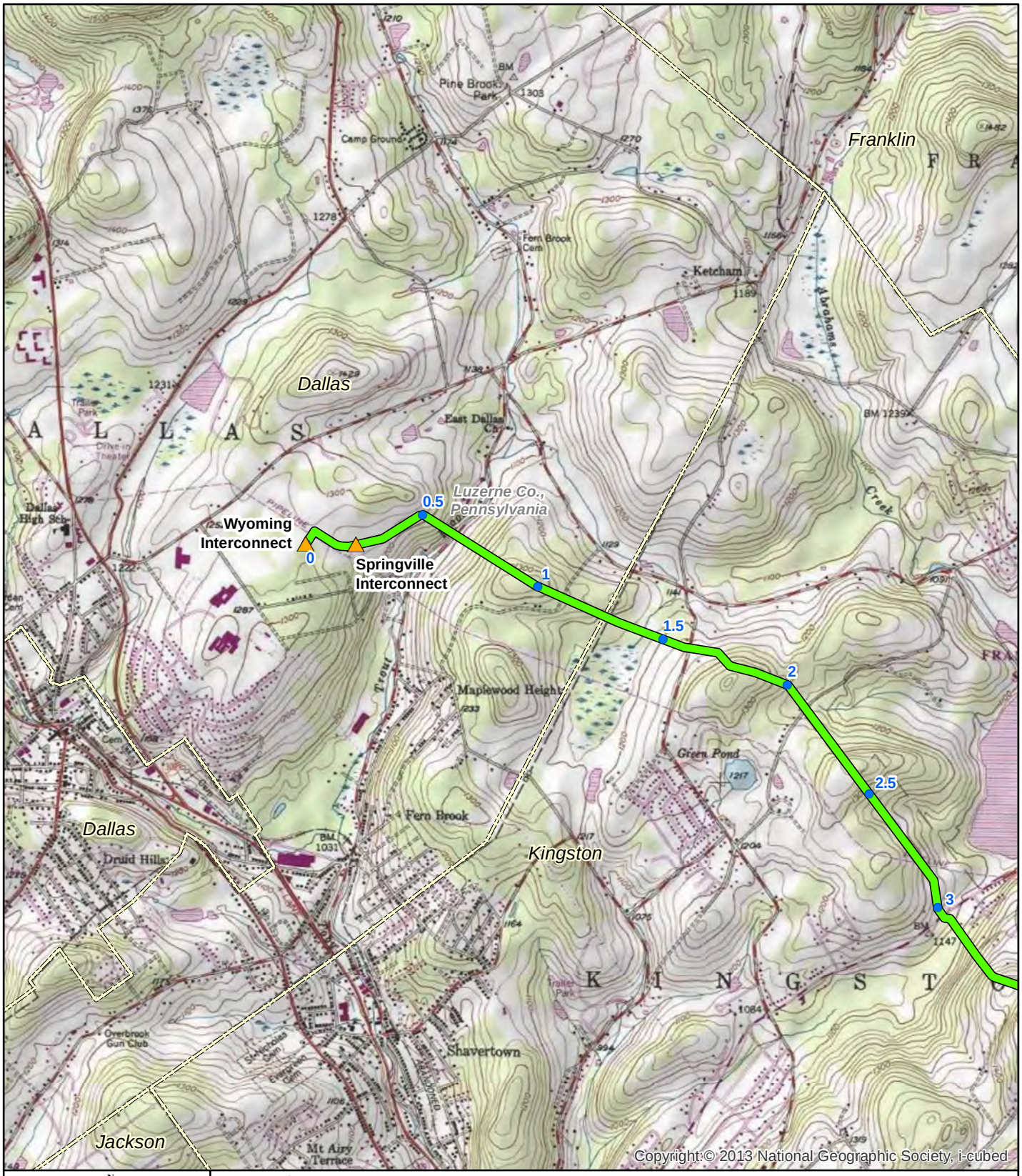
Appendix A

USGS Topographic Maps



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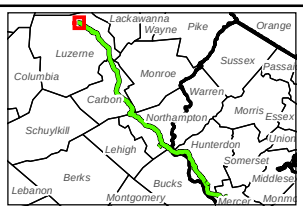
Legend

- Mile Posting
- Proposed PennEast Route
- Interconnect
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Kingston Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 1 of 33



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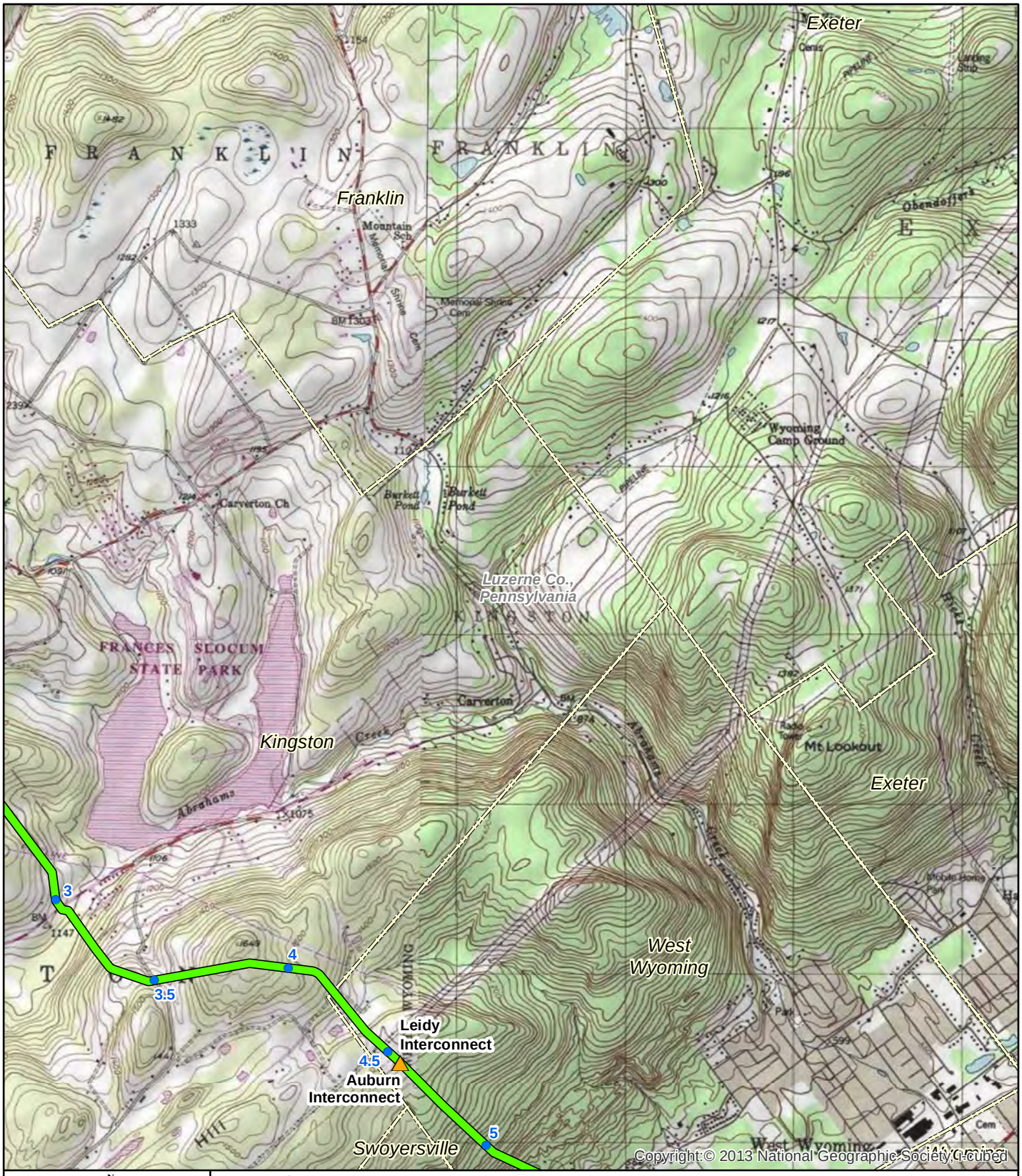

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- Proposed PennEast Route
- Interconnect
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Kingston, Pittston Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
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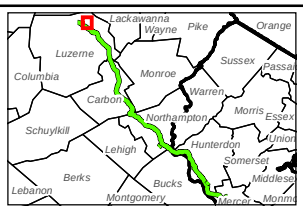

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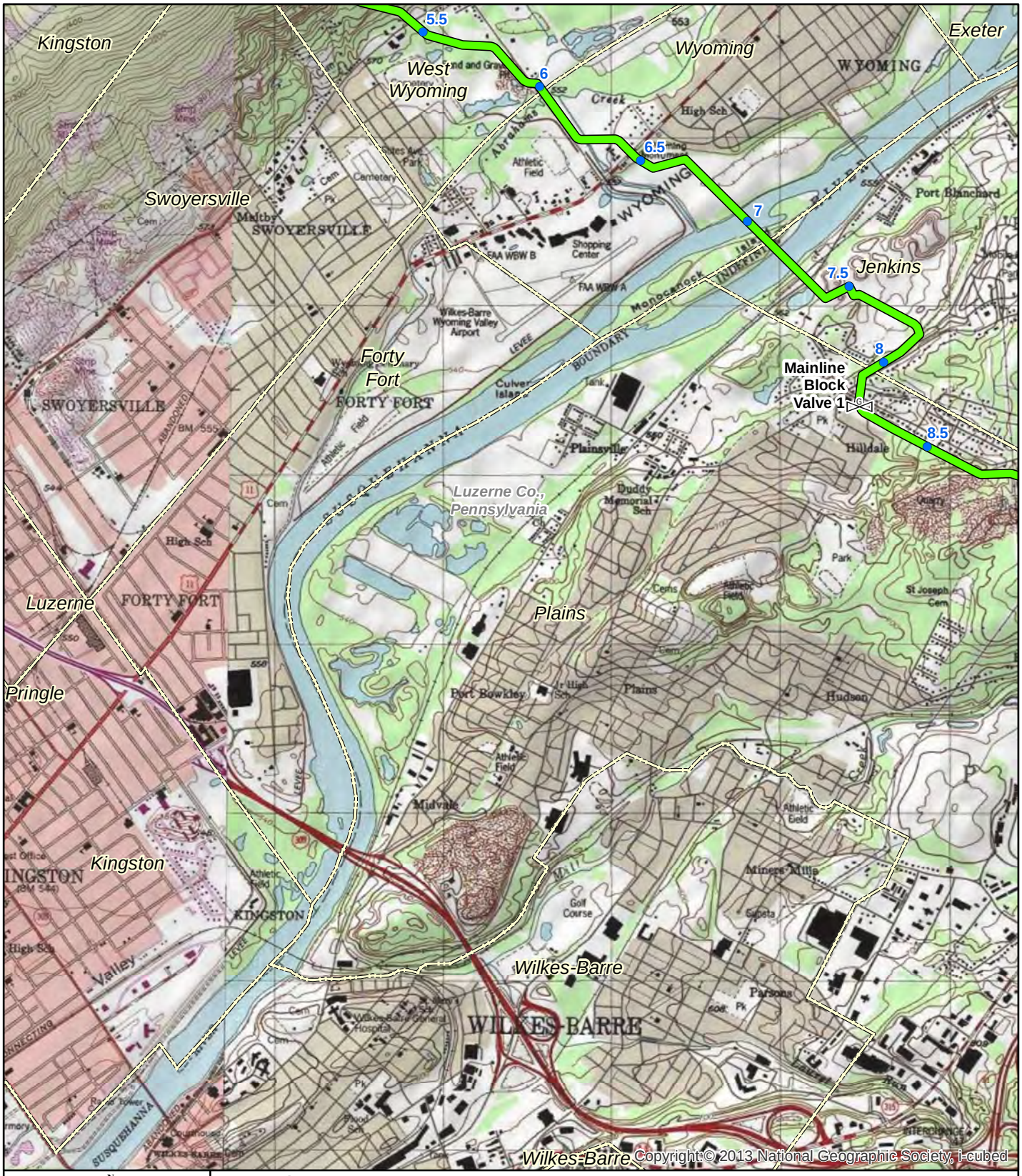

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- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Kingston, Pittston Quadrangle			REV.:
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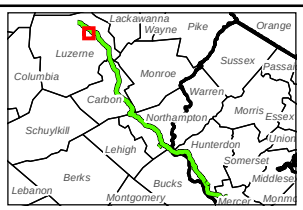

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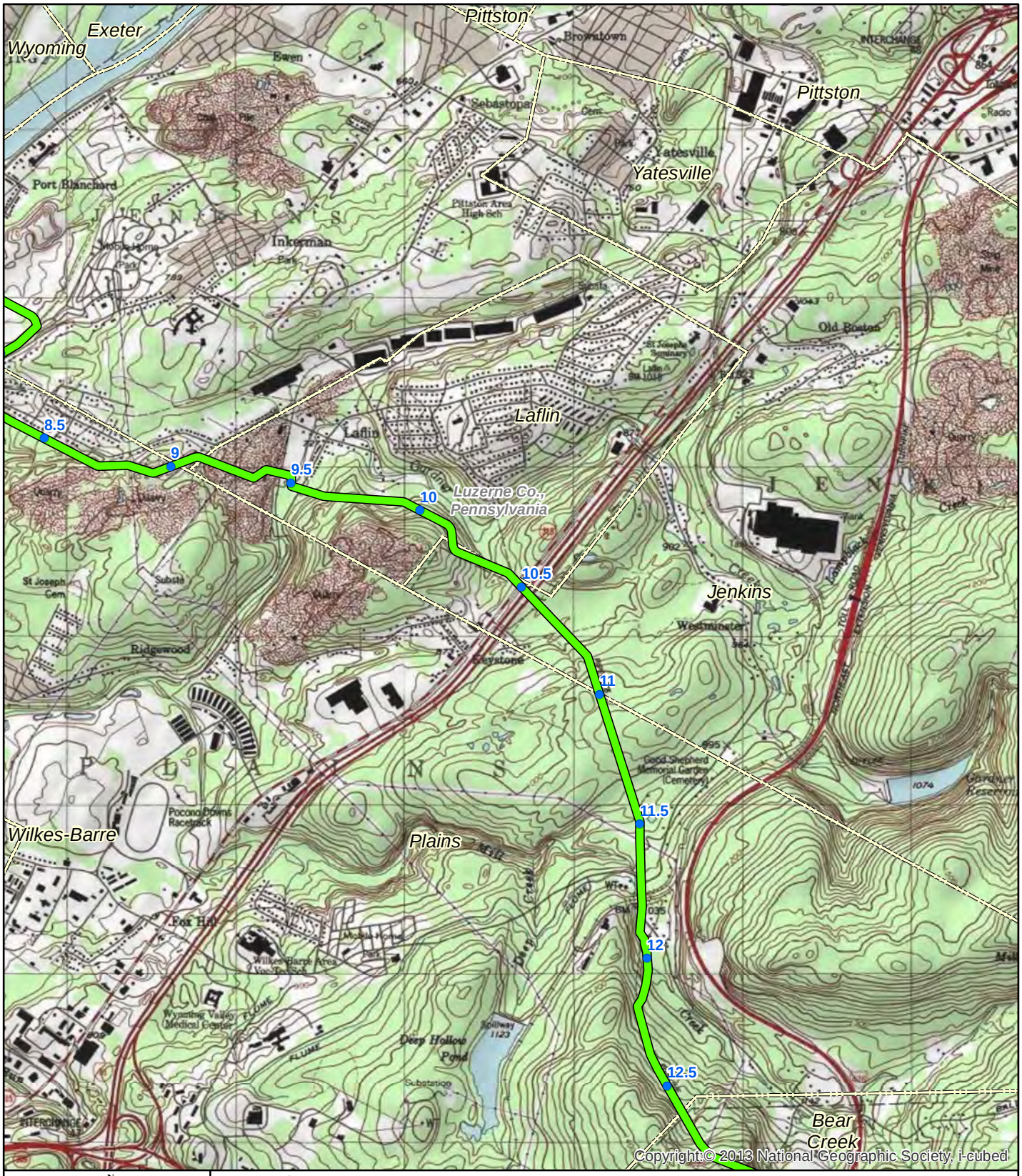

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- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Pittston Quadrangle			REV.:
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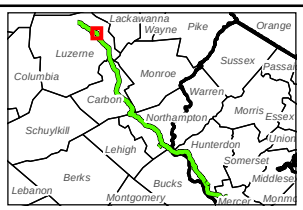

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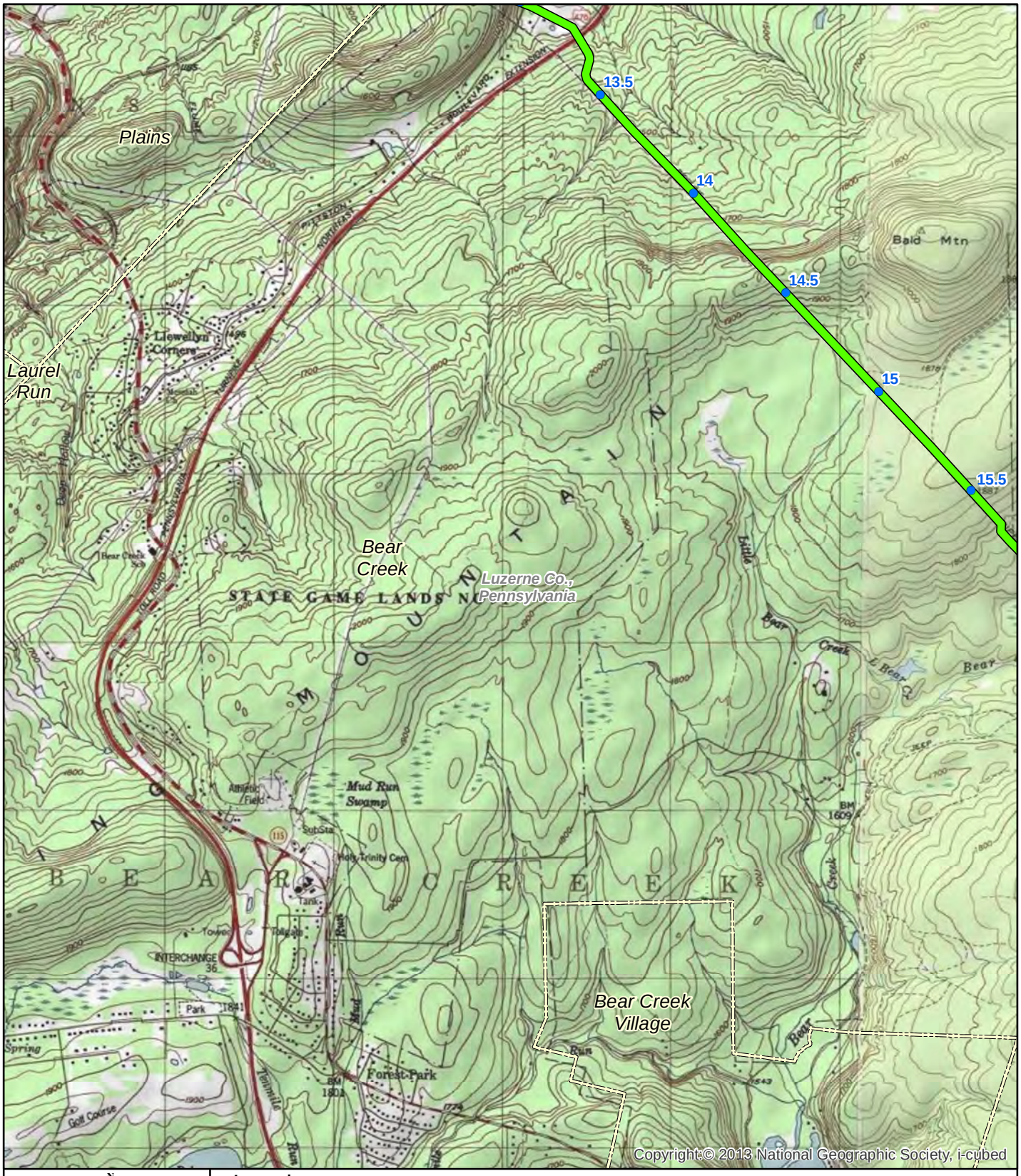

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- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Wilkes-Barre East, Pleasant View Summit Quadrangle			REV.:
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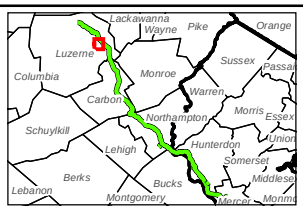

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PennEast Pipeline Company, LLC

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- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

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TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Pleasant View Summit Quadrangle			REV.:
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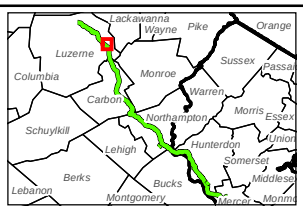

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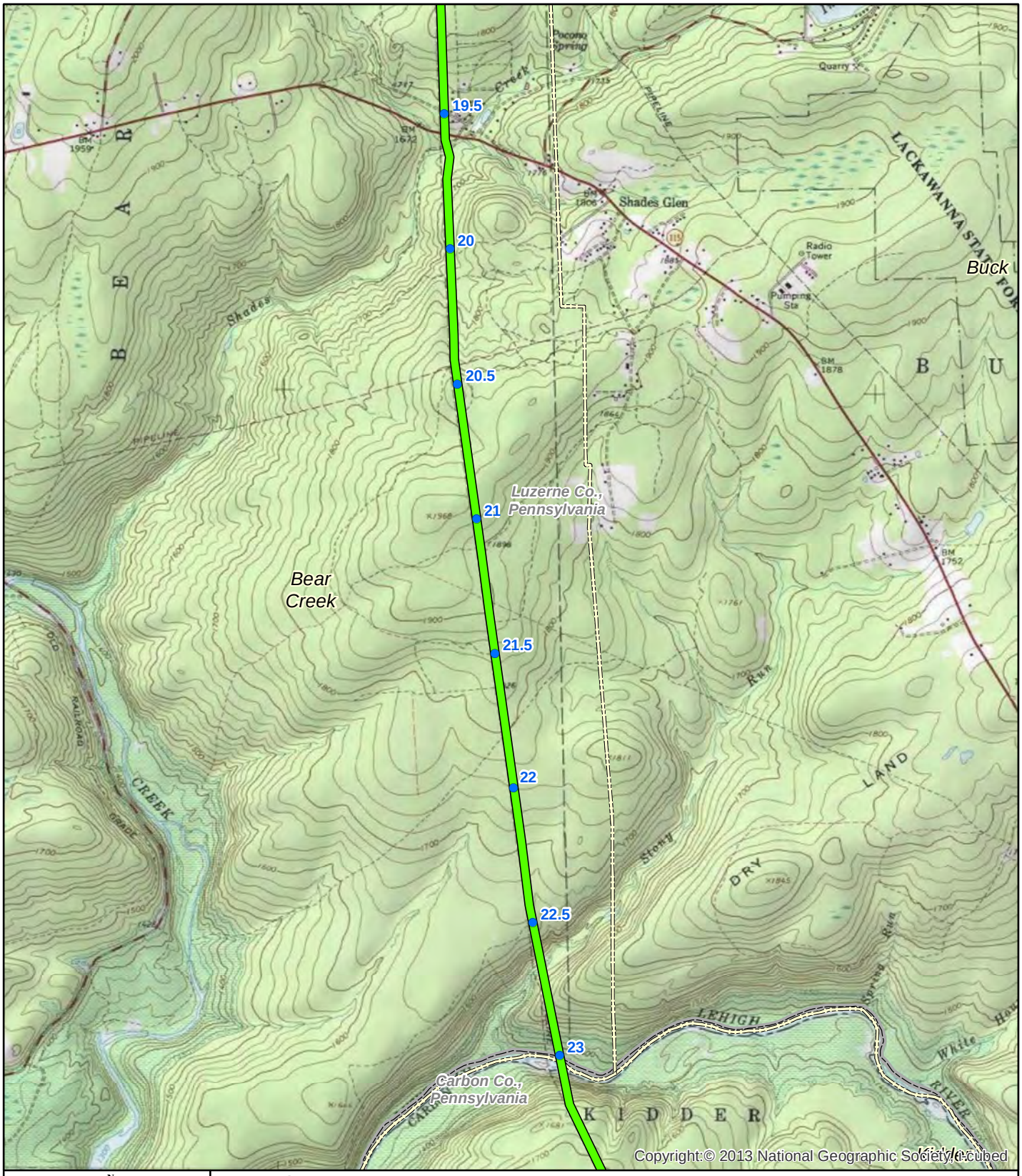

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- Municipality Boundary
- County Boundary

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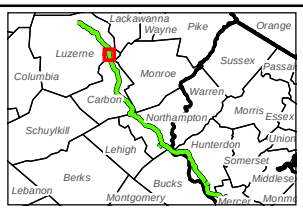

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- Mile Posting
- Proposed PennEast Route
- Compressor Station
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Hickory Run Quadrangle			REV.:
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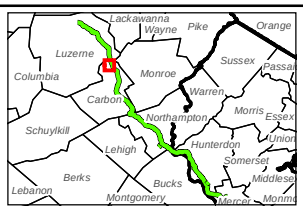

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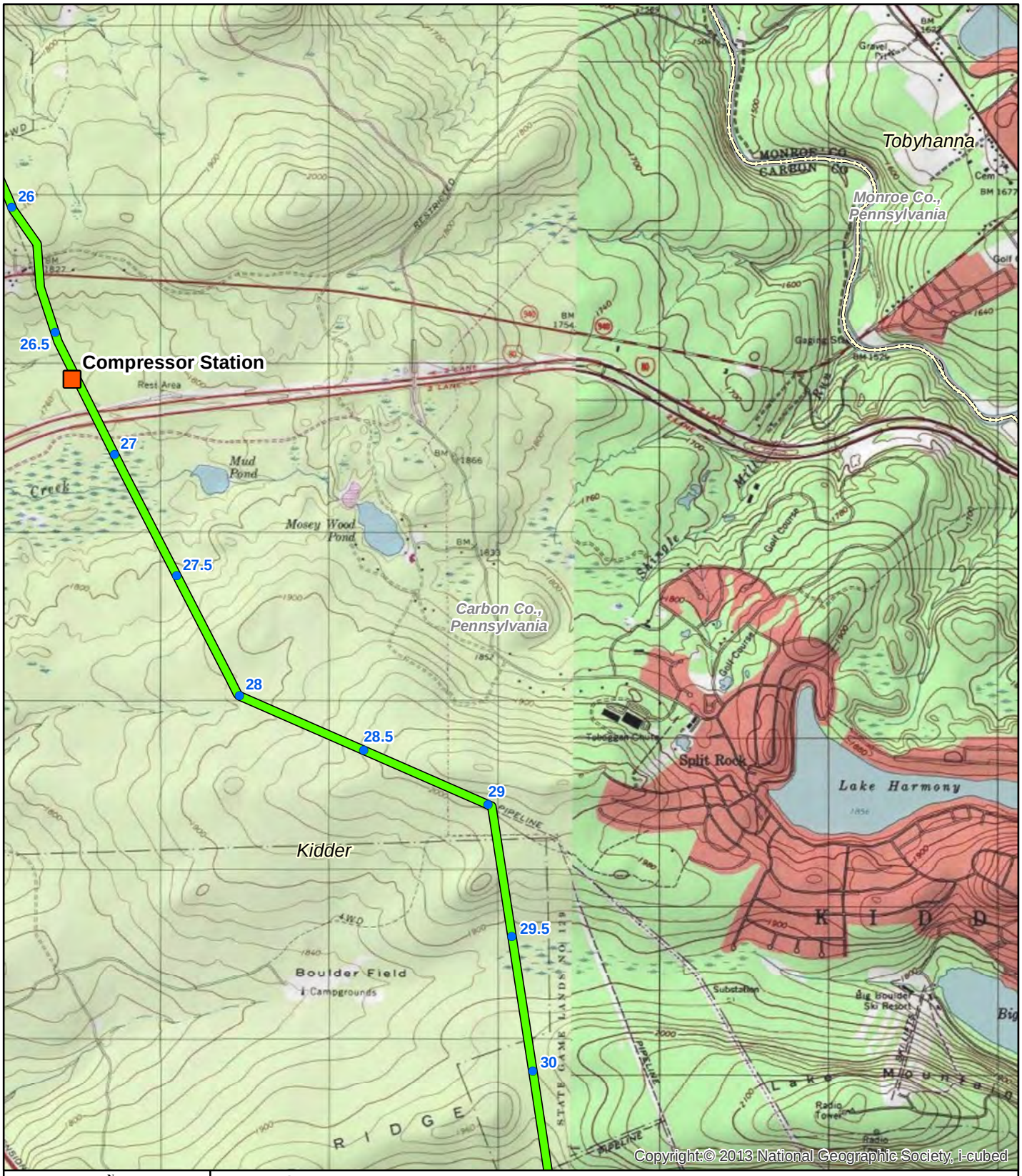

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- Compressor Station
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PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Hickory Run, Blakeslee Quadrangle			REV.:
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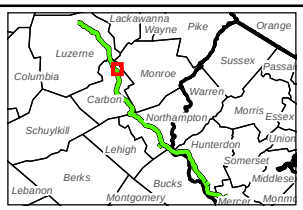

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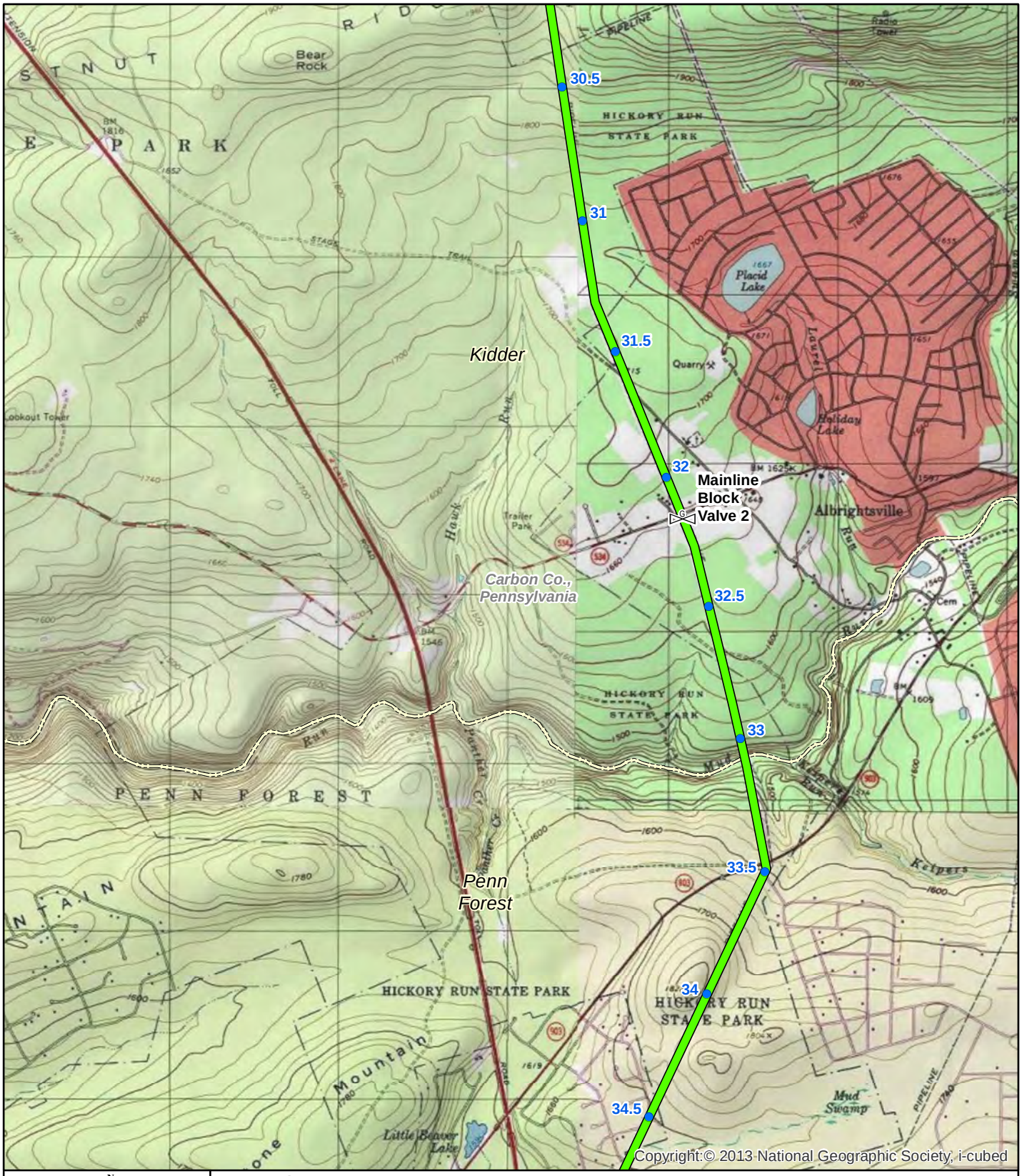

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- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Hickory Run, Blakeslee, Pohopoco Mnt. Quadrangle			REV.:
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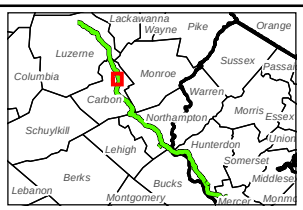

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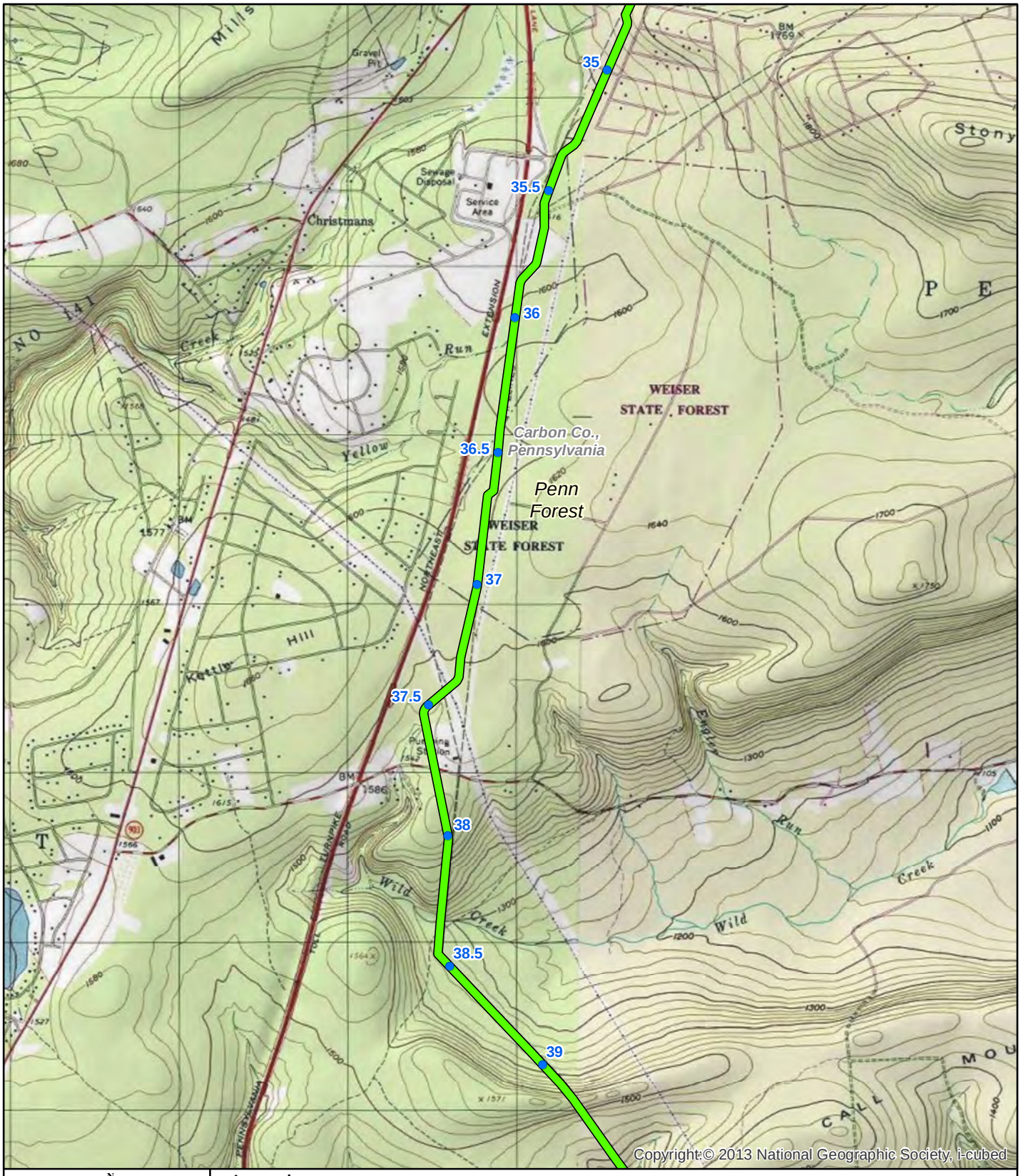

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- Municipality Boundary
- County Boundary

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PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Christmans, Pohopoco Mnt. Quadrangle			REV.:
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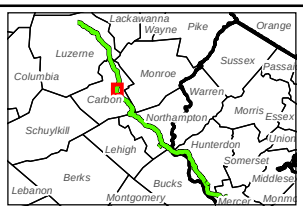
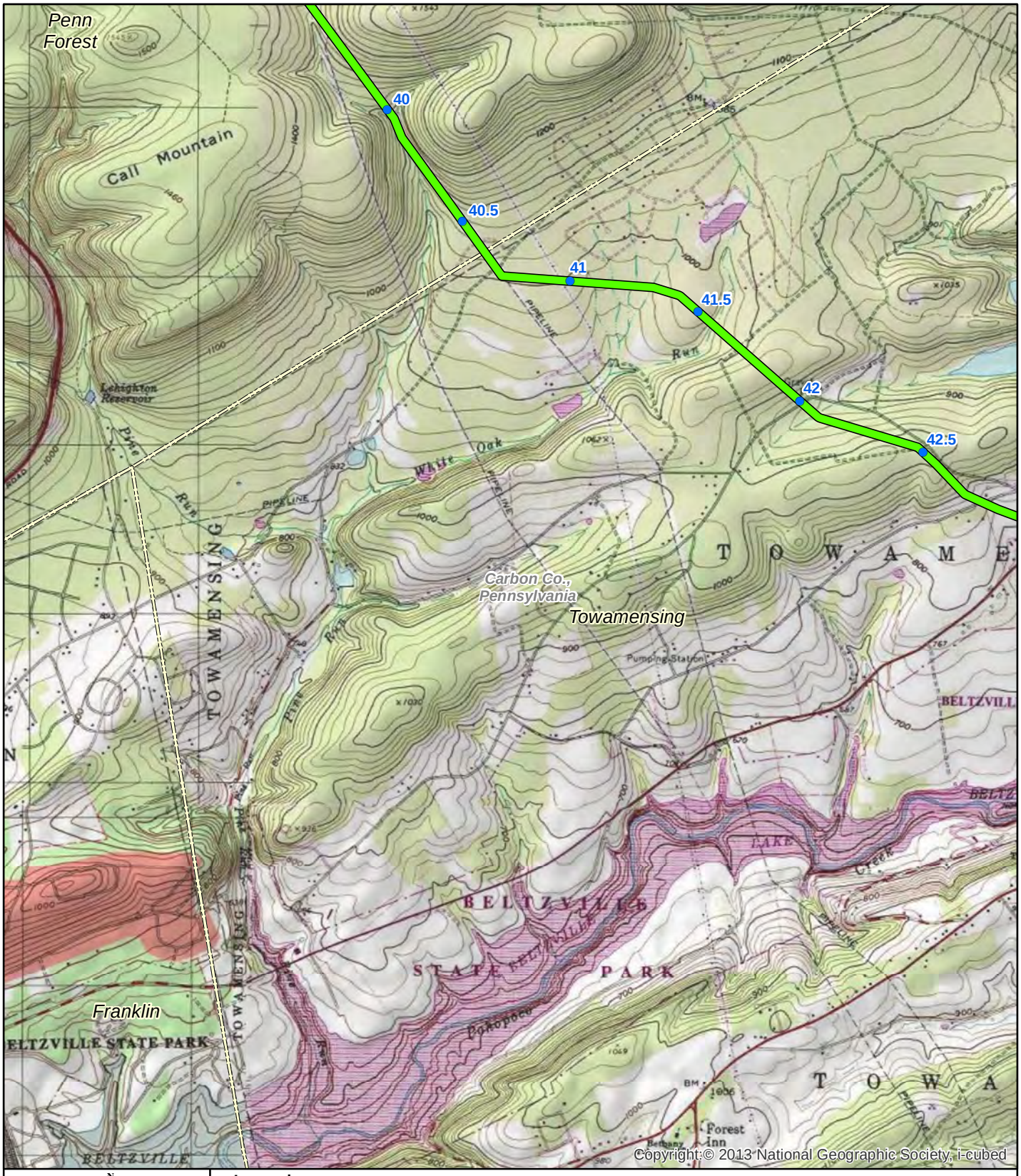


PennEast PIPELINE

PennEast Pipeline Company, LLC



N
W E
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0 800 1,600 3,200 Feet

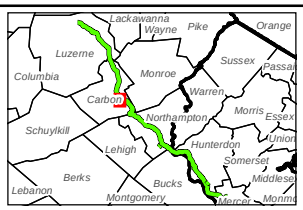
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

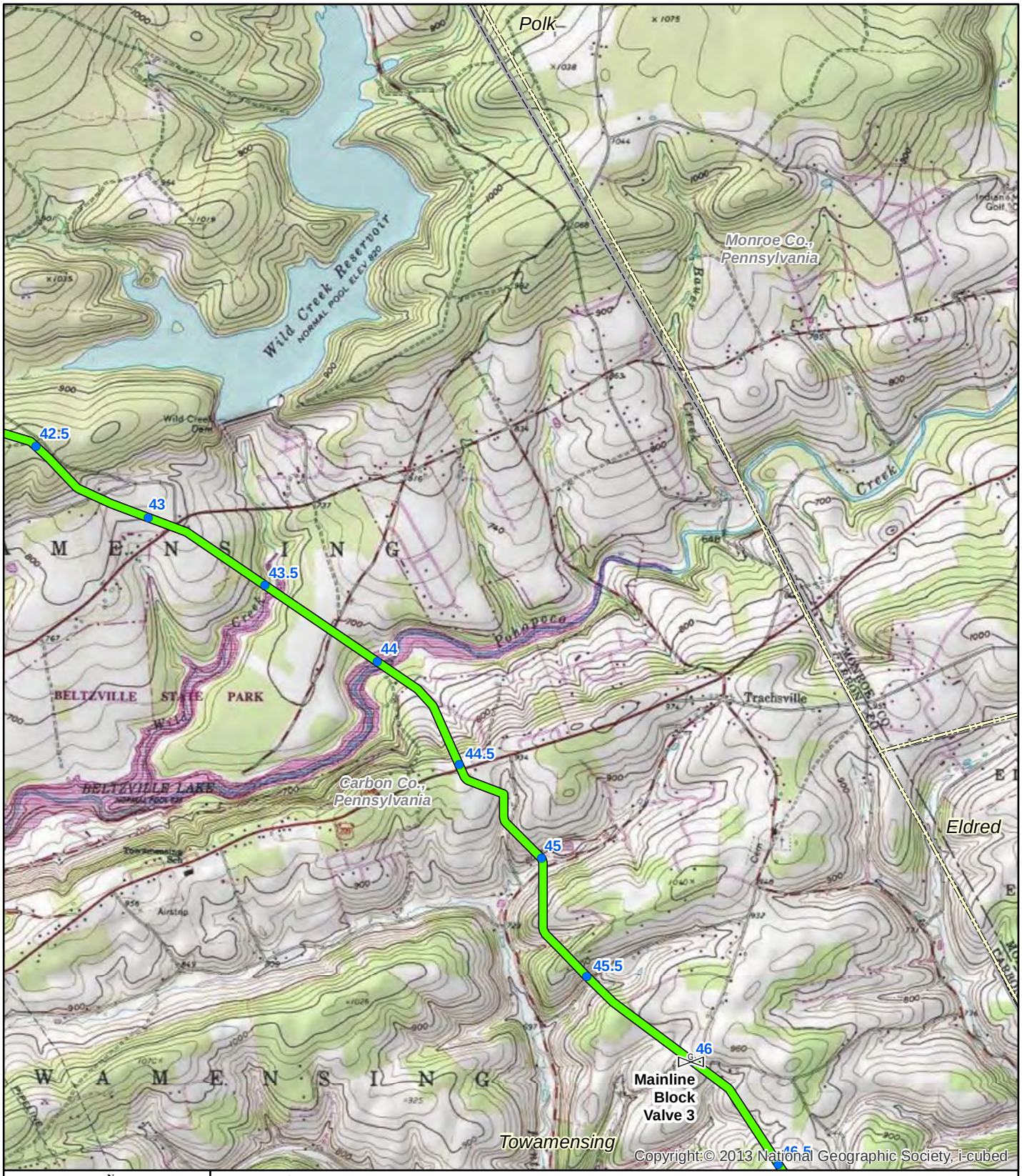
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Pohopoco Mnt., Palmerton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 12 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

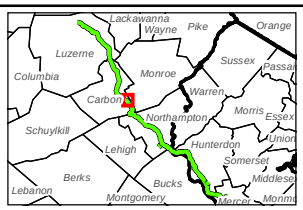
Legend

- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Pohopoco Mnt., Palmerton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 13 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC

Legend

- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

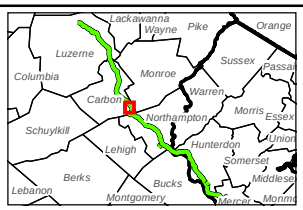
N W E S

0 800 1,600 3,200 Feet

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Palmerton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 14 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC

N
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0 800 1,600 3,200 Feet

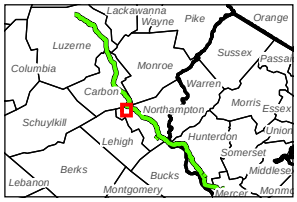
Legend

- Mile Posting
- Proposed PennEast Route
- Interconnect
- Municipality Boundary
- County Boundary

TITLE:

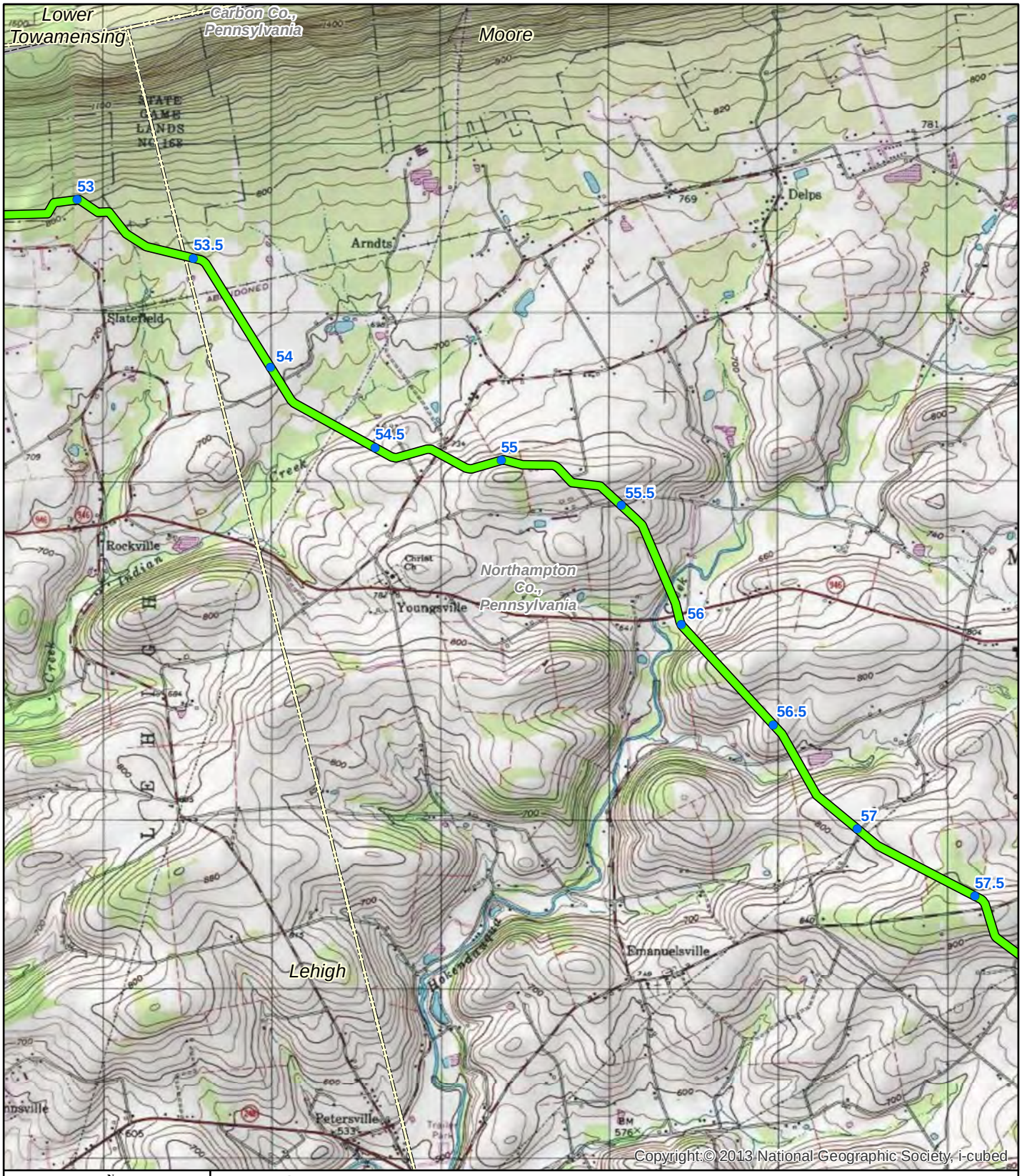
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Palmerton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 15 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

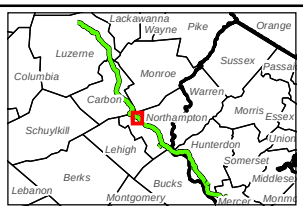
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

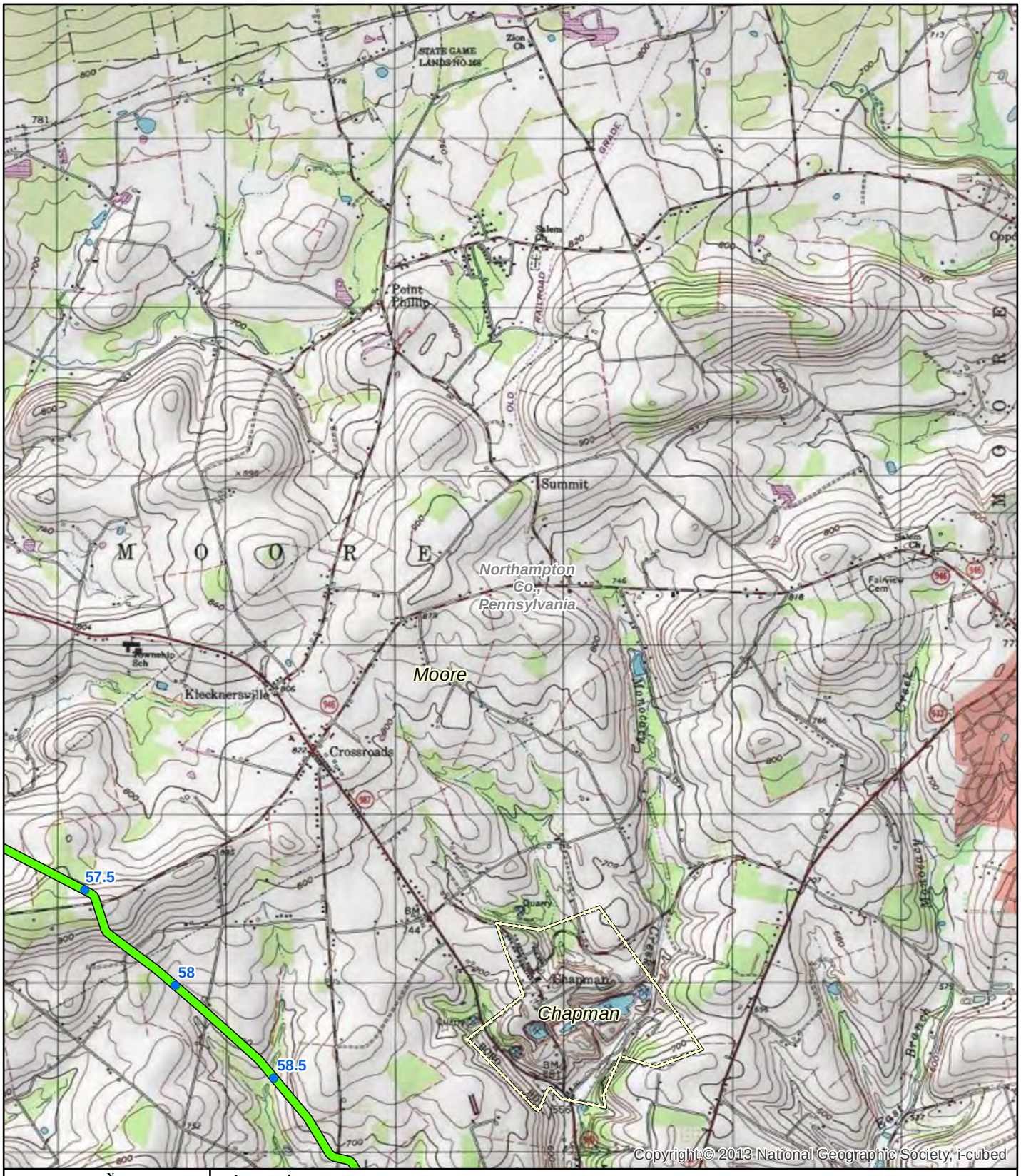
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Kunkletown Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 16 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

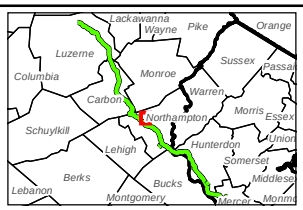
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

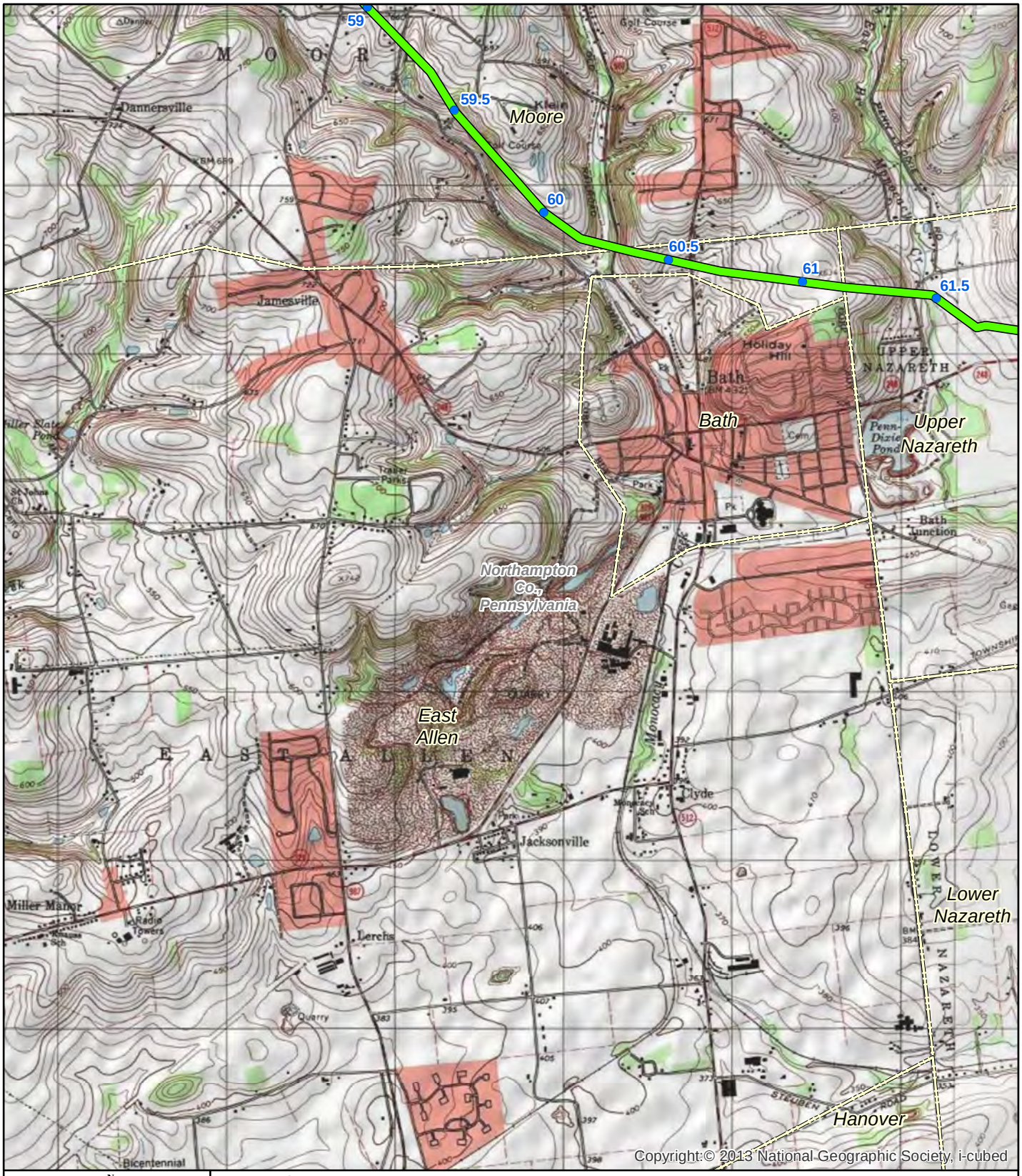
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Kunkletown Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 17 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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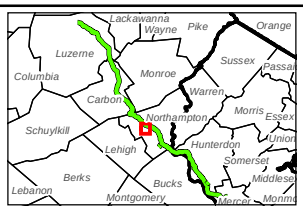
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

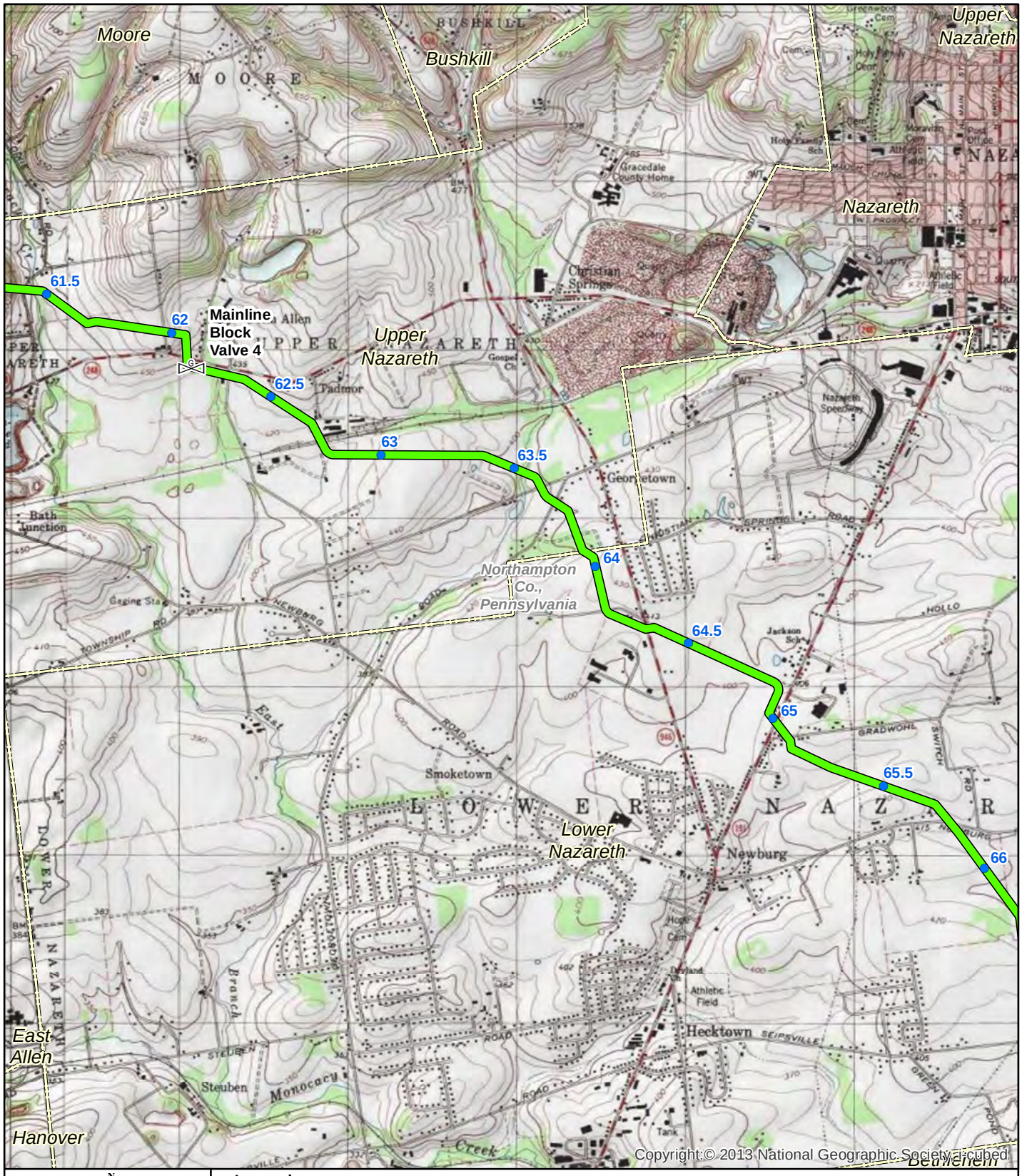
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Catasauqua Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 18 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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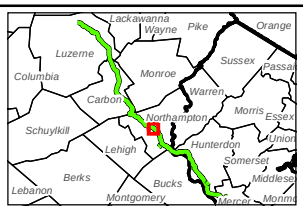
Legend

- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

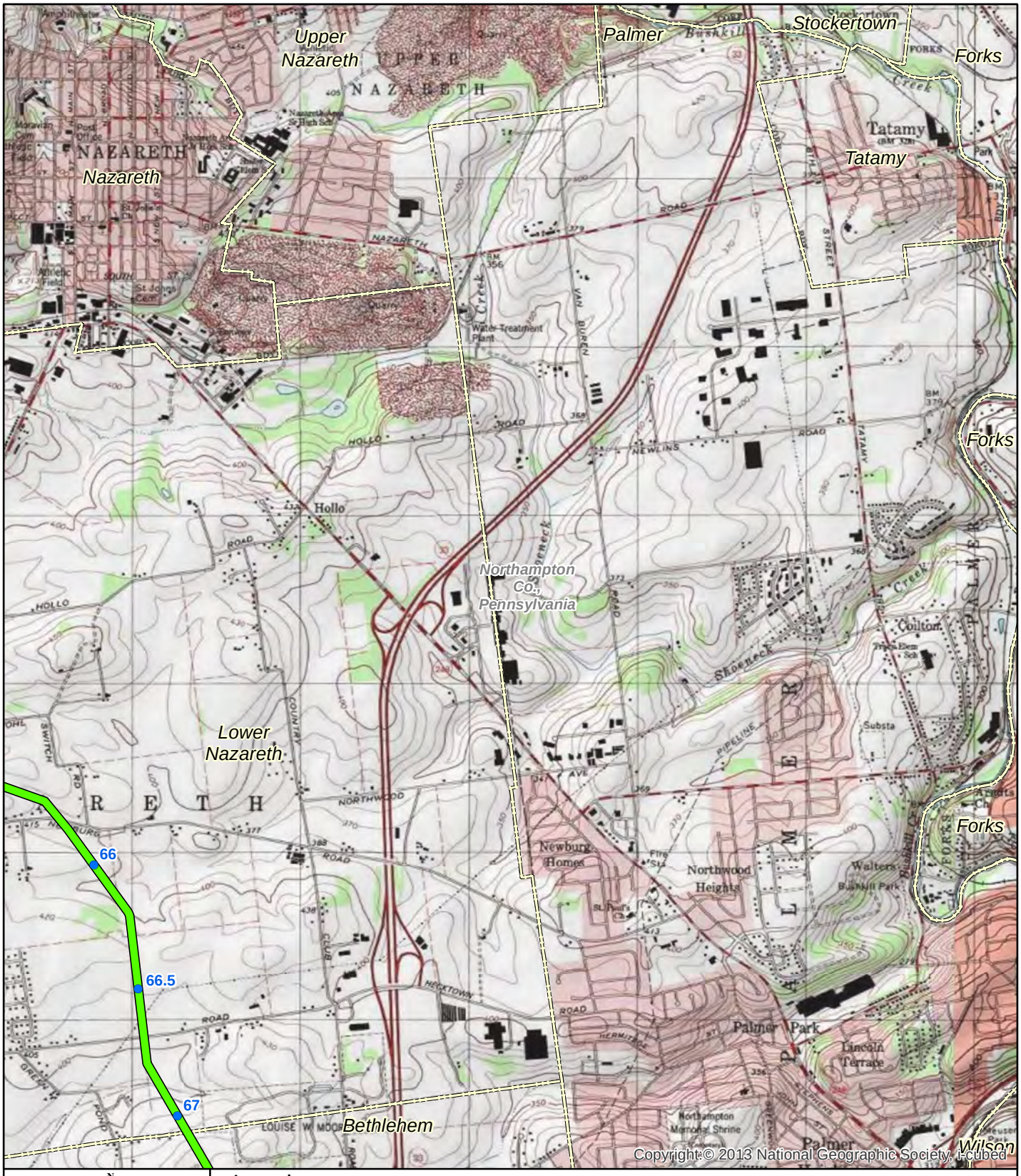
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Nazareth Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 19 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

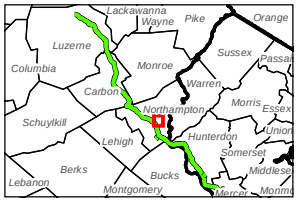
N W E S

0 800 1,600 3,200 Feet

TITLE:

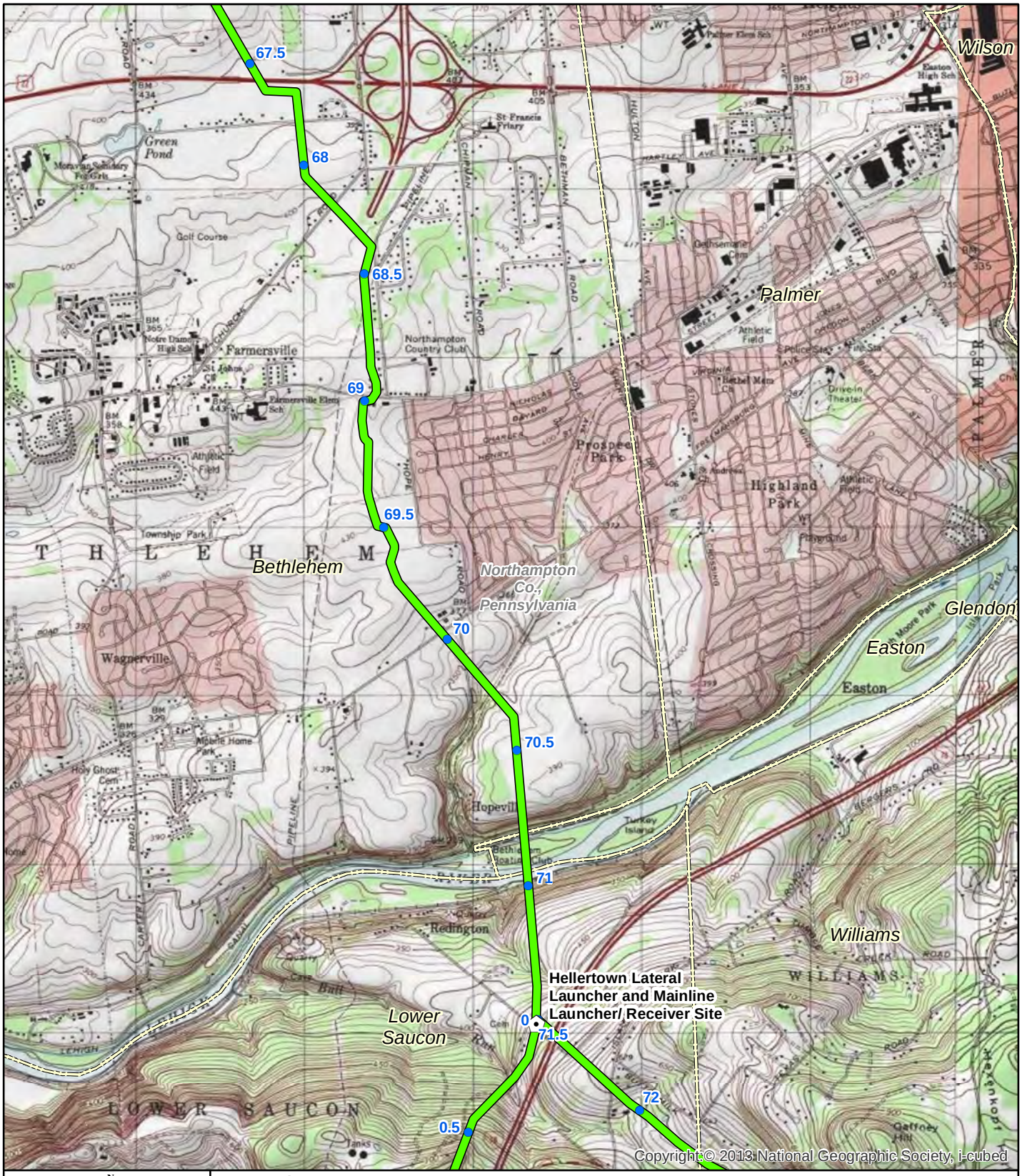
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Nazareth Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 20 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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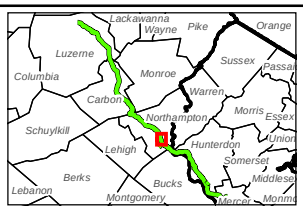
Legend

- Mile Posting
- Proposed PennEast Route
- Launcher/Receiver Site
- Municipality Boundary
- County Boundary

TITLE:

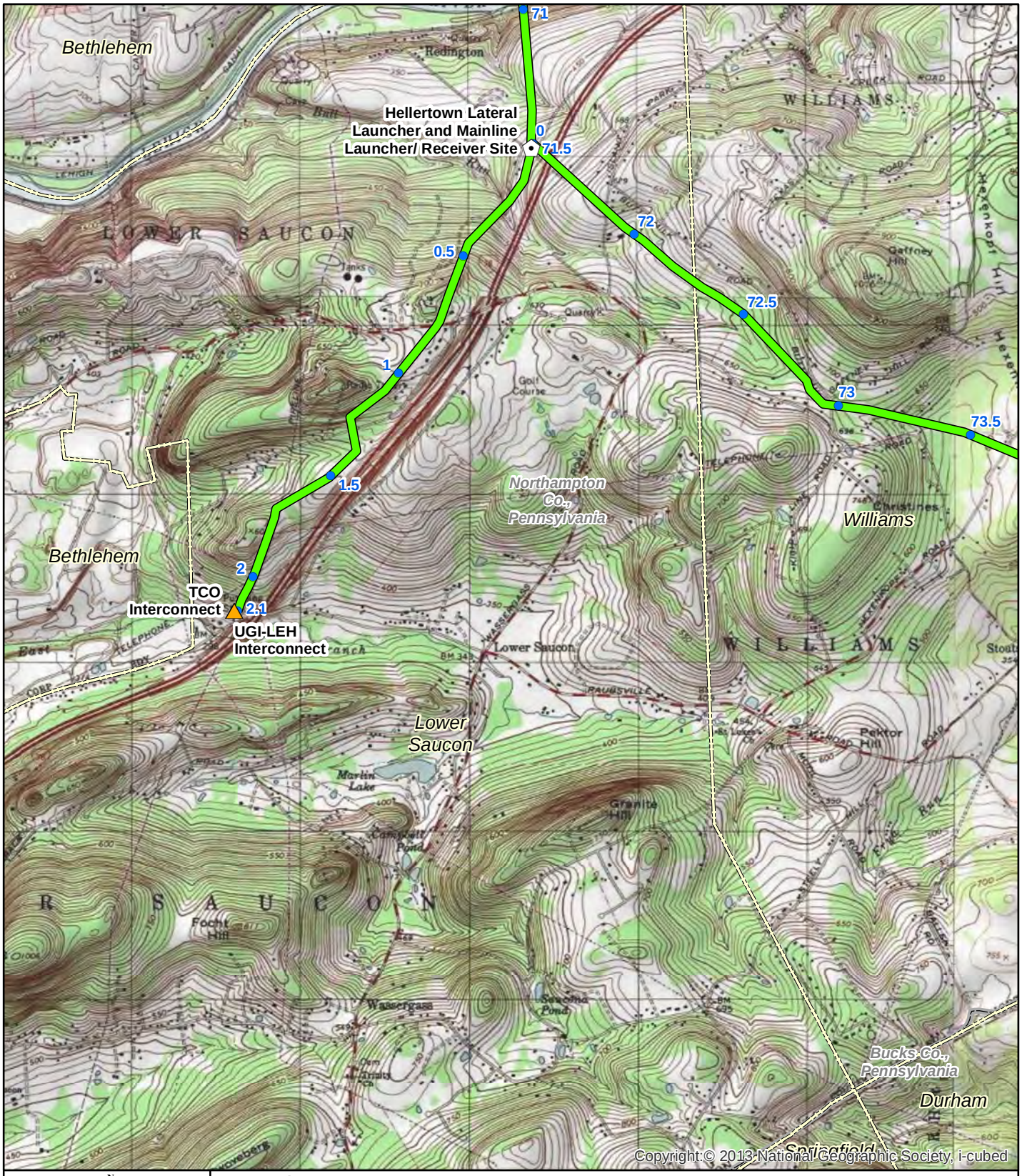
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Nazareth Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 21 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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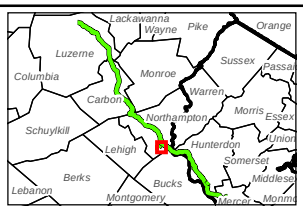
Legend

- Mile Posting
- Proposed PennEast Route
- Launcher/Receiver Site
- Interconnect
- Municipality Boundary
- County Boundary

TITLE:

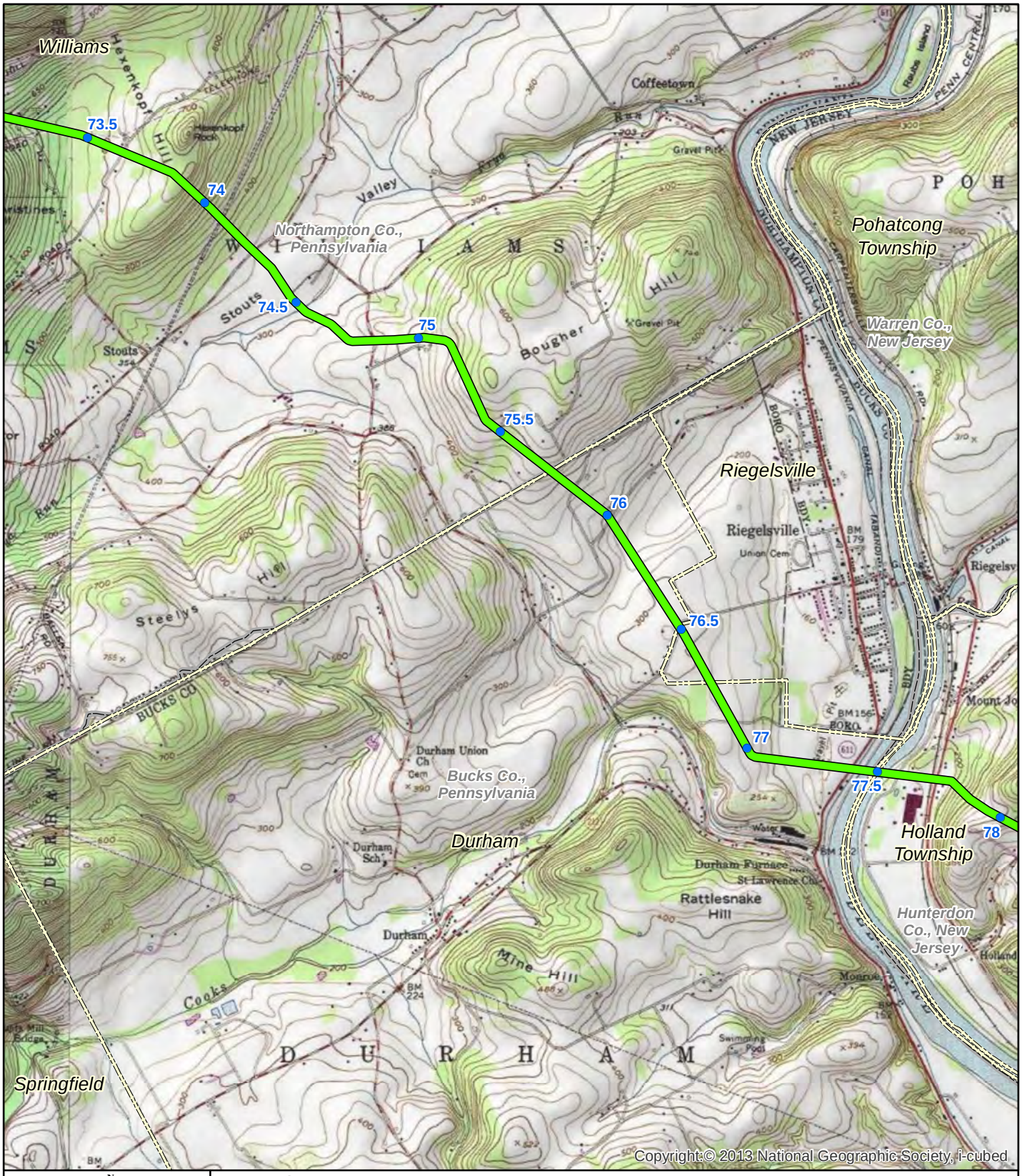
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Hellertown Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 22 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

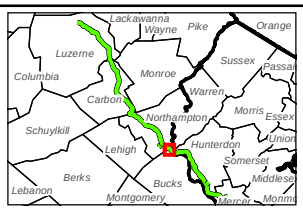
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

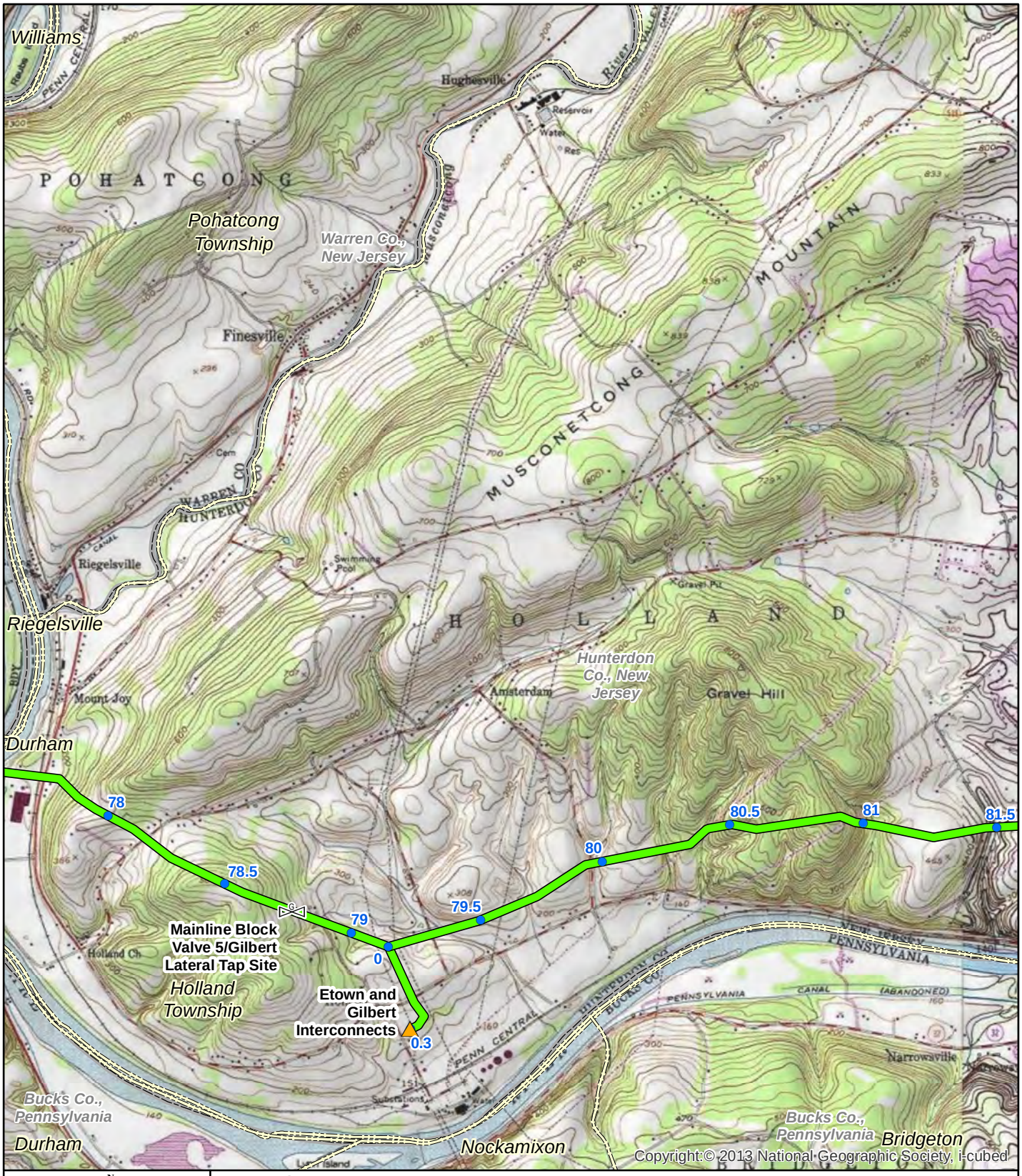
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Riegelsville Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 23 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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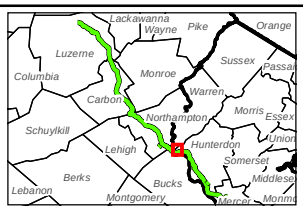
Legend

- Mile Posting
- Proposed PennEast Route
- Interconnect
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

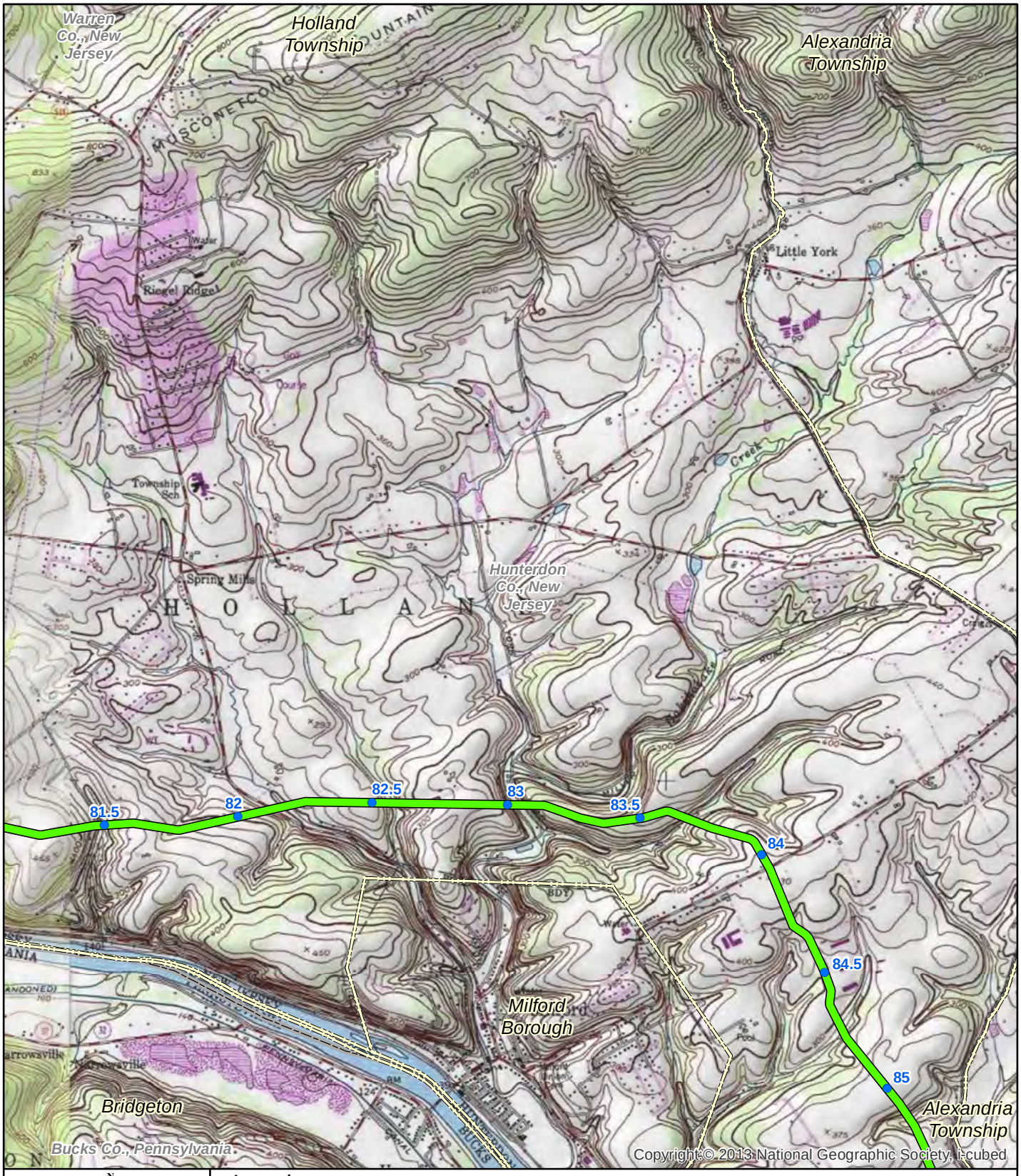
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Riegelsville Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 24 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

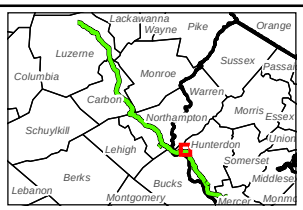
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

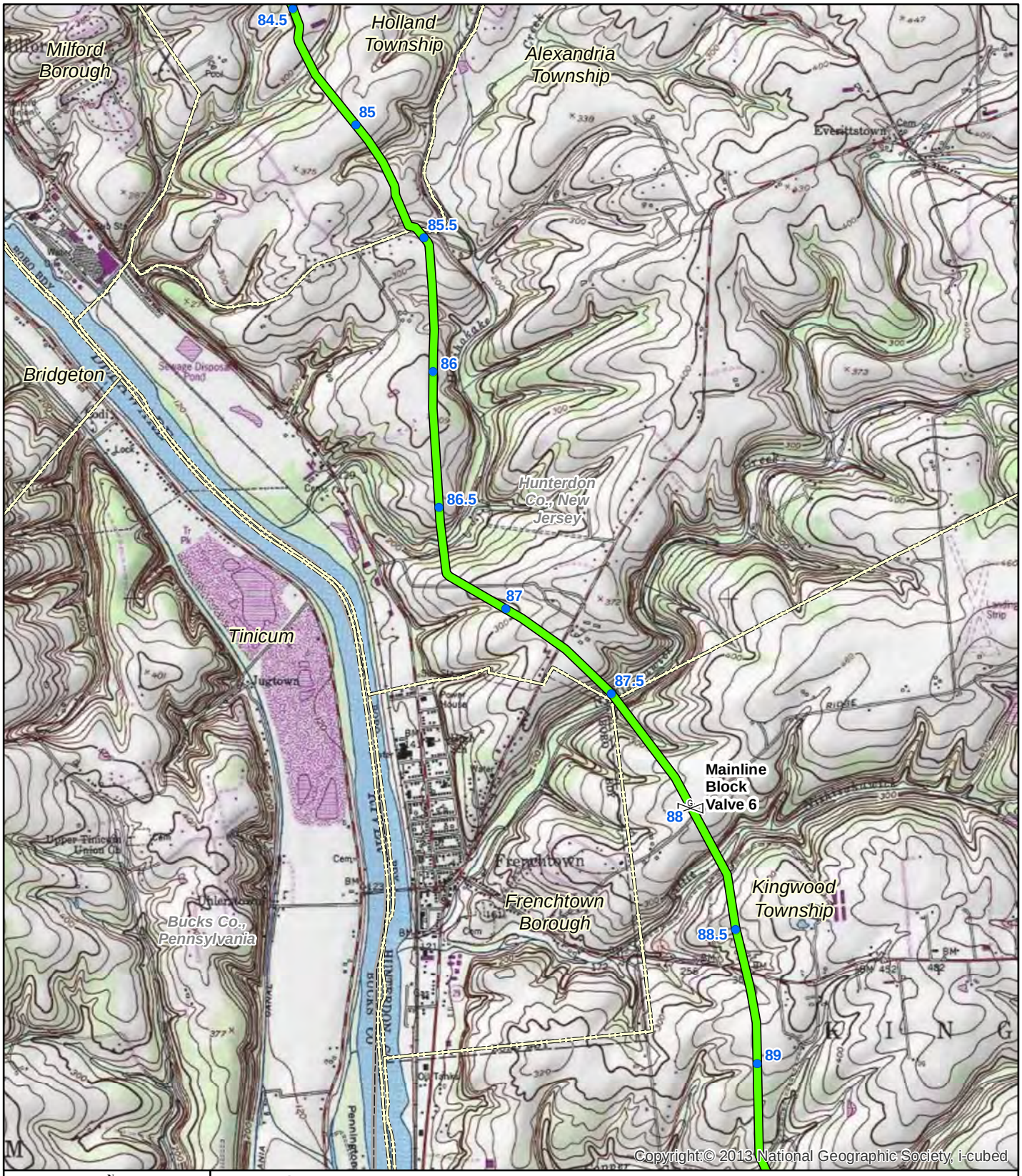
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Frenchtown Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 25 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



Legend

- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

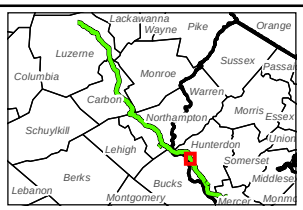
N W E S

0 800 1,600 3,200 Feet

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Frenchtown Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 26 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC

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0 800 1,600 3,200 Feet

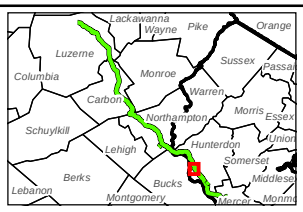
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

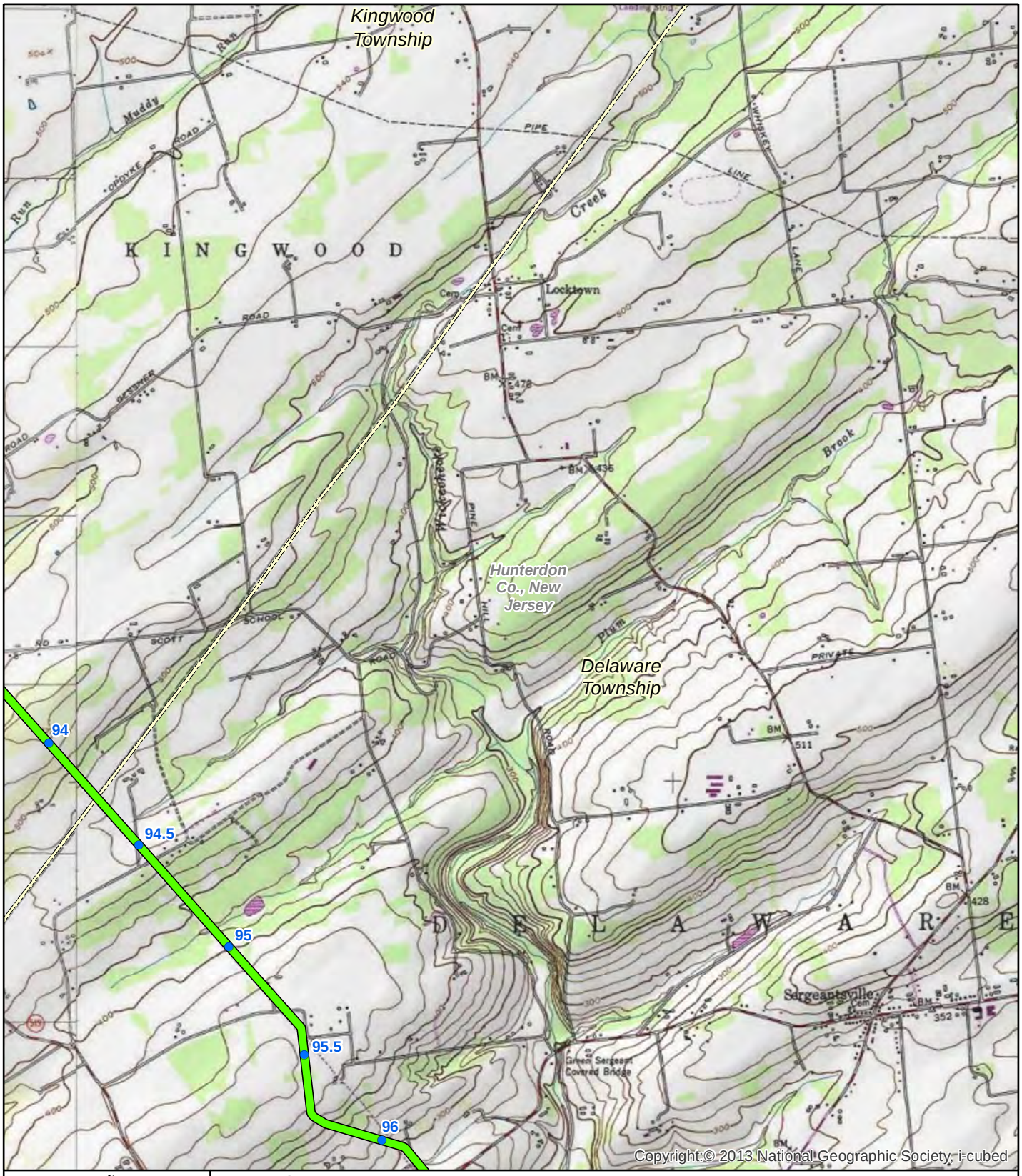
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Frenchtown, Lumberville Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 27 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



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0 800 1,600 3,200 Feet

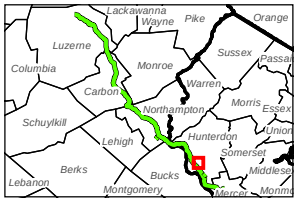
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

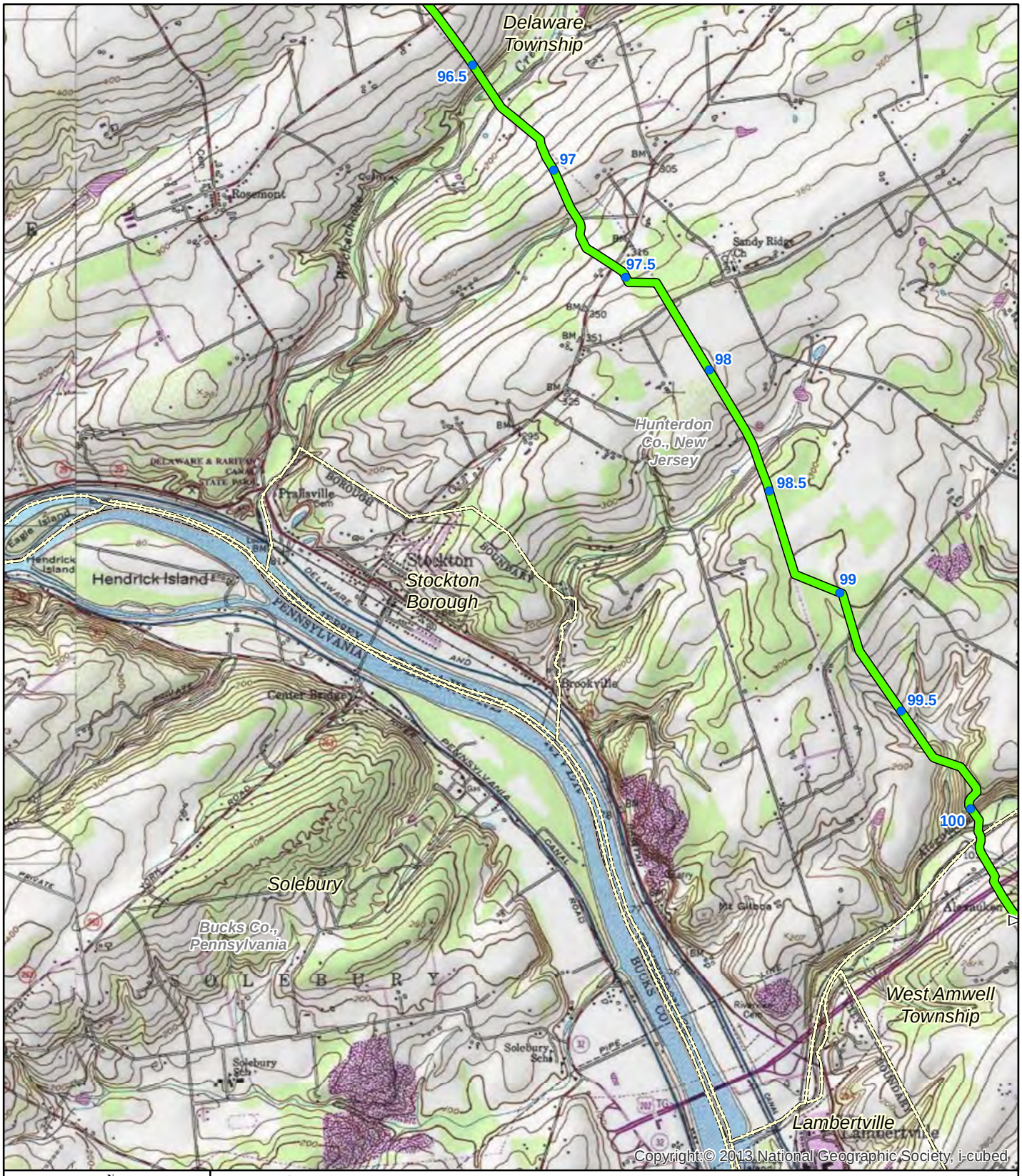
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Stockton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 28 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



N
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0 800 1,600 3,200 Feet

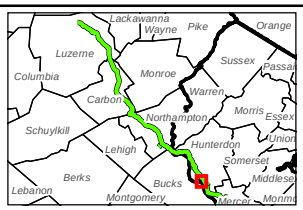
Legend

- Mile Posting
- Proposed PennEast Route
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

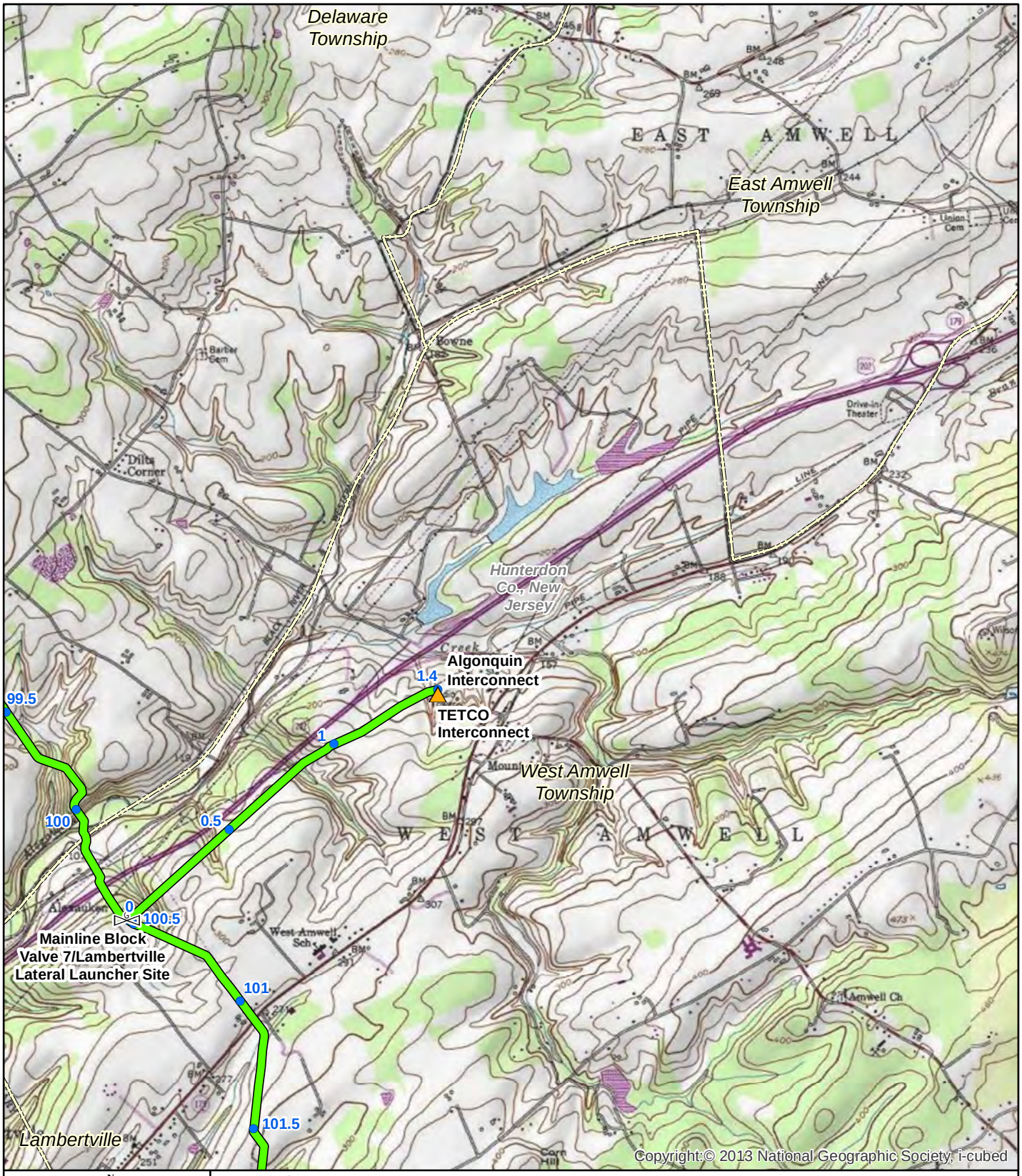
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Stockton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 29 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



N
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0 800 1,600 3,200 Feet

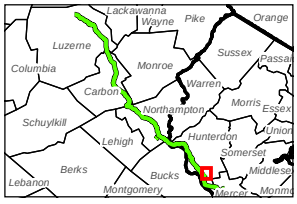
Legend

- Mile Posting
- Proposed PennEast Route
- Interconnect
- Mainline Block Valve
- Municipality Boundary
- County Boundary

TITLE:

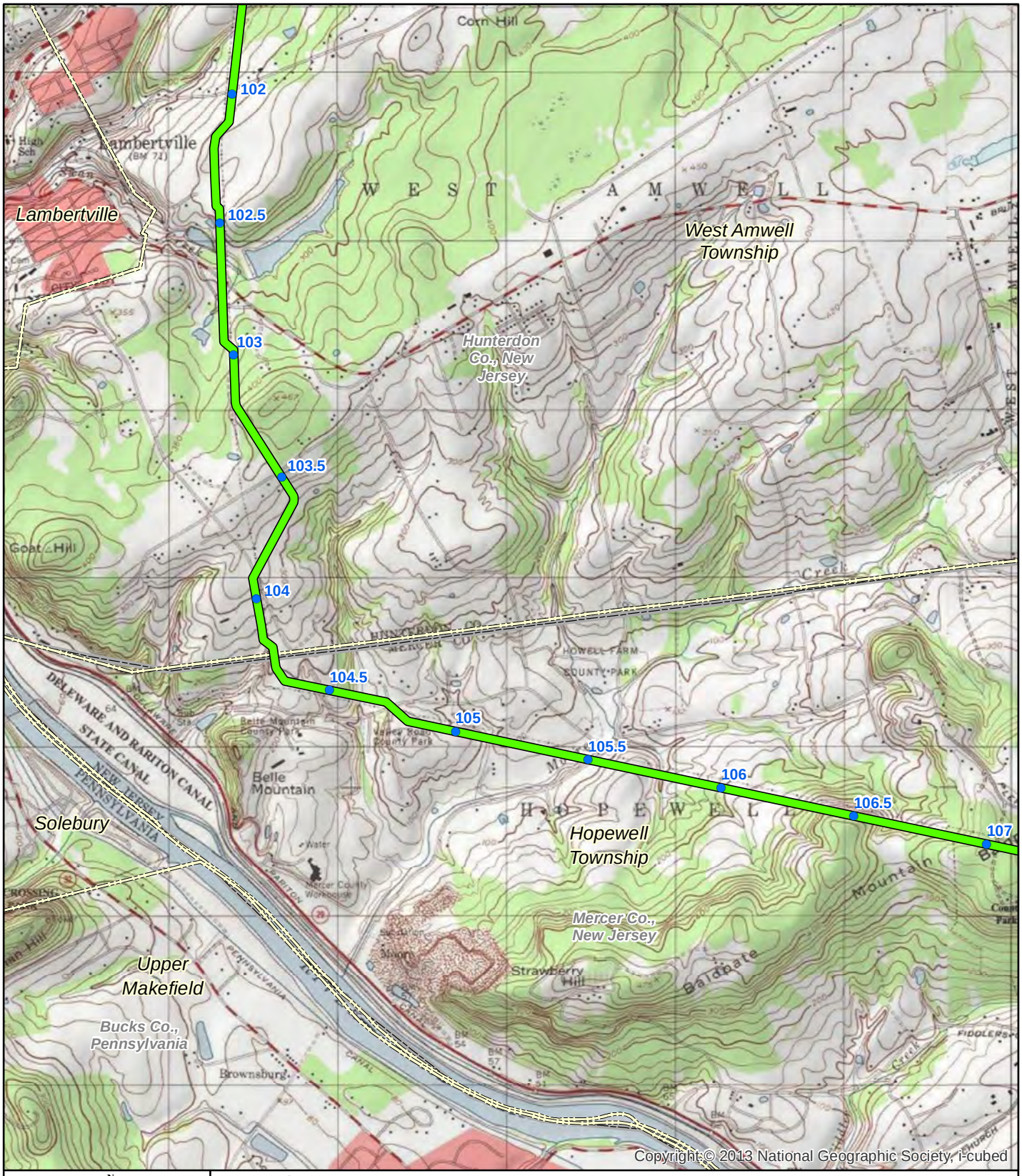
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Stockton Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 30 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



N
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0 800 1,600 3,200 Feet

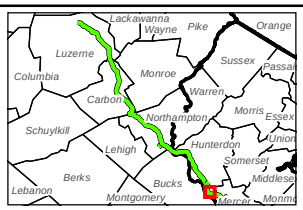
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Hopewell Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 31 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC

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N W E S

0 800 1,600 3,200 Feet

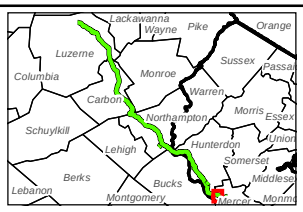
Legend

- Mile Posting
- Proposed PennEast Route
- Municipality Boundary
- County Boundary

TITLE:

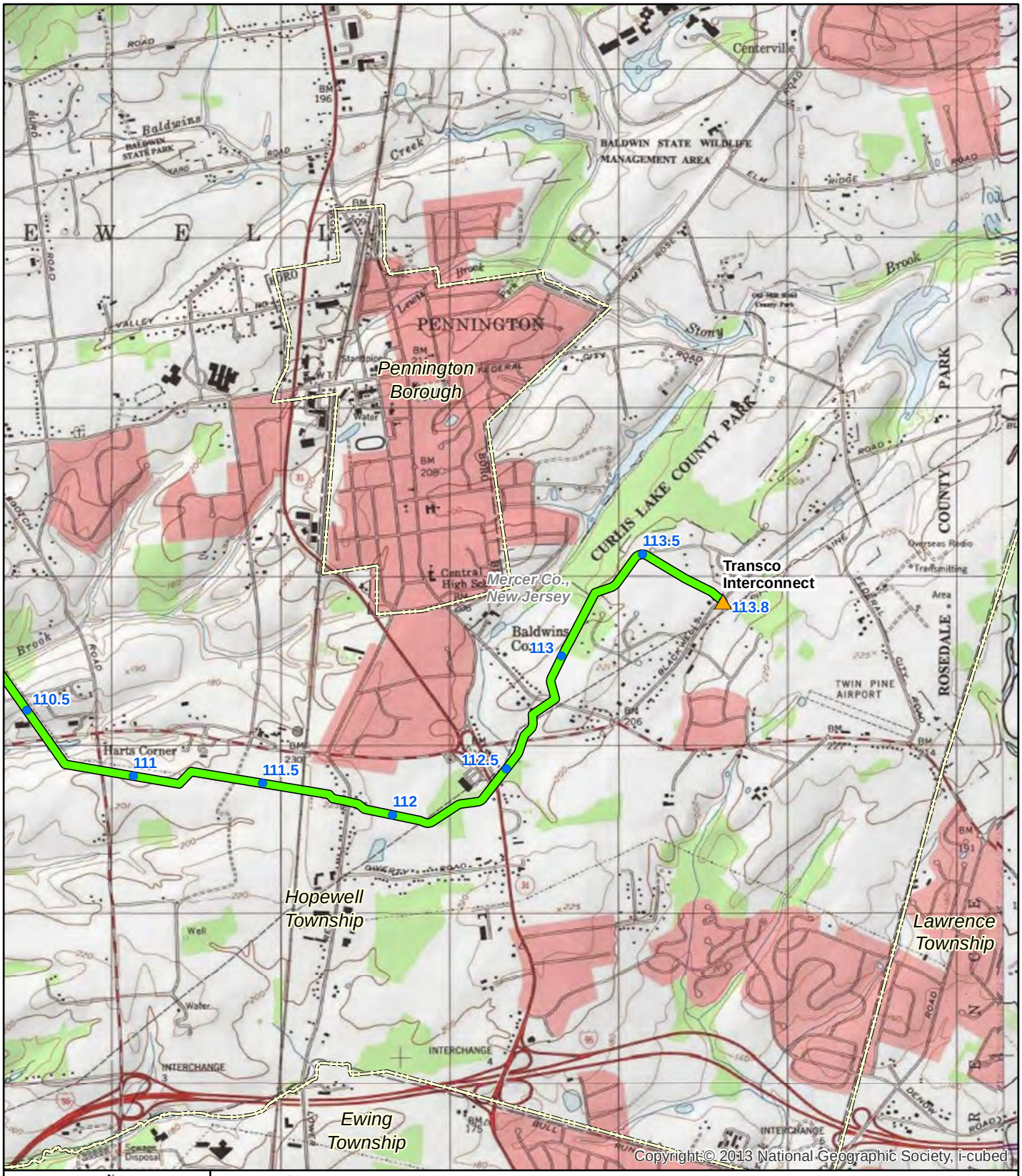
PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Lambertville Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 32 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC



N
W E
S

0 800 1,600 3,200 Feet

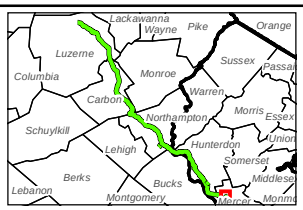
Legend

- Mile Posting
- Proposed PennEast Route
- Interconnect
- Municipality Boundary
- County Boundary

TITLE:

PennEast Pipeline Project
USGS Topographic Quadrangle Map

LOC: Pennington Quadrangle			REV.:
CKD. BY: BH	ENG.:	Date: 7/22/2015	W.O.:
DRN. BY: VP	SCALE: SEE GRAPHIC SCALE	DWG. NO.:	SHEET: 33 of 33



PennEast PIPELINE

PennEast Pipeline Company, LLC

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Appendix F

Names and Addresses of Affected Landowners and Stakeholders

This information has been removed for privileged treatment and is marked:

CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE

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Appendix L

Air and Noise Appendices

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Appendix L-1

Plan Approval Application for Compressor Station

(PennEast will provide a copy of this Application with its September 2015 FERC Filing)

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Appendix L-2
Construction Emissions

PennEast Pipeline Company, LLC
Construction Emissions
All Emissions are in Units of Tons per Construction Period

Table L2-1

Project Total Emissions	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Diesel Non-Road Equipment Totals	107	46	11	4.8	4.7	0.29	32,466	0.63
Diesel and Gas On-Road	5.0	22.8	2.53	0.29	0.17	0.03	1,690	0.18
Pipeline Construction Activity Fugitive Dust				1,580	237			
Pipeline Roadway Fugitive Dust				132	21			
Pipeline Construction Sub-Total	**112**	**69**	**14**	**1,718**	**263**	**0.31**	**34,156**	**0.80**
Compressor Station Diesel Non-Road Equip.	11.6	4.0	1.0	0.5	0.5	0.0	1579.0	0.0
Compressor Station Diesel and Gas On-Road	0.3	1.9	0.19	0.01	0.01	0.00	102	0.01
Compressor Station Construction Fugitive Dust				3	20			
Compressor Station Roadway Fugitive Dust				5.5	0.6			
Comp. Station Construction Sub-Total	**12**	**6**	**1**	**9**	**21**	**0.02**	**1,681**	**0.05**
Project Total Construction Emissions	**124**	**75**	**15**	**1,727**	**284**	**0.33**	**35,837**	**0.85**

General Conformity Threshold								
• Moderate ozone nonattainment (NO_X/VOC)	***100***	***N/A***	***50***	***N/A***	***100***	***100***	***N/A***	***N/A***
• $PM_{2.5}$ Maintenance Area (NOx, VOC, $PM_{2.5}$, SO_2)								

Project Total Emission Breakdown

Diesel Non-Road Equipment	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Pipeline Construction - Spread 1	22.4	9.8	2.4	1.0	1.0	0.06	7206.3	0.14
Pipeline Construction - Spread 2	24.8	10.9	2.6	1.1	1.1	0.07	8011.0	0.16
Pipeline Construction - Spread 3	24.4	10.7	2.6	1.1	1.1	0.07	7862.4	0.15
Pipeline Construction - Spread 4	24.2	10.6	2.6	1.1	1.1	0.07	7807.4	0.15
Pipeline Construction Sub-Total	**95.7**	**42.0**	**10.1**	**4.3**	**4.2**	**0.27**	**30887.0**	**0.59**
Compressor Station Construction Equip.	11.6	4.0	1.0	0.5	0.5	0.01	1579.0	0.04
PennEast Project Total Non-Road Equip.	**107.3**	**45.9**	**11.1**	**4.8**	**4.7**	**0.29**	**32466.0**	**0.63**

Roadway Travel Particulate Matter

Pipeline Construction				PM_{10}	$PM_{2.5}$			
Combined Pickup Trucks and Vans - Spread 1				26.2	3.9			
Float, Lowboy, Tractor Trucks Spread 1				2.9	0.6			
Bus - Spread 1				1.8	0.3			
Combined Pickup Trucks and Vans - Spread 2				29.1	4.3			
Float, Lowboy, Tractor Trucks Spread 2				2.9	0.6			
Bus - Spread 2				2.0	0.4			
Combined Pickup Trucks and Vans - Spread 3				28.6	4.3			
Float, Lowboy, Tractor Trucks Spread 3				2.9	0.6			
Bus - Spread 3				2.0	0.4			
Combined Pickup Trucks and Vans - Spread 4				28.8	4.3			
Float, Lowboy, Tractor Trucks Spread 4				3.1	0.6			
Bus - Spread 4				2.0	0.4			
Total Pipeline Construction				**132**	**21**			
Compressor Station construction:								
Gas Pickup Trucks - Supervisors/Inspectors				3.2	0.4			
Gas Pickup Trucks - Operators				1.9	0.2			
Diesel 1-Ton Trucks with Tools				0.3	0.0			
Total Compressor Station				**5.5**	**0.61**			
Total Project Roadway Travel PM				**138**	**21**			

PennEast Pipeline Company, LLC
Construction Emissions
All Emissions are in Units of Tons per Construction Period

Table L2-1 page 2

Total Project construction Emissions by Spread

Project Elements	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Spread 1								
Diesel Non-Road Equipment	22.4	9.8	2.4	1.0	1.0	0.1	7,206	0.1
Diesel and Gas On-Road	1.19	5.3	0.59	0.07	0.04	0.01	400	0.041
Pipeline Construction Fugitive Dust				193	29			
Pipeyard Construction Fugitive Dust				9	1			
Roadway Travel Particulate Matter				31.0	4.9			
Total construction Emissions Spread 1	**23.5**	**15.1**	**3.0**	**234.3**	**36.2**	**0.1**	**7,606**	**0.18**
County Breakdown:								
Luzerne County	23.5	15.1	3.0	234.3	36.2	0.1	7,606	0.18
Spread 2								
Diesel Non-Road Equipment	24.8	10.9	2.6	1.1	1.1	0.1	8,011	0.2
Diesel and Gas On-Road	1.27	5.9	0.65	0.074	0.042	0.0067	431	0.045
Construction Activity Fugitive Dust				411	62			
Pipeyard Construction Fugitive Dust				10	2			
Roadway Travel Particulate Matter				34.0	5.3			
Total construction Emissions Spread 2	**26.1**	**16.8**	**3.3**	**457.0**	**69.7**	**0.1**	**8,442**	**0.20**
County Breakdown:								
Luzerne	4.1	2.7	0.5	72.5	11.1	0.0	1,340	0.03
Carbon	17.9	11.5	2.2	313.3	47.8	0.1	5,788	0.14
Northampton	4.1	2.6	0.5	71.1	10.9	0.0	1,314	0.03
Spread 3								
Diesel Non-Road Equipment	24.4	10.7	2.6	1.1	1.1	0.1	7,862	0.1
Diesel and Gas On-Road	1.26	5.8	0.64	0.07	0.04	0.0066	426	0.044
Construction Activity Fugitive Dust				420	63			
Pipeyard Construction Fugitive Dust				12	2			
Roadway Travel Particulate Matter				33.5	5.2			
Total construction Emissions Spread 3	**25.6**	**16.5**	**3.2**	**466.6**	**71.1**	**0.1**	**8,288**	**0.19**
County Breakdown:								
Carbon	4.4	2.8	0.6	80	12.2	0.0	1,426	0.03
Northampton	18.1	11.6	2.3	329	50.1	0.1	5,839	0.14
Bucks	1.4	0.9	0.2	26	3.9	0.0	457	0.01
Hunterdon	1.7	1.1	0.2	32	4.9	0.0	565	0.01
Spread 4								
Diesel Non-Road Equipment	24.2	10.6	2.6	1.1	1.1	0.1	7,807	0.1
Diesel and Gas On-Road	1.28	5.85	0.65	0.07	0.04	0.01	433	0.045
Construction Activity Fugitive Dust				493	74			
Pipeyard Construction Fugitive Dust				12	2			
Roadway Travel Particulate Matter				34	5.3			
Total construction Emissions Spread 4	25.5	16.4	3.2	539	82.1	0.1	8,241	0.2
County Breakdown:								
Hunterdon	18.69	12.07	2.35	396	60.24	0.06	6,049	0.14
Mercer	6.77	4.37	0.85	143	21.82	0.02	2,191	0.05

Total construction Emissions by County	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Luzerne	27.7	17.8	3.5	307	47	0.08	8,946	0.21
Carbon (Pipeline Breakdown + Comp. Station)	34.2	20.2	3.7	394	61	0.08	8,793	0.21
Northampton	22.1	14.2	2.8	400	61	0.07	7,154	0.17
Bucks	1.4	0.9	0.2	26	4	0.00	457	0.01
Hunterdon	20.4	13.2	2.6	428	65	0.1	6,614	0.15
Mercer	6.8	4.37	0.85	143	22	0.02	2,191	0.05

Table L2-2.1

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 1

Criteria Emissions

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	CO	PM	NOx	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.19	0.79	0.12	3.00	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.21	0.91	0.15	3.85	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.35	1.47	0.28	4.38	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	38	112	16	10	96	6	21,888	0.481	0.95	4.09	0.65	4.92	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.48	2.36	0.43	4.25	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.14	0.50	0.08	1.33	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.23	2.07	0.22	3.44	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.23	2.29	0.29	2.44	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.18	0.63	0.12	1.86	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.18	0.63	0.12	1.86	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.16	0.65	0.15	1.49	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	6	112	16	10	96	6	3,456	0.371	0.16	0.65	0.15	1.49	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	17	112	16	10	96	6	9,792	0.371	0.15	0.44	0.08	1.34	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.15	0.44	0.08	1.34	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	22	112	16	10	96	6	12,672	0.371	0.15	0.44	0.08	1.34	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	18	112	16	10	96	6	10,368	0.371	0.15	0.77	0.12	1.90	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.15	0.77	0.12	1.90	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	14	112	16	10	96	6	8,064	0.371	0.15	0.77	0.12	1.90	0.59
	TOTAL (Tons)																	

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from EPA's MOVES2014 model.

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Table L2-2.1

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 1 **Criteria Emissions**

Description	Age	"A" [3]				Deterioration factor [3]				$S_{PM\ adj}$ [4]	Adjusted EF (g/hp-hr)						N_2O EF [8]
	Factor [3]	HC	CO	PM	NOx	HC	CO	PM	NOx	g/hp-hr	HC [5]	CO [5]	PM [4]	SO_2 [6]	NOx [5]	CO_2 [7]	g/MMBtu
Chipper	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.086	0.199	0.869	0.087	0.005	3.031	530.398	0.6
Air Compressors	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.214	1.000	0.125	0.005	3.880	589.672	0.6
Pumps	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.358	1.623	0.313	0.005	4.423	589.213	0.6
Welding Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.113	0.984	4.498	0.837	0.006	4.960	692.846	0.6
Hydro Mulcher/Seeder	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.499	2.593	0.531	0.005	4.283	588.766	0.6
Trucks: Dump, Water, Fuel, Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.149	0.550	0.027	0.005	1.342	536.343	0.6
BH/LDR, Forklift, Bush Hog	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.282	0.234	0.005	3.474	595.384	0.6
Hydro Ax, Skid Truck	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.522	0.337	0.005	2.458	595.385	0.6
Auger, Rockpiker, Loader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	0.6
Grader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	1.6
Skidder, Trencher, Boring	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	2.6
Rock Drill	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	3.6
583 Sideboom, Pipe Benders	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	4.6
D7 Tack Rig	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	5.6
DB Dozers (Winch, Ripper)	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	6.6
345 Backhoe/Hammer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	7.6
Vac Lift/Sideboom 594	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	8.6
Padder, Trencher, Backhoes	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	9.6

NOTES:

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
"Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009 is the latest available reference, and is not changed in, or by, MOVES2014.

Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for diesel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for PM use Equation 2 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

The correction factor S_{PMadj} is made to account for fuel sulfur variations; inputs specific to this calculation are noted below

0.02247 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T0, T1, T2, T3, T3B, T4A, T4B

0.30 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T4 and T4N

0.0015 soxdsl (weight percent of sulfur in diesel fuel as required per 40 CFR 80.510 for non-road diesel)

0.33 soxbas (default certification fuel sulfur weight percent, 0.33 is default)

Note 5: Adjusted Emission Factors for HC, CO, and NOx use Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

Adjusted EF = Efss * TAF * DF (TAF = 1 for steady-state equipment)

Note 6: SO_2 Emissions are calculated using Equation 7 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

SO_2 = (BSFC * 453.6 * (1- soxcnv) - $HC_{adj\ EF}$) * 0.01 * soxdsl * 2

Note 7: CO_2 Emissions are calculated using Equation 6 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

CO_2 = (BSFC * 453.6 - $HC_{adj\ EF}$) * 0.87 * 44/12

Note 8: Emission factor for N2O from 40 CFR 98 Subpart C.

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Table L2-2.1

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 1

Criteria Emissions

Description	VOC [9] tons	CO [10] tons	PM [10]/ PM_{10} [11] tons	$PM_{2.5}$ [11] tons	SO_2 [10] tons	NOx [10] tons	CO_2 [10] tons	CH_4 [12] tons	N_2O [13] tons	GHG [14] tons of CO_2e
Chipper	0.05	0.21	0.02	0.02	0.00	0.73	127.43	0.001	0.002	128.17
Air Compressors	0.01	0.05	0.01	0.01	0.00	0.21	32.20	0.000	0.001	32.38
Pumps	0.02	0.11	0.02	0.02	0.00	0.29	38.61	0.000	0.001	38.84
Welding Rigs	0.18	0.80	0.15	0.14	0.00	0.88	122.87	0.003	0.005	124.36
Hydro Mulcher/Seeder	0.02	0.11	0.02	0.02	0.00	0.19	25.72	0.000	0.000	25.87
Trucks: Dump, Water, Fuel, Rigs	0.31	1.07	0.05	0.05	0.01	2.61	1044.78	0.005	0.014	1049.18
BH/LDR, Forklift, Bush Hog	0.03	0.23	0.02	0.02	0.00	0.35	60.67	0.000	0.001	60.92
Hydro Ax, Skid Truck	0.03	0.28	0.04	0.04	0.00	0.28	66.91	0.000	0.001	67.20
Auger, Rockpiker, Loader	0.04	0.14	0.02	0.02	0.00	0.38	108.47	0.001	0.001	108.93
Grader	0.03	0.12	0.02	0.02	0.00	0.34	96.42	0.001	0.004	97.49
Skidder, Trencher, Boring	0.05	0.20	0.04	0.04	0.00	0.42	150.67	0.001	0.009	153.37
Rock Drill	0.07	0.28	0.05	0.05	0.00	0.59	210.94	0.001	0.017	216.16
583 Sideboom, Pipe Benders	0.25	0.72	0.04	0.04	0.01	2.03	802.63	0.004	0.085	827.97
D7 Tack Rig	0.02	0.04	0.00	0.00	0.00	0.12	48.22	0.000	0.006	50.07
DB Dozers (Winch, Ripper)	0.41	1.18	0.07	0.07	0.01	3.35	1325.99	0.006	0.201	1386.00
345 Backhoe/Hammer	0.39	1.97	0.20	0.19	0.01	4.46	1247.63	0.006	0.218	1312.63
Vac Lift/Sideboom 594	0.10	0.49	0.05	0.05	0.00	1.11	309.40	0.001	0.061	327.63
Padder, Trencher, Backhoes	0.35	1.78	0.18	0.17	0.01	4.02	1125.08	0.005	0.248	1199.08
	2.37	**9.80**	**1.01**	**0.98**	**0.06**	**22.35**	**6944.62**	**0.04**	**0.87**	**7206.26**

NOTES:

Note 9: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 10: Annual CO, PM, SO_2, and NOx Emissions are calculated using the following calculation (Adj. emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Note 11: For diesel engines all PM is considered to be PM_{10}, $PM_{2.5}$ is 97% of PM/PM_{10}.

Note 12: Annual CH4 emissions are calculated using the following calculation (Adj. HC emission factor (g/hp-hr) * (1-0.984) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
This equation is derived in part from subtracting methane from THC to calculate NMHC. THC - CH_4 = NMHC; THC - NMHC = CH_4; THC - (0.984 * THC) = CH_4; THC * (1-0.984) = CH_4
0.984 is the ratio of MNHC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 13: Emissions estimate for N2O is based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Note 14: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:
CO_2 = 1, CH_4 = 25, N_2O = 298

Note 15: The document referenced above, "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015, is the latest available reference, and is not changed in, or by, MOVES2014.

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Table L2-2.2

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 2

Criteria Emissions

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	CO	PM	NOx	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.19	0.79	0.12	3.00	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.21	0.91	0.15	3.85	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.35	1.47	0.28	4.38	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.481	0.95	4.09	0.65	4.92	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.48	2.36	0.43	4.25	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.14	0.50	0.08	1.33	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.23	2.07	0.22	3.44	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.23	2.29	0.29	2.44	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.18	0.63	0.12	1.86	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.18	0.63	0.12	1.86	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.16	0.65	0.15	1.49	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.16	0.65	0.15	1.49	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.15	0.44	0.08	1.34	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.15	0.44	0.08	1.34	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	25	112	16	10	96	6	14,400	0.371	0.15	0.44	0.08	1.34	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.15	0.77	0.12	1.90	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.15	0.77	0.12	1.90	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	18	112	16	10	96	6	10,368	0.371	0.15	0.77	0.12	1.90	0.59
	TOTAL (Tons)																	

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from EPA's MOVES2014 model.

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Table L2-2.2

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 2

Criteria Emissions

Description	Age Factor [3]	"A" [3] HC	"A" [3] CO	"A" [3] PM	"A" [3] NOx	Deterioration factor [3] HC	Deterioration factor [3] CO	Deterioration factor [3] PM	Deterioration factor [3] NOx	$S_{PM\ adj}$ [4] g/hp-hr	Adjusted EF (g/hp-hr) HC [5]	Adjusted EF (g/hp-hr) CO [5]	Adjusted EF (g/hp-hr) PM [4]	Adjusted EF (g/hp-hr) SO_2 [6]	Adjusted EF (g/hp-hr) NOx [5]	Adjusted EF (g/hp-hr) CO_2 [7]	N_2O EF [8] g/MMBtu
Chipper	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.086	0.199	0.869	0.087	0.005	3.031	530.398	0.6
Air Compressors	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.214	1.000	0.125	0.005	3.880	589.672	0.6
Pumps	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.358	1.623	0.313	0.005	4.423	586.213	0.6
Welding Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.113	0.984	4.498	0.837	0.006	4.960	692.846	0.6
Hydro Mulcher/Seeder	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.499	2.593	0.531	0.005	4.283	586.766	0.6
Trucks: Dump, Water, Fuel, Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.149	0.550	0.027	0.005	1.342	536.343	0.6
BH/LDR, Forklift, Bush Hog	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.282	0.234	0.005	3.474	595.384	0.6
Hydro Ax, Skid Truck	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.522	0.337	0.005	2.458	595.385	0.6
Auger, Rockpiker, Loader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	0.6
Grader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	1.6
Skidder, Trencher, Boring	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	2.6
Rock Drill	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	3.6
583 Sideboom, Pipe Benders	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	4.6
D7 Tack Rig	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	5.6
DB Dozers (Winch, Ripper)	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	6.6
345 Backhoe/Hammer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	7.6
Vac Lift/Sideboom 594	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	8.6
Padder, Trencher, Backhoes	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	9.6

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NOTES:

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
"Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009 is the latest available reference, and is not changed in, or by, MOVES2014.

Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for diesel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for PM are calculated using Equation 2 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

The correction factor S_{PMadj} is made to account for fuel sulfur variations; inputs specific to this calculation are noted below

0.02247 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T0, T1, T2, T3, T3B, T4A, T4B

0.30 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T4 and T4N

0.0015 soxdsl (weight percent of sulfur in diesel fuel as required per 40 CFR 80.510 for non-road diesel)

0.33 soxbas (default certification fuel sulfur weight percent, 0.33 is default)

Note 5: Adjusted Emission Factors for HC, CO, and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009

Adjusted EF = Efss * TAF * DF (TAF = 1 for steady-state equipment)

Note 6: SO_2 Emissions are calculated using Equation 7 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

SO_2 = (BSFC * 453.6 * (1- soxcnv) - $HC_{adj\ EF}$) * 0.01 * soxdsl * 2

Note 7: CO_2 Emissions are calculated using Equation 6 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

CO_2 = (BSFC * 453.6 - $HC_{adj\ EF}$) * 0.87 * 44/12

Note 8: Emission factor for N2O from 40 CFR 98 Subpart C.

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Table L2-2.2

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 2

Criteria Emissions

Description	VOC [9] tons	CO [10] tons	PM [10]/ PM_{10} [11] tons	$PM_{2.5}$ [11] tons	SO_2 [10] tons	NOx [10] tons	CO_2 [10] tons	CH_4 [12] tons	N_2O [13] tons	GHG [14] tons of CO_2e
Chipper	0.05	0.21	0.02	0.02	0.00	0.73	127.43	0.001	0.002	128.17
Air Compressors	0.01	0.05	0.01	0.01	0.00	0.21	32.20	0.000	0.001	32.38
Pumps	0.02	0.11	0.02	0.02	0.00	0.29	38.61	0.000	0.001	38.84
Welding Rigs	0.19	0.84	0.16	0.15	0.00	0.93	129.33	0.003	0.005	130.90
Hydro Mulcher/Seeder	0.02	0.11	0.02	0.02	0.00	0.19	25.72	0.000	0.000	25.87
Trucks: Dump, Water, Fuel, Rigs	0.31	1.07	0.05	0.05	0.01	2.61	1044.78	0.005	0.014	1049.18
BH/LDR, Forklift, Bush Hog	0.03	0.23	0.02	0.02	0.00	0.35	60.67	0.000	0.001	60.92
Hydro Ax, Skid Truck	0.03	0.28	0.04	0.04	0.00	0.28	66.91	0.000	0.001	67.20
Auger, Rockpiker, Loader	0.04	0.14	0.02	0.02	0.00	0.38	108.47	0.001	0.001	108.93
Grader	0.03	0.12	0.02	0.02	0.00	0.34	96.42	0.001	0.004	97.49
Skidder, Trencher, Boring	0.05	0.20	0.04	0.04	0.00	0.42	150.67	0.001	0.009	153.37
Rock Drill	0.09	0.38	0.07	0.07	0.00	0.79	281.25	0.001	0.023	288.21
583 Sideboom, Pipe Benders	0.27	0.76	0.05	0.05	0.01	2.15	849.84	0.004	0.090	876.68
D7 Tack Rig	0.02	0.04	0.00	0.00	0.00	0.12	48.22	0.000	0.006	50.07
DB Dozers (Winch, Ripper)	0.47	1.35	0.08	0.08	0.01	3.81	1506.81	0.007	0.228	1575.00
345 Backhoe/Hammer	0.44	2.19	0.22	0.21	0.01	4.95	1386.25	0.007	0.242	1458.48
Vac Lift/Sideboom 594	0.10	0.49	0.05	0.05	0.00	1.11	309.40	0.001	0.061	327.63
Padder, Trencher, Backhoes	0.45	2.29	0.23	0.22	0.01	5.17	1446.53	0.007	0.319	1541.67
	2.62	**10.87**	**1.12**	**1.09**	**0.07**	**24.82**	**7709.51**	**0.04**	**1.01**	**8011.01**

NOTES:

Note 9: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 10: Annual CO, PM, SO_2, and NOx Emissions are calculated using the following calculation (Adj. emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Note 11: For diesel engines all PM is considered to be PM_{10}, $PM_{2.5}$ is 97% of PM/PM_{10}.

Note 12: Annual CH4 emissions are calculated using the following calculation (Adj. HC emission factor (g/hp-hr) * (1-0.984) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
This equation is derived in part from subtracting methane from THC to calculate NMHC. THC - CH_4 = NMHC; THC - NMHC = CH_4; THC - (0.984 * THC) = CH_4; THC * (1-0.984) = CH_4
0.984 is the ratio of MNHC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 13: Emissions estimate for N2O is based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Note 14: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:
CO_2 = 1, CH_4 = 25, N_2O = 298

Note 15: The document referenced above, "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015, is the latest available reference, and is not changed in, or by, MOVES2014.

Table L2-2.3

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 3

Criteria Emissions

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	CO	PM	NOx	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.19	0.79	0.12	3.00	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.21	0.91	0.15	3.85	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.35	1.47	0.28	4.38	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.481	0.95	4.09	0.65	4.92	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.48	2.36	0.43	4.25	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.14	0.50	0.08	1.33	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.23	2.07	0.22	3.44	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.23	2.29	0.29	2.44	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.18	0.63	0.12	1.86	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.18	0.63	0.12	1.86	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.16	0.65	0.15	1.49	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.16	0.65	0.15	1.49	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.15	0.44	0.08	1.34	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.15	0.44	0.08	1.34	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	24	112	16	10	96	6	13,824	0.371	0.15	0.44	0.08	1.34	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.15	0.77	0.12	1.90	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.15	0.77	0.12	1.90	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	17	112	16	10	96	6	9,792	0.371	0.15	0.77	0.12	1.90	0.59
	TOTAL (Tons)																	

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

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NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from EPA's MOVES2014 model.

Table L2-2.3

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 3

Criteria Emissions

Description	Age Factor [3]	"A" [3]				Deterioration factor [3]				$S_{PM\ adj}$ [4] g/hp-hr	Adjusted EF (g/hp-hr)						N_2O EF [8] g/MMBtu
		HC	CO	PM	NOx	HC	CO	PM	NOx		HC [5]	CO [5]	PM [4]	SO_2 [6]	NOx [5]	CO_2 [7]	
Chipper	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.086	0.199	0.869	0.087	0.005	3.031	530.398	0.6
Air Compressors	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.214	1.000	0.125	0.005	3.880	589.672	0.6
Pumps	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.358	1.623	0.313	0.005	4.423	589.213	0.6
Welding Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.113	0.984	4.498	0.837	0.006	4.960	692.846	0.6
Hydro Mulcher/Seeder	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.499	2.593	0.531	0.005	4.283	588.766	0.6
Trucks: Dump, Water, Fuel, Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.149	0.550	0.027	0.005	1.342	536.343	0.6
BH/LDR, Forklift, Bush Hog	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.282	0.234	0.005	3.474	595.384	0.6
Hydro Ax, Skid Truck	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.522	0.337	0.005	2.458	595.385	0.6
Auger, Rockpiker, Loader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	0.6
Grader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	1.6
Skidder, Trencher, Boring	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	2.6
Rock Drill	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	3.6
583 Sideboom, Pipe Benders	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	4.6
D7 Tack Rig	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	5.6
DB Dozers (Winch, Ripper)	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	6.6
345 Backhoe/Hammer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	7.6
Vac Lift/Sideboom 594	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	8.6
Padder, Trencher, Backhoes	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	9.6

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NOTES:

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
"Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009 is the latest available reference, and is not changed in, or by, MOVES2014.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for diesel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for PM are calculated using Equation 2 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
The correction factor S_{PMadj} is made to account for fuel sulfur variations; inputs specific to this calculation are noted below

0.02247 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T0, T1, T2, T3, T3B, T4A, T4B
0.30 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T4 and T4N
0.0015 soxdsl (weight percent of sulfur in diesel fuel as required per 40 CFR 80.510 for non-road diesel)
0.33 soxbas (default certification fuel sulfur weight percent, 0.33 is default)

Note 5: Adjusted Emission Factors for HC, CO, and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (TAF = 1 for steady-state equipment)

Note 6: SO_2 Emissions are calculated using Equation 7 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
SO_2 = (BSFC * 453.6 * (1- soxcnv) - $HC_{adj\ EF}$) * 0.01 * soxdsl * 2

Note 7: CO_2 Emissions are calculated using Equation 6 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
CO_2 = (BSFC * 453.6 - $HC_{adj\ EF}$) * 0.87 * 44/12

Note 8: Emission factor for N2O from 40 CFR 98 Subpart C.

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Table L2-2.3

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 3 **Criteria Emissions**

Description	VOC [9] tons	CO [10] tons	PM [10]/ PM_{10} [11] tons	$PM_{2.5}$ [11] tons	SO_2 [10] tons	NOx [10] tons	CO_2 [10] tons	CH_4 [12] tons	N_2O [13] tons	GHG [14] tons of CO_2e
Chipper	0.05	0.21	0.02	0.02	0.00	0.73	127.43	0.001	0.002	128.17
Air Compressors	0.01	0.05	0.01	0.01	0.00	0.21	32.20	0.000	0.001	32.38
Pumps	0.02	0.11	0.02	0.02	0.00	0.29	38.61	0.000	0.001	38.84
Welding Rigs	0.19	0.84	0.16	0.15	0.00	0.93	129.33	0.003	0.005	130.90
Hydro Mulcher/Seeder	0.02	0.11	0.02	0.02	0.00	0.19	25.72	0.000	0.000	25.87
Trucks: Dump, Water, Fuel, Rigs	0.31	1.07	0.05	0.05	0.01	2.61	1044.78	0.005	0.014	1049.18
BH/LDR, Forklift, Bush Hog	0.03	0.23	0.02	0.02	0.00	0.35	60.67	0.000	0.001	60.92
Hydro Ax, Skid Truck	0.03	0.28	0.04	0.04	0.00	0.28	66.91	0.000	0.001	67.20
Auger, Rockpiker, Loader	0.04	0.14	0.02	0.02	0.00	0.38	108.47	0.001	0.001	108.93
Grader	0.03	0.12	0.02	0.02	0.00	0.34	96.42	0.001	0.004	97.49
Skidder, Trencher, Boring	0.05	0.20	0.04	0.04	0.00	0.42	150.67	0.001	0.009	153.37
Rock Drill	0.09	0.38	0.07	0.07	0.00	0.79	281.25	0.001	0.023	288.21
583 Sideboom, Pipe Benders	0.27	0.76	0.05	0.05	0.01	2.15	849.84	0.004	0.090	876.68
D7 Tack Rig	0.02	0.04	0.00	0.00	0.00	0.12	48.22	0.000	0.006	50.07
DB Dozers (Winch, Ripper)	0.45	1.29	0.08	0.08	0.01	3.65	1446.53	0.007	0.219	1512.00
345 Backhoe/Hammer	0.44	2.19	0.22	0.21	0.01	4.95	1386.25	0.007	0.242	1458.48
Vac Lift/Sideboom 594	0.10	0.49	0.05	0.05	0.00	1.11	309.40	0.001	0.061	327.63
Padder, Trencher, Backhoes	0.43	2.16	0.22	0.21	0.01	4.88	1366.16	0.007	0.301	1456.03
	2.58	**10.69**	**1.10**	**1.07**	**0.07**	**24.38**	**7568.87**	**0.04**	**0.98**	**7862.36**

NOTES:

Note 9: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 10: Annual CO, PM, SO_2, and NOx Emissions are calculated using the following calculation (Adj. emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Note 11: For diesel engines all PM is considered to be PM_{10}, $PM_{2.5}$ is 97% of PM/PM_{10}.

Note 12: Annual CH4 emissions are calculated using the following calculation (Adj. HC emission factor (g/hp-hr) * (1-0.984) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
This equation is derived in part from subtracting methane from THC to calculate NMHC. THC - CH_4 = NMHC; THC - NMHC = CH_4; THC - (0.984 * THC) = CH_4; THC * (1-0.984) = CH_4
0.984 is the ratio of MNHC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 13: Emissions estimate for N2O is based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Note 14: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:
CO_2 = 1, CH_4 = 25, N_2O = 298

Note 15: The document referenced above, "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015, is the latest available reference, and is not changed in, or by, MOVES2014.

Table L2-2.4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 4

Criteria Emissions

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	CO	PM	NOx	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.19	0.79	0.12	3.00	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.21	0.91	0.15	3.85	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.35	1.47	0.28	4.38	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.481	0.95	4.09	0.65	4.92	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.48	2.36	0.43	4.25	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.14	0.50	0.08	1.33	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.23	2.07	0.22	3.44	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.23	2.29	0.29	2.44	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.18	0.63	0.12	1.86	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.18	0.63	0.12	1.86	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	6	112	16	10	96	6	3,456	0.371	0.16	0.65	0.15	1.49	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.16	0.65	0.15	1.49	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.15	0.44	0.08	1.34	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.15	0.44	0.08	1.34	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	24	112	16	10	96	6	13,824	0.371	0.15	0.44	0.08	1.34	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.15	0.77	0.12	1.90	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.15	0.77	0.12	1.90	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	16	112	16	10	96	6	9,216	0.371	0.15	0.77	0.12	1.90	0.59
	TOTAL (Tons)																	

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

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NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from EPA's MOVES2014 model.

Table L2-2.4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 4

Criteria Emissions

Description	Age Factor [3]	"A" [3]				Deterioration factor [3]				$S_{PM\ adj}$ [4] g/hp-hr	Adjusted EF (g/hp-hr)						N_2O EF [8] g/MMBtu
		HC	CO	PM	NOx	HC	CO	PM	NOx		HC [5]	CO [5]	PM [4]	SO_2 [6]	NOx [5]	CO_2 [7]	
Chipper	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.086	0.199	0.869	0.087	0.005	3.031	530.398	0.6
Air Compressors	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.214	1.000	0.125	0.005	3.880	589.672	0.6
Pumps	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.358	1.623	0.313	0.005	4.423	589.213	0.6
Welding Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.113	0.984	4.498	0.837	0.006	4.960	692.846	0.6
Hydro Mulcher/Seeder	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.499	2.593	0.531	0.005	4.283	588.766	0.6
Trucks: Dump, Water, Fuel, Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.149	0.550	0.027	0.005	1.342	536.343	0.6
BH/LDR, Forklift, Bush Hog	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.282	0.234	0.005	3.474	595.384	0.6
Hydro Ax, Skid Truck	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.097	0.238	2.522	0.337	0.005	2.458	595.385	0.6
Auger, Rockpiker, Loader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	0.6
Grader	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.183	0.694	0.093	0.005	1.878	536.235	1.6
Skidder, Trencher, Boring	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	2.6
Rock Drill	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.170	0.715	0.140	0.005	1.506	536.278	3.6
583 Sideboom, Pipe Benders	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	4.6
D7 Tack Rig	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	5.6
DB Dozers (Winch, Ripper)	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.159	0.479	0.029	0.005	1.355	536.312	6.6
345 Backhoe/Hammer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	7.6
Vac Lift/Sideboom 594	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	8.6
Padder, Trencher, Backhoes	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.160	0.848	0.085	0.005	1.916	536.309	9.6

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NOTES:

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
"Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009 is the latest available reference, and is not changed in, or by, MOVES2014.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for diesel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for PM are calculated using Equation 2 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
The correction factor S_{PMadj} is made to account for fuel sulfur variations; inputs specific to this calculation are noted below

0.02247	soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T0, T1, T2, T3, T3B, T4A, T4B
0.30	soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T4 and T4N
0.0015	soxdsl (weight percent of sulfur in diesel fuel as required per 40 CFR 80.510 for non-road diesel)
0.33	soxbas (default certification fuel sulfur weight percent, 0.33 is default)

Note 5: Adjusted Emission Factors for HC, CO, and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (TAF = 1 for steady-state equipment)

Note 6: SO_2 Emissions are calculated using Equation 7 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
SO_2 = (BSFC * 453.6 * (1- soxcnv) - $HC_{adj\ EF}$) * 0.01 * soxdsl * 2

Note 7: CO_2 Emissions are calculated using Equation 6 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
CO_2 = (BSFC * 453.6 - $HC_{adj\ EF}$) * 0.87 * 44/12

Note 8: Emission factor for N2O from 40 CFR 98 Subpart C.

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Table L2-2.4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 4 **Criteria Emissions**

Description	VOC [9] tons	CO [10] tons	PM [10]/ PM_{10} [11] tons	$PM_{2.5}$ [11] tons	SO_2 [10] tons	NOx [10] tons	CO_2 [10] tons	CH_4 [12] tons	N_2O [13] tons	GHG [14] tons of CO_2e
Chipper	0.05	0.21	0.02	0.02	0.00	0.73	127.43	0.001	0.002	128.17
Air Compressors	0.01	0.05	0.01	0.01	0.00	0.21	32.20	0.000	0.001	32.38
Pumps	0.02	0.11	0.02	0.02	0.00	0.29	38.61	0.000	0.001	38.84
Welding Rigs	0.19	0.84	0.16	0.15	0.00	0.93	129.33	0.003	0.005	130.90
Hydro Mulcher/Seeder	0.02	0.11	0.02	0.02	0.00	0.19	25.72	0.000	0.000	25.87
Trucks: Dump, Water, Fuel, Rigs	0.31	1.07	0.05	0.05	0.01	2.61	1044.78	0.005	0.014	1049.18
BH/LDR, Forklift, Bush Hog	0.03	0.23	0.02	0.02	0.00	0.35	60.67	0.000	0.001	60.92
Hydro Ax, Skid Truck	0.03	0.28	0.04	0.04	0.00	0.28	66.91	0.000	0.001	67.20
Auger, Rockpiker, Loader	0.04	0.14	0.02	0.02	0.00	0.38	108.47	0.001	0.001	108.93
Grader	0.03	0.12	0.02	0.02	0.00	0.34	96.42	0.001	0.004	97.49
Skidder, Trencher, Boring	0.06	0.24	0.05	0.05	0.00	0.51	180.81	0.001	0.011	184.04
Rock Drill	0.09	0.38	0.07	0.07	0.00	0.79	281.25	0.001	0.023	288.21
583 Sideboom, Pipe Benders	0.27	0.76	0.05	0.05	0.01	2.15	849.84	0.004	0.090	876.68
D7 Tack Rig	0.02	0.04	0.00	0.00	0.00	0.12	48.22	0.000	0.006	50.07
DB Dozers (Winch, Ripper)	0.45	1.29	0.08	0.08	0.01	3.65	1446.53	0.007	0.219	1512.00
345 Backhoe/Hammer	0.44	2.19	0.22	0.21	0.01	4.95	1386.25	0.007	0.242	1458.48
Vac Lift/Sideboom 594	0.10	0.49	0.05	0.05	0.00	1.11	309.40	0.001	0.061	327.63
Padder, Trencher, Backhoes	0.40	2.03	0.20	0.20	0.01	4.59	1285.80	0.006	0.283	1370.38
	2.56	**10.60**	**1.10**	**1.07**	**0.07**	**24.18**	**7518.64**	**0.04**	**0.97**	**7807.38**

NOTES:

Note 9: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 10: Annual CO, PM, SO_2, and NOx Emissions are calculated using the following calculation (Adj. emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Note 11: For diesel engines all PM is considered to be PM_{10}, $PM_{2.5}$ is 97% of PM/PM_{10}.

Note 12: Annual CH4 emissions are calculated using the following calculation (Adj. HC emission factor (g/hp-hr) * (1-0.984) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
This equation is derived in part from subtracting methane from THC to calculate NMHC. THC - CH_4 = NMHC; THC - NMHC = CH_4; THC - (0.984 * THC) = CH_4; THC * (1-0.984) = CH_4
0.984 is the ratio of MNHC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 13: Emissions estimate for N2O is based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Note 14: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:
CO_2 = 1, CH_4 = 25, N_2O = 298

Note 15: The document referenced above, "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015, is the latest available reference, and is not changed in, or by, MOVES2014.

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Table L2-3.1

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 1 **HAPS Emissions Estimates**

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	38	112	16	10	96	6	21,888	0.481	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	6	112	16	10	96	6	3,456	0.371	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	17	112	16	10	96	6	9,792	0.371	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	22	112	16	10	96	6	12,672	0.371	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	18	112	16	10	96	6	10,368	0.371	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	14	0	0	0	0	6	0	0.371	0.59
	TOTAL (Tons)													

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption and load factor are from EPA's MOVES2014 model.

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Table L2-3.1

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 1 **HAPS Emissions Estimates**

Description	HAP Emissions (Tons) [4]							
	Benzene	Toluene	Xylenes	Acrolein	PAHs	1,3-Butadiene	Formaldehyde	Acetaldehyde
Chipper	7.30E-04	3.20E-04	2.23E-04	7.24E-05	1.32E-04	3.06E-05	9.24E-04	6.00E-04
Air Compressors	1.85E-04	8.09E-05	5.64E-05	1.83E-05	3.32E-05	7.73E-06	2.33E-04	1.52E-04
Pumps	2.21E-04	9.71E-05	6.76E-05	2.20E-05	3.99E-05	9.28E-06	2.80E-04	1.82E-04
Welding Rigs	7.07E-04	3.10E-04	2.16E-04	7.01E-05	1.27E-04	2.96E-05	8.94E-04	5.81E-04
Hydro Mulcher/Seeder	1.48E-04	6.47E-05	4.51E-05	1.46E-05	2.66E-05	6.19E-06	1.87E-04	1.21E-04
Trucks: Dump, Water, Fuel, Rigs	5.99E-03	2.62E-03	1.83E-03	5.94E-04	1.08E-03	2.51E-04	7.57E-03	4.92E-03
BH/LDR, Forklift, Bush Hog	3.48E-04	1.52E-04	1.06E-04	3.45E-05	6.26E-05	1.46E-05	4.40E-04	2.86E-04
Hydro Ax, Skid Truck	3.84E-04	1.68E-04	1.17E-04	3.80E-05	6.91E-05	1.61E-05	4.85E-04	3.15E-04
Auger, Rockpiker, Loader	6.22E-04	2.73E-04	1.90E-04	6.16E-05	1.12E-04	2.61E-05	7.86E-04	5.11E-04
Grader	5.53E-04	2.42E-04	1.69E-04	5.48E-05	9.95E-05	2.32E-05	6.99E-04	4.54E-04
Skidder, Trencher, Boring	8.63E-04	3.79E-04	2.64E-04	8.56E-05	1.55E-04	3.62E-05	1.09E-03	7.10E-04
Rock Drill	1.21E-03	5.30E-04	3.69E-04	1.20E-04	2.18E-04	5.07E-05	1.53E-03	9.94E-04
583 Sideboom, Pipe Benders	4.60E-03	2.02E-03	1.40E-03	4.56E-04	8.28E-04	1.93E-04	5.82E-03	3.78E-03
D7 Tack Rig	2.76E-04	1.21E-04	8.44E-05	2.74E-05	4.98E-05	1.16E-05	3.49E-04	2.27E-04
DB Dozers (Winch, Ripper)	7.60E-03	3.33E-03	2.32E-03	7.53E-04	1.37E-03	3.18E-04	9.61E-03	6.25E-03
345 Backhoe/Hammer	7.15E-03	3.13E-03	2.18E-03	7.09E-04	1.29E-03	3.00E-04	9.04E-03	5.88E-03
Vac Lift/Sideboom 594	1.77E-03	7.77E-04	5.42E-04	1.76E-04	3.19E-04	7.43E-05	2.24E-03	1.46E-03
Padder, Trencher, Backhoes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.34E-02	**1.46E-02**	**1.02E-02**	**3.31E-03**	**6.01E-03**	**1.40E-03**	**4.22E-02**	**2.74E-02**

	≤ 600 HP	> 600 HP
Emission Factor [3]	**lb/MMBtu**	**lb/MMBtu**
Benzene	9.33E-04	7.76E-04
Toluene	4.09E-04	2.81E-04
Xylenes	2.85E-04	1.93E-04
Acrolein	9.25E-05	7.88E-06
PAHs	1.68E-04	2.12E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.89E-05
Acetaldehyde	7.67E-04	2.52E-05

NOTES:

Note 3: Emission factors from AP-42 Section 3.3, Table 3.3-2 for engines ≤600 HP and AP-42 Section 3.4, Tables 3.4-3 and 3.4-4 for engines >600 HP.

Note 4: Emissions estimates are based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

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Table L2-3.2

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 2 **HAPS Emissions Estimates**

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.367	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.408	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.481	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.408	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.371	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.412	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.412	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	25	112	16	10	96	6	14,400	0.371	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	18	0	0	0	0	6	0	0.371	0.59
	TOTAL (Tons)													

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption and load factor are from EPA's MOVES2014 model.

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Table L2-3.2

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 2 **HAPS Emissions Estimates**

Description	HAP Emissions (Tons) [4]							
	Benzene	Toluene	Xylenes	Acrolein	PAHs	1,3-Butadiene	Formaldehyde	Acetaldehyde
Chipper	7.30E-04	3.20E-04	2.23E-04	7.24E-05	1.32E-04	3.06E-05	9.24E-04	6.00E-04
Air Compressors	1.85E-04	8.09E-05	5.64E-05	1.83E-05	3.32E-05	7.73E-06	2.33E-04	1.52E-04
Pumps	1.99E-04	8.73E-05	6.09E-05	1.98E-05	3.59E-05	8.35E-06	2.52E-04	1.64E-04
Welding Rigs	6.31E-04	2.77E-04	1.93E-04	6.26E-05	1.14E-04	2.64E-05	7.98E-04	5.19E-04
Hydro Mulcher/Seeder	1.48E-04	6.47E-05	4.51E-05	1.46E-05	2.66E-05	6.19E-06	1.87E-04	1.21E-04
Trucks: Dump, Water, Fuel, Rigs	7.76E-03	3.40E-03	2.37E-03	7.70E-04	1.40E-03	3.25E-04	9.82E-03	6.38E-03
BH/LDR, Forklift, Bush Hog	3.44E-04	1.51E-04	1.05E-04	3.41E-05	6.20E-05	1.44E-05	4.36E-04	2.83E-04
Hydro Ax, Skid Truck	3.45E-04	1.51E-04	1.06E-04	3.42E-05	6.22E-05	1.45E-05	4.37E-04	2.84E-04
Auger, Rockpiker, Loader	6.90E-04	3.03E-04	2.11E-04	6.84E-05	1.24E-04	2.89E-05	8.73E-04	5.68E-04
Grader	6.14E-04	2.69E-04	1.87E-04	6.08E-05	1.11E-04	2.57E-05	7.76E-04	5.05E-04
Skidder, Trencher, Boring	8.63E-04	3.79E-04	2.64E-04	8.56E-05	1.55E-04	3.62E-05	1.09E-03	7.10E-04
Rock Drill	1.61E-03	7.07E-04	4.92E-04	1.60E-04	2.90E-04	6.75E-05	2.04E-03	1.33E-03
583 Sideboom, Pipe Benders	4.87E-03	2.13E-03	1.49E-03	4.83E-04	8.77E-04	2.04E-04	6.16E-03	4.00E-03
D7 Tack Rig	2.76E-04	1.21E-04	8.44E-05	2.74E-05	4.98E-05	1.16E-05	3.49E-04	2.27E-04
DB Dozers (Winch, Ripper)	8.63E-03	3.79E-03	2.64E-03	8.56E-04	1.55E-03	3.62E-04	1.09E-02	7.10E-03
345 Backhoe/Hammer	7.94E-03	3.48E-03	2.43E-03	7.88E-04	1.43E-03	3.33E-04	1.00E-02	6.53E-03
Vac Lift/Sideboom 594	1.77E-03	7.77E-04	5.42E-04	1.76E-04	3.19E-04	7.43E-05	2.24E-03	1.46E-03
Padder, Trencher, Backhoes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.76E-02	**1.65E-02**	**1.15E-02**	**3.73E-03**	**6.77E-03**	**1.58E-03**	**4.76E-02**	**3.09E-02**

	≤ 600 HP	> 600 HP
Emission Factor [3]	**lb/MMBtu**	**lb/MMBtu**
Benzene	9.33E-04	7.76E-04
Toluene	4.09E-04	2.81E-04
Xylenes	2.85E-04	1.93E-04
Acrolein	9.25E-05	7.88E-06
PAHs	1.68E-04	2.12E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.89E-05
Acetaldehyde	7.67E-04	2.52E-05

NOTES:

Note 3: Emission factors from AP-42 Section 3.3, Table 3.3-2 for engines ≤600 HP and AP-42 Section 3.4, Tables 3.4-3 and 3.4-4 for engines >600 HP.

Note 4: Emissions estimates are based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

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Table L2-3.3

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 3 **HAPS Emissions Estimates**

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.481	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	5	112	16	10	96	6	2,880	0.371	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	24	112	16	10	96	6	13,824	0.371	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	17	0	0	0	0	6	0	0.371	0.59
	TOTAL (Tons)													

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption and load factor are from EPA's MOVES2014 model.

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Table L2-3.3

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 3

HAPS Emissions Estimates

Description	HAP Emissions (Tons) [4]							
	Benzene	Toluene	Xylenes	Acrolein	PAHs	1,3-Butadiene	Formaldehyde	Acetaldehyde
Chipper	7.30E-04	3.20E-04	2.23E-04	7.24E-05	1.32E-04	3.06E-05	9.24E-04	6.00E-04
Air Compressors	1.85E-04	8.09E-05	5.64E-05	1.83E-05	3.32E-05	7.73E-06	2.33E-04	1.52E-04
Pumps	2.21E-04	9.71E-05	6.76E-05	2.20E-05	3.99E-05	9.28E-06	2.80E-04	1.82E-04
Welding Rigs	7.44E-04	3.26E-04	2.27E-04	7.37E-05	1.34E-04	3.12E-05	9.41E-04	6.11E-04
Hydro Mulcher/Seeder	1.48E-04	6.47E-05	4.51E-05	1.46E-05	2.66E-05	6.19E-06	1.87E-04	1.21E-04
Trucks: Dump, Water, Fuel, Rigs	5.99E-03	2.62E-03	1.83E-03	5.94E-04	1.08E-03	2.51E-04	7.57E-03	4.92E-03
BH/LDR, Forklift, Bush Hog	3.48E-04	1.52E-04	1.06E-04	3.45E-05	6.26E-05	1.46E-05	4.40E-04	2.86E-04
Hydro Ax, Skid Truck	3.84E-04	1.68E-04	1.17E-04	3.80E-05	6.91E-05	1.61E-05	4.85E-04	3.15E-04
Auger, Rockpiker, Loader	6.22E-04	2.73E-04	1.90E-04	6.16E-05	1.12E-04	2.61E-05	7.86E-04	5.11E-04
Grader	5.53E-04	2.42E-04	1.69E-04	5.48E-05	9.95E-05	2.32E-05	6.99E-04	4.54E-04
Skidder, Trencher, Boring	8.63E-04	3.79E-04	2.64E-04	8.56E-05	1.55E-04	3.62E-05	1.09E-03	7.10E-04
Rock Drill	1.61E-03	7.07E-04	4.92E-04	1.60E-04	2.90E-04	6.75E-05	2.04E-03	1.33E-03
583 Sideboom, Pipe Benders	4.87E-03	2.13E-03	1.49E-03	4.83E-04	8.77E-04	2.04E-04	6.16E-03	4.00E-03
D7 Tack Rig	2.76E-04	1.21E-04	8.44E-05	2.74E-05	4.98E-05	1.16E-05	3.49E-04	2.27E-04
DB Dozers (Winch, Ripper)	8.29E-03	3.63E-03	2.53E-03	8.22E-04	1.49E-03	3.47E-04	1.05E-02	6.81E-03
345 Backhoe/Hammer	7.94E-03	3.48E-03	2.43E-03	7.88E-04	1.43E-03	3.33E-04	1.00E-02	6.53E-03
Vac Lift/Sideboom 594	1.77E-03	7.77E-04	5.42E-04	1.76E-04	3.19E-04	7.43E-05	2.24E-03	1.46E-03
Padder, Trencher, Backhoes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.55E-02	**1.56E-02**	**1.09E-02**	**3.52E-03**	**6.40E-03**	**1.49E-03**	**4.50E-02**	**2.92E-02**

	≤ 600 HP	> 600 HP
Emission Factor [3]	**lb/MMBtu**	**lb/MMBtu**
Benzene	9.33E-04	7.76E-04
Toluene	4.09E-04	2.81E-04
Xylenes	2.85E-04	1.93E-04
Acrolein	9.25E-05	7.88E-06
PAHs	1.68E-04	2.12E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.89E-05
Acetaldehyde	7.67E-04	2.52E-05

NOTES:

Note 3: Emission factors from AP-42 Section 3.3, Table 3.3-2 for engines ≤600 HP and AP-42 Section 3.4, Tables 3.4-3 and 3.4-4 for engines >600 HP.

Note 4: Emissions estimates are based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

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Table L2-3.4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 4 **HAPs Emissions**

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	Load Factor [2]
Chipper	Crushing/Proc. Equipment	2270002054	Diesel	T2	440	2	112	16	10	96	6	1,152	0.367	0.43
Air Compressors	Light Comm. Air Comp.	2270006015	Diesel	T2	50	4	112	16	10	96	6	2,304	0.408	0.43
Pumps	Light Commercial Pumps	2270006010	Diesel	T2	40	6	112	16	10	96	6	3,456	0.408	0.43
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	40	112	16	10	96	6	23,040	0.481	0.21
Hydro Mulcher/Seeder	Light Commercial Pumps	2270006010	Diesel	T2	80	2	112	16	10	96	6	1,152	0.408	0.43
Trucks: Dump, Water, Fuel, Rigs	Off-Highway Trucks	2270002051	Diesel	T2	400	13	112	16	10	96	6	7,488	0.371	0.59
BH/LDR, Forklift, Bush Hog	Rubber Tire Dozers	2270002063	Diesel	T2	68	4	112	16	10	96	6	2,304	0.412	0.59
Hydro Ax, Skid Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	3	112	16	10	96	6	1,728	0.412	0.59
Auger, Rockpiker, Loader	Rubber Tire Dozers	2270002063	Diesel	T2	180	3	112	16	10	96	6	1,728	0.371	0.59
Grader	Rubber Tire Dozers	2270002063	Diesel	T2	240	2	112	16	10	96	6	1,152	0.371	0.59
Skidder, Trencher, Boring	Tracked excavator	2270002036	Diesel	T2	150	6	112	16	10	96	6	3,456	0.371	0.59
Rock Drill	Tracked excavator	2270002036	Diesel	T2	175	8	112	16	10	96	6	4,608	0.371	0.59
583 Sideboom, Pipe Benders	Tracked excavator	2270002036	Diesel	T2	235	18	112	16	10	96	6	10,368	0.371	0.59
D7 Tack Rig	Tracked excavator	2270002036	Diesel	T2	240	1	112	16	10	96	6	576	0.371	0.59
DB Dozers (Winch, Ripper)	Tracked excavator	2270002036	Diesel	T2	300	24	112	16	10	96	6	13,824	0.371	0.59
345 Backhoe/Hammer	Tracked excavator	2270002036	Diesel	T2	345	20	112	16	10	96	6	11,520	0.371	0.59
Vac Lift/Sideboom 594	Tracked excavator	2270002036	Diesel	T2	385	4	112	16	10	96	6	2,304	0.371	0.59
Padder, Trencher, Backhoes	Tracked excavator	2270002036	Diesel	T2	400	16	0	0	0	0	6	0	0.371	0.59
	TOTAL (Tons)													

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption and load factor are from EPA's MOVES2014 model.

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Table L2-3.4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Pipeline Spread 4 **HAPs Emissions**

Description	HAP Emissions (Tons) [4]							
	Benzene	Toluene	Xylenes	Acrolein	PAHs	1,3-Butadiene	Formaldehyde	Acetaldehyde
Chipper	7.30E-04	3.20E-04	2.23E-04	7.24E-05	1.32E-04	3.06E-05	9.24E-04	6.00E-04
Air Compressors	1.85E-04	8.09E-05	5.64E-05	1.83E-05	3.32E-05	7.73E-06	2.33E-04	1.52E-04
Pumps	2.21E-04	9.71E-05	6.76E-05	2.20E-05	3.99E-05	9.28E-06	2.80E-04	1.82E-04
Welding Rigs	7.44E-04	3.26E-04	2.27E-04	7.37E-05	1.34E-04	3.12E-05	9.41E-04	6.11E-04
Hydro Mulcher/Seeder	1.48E-04	6.47E-05	4.51E-05	1.46E-05	2.66E-05	6.19E-06	1.87E-04	1.21E-04
Trucks: Dump, Water, Fuel, Rigs	5.99E-03	2.62E-03	1.83E-03	5.94E-04	1.08E-03	2.51E-04	7.57E-03	4.92E-03
BH/LDR, Forklift, Bush Hog	3.48E-04	1.52E-04	1.06E-04	3.45E-05	6.26E-05	1.46E-05	4.40E-04	2.86E-04
Hydro Ax, Skid Truck	3.84E-04	1.68E-04	1.17E-04	3.80E-05	6.91E-05	1.61E-05	4.85E-04	3.15E-04
Auger, Rockpiker, Loader	6.22E-04	2.73E-04	1.90E-04	6.16E-05	1.12E-04	2.61E-05	7.86E-04	5.11E-04
Grader	5.53E-04	2.42E-04	1.69E-04	5.48E-05	9.95E-05	2.32E-05	6.99E-04	4.54E-04
Skidder, Trencher, Boring	1.04E-03	4.54E-04	3.17E-04	1.03E-04	1.87E-04	4.34E-05	1.31E-03	8.52E-04
Rock Drill	1.61E-03	7.07E-04	4.92E-04	1.60E-04	2.90E-04	6.75E-05	2.04E-03	1.33E-03
583 Sideboom, Pipe Benders	4.87E-03	2.13E-03	1.49E-03	4.83E-04	8.77E-04	2.04E-04	6.16E-03	4.00E-03
D7 Tack Rig	2.76E-04	1.21E-04	8.44E-05	2.74E-05	4.98E-05	1.16E-05	3.49E-04	2.27E-04
DB Dozers (Winch, Ripper)	8.29E-03	3.63E-03	2.53E-03	8.22E-04	1.49E-03	3.47E-04	1.05E-02	6.81E-03
345 Backhoe/Hammer	7.94E-03	3.48E-03	2.43E-03	7.88E-04	1.43E-03	3.33E-04	1.00E-02	6.53E-03
Vac Lift/Sideboom 594	1.77E-03	7.77E-04	5.42E-04	1.76E-04	3.19E-04	7.43E-05	2.24E-03	1.46E-03
Padder, Trencher, Backhoes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.57E-02	**1.57E-02**	**1.09E-02**	**3.54E-03**	**6.43E-03**	**1.50E-03**	**4.52E-02**	**2.94E-02**

	≤ 600 HP	> 600 HP
Emission Factor [3]	**lb/MMBtu**	**lb/MMBtu**
Benzene	9.33E-04	7.76E-04
Toluene	4.09E-04	2.81E-04
Xylenes	2.85E-04	1.93E-04
Acrolein	9.25E-05	7.88E-06
PAHs	1.68E-04	2.12E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.89E-05
Acetaldehyde	7.67E-04	2.52E-05

NOTES:

Note 3: Emission factors from AP-42 Section 3.3, Table 3.3-2 for engines ≤600 HP and AP-42 Section 3.4, Tables 3.4-3 and 3.4-4 for engines >600 HP.

Note 4: Emissions estimates are based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Table L2-4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Kidder Compressor Station

Criteria Emissions

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	CO	PM	NOx	Load Factor [2]
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	9	154	22	5	132	10	11,880	0.481	0.64	3.94	0.67	5.22	0.21
8,000 Lb All-Terrain Fork Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	1	245	35	8	210	3	630	0.371	0.35	1.33	0.22	3.88	0.59
D-7 LGP Caterpillar or Equivalent	Tracked Excavator	2270002036	Diesel	T2	240	2	245	35	8	210	10	4,200	0.371	0.32	1.14	0.16	3.79	0.59
325 Caterpillar or Equivalent	Tracked Excavator	2270002036	Diesel	T2	180	2	154	22	5	132	10	2,640	0.371	0.32	1.14	0.16	3.79	0.59
330 Caterpillar with Vacuworks & Shoes	Tracked Excavator	2270002036	Diesel	T2	270	3	154	22	5	132	10	3,960	0.371	0.32	1.14	0.16	3.79	0.59
Cat Rubber Tire Backhoe	Rubber Tire Dozers	2270006005	Diesel	T2	100	3	245	35	8	210	10	6,300	0.367	0.34	0.87	0.18	4.1	0.43
583 Caterpillar Pipelayer	Tracked Excavator	2270002036	Diesel	T2	347	1	154	22	5	132	10	1,320	0.371	0.17	1.29	0.16	4.11	0.59
594 Caterpillar Pipelayer	Tracked excavator	2270002036	Diesel	T2	385	1	154	22	5	132	10	1,320	0.371	0.17	1.29	0.16	4.11	0.59
300 Ton Hydraulic Crane	Tracked excavator	2270002036	Diesel	T2	296	1	14	2	0.5	12	10	120	0.371	0.32	1.14	0.16	3.79	0.59
60 Ton Mantis	Tracked excavator	2270002036	Diesel	T2	240	1	91	13	3	78	10	780	0.371	0.32	1.14	0.16	3.79	0.59
Power Generator	Light Comm. Gen. Sets	2270006005	Diesel	T2	35	1	245	35	8	210	10	2,100	0.408	0.28	1.53	0.34	4.73	0.43
	TOTAL (Tons)																	

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from EPA's MOVES2014 model.

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Table L2-4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Kidder Compressor Station

Criteria Emissions

Description	Age Factor [3]	"A" [3]				Deterioration factor [3]				$S_{PM\ adj}$ [4] g/hp-hr	Adjusted EF (g/hp-hr)						N_2O EF [8] g/MMBtu
		HC	CO	PM	NOx	HC	CO	PM	NOx		HC [5]	CO [5]	PM [4]	SO_2 [6]	NOx [5]	CO_2 [7]	
Welding Rigs	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.113	0.662	4.338	0.874	0.006	5.267	693.873	0.6
8,000 Lb All-Terrain Fork Truck	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.362	1.464	0.237	0.005	3.915	535.665	0.6
D-7 LGP Caterpillar or Equivalent	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.331	1.255	0.149	0.005	3.824	535.764	0.6
325 Caterpillar or Equivalent	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.331	1.255	0.149	0.005	3.824	535.764	0.6
330 Caterpillar with Vacuworks & Shoes	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.331	1.255	0.149	0.005	3.824	535.764	0.6
Cat Rubber Tire Backhoe	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.086	0.352	0.958	0.179	0.005	4.137	529.910	0.6
583 Caterpillar Pipelayer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.176	1.420	0.149	0.005	4.147	536.258	0.6
594 Caterpillar Pipelayer	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.176	1.420	0.149	0.005	4.147	536.258	0.6
300 Ton Hydraulic Crane	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.331	1.255	0.149	0.005	3.824	535.764	0.6
60 Ton Mantis	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.087	0.331	1.255	0.149	0.005	3.824	535.764	0.6
Power Generator	1	0.034	0.101	0.473	0.009	1.034	1.101	1.473	1.009	0.096	0.424	1.710	0.320	0.005	4.554	589.003	0.6

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NOTES:

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
"Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009 is the latest available reference, and is not changed in, or by, MOVES2014.

Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for diesel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for PM are calculated using Equation 2 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

The correction factor S_{PMadj} is made to account for fuel sulfur variations; inputs specific to this calculation are noted below

0.02247 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T0, T1, T2, T3, T3B, T4A, T4B

0.30 soxcnv (fraction of fuel sulfur converted to direct PM) for Base, T4 and T4N

0.0015 soxdsl (weight percent of sulfur in diesel fuel as required per 40 CFR 80.510 for non-road diesel)

0.33 soxbas (default certification fuel sulfur weight percent, 0.33 is default)

Note 5: Adjusted Emission Factors for HC, CO, and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

Adjusted EF = Efss * TAF * DF (TAF = 1 for steady-state equipment)

Note 6: SO_2 Emissions are calculated using Equation 7 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

SO_2 = (BSFC * 453.6 * (1- soxcnv) - $HC_{adj\ EF}$) * 0.01 * soxdsl * 2

Note 7: CO_2 Emissions are calculated using Equation 6 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

CO_2 = (BSFC * 453.6 - $HC_{adj\ EF}$) * 0.87 * 44/12

Note 8: Emission factor for N2O from 40 CFR 98 Subpart C.

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Table L2-4

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Kidder Compressor Station

Criteria Emissions

Description	VOC [9] tons	CO [10] tons	PM [10]/ PM_{10} [11] tons	$PM_{2.5}$ [11] tons	SO_2 [10] tons	NOx [10] tons	CO_2 [10] tons	CH_4 [12] tons	N_2O [13] tons	GHG [14] tons of CO_2e
Welding Rigs	0.07	0.42	0.08	0.08	0.00	0.51	66.79	0.001	0.003	67.58
8,000 Lb All-Terrain Fork Truck	0.02	0.06	0.01	0.01	0.00	0.16	21.95	0.000	0.000	22.04
D-7 LGP Caterpillar or Equivalent	0.23	0.82	0.10	0.09	0.00	2.51	351.23	0.003	0.005	352.76
325 Caterpillar or Equivalent	0.11	0.39	0.05	0.04	0.00	1.18	165.58	0.002	0.002	166.30
330 Caterpillar with Vacuworks & Shoes	0.24	0.87	0.10	0.10	0.00	2.66	372.55	0.004	0.005	374.18
Cat Rubber Tire Backhoe	0.11	0.29	0.05	0.05	0.00	1.24	158.24	0.002	0.003	159.17
583 Caterpillar Pipelayer	0.06	0.42	0.04	0.04	0.00	1.24	159.75	0.001	0.002	160.42
594 Caterpillar Pipelayer	0.06	0.47	0.05	0.05	0.00	1.37	177.24	0.001	0.002	177.99
300 Ton Hydraulic Crane	0.01	0.03	0.00	0.00	0.00	0.09	12.38	0.000	0.000	12.43
60 Ton Mantis	0.04	0.15	0.02	0.02	0.00	0.47	65.23	0.001	0.001	65.51
Power Generator	0.02	0.06	0.01	0.01	0.00	0.16	20.52	0.000	0.000	20.64
	0.95	**3.98**	**0.52**	**0.50**	**0.01**	**11.57**	**1571.45**	**0.014**	**0.024**	**1579.04**

NOTES:

Note 9: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 10: Annual CO, PM, SO_2, and NOx Emissions are calculated using the following calculation (Adj. emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Note 11: For diesel engines all PM is considered to be PM_{10}, $PM_{2.5}$ is 97% of PM/PM_{10}.

Note 12: Annual CH4 emissions are calculated using the following calculation (Adj. HC emission factor (g/hp-hr) * (1-0.984) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
This equation is derived in part from subtracting methane from THC to calculate NMHC. THC - CH_4 = NMHC; THC - NMHC = CH_4; THC - (0.984 * THC) = CH_4; THC * (1-0.984) = CH_4
0.984 is the ratio of MNHC to THC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 13: Emissions estimate for N2O is based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Note 14: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:
CO_2 = 1, CH_4 = 25, N_2O = 298

Note 15: The document referenced above, "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015, is the latest available reference, and is not changed in, or by, MOVES2014.

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Table L2-5

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Kidder Compressor Station **HAPs Emissions**

Description	Equipment category based on NONROAD classification	SCC [1]	Fuel Type	Engine Technology Type	Equipment HP	Number of Equipment	Total Days	Total Weeks	Total Months	Total Working Days	Hours per Day	Total Working hrs	BSFC [2] lb/hp-hr	Load Factor [2]
Welding Rigs	Light Commercial Welders	2270006025	Diesel	T2	35	9	154	22	5	132	10	11880	0.481	0.21
8,000 Lb All-Terrain Fork Truck	Rubber Tire Dozers	2270002063	Diesel	T2	100	1	245	35	8	210	3	630	0.371	0.59
D-7 LGP Caterpillar or Equivalent	Tracked Excavator	2270002036	Diesel	T2	240	2	245	35	8	210	10	4200	0.371	0.59
325 Caterpillar or Equivalent	Tracked Excavator	2270002036	Diesel	T2	180	2	154	22	5	132	10	2640	0.371	0.59
330 Caterpillar with Vacuworks & Shoes	Tracked Excavator	2270002036	Diesel	T2	270	3	154	22	5	132	10	3960	0.371	0.59
Cat Rubber Tire Backhoe	Rubber Tire Dozers	2270006005	Diesel	T2	100	3	245	35	8	210	10	6300	0.367	0.43
583 Caterpillar Pipelayer	Tracked Excavator	2270002036	Diesel	T2	347	1	154	22	5	132	10	1320	0.371	0.59
594 Caterpillar Pipelayer	Tracked excavator	2270002036	Diesel	T2	385	1	154	22	5	132	10	1320	0.371	0.59
300 Ton Hydraulic Crane	Tracked excavator	2270002036	Diesel	T2	296	1	14	2	0.5	12	10	120	0.371	0.59
60 Ton Mantis	Tracked excavator	2270002036	Diesel	T2	240	1	91	13	3	78	10	780	0.371	0.59
Power Generator	Light Comm. Gen. Sets	2270006005	Diesel	T2	35	1	245	35	8	210	10	2100	0.408	0.43
	TOTAL (Tons)													

AECOM assumed engines tiers for construction based on start date and length of time from effective dates of engine tiers

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption and load factor are from EPA's MOVES2014 model.

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Table L2-5

PennEast Pipeline Company, LLC
Construction Emissions - Off-road Engines - Kidder Compressor Station **HAPs Emissions**

Description	HAP Emissions (Tons) [4]							
	Benzene	Toluene	Xylenes	Acrolein	PAHs	1,3-Butadiene	Formaldehyde	Acetaldehyde
Welding Rigs	3.84E-04	1.68E-04	1.17E-04	3.80E-05	6.91E-05	1.61E-05	4.85E-04	3.15E-04
8,000 Lb All-Terrain Fork Truck	1.26E-04	5.52E-05	3.85E-05	1.25E-05	2.27E-05	5.28E-06	1.59E-04	1.04E-04
D-7 LGP Caterpillar or Equivalent	2.01E-03	8.83E-04	6.15E-04	2.00E-04	3.63E-04	8.44E-05	2.55E-03	1.66E-03
325 Caterpillar or Equivalent	9.50E-04	4.16E-04	2.90E-04	9.42E-05	1.71E-04	3.98E-05	1.20E-03	7.81E-04
330 Caterpillar with Vacuworks & Shoes	2.14E-03	9.37E-04	6.53E-04	2.12E-04	3.85E-04	8.96E-05	2.70E-03	1.76E-03
Cat Rubber Tire Backhoe	9.08E-04	3.98E-04	2.77E-04	9.00E-05	1.63E-04	3.80E-05	1.15E-03	7.46E-04
583 Caterpillar Pipelayer	9.16E-04	4.01E-04	2.80E-04	9.08E-05	1.65E-04	3.84E-05	1.16E-03	7.53E-04
594 Caterpillar Pipelayer	1.02E-03	4.45E-04	3.10E-04	1.01E-04	1.83E-04	4.26E-05	1.28E-03	8.35E-04
300 Ton Hydraulic Crane	7.10E-05	3.11E-05	2.17E-05	7.04E-06	1.28E-05	2.98E-06	8.98E-05	5.84E-05
60 Ton Mantis	3.74E-04	1.64E-04	1.14E-04	3.71E-05	6.74E-05	1.57E-05	4.73E-04	3.08E-04
Power Generator	1.18E-04	5.16E-05	3.60E-05	1.17E-05	2.12E-05	4.93E-06	1.49E-04	9.68E-05
	9.01E-03	**3.95E-03**	**2.75E-03**	**8.94E-04**	**1.62E-03**	**3.78E-04**	**1.14E-02**	**7.41E-03**

	≤ 600 HP	> 600 HP
Emission Factor [3]	**lb/MMBtu**	**lb/MMBtu**
Benzene	9.33E-04	7.76E-04
Toluene	4.09E-04	2.81E-04
Xylenes	2.85E-04	1.93E-04
Acrolein	9.25E-05	7.88E-06
PAHs	1.68E-04	2.12E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.89E-05
Acetaldehyde	7.67E-04	2.52E-05

NOTES:

Note 3: Emission factors from AP-42 Section 3.3, Table 3.3-2 for engines ≤600 HP and AP-42 Section 3.4, Tables 3.4-3 and 3.4-4 for engines >600 HP.

Note 4: Emissions estimates are based on a higher heating value of 138,000 Btu/gallon and a density of 7.05 lb/gallon.

Table L2-6
PennEast Pipeline Company, LLC
Pipeline Construction Emissions - On-road Vehicles

Description	Category Based on MOVES2014 Classification	Number of Equipment	Total Days	Total Weeks	Total Months	Working Days	Miles per Day	Calc. VMT [1]
Gas Pickup Trucks - Spread 1	31 - Passenger Truck - Gas	94	112	16	10	96	50	451,200
Gas Pickup Trucks - Spread 2	31 - Passenger Truck - Gas	105	112	16	10	96	50	504,000
Gas Pickup Trucks - Spread 3	31 - Passenger Truck - Gas	103	112	16	10	96	50	494,400
Gas Pickup Trucks - Spread 4	31 - Passenger Truck - Gas	104	112	16	10	96	50	499,200
Float, Lowboy, Tractor Trucks Spread 1	52 - Single Unit Short-Haul Truck - Diesel	21	112	16	10	96	50	100,800
Float, Lowboy, Tractor Trucks Spread 2	52 - Single Unit Short-Haul Truck - Diesel	21	112	16	10	96	50	100,800
Float, Lowboy, Tractor Trucks Spread 3	52 - Single Unit Short-Haul Truck - Diesel	21	112	16	10	96	50	100,800
Float, Lowboy, Tractor Trucks Spread 4	52 - Single Unit Short-Haul Truck - Diesel	22	112	16	10	96	50	105,600
Diesel Parts Vans - Spread 1	32 - Light Commercial Truck - Diesel	8	112	16	10	96	50	38,400
Diesel Parts Vans - Spread 2	32 - Light Commercial Truck - Diesel	8	112	16	10	96	50	38,400
Diesel Parts Vans - Spread 3	32 - Light Commercial Truck - Diesel	8	112	16	10	96	50	38,400
Diesel Parts Vans - Spread 4	32 - Light Commercial Truck - Diesel	8	112	16	10	96	50	38,400
Bus - Spread 1	32 - Light Commercial Truck - Diesel	10	112	16	10	96	50	48,000
Bus - Spread 2	32 - Light Commercial Truck - Diesel	11	112	16	10	96	50	52,800
Bus - Spread 3	32 - Light Commercial Truck - Diesel	11	112	16	10	96	50	52,800
Bus - Spread 4	32 - Light Commercial Truck - Diesel	11	112	16	10	96	50	52,800

Description	Category Based on MOVES2014 Classification	VOC [2] g/VMT	CO [2] g/VMT	PM_{10} [2] g/VMT	$PM_{2.5}$ [2] g/VMT	SO_2 [2] g/VMT	NOx [2] g/VMT	CO_2 [2] g/VMT	CH_4 [2] g/VMT	N_2O [2] g/VMT	GHG [3] g CO_2e /VMT	HAPs [2,4] g/VMT
Gas Pickup Trucks - Spread 1	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Gas Pickup Trucks - Spread 2	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Gas Pickup Trucks - Spread 3	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Gas Pickup Trucks - Spread 4	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Float, Lowboy, Tractor Trucks Spread 1	52 - Single Unit Short-Haul Truck - Diesel	0.39	1.47	0.23	0.16	0.01	3.02	912.36	0.05	0.00	914.26	0.06
Float, Lowboy, Tractor Trucks Spread 2	52 - Single Unit Short-Haul Truck - Diesel	0.39	1.47	0.23	0.16	0.01	3.02	912.36	0.05	0.00	914.26	0.06
Float, Lowboy, Tractor Trucks Spread 3	52 - Single Unit Short-Haul Truck - Diesel	0.39	1.47	0.23	0.16	0.01	3.02	912.36	0.05	0.00	914.26	0.06
Float, Lowboy, Tractor Trucks Spread 4	52 - Single Unit Short-Haul Truck - Diesel	0.39	1.47	0.23	0.16	0.01	3.02	912.36	0.05	0.00	914.26	0.06
Diesel Parts Vans - Spread 1	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Diesel Parts Vans - Spread 2	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Diesel Parts Vans - Spread 3	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Diesel Parts Vans - Spread 4	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Bus - Spread 1	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Bus - Spread 2	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Bus - Spread 3	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09
Bus - Spread 4	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09

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PennEast Pipeline Company, LLC
Pipeline Construction Emissions - On-road Vehicles

Description	Category Based on MOVES2014 Classification	VOC ton/yr	CO ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	SO_2 ton/yr	NOx ton/yr	CO_2 ton/yr	CH_4 ton/yr	N_2O ton/yr	GHG ton CO_2e /yr	HAPs ton/yr
Gas Pickup Trucks - Spread 1	31 - Passenger Truck - Gas	4.86E-01	4.73E+00	3.04E-02	1.27E-02	4.66E-03	6.50E-01	233.8	1.58E-02	1.31E-02	238.08	2.63E-02
Gas Pickup Trucks - Spread 2	31 - Passenger Truck - Gas	5.43E-01	5.28E+00	3.40E-02	1.42E-02	5.20E-03	7.26E-01	261.1	1.77E-02	1.46E-02	265.95	2.94E-02
Gas Pickup Trucks - Spread 3	31 - Passenger Truck - Gas	5.33E-01	5.18E+00	3.33E-02	1.39E-02	5.11E-03	7.12E-01	256.2	1.74E-02	1.44E-02	260.88	2.89E-02
Gas Pickup Trucks - Spread 4	31 - Passenger Truck - Gas	5.38E-01	5.23E+00	3.37E-02	1.40E-02	5.15E-03	7.19E-01	258.7	1.75E-02	1.45E-02	263.41	2.91E-02
Float, Lowboy, Tractor Trucks Spread 1	52 - Single Unit Short-Haul Truck - Diesel	4.32E-02	1.64E-01	2.52E-02	1.80E-02	8.92E-04	3.36E-01	101.4	5.48E-03	2.48E-04	101.59	6.26E-03
Float, Lowboy, Tractor Trucks Spread 2	52 - Single Unit Short-Haul Truck - Diesel	4.32E-02	1.64E-01	2.52E-02	1.80E-02	8.92E-04	3.36E-01	101.4	5.48E-03	2.48E-04	101.59	6.26E-03
Float, Lowboy, Tractor Trucks Spread 3	52 - Single Unit Short-Haul Truck - Diesel	4.32E-02	1.64E-01	2.52E-02	1.80E-02	8.92E-04	3.36E-01	101.4	5.48E-03	2.48E-04	101.59	6.26E-03
Float, Lowboy, Tractor Trucks Spread 4	52 - Single Unit Short-Haul Truck - Diesel	4.53E-02	1.71E-01	2.64E-02	1.88E-02	9.35E-04	3.52E-01	106.2	5.74E-03	2.60E-04	106.42	6.56E-03
Diesel Parts Vans - Spread 1	32 - Light Commercial Truck - Diesel	2.68E-02	1.87E-01	6.13E-03	4.34E-03	2.38E-04	8.96E-02	26.6	2.36E-03	8.87E-05	26.68	3.84E-03
Diesel Parts Vans - Spread 2	32 - Light Commercial Truck - Diesel	2.68E-02	1.87E-01	6.13E-03	4.34E-03	2.38E-04	8.96E-02	26.6	2.36E-03	8.87E-05	26.68	3.84E-03
Diesel Parts Vans - Spread 3	32 - Light Commercial Truck - Diesel	2.68E-02	1.87E-01	6.13E-03	4.34E-03	2.38E-04	8.96E-02	26.6	2.36E-03	8.87E-05	26.68	3.84E-03
Diesel Parts Vans - Spread 4	32 - Light Commercial Truck - Diesel	2.68E-02	1.87E-01	6.13E-03	4.34E-03	2.38E-04	8.96E-02	26.6	2.36E-03	8.87E-05	26.68	3.84E-03
Bus - Spread 1	32 - Light Commercial Truck - Diesel	3.35E-02	2.34E-01	7.67E-03	5.43E-03	2.97E-04	1.12E-01	33.2	2.94E-03	1.11E-04	33.35	4.80E-03
Bus - Spread 2	32 - Light Commercial Truck - Diesel	3.68E-02	2.57E-01	8.43E-03	5.97E-03	3.27E-04	1.23E-01	36.6	3.24E-03	1.22E-04	36.68	5.28E-03
Bus - Spread 3	32 - Light Commercial Truck - Diesel	3.68E-02	2.57E-01	8.43E-03	5.97E-03	3.27E-04	1.23E-01	36.6	3.24E-03	1.22E-04	36.68	5.28E-03
Bus - Spread 4	32 - Light Commercial Truck - Diesel	3.68E-02	2.57E-01	8.43E-03	5.97E-03	3.27E-04	1.23E-01	36.6	3.24E-03	1.22E-04	36.68	5.28E-03
Total		**2.53**	**22.84**	**0.29**	**0.17**	**0.026**	**5.01**	**1669**	**0.11**	**0.06**	**1690**	**0.18**

Project Element Subtotals	VOC ton/yr	CO ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	SO_2 ton/yr	NOx ton/yr	CO_2 ton/yr	CH_4 ton/yr	N_2O ton/yr	GHG ton CO_2e /yr	HAPs ton/yr
Pipeline Construction - Spread 1	0.590	5.314	0.069	0.040	0.006	1.19	395	0.027	0.014	400	0.041
Pipeline Construction - Spread 2	0.650	5.891	0.074	0.042	0.007	1.27	426	0.029	0.015	431	0.045
Pipeline Construction - Spread 3	0.640	5.790	0.073	0.042	0.007	1.26	421	0.028	0.015	426	0.044
Pipeline Construction - Spread 4	0.647	5.848	0.075	0.043	0.007	1.28	428	0.029	0.015	433	0.045
Total Pipeline On-Road Emissions	**2.53**	**22.84**	**0.29**	**0.17**	**0.026**	**5.01**	**1669**	**0.11**	**0.06**	**1690**	**0.18**

NOTES:

Note 1: Vehicle Miles Traveled (VMT) = (Number of Equipment) * (Working Days) * (Miles per day)

Note 2: Emissions estimates are based on EPA's MOVES2014 motor vehicle emissions estimation program. Year 2016 is used as the base year for EFs. Factors are based on county data from Luzerne County, PA.

Note 3: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:

CO_2 = 1, CH_4 = 25, N_2O = 298

Note 4: HAPs are aggregated for benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein

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Table L2-7
PennEast Pipeline Company, LLC
Kidder Compressor Station Construction Emissions - On-road Vehicles

Description	Category Based on MOVES2014 Classification	Number of Equipment	Total Days	Total Weeks	Total Months	Working Days	Miles per Day	Calc. VMT [1]
Gas Pickup Trucks - Supervisors/Inspectors	31 - Passenger Truck - Gas	10	245	35	8	210	50	105,000
Gas Pickup Trucks - Operators	31 - Passenger Truck - Gas	6	245	35	8	210	50	63,000
Diesel 1-Ton Trucks with Tools	32 - Light Commercial Truck - Diesel	3	154	22	5	132	50	19,800

Description	Category Based on MOVES2014 Classification	VOC [2] g/VMT	CO [2] g/VMT	PM_{10} [2] g/VMT	$PM_{2.5}$ [2] g/VMT	SO_2 [2] g/VMT	NOx [2] g/VMT	CO_2 [2] g/VMT	CH_4 [2] g/VMT	N_2O [2] g/VMT	GHG [3] g CO_2e /VMT	HAPs [2,4] g/VMT
Gas Pickup Trucks - Supervisors/Inspectors	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Gas Pickup Trucks - Operators	31 - Passenger Truck - Gas	0.98	9.51	0.06	0.03	0.01	1.31	470.04	0.03	0.03	478.69	0.05
Diesel 1-Ton Trucks with Tools	32 - Light Commercial Truck - Diesel	0.63	4.42	0.14	0.10	0.01	2.12	628.28	0.06	0.002	630.30	0.09

Description	Category Based on MOVES2014 Classification	VOC ton/yr	CO ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	SO_2 ton/yr	NOx ton/yr	CO_2 ton/yr	CH_4 ton/yr	N_2O ton/yr	GHG ton CO_2e /yr	HAPs ton/yr
Gas Pickup Trucks - Supervisors/Inspectors	31 - Passenger Truck - Gas	1.13E-01	1.10E+00	7.08E-03	2.95E-03	1.08E-03	1.51E-01	54.4	3.69E-03	3.05E-03	55.41	6.13E-03
Gas Pickup Trucks - Operators	31 - Passenger Truck - Gas	6.79E-02	6.60E-01	4.25E-03	1.77E-03	6.51E-04	9.07E-02	32.6	2.21E-03	1.83E-03	33.24	3.68E-03
Diesel 1-Ton Trucks with Tools	32 - Light Commercial Truck - Diesel	1.38E-02	9.64E-02	3.16E-03	2.24E-03	1.22E-04	4.62E-02	13.7	1.21E-03	4.58E-05	13.76	1.98E-03
Total		**0.19**	**1.86**	**0.01**	**0.01**	**0.002**	**0.29**	**101**	**0.01**	**0.00**	**102**	**0.01**

Project Element Subtotals	VOC ton/yr	CO ton/yr	PM_{10} ton/yr	$PM_{2.5}$ ton/yr	SO_2 ton/yr	NOx ton/yr	CO_2 ton/yr	CH_4 ton/yr	N_2O ton/yr	GHG ton CO_2e /yr	HAPs ton/yr
Kidder Station Construction	0.19	1.86	0.01	0.01	0.00	0.29	100.76	0.01	0.00	102.41	0.012
Total Station On-Road Emissions	**0.19**	**1.86**	**0.01**	**0.01**	**0.002**	**0.29**	**101**	**0.01**	**0.00**	**102**	**0.01**

NOTES:

Note 1: Vehicle Miles Traveled (VMT) = (Number of Equipment) * (Working Days) * (Miles per day)

Note 2: Emissions estimates are based on EPA's MOVES2014 motor vehicle emissions estimation program. Year 2016 is used as the base year for EFs. Factors are based on county data from Luzerne County, PA.

Note 3: Greenhouse gasses (GHG) are converted to carbon dioxide equivalents (CO2) using 40 CFR 98 Subpart A global warming potentials as follows:

CO_2 = 1, CH_4 = 25, N_2O = 298

Note 4: HAPs are aggregated for benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein

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Table L2-8
PennEast Pipeline Company, LLC
Construction Emissions - Fugitive Dust from Roadways

Vehicle Type	Daily Onsite Vehicular Traffic [1]	Construction Days [1]	Average Daily Travel Distance per Vehicle [1] (VMT/vehicle/day)		Distance Traveled [2] (VMT)		Estimated Vehicle Weight	
	(Veh)		Paved	Unpaved	Paved	Unpaved	(lbs)	(tons)
Combined Pickup Trucks and Vans - Spread 1	102	96	40	10	391,680	97,920	5000	2.5
Combined Pickup Trucks and Vans - Spread 2	113	96	40	10	433,920	108,480	5000	2.5
Combined Pickup Trucks and Vans - Spread 3	111	96	40	10	426,240	106,560	5000	2.5
Combined Pickup Trucks and Vans - Spread 4	112	96	40	10	430,080	107,520	5000	2.5
Float, Lowboy, Tractor Trucks Spread 1	21	96	48	2	96,768	4,032	50000	25.0
Float, Lowboy, Tractor Trucks Spread 2	21	96	48	2	96,768	4,032	50000	25.0
Float, Lowboy, Tractor Trucks Spread 3	21	96	48	2	96,768	4,032	50000	25.0
Float, Lowboy, Tractor Trucks Spread 4	22	96	48	2	101,376	4,224	50000	25.0
Bus - Spread 1	10	96	45	5	43,200	4,800	20000	10.0
Bus - Spread 2	11	96	45	5	47,520	5,280	20000	10.0
Bus - Spread 3	11	96	45	5	47,520	5,280	20000	10.0
Bus - Spread 4	11	96	45	5	47,520	5,280	20000	10.0
TOTALS (VMT)					**2,259,360**	**457,440**		
WEIGHTED AVERAGE VEHICLE WEIGHT (tons)							Paved	**3.64**
							Unpaved	**4.45**

Parameter	PM10			PM2.5		
	Paved	**Unpaved**	**Total**	**Paved**	**Unpaved**	**Total**
Uncontrolled Emission Factor (lb/VMT) [3],[4]	0.05	0.71	--	0.01	0.07	--
Control Efficiency for dust suppression activities	0%	50%	--	0%	50%	--
Controlled Emission Factor (lb/VMT)	0.05	0.35	--	0.01	0.04	--
Fugitive Roadways Emissions (tons) [5]	51.54	80.86	**132.39**	12.65	8.09	**20.74**

[1] Based on 6 days of operation per week.
[2] VMT = Vehicles x Construction Days x Daily Distance Traveled per Vehicle.
[3] The emission factor for paved roads was estimated using USEPA's AP-42 (1/11) Section 13.2.1 "Paved Roads" and the following:
  A. Emission factor (E) is calculated using Equation (2) in Section 13.2.1: E =(k x (sL)^0.91 x (W)^1.02) x (1 - P/4N)
  B. Table 13.2.1-1 specifies that for PM-10, k is 0.0022 lb/VMT and for PM-2.5, k is 0.00054 lb/VMT.
  C. Table 13.2.1-3 specifies that the typical mean silt loading value (sL) for a municipal solid waste landfill is 7.4 g/m^2, which is assumed to represent the construction site condition.
  D. Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 150; N is 365 days.
[4] The emission factor for unpaved roads was estimated using USEPA's AP-42 (11/06) Section 13.2.2 "Unpaved Roads" and the following:
  A. Emission factor (E) is calculated using Equations (1a) and (2) in Section 13.2.2: E = (k x (s/12)^a x (W/3)^b) x ((365-P)/365)
  B. Table 13.2.2-1 specifies that the typical mean silt content value (s) for a construction site is 8.5%.
  C. Table 13.2.2-2 specifies that for PM-10, k is 1.5 lb/VMT, a is 0.9, and b is 0.45, and for PM-2.5, k is 0.15 lb/VMT, a is 0.9, and b is 0.45.
  D. Figure 13.2.2-1 estimates that days of precipitation >0.01 inch per year (P) is approximately 150.
[5] Dust suppression by water spray at construction site is conservatively assumed to have a control efficiency of 50%.

Table L2-8
PennEast Pipeline Company, LLC
Construction Emissions - Fugitive Dust from Roadways

Vehicle Type	Daily Onsite Vehicular Traffic [1]	Construction Days [1]	Average Daily Travel Distance per Vehicle [1] (VMT/vehicle/day)		Distance Traveled [2] (VMT)		Estimated Vehicle Weight	
	(Veh)		Paved	Unpaved	Paved	Unpaved	(lbs)	(tons)
Gas Pickup Trucks - Supervisors/Inspectors	10	210	40	10	84,000	21,000	5000	2.5
Gas Pickup Trucks - Operators	6	210	40	10	50,400	12,600	5000	2.5
Diesel 1-Ton Trucks with Tools	3	132	45	5	17,820	1,980	6000	3.0
			0	0	0	0		0.0
TOTALS (VMT)					**152,220**	**35,580**		
WEIGHTED AVERAGE VEHICLE WEIGHT (tons)							Paved	**0.47**
							Unpaved	**1.00**

Parameter	PM10			PM2.5		
	Paved	Unpaved	Total	Paved	Unpaved	Total
Uncontrolled Emission Factor (lb/VMT) [3],[4]	0.01	0.28	--	0.00	0.03	--
Control Efficiency for dust suppression activities	0%	50%	--	0%	50%	--
Controlled Emission Factor (lb/VMT)	0.01	0.14	--	0.00	0.01	--
Fugitive Roadways Emissions (tons) [5]	0.43	2.51	**2.94**	0.11	0.25	**0.36**

[1] Based on 6 days of operation per week.
[2] VMT = Vehicles x Construction Days x Daily Distance Traveled per Vehicle.
[3] The emission factor for paved roads was estimated using USEPA's AP-42 (1/11) Section 13.2.1 "Paved Roads" and the following:
  A. Emission factor (E) is calculated using Equation (2) in Section 13.2.1: E =(k x (sL)^0.91 x (W)^1.02) x (1 - P/4N)
  B. Table 13.2.1-1 specifies that for PM-10, k is 0.0022 lb/VMT and for PM-2.5, k is 0.00054 lb/VMT.
  C. Table 13.2.1-3 specifies that the typical mean silt loading value (sL) for a municipal solid waste landfill is 7.4 g/m^2, which is assumed to represent the construction site condition.
  D. Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 150; N is 365 days.
[4] The emission factor for unpaved roads was estimated using USEPA's AP-42 (11/06) Section 13.2.2 "Unpaved Roads" and the following:
  A. Emission factor (E) is calculated using Equations (1a) and (2) in Section 13.2.2: E = (k x (s/12)^a x (W/3)^b) x ((365-P)/365)
  B. Table 13.2.2-1 specifies that the typical mean silt content value (s) for a construction site is 8.5%.
  C. Table 13.2.2-2 specifies that for PM-10, k is 1.5 lb/VMT, a is 0.9, and b is 0.45, and for PM-2.5, k is 0.15 lb/VMT, a is 0.9, and b is 0.45.
  D. Figure 13.2.2-1 estimates that days of precipitation >0.01 inch per year (P) is approximately 150.
[5] Dust suppression by water spray at construction site is conservatively assumed to have a control efficiency of 50%.

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Table L2-9
PennEast Pipeline Company, LLC
Construction Emissions - Fugitive dust from construction activities

Source	Area of Land Disturbance[1] (acres):	Months of Construction Activity[2]:	PM2.5 ton/period	PM10 ton/period
Pipeline Spread 1	243	6.5	29	193
Spread 1 Pipe Yard	25	3	1	9
Pipeline Spread 2	455	6.5	62	411
Spread 2 Pipe Yard	25	3	2	10
Pipeline Spread 3	420	6.5	63	420
Spread 3 Pipe Yard	25	3	2	12
Pipeline Spread 4	492	6.5	74	493
Spread 4 Pipe Yard	25	3	2	12
Kidder Compressor Station	24	6	3	20
Total(1)	1734		237	1580
Pipeline Only	1710			

Emission Factor Equations[3]
PM10 Emission Factor = 0.42 x (1 - CE) x SAE x SMA
PM2.5 Emission Factor = PM10 Emission Factor x Ratio

Project Area Specific PM Emission Factors

Base PM10 Emission Factor(tons/acre-month)	0.42	
Ratio of PM2.5 to PM10 (Ratio)	0.15	
Construction Dust Plan Control Efficiency Factor	50%	
Silt Adjustment Factor (SAF):	3.67	(SAF = Project Value/ 9%)
Basis (original Studies value, see Note 3)	9%	
Average Dry Silt Percent of Project Soils	33%	Weighted Average by Area of Soil Type (Surface Texture Report, See RR7)

Soil Moisture Adjustment Factor (per Climate Divisions of Project Area)

		Thornthwaite's Precipitation-Evaporation Index[5]	Soil Moisture Adjustment (SMA)	Adjusted Emission Factors PM2.5	Adjusted Emission Factors PM10
Basis (Arid Southwest US)	See Note 3	24			
Spread 1	Luzerne County	151	0.16	0.0184	0.1224
Spread 2	Carbon County	133	0.18	0.0208	0.1389
Spread 3	Northampton	120	0.20	0.0231	0.1540
Spread 4	Mercer	120	0.20	0.0231	0.1540

NOTES:

[1] Acres per project spread are calculated in the attached Spread Details table. Size of Pipe Yards was defined by preliminary engineering.

[2] The entire construction activity duration is expected to be 8 to 10 months; however, based on crew activity type and phasing, the emission causing Months of Heavy Construction Activity is used in the emission calculations as shown above. Travel on unpaved roads for crews not using heavy equipment are accounted for in Off-Road travel.

[3] Estimating Particulate Matter Emissions From Construction Operations, Final Report, Eastern Research Group, Inc., September 30, 1999, EPA Contract 68-D7-0068, Section 5.6. It is assumed that the factor and methodology for adjusting the factor for Roadway Construction Emissions are similar in nature to the pipeline construction.

[4] Required and effective fugitive dust control measures will be determined at the site during construction activity. Application of water to mitigate fugitive dust will be used as one of the primary control measure. Mitigation of fugitive dust by the use of water application and other measures is reflected in the 50% control efficiency recommended in the referenced EPA Contract 68-D7-0068 Document.

[5] Thornthwaite's Precipitation-Evaporation Index values are taken from the map on page 5-12 of cited EPA Contract 68-D7-0068 Document.

Table L2-9.1
PennEast Pipeline Company, LLC
Supporting Information for Fugitive Dust from Construction Activities

Spread	From MP	To MP	Total Miles	Laterals		Disturbance Area	From	To
1	0	17.8	17.8			242.73	Origination	Meadow Run Road Crossing
2	17.8	49.1	31.3	2.1	33.4	455.45	Meadow Run Road Crossing	Little Gap Road Crossing
3*	49.1	78	28.9	1.9	30.8	420.00	Little Gap Road Crossing	Delaware River
4**	78	114.1	36.1			492.27	Delaware River	End
						1,610.45		

* Spread 3 includes the 24-inch Hellertown Lateral
** Spread 4 includes 12-inch Gilbert Lateral and the 36-inch Lambertville Lateral

Note: Mile Posts are Preliminary and Approximate

Percent of pipeline distance that is disturbed for construction:

50%	100	feet wide construction disturbance area
50%	125	feet wide construction disturbance area
100%	112.50	average width of disturbance area

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Appendix L-3

Operational Emissions

Table L3-1 **Configuration: Mars 100 Turbines and Caterpillar G3516 LE Emergency Generator**

Kidder Compressor Station Total Annual Emissions - Estimate of Potential to Emit (PTE)

Month	Hours in specified Month	NOx (Average lbm/month)	CO (lb/month)	VOC (lb/month)	SO_2 (lb/month)	Formaldehyde (Single HAP) (lb/month)	Total HAP (lb/month)	Total PM_{10} (lb/month)	Total $PM_{2.5}$ (lb/month)	Total CO_2 (lb/month)
12	744	5,119	5,192	403.1	319.2	226.3	242.2	1408.4	1408.4	10,328,396
1	744	5,212	5,288	413.6	324.9	230.3	246.6	1433.4	1433.4	10,511,887
2	672	4,691	4,759	371.7	292.4	207.3	221.9	1290.2	1290.2	9,461,304
3	744	5,127	5,200	403.9	319.7	226.6	242.6	1410.6	1410.6	10,344,161
4	720	4,799	4,864	373.4	299.7	212.4	227.4	1322.0	1322.0	9,694,836
5	744	4,837	4,901	373.6	302.6	214.5	229.6	1334.9	1334.9	9,789,260
6	720	4,595	4,655	353.4	288.0	204.1	218.5	1270.4	1270.4	9,316,319
7	744	4,720	4,780	362.5	295.9	209.8	224.6	1305.6	1305.6	9,574,294
8	744	4,748	4,810	365.2	297.6	210.9	225.8	1312.8	1312.8	9,626,863
9	720	4,652	4,713	358.8	291.2	206.4	221.0	1284.6	1284.6	9,420,358
10	744	4,884	4,949	378.3	305.3	216.4	231.7	1346.9	1346.9	9,877,587
11	720	4,840	4,907	377.7	302.1	214.1	229.3	1332.9	1332.9	9,774,428
Total Hours per year	8760									
Total per One Solar Mars 100 (tpy)		**29.11**	**29.51**	**2.27**	**1.82**	**1.29**	**1.38**	**8.03**	**8.03**	**58,860**
Total for 3 turbines (tpy)		**87.34**	**88.53**	**6.80**	**5.46**	**3.87**	**4.14**	**24.08**	**24.08**	**176,580**
Shutdown/Startup - 48 cycles of one turbine (tpy)		**0.08**	**7.63**	**0.09**						**47**
Total Combined with Start/Stop for 3 Turbines (tpy)		**87.42**	**96.16**	**6.89**	**5.46**	**3.87**	**4.14**	**24.08**	**24.08**	**176,627**
Emergency Generator (tpy)		**3.62**	**1.69**	**0.07**	**0.05**					**313**
Process Heaters (tpy)		**0.64**	**0.54**	**0.05**	**0.005**	**0.0005**	**0.01**	**0.05**	**0.05**	**769**
Equipment Leaks (tpy)				**0.003**						**96**
Natural Gas Venting (tpy)				**0.006**						**47**
Total Combined Compressor Station Emission Sources (tpy)		**91.7**	**98.4**	**7.02**	**5.52**	**3.87**	**4.15**	**24.1**	**24.1**	**177,852**
Significance Thresholds in Carbon County, PA (tpy)		***100***	***100***	***50***	***100***	***10***	***25***	***100***	***100***	**-**
Title V (Major Source) Significance Threshold Exceeded?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**-**

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L3-2

Kidder Compressor Station

Estimate of Average Hourly Emission Rates - Based on Monthly Average Ambient Temperatures

Month	Monthly mean temperature °Farenheit[1]	Variable Fuel Flow (MMBtu/hr)[2]	NOx (lbm/hr)[2]	CO (lbm/hr)[2]	*UHC (lbm/hr)	VOC (lbm/hr)[3]	SO_2 (lb/hr)[4]	Formaldehyde (lb/hr)[5]	Combined HAPs (lb/hr)[5]	PM_{10} (lb/hr)[6]	$PM_{2.5}$ (lb/hr)[6]	CO2 (lb/hr)[7]
12	29.84	**126.20**	6.88	6.98	2.709	0.542	0.429	0.304	0.326	1.89	1.89	13882
1	19.22	**128.44**	7.00	7.11	2.780	0.556	0.437	0.310	0.331	1.93	1.93	14129
2	21.38	**127.99**	6.98	7.08	2.765	0.553	0.435	0.308	0.330	1.92	1.92	14079
3	28.94	**126.39**	6.89	6.99	2.715	0.543	0.430	0.305	0.326	1.90	1.90	13903
4	47.12	**122.41**	6.66	6.76	2.593	0.519	0.416	0.295	0.316	1.84	1.84	13465
5	59.36	**119.61**	6.50	6.59	2.511	0.502	0.407	0.288	0.309	1.79	1.79	13158
6	67.82	**117.63**	6.38	6.46	2.454	0.491	0.400	0.283	0.303	1.76	1.76	12939
7	70.52	**116.99**	6.34	6.43	2.436	0.487	0.398	0.282	0.302	1.75	1.75	12869
8	67.82	**117.63**	6.38	6.46	2.454	0.491	0.400	0.283	0.303	1.76	1.76	12939
9	62.24	**118.94**	6.46	6.55	2.492	0.498	0.404	0.287	0.307	1.78	1.78	13084
10	54.68	**120.69**	6.56	6.65	2.542	0.508	0.410	0.291	0.311	1.81	1.81	13276
11	42.62	**123.41**	6.72	6.82	2.623	0.525	0.420	0.297	0.318	1.85	1.85	13576
	MAXIMUM per turbine	**128.44**	**7.00**	**7.11**	**2.78**	**0.56**	**0.44**	**0.31**	**0.33**	**1.93**	**1.93**	**14,129**
	MAXIMUM combined (3) turbines	**385.33**	**21.01**	**21.32**	**8.34**	**1.67**	**1.31**	**0.93**	**0.99**	**5.78**	**5.78**	**42,387**

Notes

[1] "Monthly Mean (Average) Temperature" (MNTM) Temperatures taken from NWS dataset for Carbon County PA, December 2012-November 2013 (12 month data set).

[2] Linear Regression extrapolated from manufacturers' performance data @ 100% load- See '3' for formulae

[3] Suggested 10-20% of UHC = VOCs for Solar Turbines burning natural gas, based on a ratio of total NMHC to total Organic Compounds, taken from Volatile Organic Compound, Sulfur Dioxide and Formaldehyde Emission Estimates document by Solar Turbines Incorporated

[4] SO2 based on AP42 Table 3.1-2a, April 2000. Emission factor is of 0.0034 lb SO2/MMBtu on HHV of Natural Gas, taken from "Volatile Organic Compound, Sulfur Dioxide and Formaldehyde Emission Estimates" document provided by Solar Turbines

[5] AP42 Revised HAP Emission Factors for Stationary Combustion Turbines. Factor in lb/MMBtu HHV (95% Upper Confidence of Data - worst case) @ > 90% load Based on HHV of Natural Gas.

[6] PM Factors taken from "Particulate Matter Emission Estimates" by Solar Turbines Incorporated

[7] CO2 Factor (A - rated) taken from Table 3.1-2a "Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines" AP-42 Chapter 3.1

Table L3-3a **Natural Gas Engine Details and Comparison to Diesel Project Emission Potential**

Emergency Generator Emissions (based on an assumed 500 hours of annual operation)

	Proposed Emergency Generator Emissions (g/hp-hr)[1]	PADEP BAT Emission Factor (g/bhp-hr)[2,3]	Subpart JJJJ limits (g/hp-hr)[4]	Project Emission Potential (tpy)	PET From Diesel Sheet	Diesel is greater	PET Values moved to Project Total Sheet
NOx[1]	2	2	2	**1.61**	3.62	**TRUE**	3.62
CO[1]	2.1	1.3	4	**1.69**	0.07	FALSE	1.69
HC (total)	2.3	1.7		**1.85**	0.04	FALSE	1.85
VOC[2]	0.092	0.27	1	**0.07**	0.04	FALSE	0.07
SO_2 (lbs/hr)[3]	1.30E-03	N/A	-	**3.25E-04**	0.05	**TRUE**	0.05
CO2 (lb/MMBtu)	110	N/A	N/A	**313**	0.00	FALSE	313

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Notes

[1] Taken from Manufacturer's Specification Sheet

[2] VOC= NMHC (non-methane) according to EPA's "Conversion Factors for Hydrocarbon Emission Components"
NR-002c December 2005, pg. 3, THC = NMHC = NMOG (http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2005/420r05015.pdf)
This approach does not exclude ethane from the VOC estimate, so the emission estimate

[3] Units of SO2 different from others. SO2 based on Sulfur content of the fuel supply and not specific to the engine.

[4] Table 1 to Subpart JJJJ of Part 60 - Emission Standards for Emergency Engines greater than 130 HP.
Note that the JJJJ limit for VOC does not include formaldehyde as a VOC.

Table L3-3a Natural Gas Engine Details and Comparison to Diesel Project Emission Potential
Emergency Generator Emissions (based on an assumed 500 hours of annual operation)

EMERGENCY GENERATOR DETAILS		CONVERSION FACTORS	
Model	Caterpillar G3516 LE	*lbs per ton*	2000
Fuel Type	Natural Gas	*grams per lb*	454
kWb rating	1,091	*grains per lb*	7,000
bhp	1,462	*grams per ton*	907,200
Environmental Controls (i.e. oxidation catalyst, SCR, urea, etc.)?	**NO**	*Total S content of natural gas (UGI spec. sheet dated August 2013) (Grains/ft^3)*	3.68E-04
Speed (RPM)	1,800	*Molar Weight of SO2 (lb SO2/lb-mol)*	64.06
Compression Ratio	11:01	*Molar Weight of S (lb S/lb-mol)*	32.06
Displacement (in^3)	2,193		
Exhaust O_2 (%)	7.4		
Reference Exhaust O_2 (%)	15		
HHV of fuel (UGI spec sheet dated August 2013) (Btu/scf)	920		
Fuel Consumption from Manufacturer's Spec Sheet (BTU/bhp-hr)	7784.0		
Assumed Annual hours of operation	*500*		

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CO2 Calculation

110	11.38	500	1,251.82	**312.96**
lb CO2/mmbtu	mmbtu/hr	hours	lb CO2/hr	**tons CO2/year**

$$C_r = C_m \cdot \frac{(20.9 - r)}{(20.9 - m)}$$

53.06 kg CO2/MMBtu natural gas
116.732 lb/MMBtu

Table L3-3b **Diesel Fueled Engine**

Emergency Generator Emissions (based on an assumed 500 hours of annual operation)

	Proposed Emergency Generator Emissions (g/hp-hr)	PADEP BAT Emission Factor (g/bhp-hr)[2,3,5]	NSPS Subpart IIII limits (g/hp-hr)[4,6]	Project Emission Potential (tpy)
NOx[1] or NOx+NMHC[6]	**4.9**	6.9	4.8	**3.62**
CO[1]	**0.1**	2	2.6	**0.07**
HC (total)	**0.056**	1	N/A	**0.04**
VOC[2]	**5.34E-02**	N/A	N/A	**0.04**
PM	**0.074**	0.4	0.15	**0.05**
SO_2 (lbs/hr)[3]	0.015	0.3% by weight	-	**3.83E-03**
CO2 (lbs/hr)	**333.17**	N/A	N/A	**83.29**

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Notes

[1] Taken from Manufacturer's Specification Sheet

[2] VOC= NMHC (non-methane) according to EPA's "Conversion Factors for Hydrocarbon Emission Components"
NR-002c December 2005, pg. 3, VOC*1.053 = THC (http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2005/420r05015.pdf)
This approach does not exclude ethane from the VOC estimate, so the emission estimate

[3] Units of SO2 different from others. SO2 based on Sulfur content of the ULSD (15 ppm S) fuel supply and not specific to the engine. PADEP BAT is < 0.3% sulfur in fuel by weight, but with ULSD it is well below this limit

[4] Table 1 to Subpart JJJJ of Part 60 - Emission Standards for Emergency Engines greater than 130 HP.
Note that the JJJJ limit for VOC does not include formaldehyde as a VOC.

[5] PADEP BAT emission factors for Diesel generators, based on number of hours of actual operation, engine size (hp) and moderate ozone non-attainment status

[6] The NSPS limit for a new, emergency diesel engine with a displacement less than 10 L/cyl is in units of **NMHC+Nox. The limits were expressed in g/kW-hr but were converted to g/hp-hr by dividing by 1.34.**

EMERGENCY GENERATOR DETAILS			**CONVERSION FACTORS**	
Model	CAT C32 Generator Set		*lbs per ton*	2000
Fuel Type	Diesel		*grams per lb*	454
Max kW rating	1,000		*grains per lb*	7,000
Max bhp	1,340		*grams per ton*	907,200
Environmental Controls (i.e. oxidation catalyst, SCR, urea, etc.)?	**NO**		*Molar Weight of SO2 (lb SO2/lb-mol)*	64.06
Speed (RPM)	1,800		*Molar Weight of S (lb S/lb-mol)*	32.06
Compression Ratio	15.0:1		*Total S content of Diesel Fuel in lb/hr*	1.53E-02
Displacement (L/cyl) in a 12 cylinder engine	2.68			
Exhaust Gas Flow Rate (m3/min)	228.4			
Exhaust O_2 (%)	Unknown			
Reference Exhaust O_2 (%)	15			
HHV of fuel (Btu/gallon)[1]	138,000			
Fuel Consumption in Gal/hr	71.9			
Assumed Annual hours of operation	*500*			

Table L3-3b **Diesel Fueled Engine**

Emergency Generator Emissions (based on an assumed 500 hours of annual operation)

[1] Table C-1 to Subpart C of 40 CFR Part 98—Default CO2 Emission Factors and High Heat Values for Various Types of Fuel

CO2 calculation

73.96	0.138	71.9	500	0.454	**333.17**
kg CO2/MMBtu Diesel	MMBtu/gallon Diesel	Gallons diesel/hr @ 100%	hours of operation	lbs/kg	**lbs/hr CO2**

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$$C_r = C_m \cdot \frac{(20.9 - r)}{(20.9 - m)}$$

53.06	kg CO2/MMBtu natural gas
116.732	lb/MMBtu

Table L3-4

Start-up/Shutdown Emissions - Mars 100 16002S G SC

	Operating Time		NOx	CO	UHC	VOC	CO_2
	Cycles	Hr/Yr					ton/yr
Emissions per 10-minute Start-up (lbs)[1]			1.6	151.2	8.6	1.72	952
Emissions per 10-minute Shutdown (lbs)[1]			1.9	166.8	9.5	1.9	1026
Total per combined Startup/Shutdown event (lbs)			3.5	318	18.1	3.62	1978
Yearly Startup / Shutdown Emissions (tons per year)	**48**	**16**	**0.08**	**7.63**	**0.43**	**0.09**	**47.472**

At ISO conditions: 59F, 60% RH, se level, no losses, full load operation prior to shutdown, natural gas firing

1. Based on data from Solar PIL170, Table 3 of Solar Turbines Incorporated "Emission Estimates at Start-up, Shutdown, and Commissioning for SoLoNOx Combustion Products"

Table L3-5 Speciated and Total HAPs from Solar Mars 100 Turbines

	Speciated HAP	Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Naphthalene	PAH	Propylene Oxide	Toluene	Xylenes		
	Emission Factor[1] (lb/MMBtu)	4.00E-05	6.40E-06	1.20E-05	3.20E-05	7.10E-04	1.30E-06	2.20E-06	2.90E-05	1.30E-04	6.40E-05		
Month	**Hours per specified month**											**Total HAPs lbs/month**	**Total HAPs tons/month**
December	744	5.05E-03	8.08E-04	1.51E-03	4.04E-03	8.96E-02	1.64E-04	2.78E-04	3.66E-03	1.64E-02	8.08E-03	93.7	4.68E-02
January	744	5.14E-03	8.22E-04	1.54E-03	4.11E-03	9.12E-02	1.67E-04	2.83E-04	3.72E-03	1.67E-02	8.22E-03	95.4	4.77E-02
February	672	5.12E-03	8.19E-04	1.54E-03	4.10E-03	9.09E-02	1.66E-04	2.82E-04	3.71E-03	1.66E-02	8.19E-03	85.8	4.29E-02
March	744	5.06E-03	8.09E-04	1.52E-03	4.04E-03	8.97E-02	1.64E-04	2.78E-04	3.67E-03	1.64E-02	8.09E-03	93.8	4.69E-02
April	720	4.90E-03	7.83E-04	1.47E-03	3.92E-03	8.69E-02	1.59E-04	2.69E-04	3.55E-03	1.59E-02	7.83E-03	87.9	4.40E-02
May	744	4.78E-03	7.66E-04	1.44E-03	3.83E-03	8.49E-02	1.55E-04	2.63E-04	3.47E-03	1.55E-02	7.66E-03	88.8	4.44E-02
June	720	4.71E-03	7.53E-04	1.41E-03	3.76E-03	8.35E-02	1.53E-04	2.59E-04	3.41E-03	1.53E-02	7.53E-03	84.5	4.23E-02
July	744	4.68E-03	7.49E-04	1.40E-03	3.74E-03	8.31E-02	1.52E-04	2.57E-04	3.39E-03	1.52E-02	7.49E-03	86.9	4.34E-02
August	744	4.71E-03	7.53E-04	1.41E-03	3.76E-03	8.35E-02	1.53E-04	2.59E-04	3.41E-03	1.53E-02	7.53E-03	87.3	4.37E-02
September	720	4.76E-03	7.61E-04	1.43E-03	3.81E-03	8.45E-02	1.55E-04	2.62E-04	3.45E-03	1.55E-02	7.61E-03	85.5	4.27E-02
October	744	4.83E-03	7.72E-04	1.45E-03	3.86E-03	8.57E-02	1.57E-04	2.66E-04	3.50E-03	1.57E-02	7.72E-03	89.6	4.48E-02
November	720	4.94E-03	7.90E-04	1.48E-03	3.95E-03	8.76E-02	1.60E-04	2.72E-04	3.58E-03	1.60E-02	7.90E-03	88.7	4.43E-02
	TPY Speciated HAPs per turbine	**2.14E-02**	**3.42E-03**	**6.42E-03**	**1.71E-02**	**3.80E-01**	**6.96E-04**	**1.18E-03**	**1.55E-02**	**6.96E-02**	**3.42E-02**	**Total HAPs tons per year per turbine**	**5.34E-01**
												Total HAPs (tpy) for 2 turbines	**1.07**
												Total HAPs (tpy) for 3 turbines	**1.60**

Notes:

1 Emissions Factors taken from AP42 - Chapter 3.1: Stationary Gas Turbines http://www.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf

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Table L3-6
PennEast Pipeline, LLC

Kidde Compressor Station Emissions from Venting Estimates

		Exhaust Flow (each)	Usage (each)	Total Flow/Year
Pneumatic Actuators	Quantity	scf	strokes/yr	scf/yr
Station Inlet Valve	1	91.2	2	182
Recycle Valve	1	48.9	12	587
Station Outlet Valve	1	91.2	2	182
Suction Blowdown valve	1	48.9	2	98
Discharge blowdown valve	1	48.9	2	98
Main Line Valve	1	91.2	2	182
After Cooler Valves	3	91.2	2	547
Compressor Inlet Valves	3	91.2	48	13,133
Compressor Outlet Valves	3	91.2	48	13,133
Anti-Surge Vents	3	91.2	8	2,189
Emergency Shut Down (ESD) Valves	1	6.5	4	26
Fuel Gas Valves	1	6.5	4	26
Station Bypass Valve	1	91.2	4	365
Filter Valves	6	91.2	8	4,378
Process Vents		Flow per event	Events per Year	
Pressure Safety Valves (PSV)	10	1	24	240
ESD Shutdown Panel Vent	1	25	1	25
Fuel Gas Shutdown Panel Vent	1	25	1	25
Turbine Lube Oil Tank Vent	1	10	365	3,650
Turbine Seal Vents	2	2	365	1,460
2" Fuel Gas Blowdown	1	500	1	500
Waste Water Storage	1	2	365	730
Emergency Shutdown (entire station)	1	50000	1	50,000
Total Annual Natural Gas Venting				**91,756**

Component	**Emission Rate**			
	CH_4	**CO_2**	**CO_2e[4]**	**VOC[6]**
Station Operation Vent flow from Above (scf/yr)	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**
91,756	1.90	0.00	47.5	0.01
Intermittent During Startup/Shutdown	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**
Pneumatic Starter (Total for number of units)[1]	0.00	0.00	0	0.00
Blowdowns (Total for number of units)[1,5]	0.00	0.00	0	0.00
		Total:	47	0.01

1. Turbines will use DAC starters; therefore no Pneumatic Starter Emissions
2. CH_4 and CO_2 emission rates based on volume fractions of CH4 and CO2 below, per Gas Analsyis Table L3-17.
3. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ratio of VOC to methane as calculated from gas composition

Table L3-7

Fugitive Emissions from Pipeline (Estimated Leak Emissions from Pipeline Pipe)

System Location: **Entire Pipeline**

Transmission Pipeline Segments	Pipeline Miles[1]	Leak Emission Factor[2]	Total Vent flow (365 days/yr)	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scfd/mile	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
Luzerne County, PA	23.1	1.55	13,069	551	-	0.28	-	6.89	0.0009
Carbon County, PA	28.2	1.55	15,954	672	-	0.34	-	8.41	0.0011
Northampton County, PA	26.9	1.55	15,219	641	-	0.32	-	8.02	0.0010
Bucks County, PA	1.7	1.55	962	41	-	0.02	-	0.51	0.0001
Hunterdon County, NJ	28.5	1.55	16,124	680	-	0.34	-	8.50	0.0011
Mercer County, NJ	9.6	1.55	5,431	229	-	0.11	-	2.86	0.0004
Pipeline Total	118		66,759	2,814	-	1.41	-	35	0.0046
Pennsylvania Sub-Total			45,203	1,905	-	1	-	24	0.0031
Pennsylvania Sub-Total			21,555	909	-	0	-	11	0.0015

1. Consideres main line and laterals as per route established in July 2015.

2. Pipeline emission factor based on "Table 2-7. 2011 Data and Calculated Methane Potential Leak Emissions for the Natural Gas Processing and Natural Gas Transmissions Segments" on page 22 of EPA document "Oil and Natural Gas Sector Leaks, Report for Oil and Natural Gas Sector Leaks, Review Panel, April 2014.

3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
4. Based on 40 CFR 98 Subpart A Global Warming Potentials

Volume fractions based on Gas Analysis from UGI Pipeline in Reading PA, April 2015

0.9780 CH_4

0.0000 CO_2

0.00325 mass fraction of VOC per methane (per gas analysis)

Natural Gas Density per Gas analysis:

0.0431 lb/scf

GWP per 40 CFR 98 Subpart A:

25 lb CO_2e/lb CH_4

Conversion Factor

2.20462 lb/kg

Table L3-8

Fugitive Emissions from Station Piping (Leaks from Valves, Flanges, etc.)

System Location: **Kidder Compressor Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2, 3] (lb/hr/compo-nent)	VOC Emission Factor[2, 3] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate[4] (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	65	8.26E-04	5.43E-07	3.53E-05	1.55E-04	5.37E-02	2.35E-01	1.34E+00	5.88E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	80	9.53E-03	6.27E-06	5.01E-04	2.20E-03	7.63E-01	3.34E+00	1.91E+01	8.35E+01
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.001	0.003	0.87	3.82	21.81	95.52

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Based on 40 CFR 98 Subpart A Global Warming Potentials

Volume fractions based on Gas Analysis from UGI Pipeline in Reading PA, April 2015

0.9780 CH_4

0.0000 CO_2

GWP per 40 CFR 98 Subpart A:

Table L3-9

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Hellertown**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	66	8.26E-04	5.43E-07	3.58E-05	1.57E-04	5.45E-02	2.39E-01	1.36E+00	5.97E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	79	9.53E-03	6.27E-06	4.95E-04	2.17E-03	7.53E-01	3.30E+00	1.88E+01	8.25E+01
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.001	0.002	0.86	3.78	21.59	94.56

Pnematic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
6"-600# Valve	1	6.5	2	13.0	0.54	-	0.0003	0.00000	0.01	8.75E-07
8"-600# Valve	1	6.5	2	13.0	0.54	-	0.0003	0.00000	0.01	8.75E-07
12"-600# Valve	1	6.5	2	13.0	0.54	-	0.0003	0.00000	0.01	8.75E-07
14"-600# Valve	2	6.5	2	26.0	1.08	-	0.0005	0.00000	0.01	1.75E-06
24"-600# Valve	2	6.5	2	26.0	1.08	-	0.0005	0.00000	0.01	1.75E-06

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
2"-Control Valves	1	55.0	24	481,800	19,945	-	10	-	249	3.24E-02
4"-Control Valves	4	55.0	24	1,927,200	79,781	-	40	-	997	1.30E-01
6"-Control Valves	4	55.0	24	1,927,200	79,781	-	40	-	997	1.30E-01
12"-Control Valves	6	55.0	24	2,890,800	119,672	-	60	-	1496	1.94E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**3,834**	**4.89E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials

Table L3-10

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Leidy/Auburn Interconnect Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	75	8.26E-04	5.43E-07	4.07E-05	1.78E-04	6.20E-02	2.71E-01	1.55E+00	6.79E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	155	9.53E-03	6.27E-06	9.71E-04	4.25E-03	1.48E+00	6.47E+00	3.69E+01	1.62E+02
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.001	0.005	1.60	6.99	39.89	174.71

Pnematic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
12"-600# Valve	2	48.9	2	195.6	8.10	-	0.0040	0.00000	0.10	1.32E-05
16"-600# Valve	3	48.9	2	293.4	12.15	-	0.0061	0.00000	0.15	1.97E-05
24"-600# Valve	1	91.2	2	182.4	7.55	-	0.0038	0.00000	0.09	1.23E-05
36"-600# Valve	1	91.2	2	182.4	7.55	-	0.0038	0.00000	0.09	1.23E-05

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
10"-Control Valves	4	55.0	24	1,927,200	79,781	-	40	-	997	1.30E-01
12"-Control Valves	6	55.0	24	2,890,800	119,672	-	60	-	1496	1.94E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**2,668**	**3.29E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials
6. Based on a 0.00325 ratio of VOC to methane as calculated from gas composition.

Table L3-11

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Springville Interconnect Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	37	8.26E-04	5.43E-07	2.01E-05	8.80E-05	3.06E-02	1.34E-01	7.64E-01	3.35E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	43	9.53E-03	6.27E-06	2.69E-04	1.18E-03	4.10E-01	1.80E+00	1.02E+01	4.49E+01
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.000	0.001	0.50	2.17	12.41	54.36

Pnematic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
12"-600# Valve	3	48.9	2	293.4	12.15	-	0.0061	0.00000	0.15	1.97E-05
24"-600# Valve	1	91.2	2	182.4	7.55	-	0.0038	0.00000	0.09	1.23E-05

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
12"-Control Valves	6	55.0	24	2,890,800	119,672	-	60	-	1496	1.94E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**1,551**	**1.96E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials

Table L3-12

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Tetco/Algoquin Interconnect Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	90	8.26E-04	5.43E-07	4.89E-05	2.14E-04	7.44E-02	3.26E-01	1.86E+00	8.14E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	110	9.53E-03	6.27E-06	6.89E-04	3.02E-03	1.05E+00	4.59E+00	2.62E+01	1.15E+02
Other (Meters)	4	1.86E-02	1.23E-05	4.90E-05	2.15E-04	7.46E-02	3.27E-01	1.86E+00	8.17E+00
			TOTAL =	0.001	0.003	1.20	5.25	29.94	131.13

Pnematic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
14"-600# Valve	2	48.9	2	195.6	8.10	-	0.0040	0.00000	0.10	1.32E-05
16"-600# Valve	4	48.9	2	391.2	16.19	-	0.0081	0.00000	0.20	2.63E-05
36"-600# Valve	5	98.1	2	981.0	40.61	-	0.0203	0.00000	0.51	6.60E-05
42"-600# Valve	1	98.1	2	196.2	8.12	-	0.0041	0.00000	0.10	1.32E-05

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
2"-Control Valve	2	55.0	24	963,600	39,891	-	20	-	499	6.48E-02
12"-Control Valve	12	55.0	24	5,781,600	239,344	-	120	-	2992	3.89E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**3,622**	**4.55E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials

Table L3-13

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Transco Interconnect Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	59	8.26E-04	5.43E-07	3.20E-05	1.40E-04	4.87E-02	2.14E-01	1.22E+00	5.34E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	55	9.53E-03	6.27E-06	3.45E-04	1.51E-03	5.24E-01	2.30E+00	1.31E+01	5.74E+01
Other (Meters)	5	1.86E-02	1.23E-05	6.13E-05	2.68E-04	9.32E-02	4.08E-01	2.33E+00	1.02E+01
			TOTAL =	0.000	0.002	0.67	2.92	16.66	72.96

Pneumatic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
16"-600# Valve	3	48.9	2	293.4	12.15	-	0.0061	0.00000	0.15	1.97E-05
42"-600# Valve	1	98.1	2	196.2	8.12	-	0.0041	0.00000	0.10	1.32E-05

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
2"-Control Valve	1	55.0	24	481,800	19,945	-	10	-	249	3.24E-02
12"-Control Valve	8	55.0	24	3,854,400	159,562	-	80	-	1995	2.59E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**2,317**	**2.94E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials

Table L3-14

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Wyoming Interconnect Station**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	65	8.26E-04	5.43E-07	3.53E-05	1.55E-04	5.37E-02	2.35E-01	1.34E+00	5.88E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	80	9.53E-03	6.27E-06	5.01E-04	2.20E-03	7.63E-01	3.34E+00	1.91E+01	8.35E+01
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.001	0.003	0.87	3.82	21.81	95.52

Pneumatic Gas Control Venting and Bleed Emissions

Description	Qty	Exhaust Flow	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
12"-600# Valve	3	48.9	2	293.4	12.15	-	0.0061	0.00000	0.15	1.97E-05
24"-600# Valve	1	98.1	2	196.2	8.12	-	0.0041	0.00000	0.10	1.32E-05

Description	Qty	Exhaust Flow	Bleed Rate	Total Bleed flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
12"-Control Valve	6	55.0	24	2,890,800	119,672	-	60	-	1496	1.94E-01
								Total of Fugitive Leaks, Venting, and Control Valves	**1,592**	**1.97E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials

Table L3-15

Fugitive Emissions from Interconnection Piping (Leaks from Valves, Flanges, etc.)

System Location: **Elizabethtown Interconnect**

Equipment Type	Component Count[1]	CH4 Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Factor[2] (lb/hr/compo-nent)	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)	CH4 Emission Rate (lb/hr)	CH4 Emission Rate (TPY)	CO2e Emission Rate (lb/hr)	CO2e Emission Rate (TPY)
Connectors	0	4.24E-04	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flanges	65	8.26E-04	5.43E-07	3.53E-05	1.55E-04	5.37E-02	2.35E-01	1.34E+00	5.88E+00
Open-Ended Lines	0	4.24E-03	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pump Seals	0	5.08E-03	3.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Valves	80	9.53E-03	6.27E-06	5.01E-04	2.20E-03	7.63E-01	3.34E+00	1.91E+01	8.35E+01
Other (Meters)	3	1.86E-02	1.23E-05	3.68E-05	1.61E-04	5.59E-02	2.45E-01	1.40E+00	6.12E+00
			TOTAL =	0.001	0.003	0.87	3.82	21.81	95.52

Pnematic Gas Control Venting and Bleed Emissions

Description	Qty[1]	Exhaust Flow[1]	Usage	Total Vent flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf/stroke	strokes/yr	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
4"-600# Valves	2	6.5	2	26.0	1.08	-	0.0005	0.00000	0.01	1.75E-06
6"-600# Valves	2	6.5	2	26.0	1.08	-	0.0005	0.00000	0.01	1.75E-06
12"-600# Valves	2	6.5	2	26.0	1.08	-	0.0005	0.00000	0.01	1.75E-06

Description	Qty[1]	Bleed Flow Rate[1]	Bleed Duration	Total Bleed Flow	CH_4[4]	CO_2[4]	CH_4	CO_2	CO_2e[5]	VOC[6]
		scf / h	hr/day	scf/yr	lb/yr	lb/yr	ton/yr	ton/yr	ton/yr	ton/yr
2"-Control Valves	2	55.0	24	963,600	39,891	-	20	-	499	6.48E-02
4"-Control Valves	6	55.0	24	2,890,800	119,672	-	60	-	1496	1.94E-01
6"-Control Valves	3	55.0	24	1,445,400	59,836	-	30	-	748	9.72E-02
8"-Control Valves	3	55.0	24	1,445,400	59,836	-	30	-	748	9.72E-02
								Total of Fugitive Leaks, Venting, and Control Valves	**3,586**	**4.56E-01**

1. Counts and flow rates based on Preliminary Design Data from QPS April, 2015
2. VOC and CH4 emission factors are based on Gas Analysis and values from Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
   Gas analysis and calculation of the CH4 and VOC emission factors are shown on Table L3-17
3. CH_4 and CO_2 emission rates based on volume fractions of natural gas analysis shown below as provided in the Gas Analysis Details Table
4. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
5. Based on 40 CFR 98 Subpart A Global Warming Potentials
6. Based on a 0.00325 ratio of VOC to methane as calculated from gas composition.

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

				Connection:	Tetco
Assumed Average Firing Rate:				80%	Percent of Max
Design Heat Input:				50	MMBtu/hr
Annual Operating Hours:				8760	hr/yr
Estimated Annual Fuel Use:				343.53	MMscf/yr
Maximum Fuel Use:				49019.6	scf/hr
Pollutant	**Emission Factor**			**Emission Rate**	
	lb/MMscf	**lb/MMBtu**	**Emission Factor Reference**	**lb/hr**	**ton/yr**
NO_x	100	0.098	AP-42 Table 1.4-1 (7/98)	4.90	17.18
CO	84	0.082	AP-42 Table 1.4-1 (7/98)	4.12	14.43
CO_2e		117.1	40 CFR 98 Subpart C	5,855	20,516
PM_{10}	7.6	0.007	AP-42 Table 1.4-2 (7/98)	0.373	1.31
$PM_{2.5}$	7.6	0.007	AP-42 Table 1.4-2 (7/98)	0.373	1.31
VOC	5.5	0.005	AP-42 Table 1.4-2 (7/98)	0.270	0.94
SO_2 (Maximum Hourly)		0.0057	2 grains S / 100 scf	0.29	
SO_2 (Average Annual)		0.000714	0.25 grains S / 100 scf		1.25E-01
Formaldehyde	0.075	0.00007	AP-42 Table 1.4-3 (7/98)	3.68E-03	1.29E-02
Hexane	1.800	0.00176	AP-42 Table 1.4-3 (7/98)	8.82E-02	3.09E-01
Total HAPs	1.89	0.00185	AP-42 Table 1.4-3 & 4 (7/98)	9.26E-02	3.24E-01

Assumed Average Natural Gas Heat Content: 1020 Btu/scf

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

	Connection:	Algonquin	Connection:	Transco	Connection:	Elizabethtown
Assumed Average Firing Rate:	80%	Percent of Max	80%	Percent of Max	80%	Percent of Max
Design Heat Input:	50	MMBtu/hr	50	MMBtu/hr	6.7	MMBtu/hr
Annual Operating Hours:	8760	hr/yr	8760	hr/yr	8760	hr/yr
Estimated Annual Fuel Use:	343.53	MMscf/yr	343.53	MMscf/yr	46.03	MMscf/yr
Maximum Fuel Use:	49019.6	scf/hr	49019.6	scf/hr	6568.6	scf/hr
Pollutant	**Emission Rate**		**Emission Rate**		**Emission Rate**	
	lb/hr	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
NO_x	4.90	17.18	4.90	17.18	0.66	2.30
CO	4.12	14.43	4.12	14.43	0.55	1.93
CO_2e	5,855	20,516	5,855	20,516	785	2,749
PM_{10}	0.373	1.31	0.373	1.31	0.050	0.17
$PM_{2.5}$	0.373	1.31	0.373	1.31	0.050	0.17
VOC	0.270	0.94	0.270	0.94	0.036	0.13
SO_2 (Maximum Hourly)	0.29		0.29		0.04	
SO_2 (Average Annual)		1.25E-01		1.25E-01		1.68E-02
Formaldehyde	3.68E-03	1.29E-02	3.68E-03	1.29E-02	4.93E-04	1.73E-03
Hexane	8.82E-02	3.09E-01	8.82E-02	3.09E-01	1.18E-02	4.14E-02
Total HAPs	9.26E-02	3.24E-01	9.26E-02	3.24E-01	1.24E-02	4.35E-02

Assumed Average Natural Gas Hea

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

	Connection:	NRG	Connection:	Hellertown	Connection:	Kidder Station
Assumed Average Firing Rate:	80%	Percent of Max	80%	Percent of Max	100%	Percent of Max
Design Heat Input:	6.7	MMBtu/hr	16.1	MMBtu/hr	1.5	MMBtu/hr
Annual Operating Hours:	8760	hr/yr	8760	hr/yr	8760	hr/yr
Estimated Annual Fuel Use:	46.03	MMscf/yr	110.62	MMscf/yr	12.88	MMscf/yr
Maximum Fuel Use:	6568.6	scf/hr	15784.3	scf/hr	1470.6	scf/hr
Pollutant	**Emission Rate**		**Emission Rate**		**Emission Rate**	
	lb/hr	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
NO_x	0.66	2.30	1.58	5.53	0.15	0.64
CO	0.55	1.93	1.33	4.65	0.12	0.54
CO_2e	785	2,749	1,885	6,606	176	769
PM_{10}	0.050	0.17	0.120	0.42	0.011	0.05
$PM_{2.5}$	0.050	0.17	0.120	0.42	0.011	0.05
VOC	0.036	0.13	0.087	0.30	0.008	0.04
SO_2 (Maximum Hourly)	0.04		0.09		0.01	
SO_2 (Average Annual)		1.68E-02		4.03E-02		4.69E-03
Formaldehyde	4.93E-04	1.73E-03	1.18E-03	4.15E-03	1.10E-04	4.83E-04
Hexane	1.18E-02	4.14E-02	2.84E-02	9.96E-02	2.65E-03	1.16E-02
Total HAPs	1.24E-02	4.35E-02	2.98E-02	1.04E-01	2.78E-03	1.22E-02

Assumed Average Natural Gas Hea

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

HAPs	HAP Emission Factors lb/MMscf	Source
Lead	0.0005	AP-42 Table 1.4-2 (7/98)
2-Methylnaphthalene	2.40E-05	AP-42 Table 1.4-3 (7/98)
3-Methylchloranthrene	1.80E-06	AP-42 Table 1.4-3 (7/98)
7,12-Dimethylbenz(a)anthracene	1.60E-05	AP-42 Table 1.4-3 (7/98)
Acenaphthene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Acenaphthylene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Anthracene	2.40E-06	AP-42 Table 1.4-3 (7/98)
Benz(a)anthracene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Benzene	2.10E-03	AP-42 Table 1.4-3 (7/98)
Benzo(a)pyrene	1.20E-06	AP-42 Table 1.4-3 (7/98)
Benzo(b)fluoranthene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Benzo(g,h,i)perylene	1.20E-06	AP-42 Table 1.4-3 (7/98)
Benzo(k)fluoranthene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Chrysene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Dibenzo(a,h)anthracene	1.20E-06	AP-42 Table 1.4-3 (7/98)
Dichlorobenzene	1.20E-03	AP-42 Table 1.4-3 (7/98)
Fluoranthene	3.00E-06	AP-42 Table 1.4-3 (7/98)
Fluorene	2.80E-06	AP-42 Table 1.4-3 (7/98)
Formaldehyde	7.50E-02	AP-42 Table 1.4-3 (7/98)
Hexane	1.80E+00	AP-42 Table 1.4-3 (7/98)
Indeno(1,2,3-cd)pyrene	1.80E-06	AP-42 Table 1.4-3 (7/98)
Naphthalene	6.10E-04	AP-42 Table 1.4-3 (7/98)
Phenanthrene	1.70E-05	AP-42 Table 1.4-3 (7/98)
Pyrene	5.00E-06	AP-42 Table 1.4-3 (7/98)
Toluene	3.40E-03	AP-42 Table 1.4-3 (7/98)
Arsenic	2.00E-04	AP-42 Table 1.4-4 (7/98)
Beryllium	1.20E-05	AP-42 Table 1.4-4 (7/98)
Cadmium	1.10E-03	AP-42 Table 1.4-4 (7/98)
Chromium	1.40E-03	AP-42 Table 1.4-4 (7/98)
Cobalt	8.40E-05	AP-42 Table 1.4-4 (7/98)
Manganese	3.80E-04	AP-42 Table 1.4-4 (7/98)
Mercury	2.60E-04	AP-42 Table 1.4-4 (7/98)
Nickel	2.10E-03	AP-42 Table 1.4-4 (7/98)
Selenium	2.40E-05	AP-42 Table 1.4-4 (7/98)
Total	1.8884582	

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

Gas Heater Emission Installation Summary

Gas Heater Location	Connection	Owner	Operator	MMBTU/hr
Tetco/Algonquin IS	Tetco	PennEast	Tetco	50
Tetco/Algonquin IS	Algonquin	PennEast	Algonquin	50
Transco IS	Transco	PennEast	Transco	50
Elizabethtown Gas (ETG/NRG) IS	Elizabethtown	Others	Others	6.7
Elizabethtown Gas (ETG/NRG) IS	NRG	Others	Others	6.7
Hellertown (UGI/TCO)	Hellertown	Others	Others	16.1
Kidder Compressor Station	Kidder Station	PennEast	PennEast	1.5

Note: IS = Interconnect Station

Gas Heater Location	County	State
Tetco/Algonquin IS	Hunterdon	NJ
Tetco/Algonquin IS	Hunterdon	NJ
Transco IS	Mercer	NJ
Elizabethtown Gas (ETG/NRG) IS	Hunterdon	NJ
Elizabethtown Gas (ETG/NRG) IS	Hunterdon	NJ
Hellertown (UGI/TCO)	Northampton	PA
Kidder Compressor Station	Carbon	PA

Table L3-16
Indirect-fired Nat. Gas
Heat Exchanger Emissions

Total for All Interconnect Stations

Pollutant	Total (ton/yr)
NO_x	61.7
CO	51.8
CO_2e	73,651
PM_{10}	4.7
$PM_{2.5}$	4.7
VOC	3.39
SO_2	0.45
Formaldehyde	0.046
Hexane	1.11
Total HAPs	1.16

Subtotal for PA Interconnect Station

Pollutant	Total (ton/yr)
NO_x	5.53
CO	4.65
CO_2e	6606.0
PM_{10}	0.42
$PM_{2.5}$	0.42
VOC	0.30
SO_2	0.04
Formaldehyde	0.004
Hexane	0.0
Total HAPs	0.1

Subtotal for NJ Stations

Pollutant	Total (ton/yr)
NO_x	56.1
CO	47.2
CO_2e	67044.9
PM_{10}	4.3
$PM_{2.5}$	4.3
VOC	3.1
SO_2	0.4
Formaldehyde	0.0
Hexane	1.1
Total HAPs	1.1

Table L3-17

Gas Analysis Details Table

Gas Fractional Analysis			
Component	**Mol Fraction**	MW (g/mol)	Mass of 100 Moles
Methane	0.97800	16.04	15.68712
Ethane	0.01797	30.07	0.5403579
Propane	0.00050	44.09	0.022045
n-Butane	0.00001	58.12	0.0005812
Pentane	0.00000	72.15	0
Hexane+	0.00000	86.17	0
Nitrogen	0.00350	28.02	0.09807
Carbon Dioxide	0.00000	44.01	0
Oxygen	0.00000	32.00	0
TOC	0.99648		0
VOC[3]	0.00051	100	0.051

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TOC Mol Wgt	16.31	
Gas Mol Wgt	16.35	
Density	0.0431	lb/cf

Project Specific Leak Emission Factors for Above Gound Process Piping Component based on Gas Properties per Gas Analysis

Equipment Type	**TOC Emission Factor (kg/hr/component)[1]**	**VOC Emission Factor (kg/hr/component)[2]**	**VOC Emission Factor (lb/hr/component)**	**CH4 Emission Factor (kg/hr/component)**	**CH4 Emission Factor (lb/hr/component)**
Connectors	2.0E-04	2.79E-07	6.14E-07	1.93E-04	4.24E-04
Flanges	3.9E-04	5.43E-07	1.20E-06	3.76E-04	8.26E-04
Open-Ended Lines	2.0E-03	2.79E-06	6.14E-06	1.93E-03	4.24E-03
Pump Seals	2.4E-03	3.34E-06	7.37E-06	2.31E-03	5.08E-03
Valves	4.5E-03	6.27E-06	1.38E-05	4.33E-03	9.53E-03
Other	8.8E-03	1.23E-05	2.70E-05	8.47E-03	1.86E-02

Ratio of VOC mass per Mass of Methane used to estimate VOC[3] emissions: 0.00325

Notes:

1. From Table 2-4 of "Protocol for Equipment Leak Emission Estimates". EPA document 453/R-95-017
2. VOC emissions speciated using approach specified in Section 2.4.1 of "Protocol for Equipment Leak Emission Estimates"
3. Molecular weight of unidentified VOC compounds are conservatively estimated at 100 g/mol in order to estimate the mass ratio to methane.

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Table L3-18

Atlantic Analytical Laboratory

Gas Analysis Report

UGI Energy Services
5665 Leesport Avenue
Reading, PA 19605
610-736-5591; E-mail: Dschoiack@ugies.com
Attn: Derek Schoiack

AAL Number: 33279-1
Received On: 15 July 14
Report Date: 21 July 14
PO Number: 0000001840

Sample ID.: Natural Gas # 1; Pre Odor Tap.
Comments: 1 of 2 samples rec'd in 1, 1000 cc cust cyl # CM1019.

Sampled on: 15 July 14
Location: Reading, PA

Non-Condensable Gases	Result % v/v	D.L.
Nitrogen:	0.35	0.01
Oxygen:	nd	0.01
Carbon Dioxide:	nd	0.05
Carbon Monoxide:	nd	0.05
Hydrogen:	nd	0.05
Argon:	nd	0.01
Water Vapor:	--	0.001
Dew Point (°F @ 0 psig):	--	-77

Hydrocarbons	% v/v	D.L.
Methane:	97.80	0.01
Ethylene:	nd	0.001
Ethane:	1.797	0.001
Propylene:	nd	0.001
Propane:	0.050	0.001
Isobutane:	nd	0.001
n-Butane:	0.001	0.001
Butene:	nd	0.001
Isopentane:	nd	0.001
n-Pentane:	nd	0.001
Pentenes:	nd	0.001
Hexanes+:	nd	0.001

Comments:

Total Sulfur (as H_2S):	ppm v/v	D.L.	ppm w/w	D.L.	Grains/100ft^3	D.L.
	--	0.05	--	0.1	--	0.003

D.L. = instrumental detection limit for the reported analyte. **nd** = indicates the concentration is less than the accompanying report detection limit. -- = test not performed. **%** = parts per hundred (percent). **ppm** = parts per million. **w/w** = weight analyte/weight sample format. **v/v** = volume analyte/volume sample format (equivalent to mole fraction for normalized, ideal gas mixtures). **Conversions:** 0.0001% = 1 ppm.

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Table L3-18

Sample ID.: UGI Energy Services

AAL Number: 33279-1

GC/MS
C6+ Extended Range Results

Libr. Hit List[1] &/or Target Analyte(s)		**Result % v/v**
Aliphatic Hydrocarbons (C_6 range):	----------	nd 0.001
Aliphatic Hydrocarbons (C_7 range):	----------	nd 0.001
Aliphatic Hydrocarbons (C_8 range):	----------	nd 0.001
Aliphatic Hydrocarbons (C9 range):	----------	nd 0.001
Aliphatic Hydrocarbons (C10 range):	----------	nd 0.001
Aliphatic Hydrocarbons (C_{11} – C_{14} range):	----------	nd 0.001

Aromatic Hydrocarbons:	**Peak ID/Scan No.**	**Result ppm v/v**
Benzene	--/655	nd 0.1
Toluene	--/912	nd 0.1
Ethylbenzene	--/1159	nd 0.1
m+p Xylenes	--/1172	nd 0.1
o-Xylene	--/1250	nd 0.1

Peak ID. Category: **a** = computer library match >900, + retention time (t_r) match with a calibration std. **b1** = computer library match >900, not confirmed by a calibration std. **b2** = Computer library match between 800 - 900, not confirmed by a (t_r) match with a calibration std. **c** = Computer library match <800, potential structure + functional group information only.

D.L. = report detection limit. **nd** = indicates the concentration is less than the report detection limit. -- = test not performed. **L.T.** = less than the amount specified. **%** = percent. **ppm** = parts per million. **ppb** = parts per billion. **v/v** = volume analyte/volume sample. **w/w** = weight analyte/weight sample. **[result]** indicates the result was obtained by the method listed within brackets. **Unit Conversions:** 1 ppm v/v = 1µL/L = 1,000 ppb = 0.0001% v/v.

Atlantic Analytical Laboratory, LLC
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Shipping address: 291 Rte 22 East • Salem Industrial Park – Building # 4 • Whitehouse, NJ 08888
Phone (908) 534-5600 • Fax (908) 534-2017 • www.AtlanticAnalytical.com

PJLA Testing
Accreditation # 59415

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Table L3-18

Sample ID.: UGI Energy Services

AAL Number: 33279-1

Elemental Composition (Normalized, % w/w)

Element		Result
Carbon Content (% C, w/w):	----------	74.70
Hydrogen Content (% H, w/w):	----------	24.70
Oxygen Content (% O, w/w):	----------	0.00
Nitrogen Content (% N, w/w):	----------	0.60

Heat of Combustion & Physical Properties (by ASTM D 3588-91)

I. @ ASTM Base Conditions: 14.696 psia, 60°F, dry gas format.	Result
Net Heat of Combustion (Lower Heating Value, Btu/ft.^{3}):	919
Gross Heat of Combustion (Higher Heating Value, Btu/ft.^{3}):	1,021
Gross Heat of Combustion (Water Saturated Gas Format, Btu/ft.^{3}):	1,003
Net Heat of Combustion (Lower Heating Value, Btu/lb.):	21,344
Gross Heat of Combustion (Higher Heating Value, Btu/lb.):	23,694
Molecular Weight:	16.35
Density (lb./ft.^{3}):	0.0431
Specific Gravity (vs. dry/normal air):	0.5646
Compressibility Factor (z):	0.9980

D.L. = instrumental detection limit for the reported analyte. **nd** = indicates the concentration is less than the accompanying report detection limit. -- = test not performed. **%** = parts per hundred (percent). **ppm** = parts per million. **w/w** = weight analyte/weight sample format. **v/v** = volume analyte/volume sample format (equivalent to mole fraction for normalized, ideal gas mixtures). Conversions: 0.0001% = 1 ppm.

Reviewed By,

Richard F. Frisch

Addendum: - Chromatograms on-file
Notebook data on-file

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Accreditation # 59415

Table L3-20

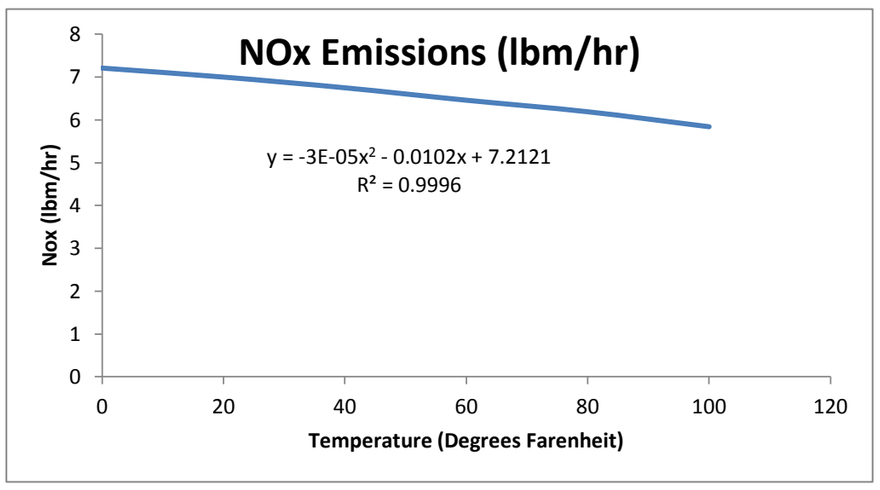
Temperature (Degrees Farenheit)	100% Full Load Nox (lbm/hr)	CO (lbm/hr)	UHC (lbm/hr)
100	5.84	5.93	3.39
80	6.19	6.28	3.6
60	6.46	6.55	3.75
40	6.75	6.85	3.92
20	7.00	7.10	4.07
0	7.21	7.32	4.19

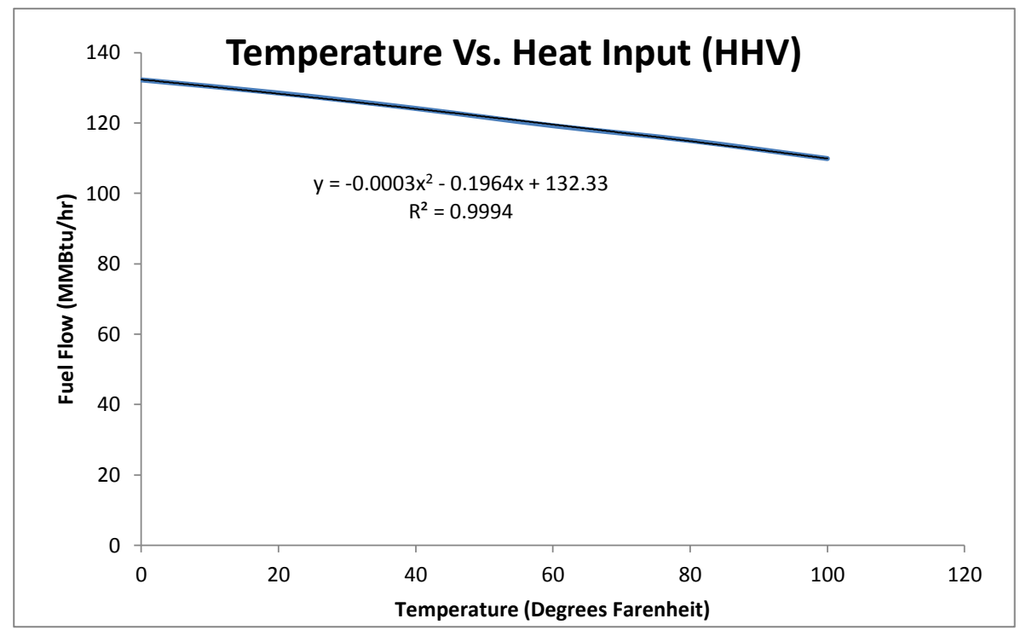
100% Full Load Temperature (Degrees Farenheit)	MMBtu/hr (LHV)	MMBtu/hr (HHV)
100	99.88	109.868
80	104.53	114.98
60	108.37	119.21
40	112.83	124.113
20	116.81	128.49
0	120.20	132.22

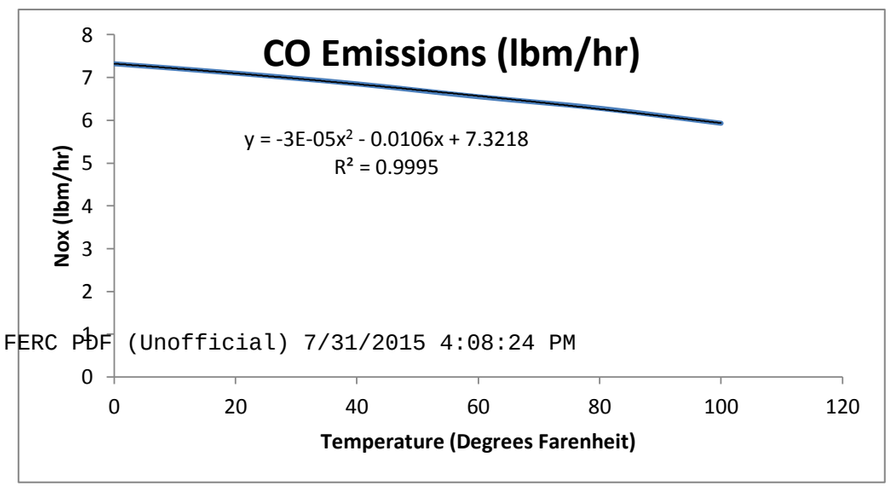
HHV values calculated based on LHV as follows: HHV = LHV * 1.1

Data for:	Mars 100-16000S	
Engine Performance Code:		Rev. 4.15.1.17.10
Date Run:	30-Jun-15	
ISO Rating	15,900	
Times 3	47700	
ISO Heat Rate	7395	
Heat Input ISO (HHV)	117.6	MMBTU/hr

Expected Emission rates at -20 F are from Solar PIL 167 - NOx is 42 ppm, CO is 100 ppm, UHC is 50 ppm at 15% O_2







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Polynomial Coefficients

	X2	X1	X0
NOx	-3.00E-05	-0.0102	7.2121
CO	-3.00E-05	-0.0106	7.3218
UHC	-2.00E-05	-6.00E-03	4.1918
VOC			
Fuel Flow	-0.0003	-0.1964	132.33

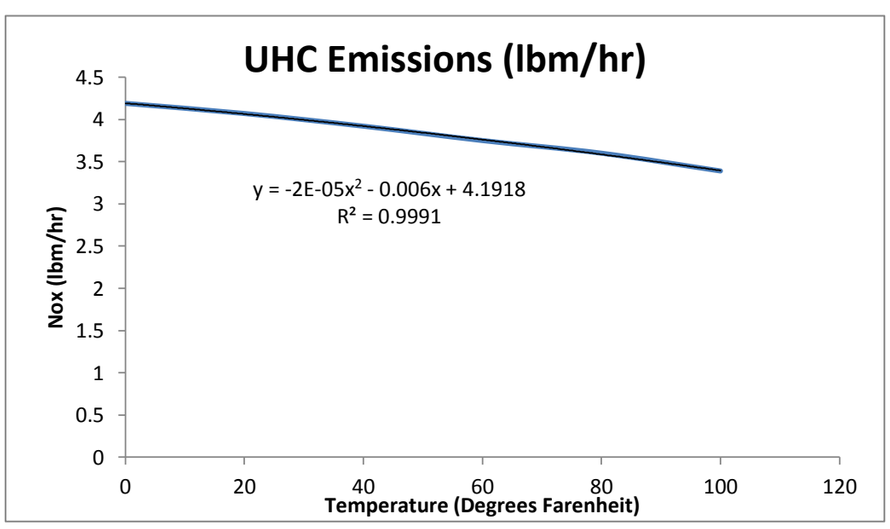

Table L3-21 **Referenced Factors**

Parameter	Emission Factor/Formula	R-squared	Units	Details
NOx Emissions	y1 = -9E-05x2 - 0.0028x + 4.8911	0.9979	lbm/hr	Formulae extrapolated from performance data supplied by Solar Turbines Incorporated, where y=NOx emissions in lbm/hr and x=temperature in degrees Farenheit
CO Emissions	y2 = -9E-05x2 - 0.0028x + 4.9611	0.9978	lbm/hr	Formulae extrapolated from performance data supplied by Solar Turbines Incorporated, where y=CO emissions in lbm/hr and x=temperature in degrees Farenheit
UHC	y3 = -5E-05x2 - 0.0019x + 2.8443	0.9978	lbm/hr	Formulae extrapolated from performance data supplied by Solar Turbines Incorporated, where y=UHC emissions in lbm/hr and x=temperature in degrees Farenheit
VOC	y4 = y3*0.20	1	lbm/hr	Manufacturer's recommendation VOCs = 20% UHC
Variable Fuel Flow	y5 = -0.0014x2 - 0.0554x + 88.471	0.9969	MMBtu/hr	Formulae extrapolated from performance data supplied by Solar Turbines Incorporated, where y= Variable Fuel Flow in MMBtu/hr and x=temperature in degrees Farenheit
SO2	0.0034		lb/MMBtu fuel input	Based on HHV of Natural Gas
Formaldehyde	0.00241		lb/MMBtu fuel input	Based on HHV, 95% Upper Confidence of data (conservative estimate) for engine loads greater than 90%
Combined HAPs	0.00258		lb/MMBtu fuel input	Based on HHV, 95% Upper Confidence of data (conservative estimate) for engine loads greater than 90%
PM10	0.015		lb/MMBtu fuel input	Based on HHV of Natural Gas
PM2.5	0.015		lb/MMBtu fuel input	Based on HHV of Natural Gas
CO2	110		lb/MMBtu fuel input	A' Emission Factor Rating, Table 3.1-2a "Emission Factors for Criteria Air Pollutants and GHGs from Stationary Gas Turbines" AP42
HHV/LLV	1.1		unitless	

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Appendix L-4

Kidder Compressor Station Ambient Sound Survey and Noise Impact Analysis

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Appendix L4 – Hourly Detail of Long-term (LT) Noise Monitoring Measurement Data Collection

Table L4-1. Measurement Data from Position LT-1, April 22nd 2015

Hour Start Time (hh:mm)	Hourly L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)
10:15	57	77	48	59	54	51
11:15	56	71	48	58	54	51
12:15	55	69	47	58	53	50
13:15	58	71	45	59	56	53
14:15	56	72	43	58	53	50
15:15	53	65	42	56	50	47
16:15	52	66	42	56	50	46
17:15	52	69	44	55	50	47
18:15	50	66	41	53	47	44
19:15	51	66	41	54	48	45
20:15	56	78	43	57	55	53
21:15	55	66	46	56	54	53
22:15	55	71	39	56	51	47
23:15	51	68	37	52	47	42
00:15	51	67	37	50	45	40
01:15	51	71	37	49	43	40
02:15	50	72	36	48	43	40
03:15	50	71	36	48	43	40
04:15	49	68	38	49	43	40
05:15	52	66	40	54	48	44
06:15	52	67	39	56	48	44
07:15	52	69	41	55	48	45
08:15	54	78	40	55	47	44
09:15	51	67	39	54	48	44

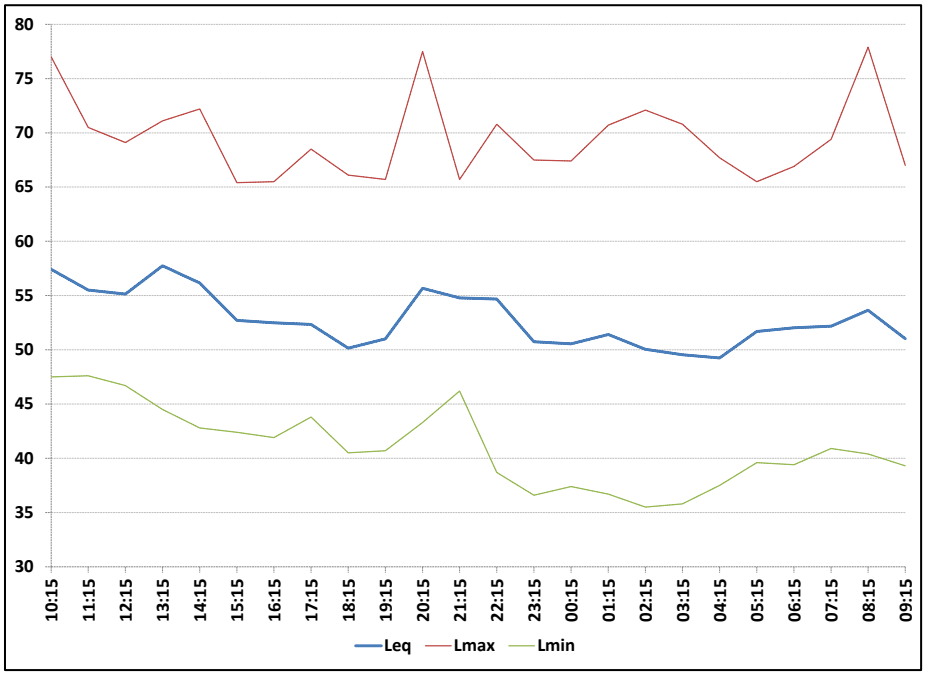

Figure L4-1. Measurement Data (dBA vs. time) from Position LT-1, April 22nd 2015

Table L4-2. Measurement Data from Position LT-1, April 23rd 2015

Hour Start Time (hh:mm)	Hourly L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)
10:25	52	76	40	54	48	45
11:25	51	64	42	54	48	45
12:25	51	67	40	54	47	44
13:25	53	72	39	55	49	45
14:25	53	73	42	55	50	47
15:25	54	80	42	55	49	45
16:25	53	64	41	56	50	46
17:25	50	66	38	53	45	41
18:25	49	63	38	53	45	41
19:25	49	77	37	52	44	41
20:25	47	64	35	50	45	41
21:25	50	70	36	51	43	39
22:25	51	70	36	51	43	39
23:25	49	70	36	47	40	38
00:25	47	66	35	46	40	38
01:25	49	67	35	48	40	37
02:25	49	69	37	48	41	39
03:25	47	70	36	46	41	39
04:25	45	61	38	46	43	40
05:25	48	69	38	50	44	42
06:25	49	65	38	52	44	40
07:25	54	74	38	56	48	43
08:25	51	66	41	55	48	44
09:25	51	68	39	54	47	43

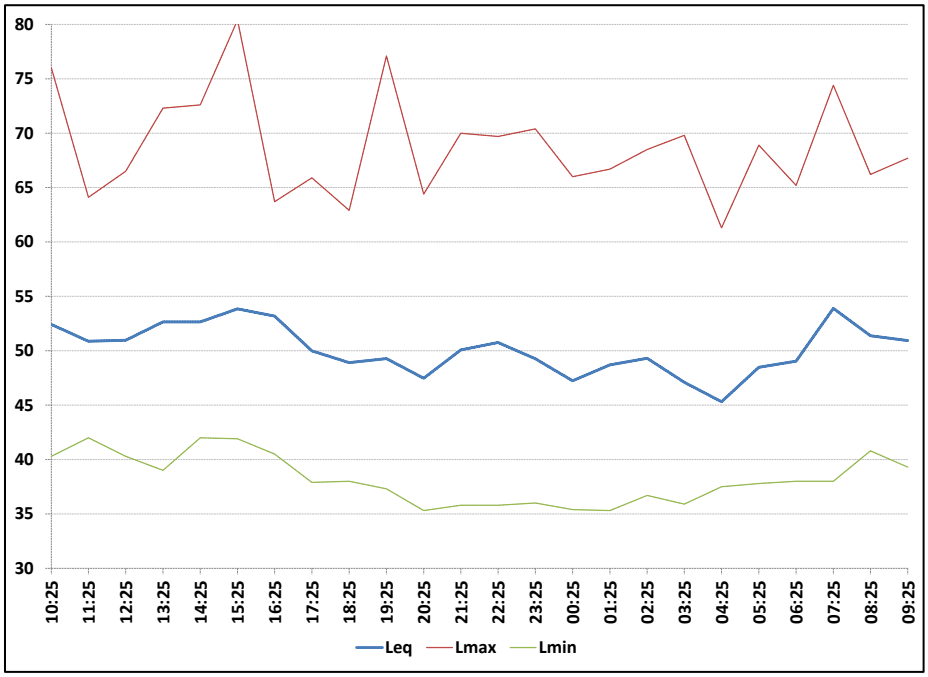

Figure L4-2. Measurement Data (dBA vs. time) from Position LT-1, April 23rd 2015

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Table L4-3. Measurement Data from Position LT-2, April 22nd 2015

Hour Start Time (hh:mm)	Hourly L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)
10:40	56	77	47	57	53	50
11:40	54	66	46	56	52	50
12:40	56	70	45	58	53	50
13:40	56	72	44	59	54	50
14:40	56	76	43	59	51	48
15:40	53	66	44	57	50	46
16:40	54	69	44	57	50	47
17:40	54	67	41	57	50	47
18:40	51	67	40	55	47	44
19:40	51	78	39	53	46	44
20:40	51	67	41	54	48	44
21:40	51	72	39	52	47	44
22:40	54	72	39	55	46	43
23:40	51	71	36	50	42	39
00:40	52	71	37	50	41	39
01:40	53	72	35	50	42	39
02:40	51	70	37	51	43	41
03:40	48	70	36	46	41	39
04:40	52	71	38	52	43	41
05:40	52	69	39	56	47	43
06:40	53	70	41	56	47	43
07:40	53	72	40	56	48	44
08:40	54	72	41	57	48	44
09:40	52	67	39	55	48	44

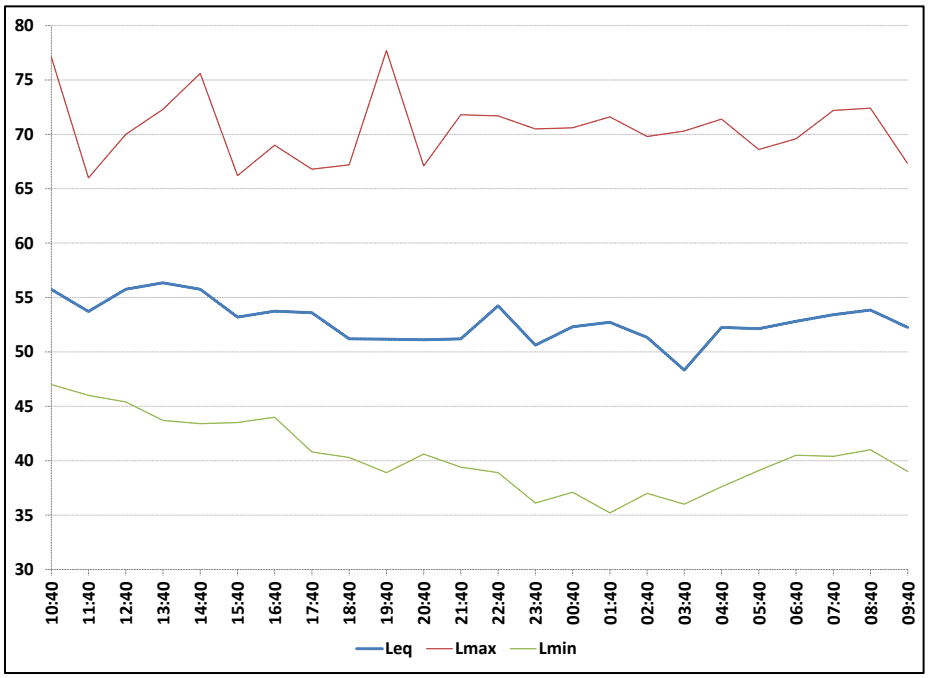

Figure L4-3. Measurement Data (dBA vs. time) from Position LT-2, April 22nd 2015

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Table L4-4. Measurement Data from Position LT-2, April 23rd 2015

Hour Start Time (hh:mm)	Hourly L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)
10:40	54	75	42	57	50	46
11:40	53	67	43	57	50	47
12:40	53	68	40	56	48	44
13:40	55	75	44	58	52	48
14:40	55	73	45	58	53	48
15:40	54	69	42	58	50	46
16:40	54	68	41	58	49	45
17:40	52	67	38	56	46	42
18:40	50	67	36	55	45	40
19:40	49	68	36	53	43	39
20:40	48	69	33	51	39	36
21:40	53	73	34	53	41	36
22:40	52	71	34	51	40	37
23:40	50	69	33	48	39	36
00:40	52	73	33	49	40	37
01:40	52	71	34	51	40	37
02:40	50	71	35	48	42	39
03:40	49	69	36	49	41	39
04:40	47	61	36	48	43	40
05:40	51	70	38	54	44	40
06:40	52	69	37	56	46	41
07:40	57	79	38	58	49	43
08:40	53	66	40	57	50	45
09:40	56	75	40	58	50	45

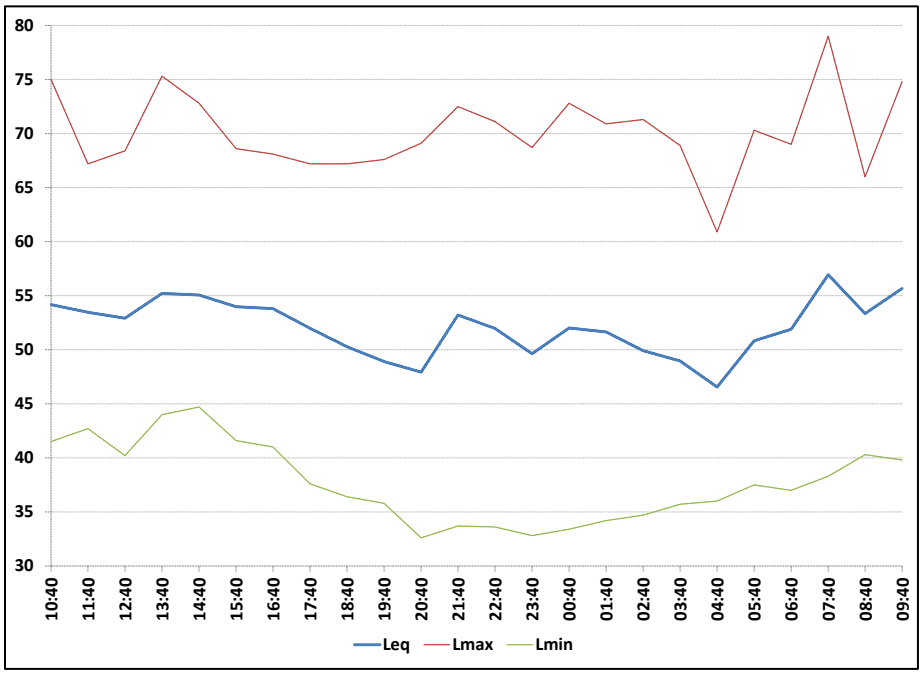

Figure L4-4. Measurement Data (dBA vs. time) from Position LT-2, April 23rd 2015

Appendix L4 – Sample Kidder Compressor Station Operation Noise Prediction

			Unweighted Sound Power Levels													
Equip	**Qty**	**ref dist (ft)**	**31.5**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Overall**	**dBA**	**Notes**	**Reference**	**In Bldg.?**
unsilenced combustion air inlet			81	87	93	94	95	97	100	129	121			SPL at 50'	Solar Turbines PIB 252, rev 2, full load, Mars 100	
unsilenced combustion exhaust			91	95	93	96	100	95	87	77	67			SPL at 50'	Solar Turbines PIB 252, rev 2, full load, Mars 100	
unenclosed package			75	74	80	80	83	81	90	88	83			SPL at 50'	Solar Turbines PIB 252, rev 2, full load, Mars 100	
lube oil cooler (standard)			73	80	77	70	65	62	58	54	49			SPL at 50'	Solar Turbines PIB 252, rev 2, full load, Mars 100	
		n/a	104	103	109	104	105	103	111	108	103			PWL	Solar Turbines PIB 252, rev 2, full load, Mars 100	
RAW SOURCES																
NGL Cooler	3	100	97	103	102	99	94	91	84	80	74	108	97		PennEast (confidential data) "55 dBA at 100 feet" SPL per 3-fan bay; apply Moore Fans spectral dBA mods	
Lube Oil Cooler	3	50	109	116	113	106	101	98	94	90	85	119	105		Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Air Inlet (unsilenced)	3	50	117	123	129	130	131	133	136	165	157	166	167		Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Exhaust (unsilenced)	3	50	127	131	129	132	136	131	123	113	103	140	136		Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Package (unenclosed)	3	50	111	110	116	116	119	117	126	124	119	130	130		Solar Turbines PIB 252, rev 2, full load, Mars 100	Y
Ventilation Duct Inlet/Outlet Unsilenced	3		109	108	114	109	110	108	116	113	108	121	119		Solar Turbines PIB 252, rev 2, full load, Mars 100	
Fuel Gas Meter Skid	1		96	85	82	75	82	83	93	90	88	99	97		from CPV Towantic report	
Fuel Gas Heater	1		84	88	93	85	94	97	98	101	91	105	105		from CPV Towantic report	
OBCF modifier (unweighted) from Moore Fans			0	6	5	2	-3	-6	-13	-17	-23				Moore Fans TMC-651-RevD-05/03	
BUILDING NOISE REDUCTION																
Building Geometry factor			15	15	15	15	15	15	15	15	15				EEI, EPPENG, Vol. I, 2nd ed., Table 6.2, ~245000 ft3 bldg (e.g., 175'x70'x20')	
Wall TL			1	7	13	17	26	33	36	47	47				NAIMA MB315, R13 faced 202-96 insulation over girts (STC 29, OITC 20); assume roof offers comparable STC/OITC	
Wall radiation			25	25	25	25	25	25	25	25	25				EEI, EPPENG, Vol. I, 2nd ed., Eq. 6.4, 3400 ft2 wall	
Net NR			-3	3	9	13	22	29	32	43	43				EEI, EPPENG, Vol. I, 2nd ed., Eq. 6.1	
TURBINE SOUND ATTENUATIONS																
Turbine Inlet Silencer			0	1	4	7	26	43	52	60	55				Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Inlet Filters			2	4	8	9	13	26	27	27	33				Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Exhaust Silencer			3	5	10	21	32	37	39	38	34				Solar Turbines PIB 252, rev 2, full load, Mars 100	
Turbine Enclosure			-9	-3	6	9	14	13	24	25	25				Solar Turbines PIB 252, rev 2, full load, Mars 100; values are diff. between enclosed and unenclosed package	
Ventilation Inlet Silencer			0	1	5	11	22	29	33	31	22				Solar Turbines PIB 252, rev 2, full load, Mars 100	
Ventilation Outlet Silencer			0	2	7	11	16	19	21	20	16				Solar Turbines PIB 252, rev 2, full load, Mars 100	
ATTENUATED SOURCES																
NGL Cooler			97	103	102	99	94	91	84	80	74	108	97			
Lube Oil Cooler			109	116	113	106	101	98	94	90	85	119	105			
Turbine Air Inlet (silenced)			115	118	117	114	92	64	57	78	69	123	107		applies inlet silencer and inlet filters	
Turbine Exhaust (silenced)			124	126	119	111	104	94	84	75	69	129	108		applies exhaust silencer	
Turbine Package (enclosed)			123	110	101	94	83	75	70	56	51	124	92		applies enclosure	
Ventilation Duct Inlet/Outlet			109	106	107	98	94	89	95	93	92	112	101		applies outlet silencer	
Fuel Gas Meter Skid			96	85	82	75	82	83	93	90	88	99	97			
Fuel Gas Heater			84	88	93	85	94	97	98	101	91	105	105			
Aggregate			127	128	122	117	107	102	102	102	96	131	0			
		A-weighting factors	-39	-26	-16	-9	-3	0	1	1	-1					
		CONCAWE Met. Category (2, 4, or 6)	31.5	63	125	250	500	1000	2000	4000	8000	Linear	Overall A-wgt.	Notes	Reference	
Aggregate to Rcvr Distance (m)	655		58.3	58.5	53.3	47.7	38.0	33.2	32.6	33.2	26.7	62.2			air term in calc is from B&V, eq. 5.7, p. 122; ground term is from B&V, eq. 5.9, p. 125	
equivalent feet -->	2148	4	0	0	0	0	0	0	0	0	0					
		A-weighted	19.3	32.5	37.3	38.7	35.0	33.2	33.6	34.2	25.7		**44.0**	**Leq**		
													50.4	**Ldn**		

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Date: 4/22/15

Photograph 1

Site: PennEast Pipeline Project Study Area

Measurement: LT-1

Econo Lodge Inn & Suites
PA-940
White Haven, PA 18661

(View S)

Date: 4/22/15

Photograph 2

Site: PennEast Pipeline Project Study Area

Measurement: LT-1

Econo Lodge Inn & Suites
PA-940
White Haven, PA 18661

(View N)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Date: 4/22/15

Photograph 3

Site: PennEast Pipeline Project Study Area

Measurement: LT-2

Pizza Residence
Route 940
Lake Harmony, PA

(View S)

Date: 4/22/15

Photograph 4

Site: PennEast Pipeline Project Study Area

Measurement: LT-2

Pizza Residence
Route 940
Lake Harmony, PA

(View N)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Date: 4/23/15

Photograph 5

Site: LNG Liquefaction Facility Study Area

Measurement: ST-1

Pizza Residence (rear)
Route 940
Lake Harmony, PA

(View S)

Date: 4/23/15

Photograph 6

Site: PennEast Pipeline Project Study Area

Measurement: ST-1

Pizza Residence (rear)
Route 940
Lake Harmony, PA

(View N)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Date: 4/23/15

Photograph 7

Site: PennEast Pipeline Project Study Area

Measurement: ST-2

Pizza Residence (front)
Route 940
Lake Harmony, PA

(View N)

Date: 4/23/15

Photograph 8

Site: PennEast Pipeline Project Study Area

Measurement: ST-2

Pizza Residence (front)
Route 940
Lake Harmony, PA

(View S)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Date: 4/23/15

Photograph 9

Site: PennEast Pipeline Project Study Area

Measurement: ST-3

Econo Lodge Inn & Suites (front)
PA-940
White Haven, PA 18661

(View N)

Date: 4/23/15

Photograph 10

Site: PennEast Pipeline Project Study Area

Measurement: ST-3

Econo Lodge Inn & Suites (front)
PA-940
White Haven, PA 18661

(View S)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Date: 4/23/15

Photograph 11

Site: PennEast Pipeline Project Study Area

Measurement: ST-4

Econo Lodge Inn & Suites (rear)
PA-940
White Haven, PA 18661

(View S)

Date: 4/23/15

Photograph 12

Site: PennEast Pipeline Project Study Area

Measurement: ST-4

Econo Lodge Inn & Suites (rear)
PA-940
White Haven, PA 18661

(View N)

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: LT-01 ECONOLODGE Analyst: JDD

Sound Level Meter

Model #: LD820

Serial #: 1652

Weighting: A / C / Flat

Response: Slow / Fast / Impl

Windscreen: Yes / No (explain)

Field Calibration

Model #: CAL200

Serial #: 5789

Calibration Level (dBA): 94 / 114

Pre-Test 114.0 dBA

Post-Test 114.1 dBA

Weather Data

Model #: K3500

Serial #: 1703474

Wind: Steady/Gusty/Calm

Precipitation: Yes (explain) / No

Avg Wind Speed/Direction: 4-6 MPH N

Temp (°F): 52° RH (%): 51 %

Bar Psr (Hg): 938.2 Cloud Cover (%): 100%

Topo: Flat / Hilly

Terrain: Hard/Soft/Mixed/Snow

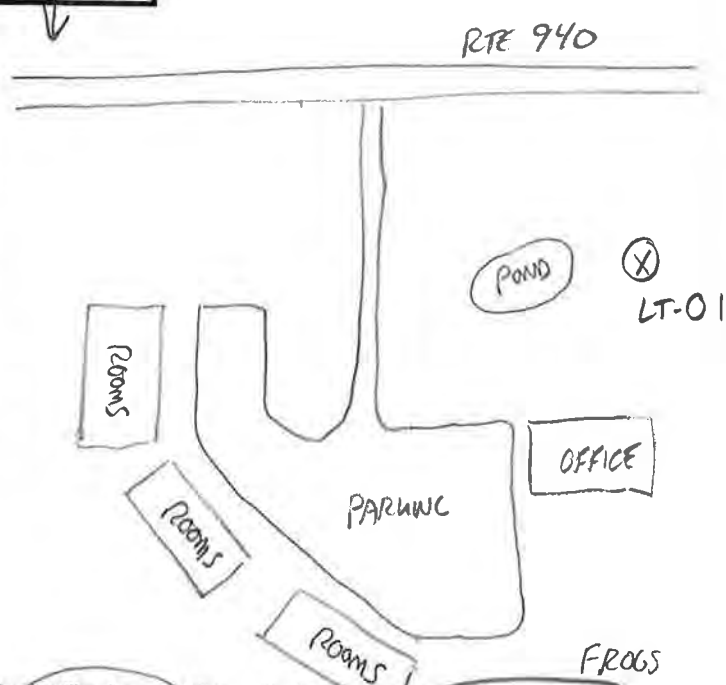
GPS Coordinates (at SLM location)#: N41°05.312' W075°39.956'

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	10:15	4/22							START LONG TERM
	13:15	4/22 →		15:00	4/22				RAIN EVENT
	16:30	4/22							ROADS DRY
	20:21	4/22							BATTERY CHECK
	22:00	4/22 →		23:00	4/22				RAIN EVENT
	≈ 00:00	4/23							ROADS DRY
	10:12	4/23 →		10:23	4/23				DOWNLOAD / BATTERY REPLACEMENT
	19:58	4/23		BATTERY CHECK					36° NW WINDS GUSTY 10MPH 63.3 RH 939.6
									100% CLOUDS
	10:08	4/24							STOPPED LONG TERM

Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	241	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	∅	N/A
Stoplights	∅	N/A
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No 10

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: LT-02 ROUTE 940 (PIZZA RESIDENCE) Analyst: JDD

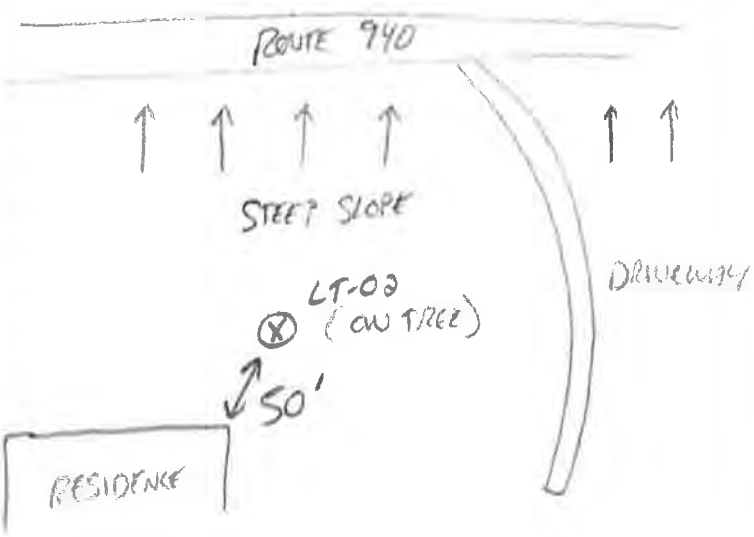
Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD 820	Model #:	CAL200	Model #:	K3500
Serial #:	1651	Serial #:	5789	Serial #:	1703474
Weighting: A / C / Flat		Calibration Level (dBA):	94 / 114	Wind: Steady/Gusty/Calm	
Response: Slow / Fast / Impl		Pre-Test	114.0 dBA	Precipitation: Yes (explain) / No	
Windscreen: Yes / No (explain)		Post-Test	113.4 dBA	Avg Wind Speed/Direction:	3-6 MPH N
Topo: Flat / Hilly		GPS Coordinates (at SLM location)#		Temp (°F): 56.3	RH (%): 53.6%
Terrain: Hard/Soft/Mixed/Snow		N41°05.253' W075°39.801'		Bar Psr (Hg): 938.8	Cloud Cover (%): 100%

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	10:37	4/22							START LONG TERM
	13:15	4/22 →		15:00	4/22				RAIN EVENT
	16:30	4/22							ROADS DRY
	19:50	4/22							BATTERY CHECK
	22:00	4/22 →		23:00	4/22				RAIN EVENT
	@ 00:00	4/23							ROADS DRY
	10:29	4/23 →		10:40	4/23				DOWNLOAD / BATTERY REPLACEMENT
	19:16	4/23	BATTERY	CHECK					36° WINDS 4-6 N w/ GUSTS 10
									79.1% RH 941.1 PRESS CLOUDS 100%
	10:26	4/24							STOPPED LONG TERM

Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	24'	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	Ø	N/A
Stoplights	Ø	N/A
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No 11

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/I-80/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: ST-01 ROUTE 940 (PIZZA RESIDENCE) Analyst: JDD

Sound Level Meter
Model #: LD820
Serial #: 1736
Weighting: A / C / Flat
Response: Slow / Fast / Impl
Windscreen: Yes / No (explain)

Field Calibration (REAR)
Model #: CAL 200
Serial #: 5789
Calibration Level (dBA): 94 / 114
Pre-Test 114.0 dBA
Post-Test 114.9 dBA

Weather Data
Model #: K3500
Serial #: 1703474
Wind: Steady/Gusty/Calm
Precipitation: Yes (explain) / No
Avg Wind Speed/Direction: 2-3 MPH E
Temp (°F): 56.3 RH (%): 49.2%
Bar Psr (Hg): 940.0 Cloud Cover (%): 100%

Topo: Flat / Hilly
Terrain: Hard/Soft/Mixed/Snow

GPS Coordinates (at SLM location)#
N41°05.144' W075°39.752'

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	11:13	11:31							1 MIN INTERVALS
	19:12	19:28							1 MIN INTERVALS
									2-4 MPH E 48° TEMP 63.7% RH
									PRESS 939.6 CLOUDS 80%
									AUTO 17 MT 0 HT 0 MOTO 1 15 MIN
	NO NIGHT	TIME	READINGS						WET ROADS

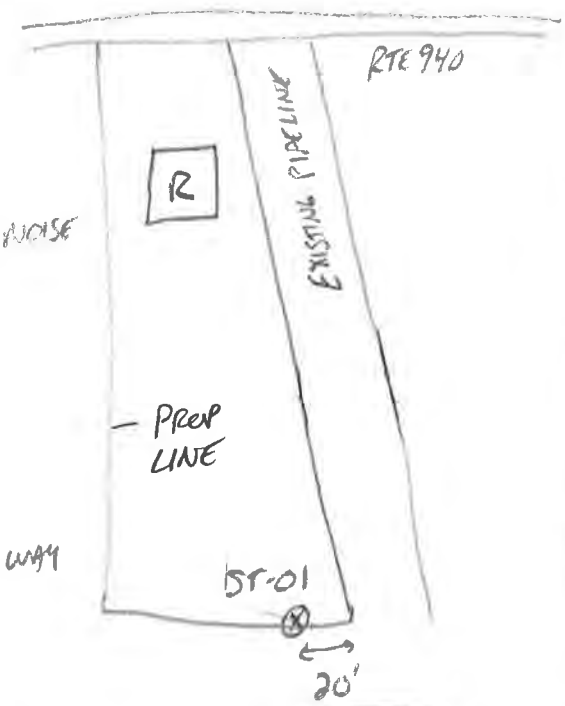
Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	24'	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	Ø	N/A
Stoplights	Ø	N/A
Motorcycles	4	
Automobiles	38	
Medium Trucks	3	
Heavy Trucks	2	
Buses	Ø	
Count duration	15 MIN	

compass

N

* DOMINANT NOISE WAS I-80

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: ST-02 ROUTE 940 (PIZZA RESIDENCE) Analyst: JDD

Sound Level Meter
Model #: LD820
Serial #: 1736
Weighting: A / C / Flat
Response: Slow / Fast / Impl
Windscreen: Yes / No (explain)

Field Calibration (FRONT)
Model #: CAL 200
Serial #: 5789
Calibration Level (dBA): 94 / 114
Pre-Test 114.0 dBA
Post-Test 114.9 dBA

Weather Data
Model #: K3500
Serial #: 1703474
Wind: Steady/Gusty/Calm
Precipitation: Yes (explain) / No
Avg Wind Speed/Direction: 2-3 MPH N
Temp (°F): 55.4 RH (%): 56.6%
Bar Psr (Hg): 937.3 Cloud Cover (%): 100%

Topo: Flat / Hilly
Terrain: Hard/Soft/Mixed/Snow

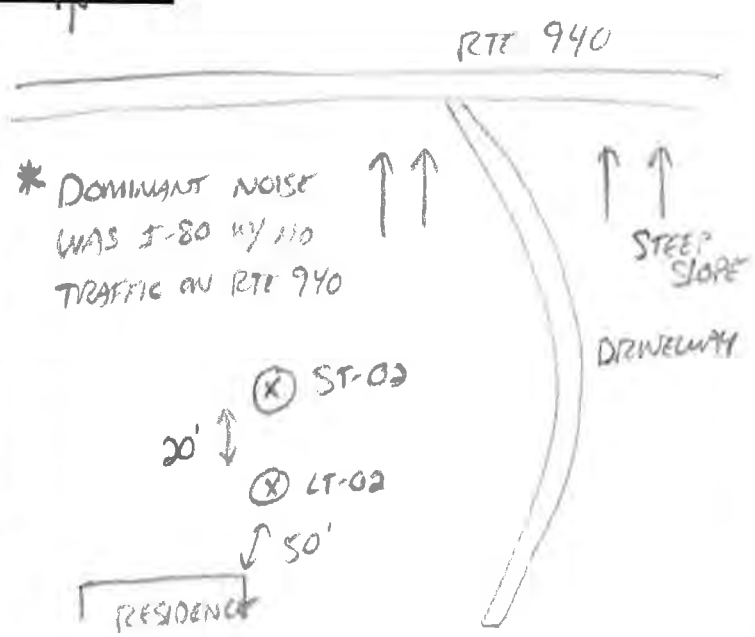
GPS Coordinates (at SLM location)#
N41°05.254' W075°39.788'

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	11:38	11:55							1 MIN INTERVALS
	19:33	19:50							1 MIN INTERVALS
									2-4 MPH N 47° 63.5% RH
									PRESS 939.6 CLOUDS 70%
									AUTO 19 MT 0 HT 3 MOTO 0 15 MIN
	NO	NIGHT	TIME	READINGS					WET ROADS

Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	24'	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	Ø	N/A
Stoplights	Ø	N/A
Motorcycles	Ø	
Automobiles	22	
Medium Trucks	2	
Heavy Trucks	0	
Buses	Ø	
Count duration	15 MIN	

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No 10

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: ST-03 ECONOLODGE (FRONT) Analyst: JDD

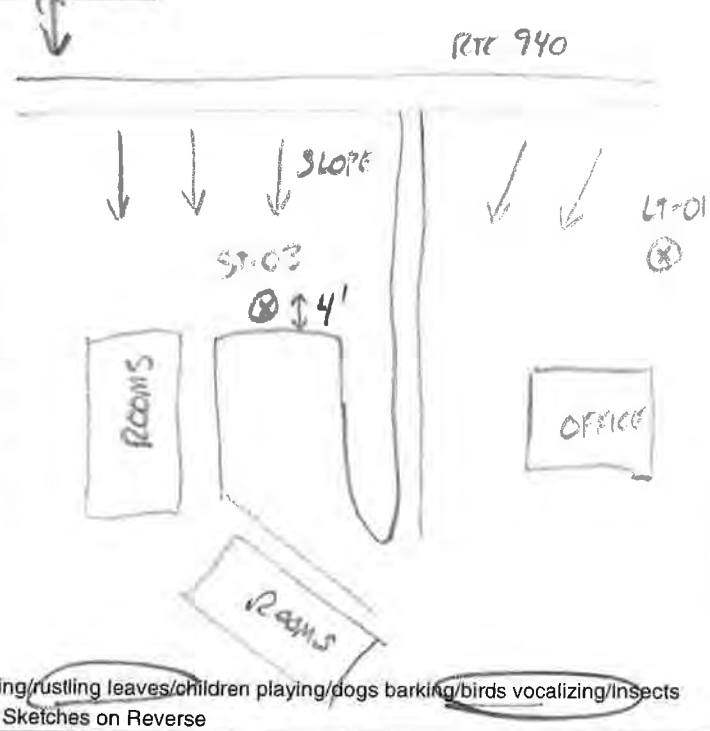
Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD820	Model #:	CAL 200	Model #:	K3500
Serial #:	1736	Serial #:	5789	Serial #:	1703424
Weighting: A / C / Flat		Calibration Level (dBA):	94 / 114	Wind: Steady/Gusty/Calm	
Response: Slow / Fast / Impl		Pre-Test	114.0 dBA	Precipitation: Yes (explain) / No	
Windscreen : Yes / No (explain)		Post-Test	114.9 dBA	Avg Wind Speed/Direction:	6-8 MPH N
Topo: Flat / Hilly		GPS Coordinates (at SLM location)#		Temp (°F): 55.5	RH (%): 57.9%
Terrain: Hard/Soft/Mixed/Snow		N41°05.303' W075°39.911'		Bar Psr (Hg): 935.6	Cloud Cover (%): 80%

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	12:04	12:21							1 MIN INTERVALS
	20:29	20:44							1 MIN INTERVALS
									3-5 MPH S 45.8° 64.0% RH
									937.7 PRESS CLOUDS N/A
									AUTO 17 MT Ø HT Ø 15 MIN
									(PEOPLE OUTSIDE OF HOTEL TALKING)
	NO NIGHT TIME			READINGS					WET ROADS

Roadway Name/Dir	RTE 940	
Speed (post/obs)*	45	
Number of Lanes	2	
Width (pave/row)	24'	
1- or 2- way	2	
Grade	HILLY	
Bus Stops	Ø	
Stoplights	Ø	
Motorcycles	Ø	
Automobiles	29	
Medium Trucks	3	
Heavy Trucks	2	
Buses	Ø	
Count duration	15 MIN	

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No 9

Additional Notes/Comments:

I-80

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/22/15 Page ___ of ___

Monitoring Location: ST-04 ECONOLODGE (REAR) Analyst: JDD

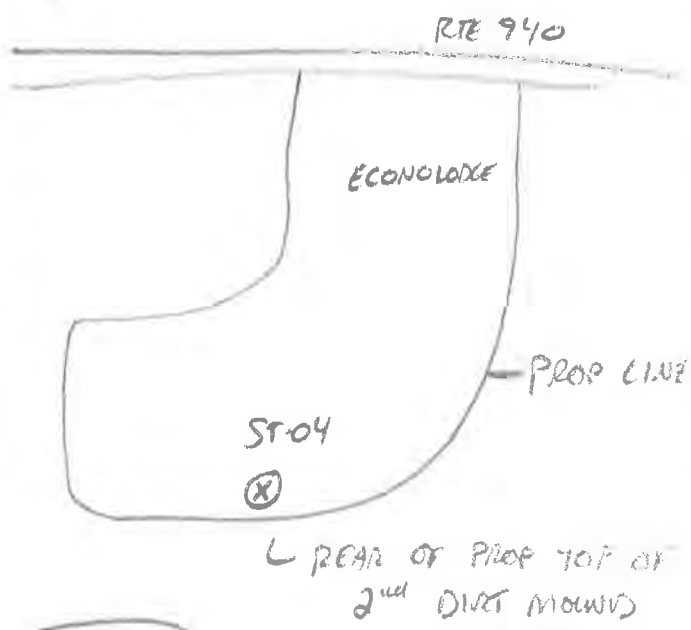
Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD 820	Model #:	CAL 200	Model #:	K3500
Serial #:	1736	Serial #:	5789	Serial #:	1703474
Weighting: A / C / Flat		Calibration Level (dBA):	94 / 114	Wind: Steady/Gusty/Calm	
Response: Slow / Fast / Impl		Pre-Test	114.0 dBA	Precipitation: Yes (explain) / No	
Windscreen: Yes / No (explain)		Post-Test	114.9 dBA	Avg Wind Speed/Direction:	6.8 MPH N
Topo: Flat / Hilly		GPS Coordinates (at SLM location)#		Temp (°F):	56.1 RH (%): 57.6%
Terrain: Hard/Soft/Mixed/Snow		N41°05.413' W075°39.913'		Bar Psr (Hg):	933.8 Cloud Cover (%): 80%

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	12:35	12:54							1-MIN INTERVALS
	20:01	20:16							1 MIN INTERVALS
									2-4 MPH N 49.9° 64.9% RH
									935.5 PRESS CLOUDS 70%
									AUTO 14 MT Ø HT Ø 15 MIN
	NO NIGHT	TIME	READINGS						WET ROADS

Roadway Name/Dir	RTE 940	
Speed (post/obs)*	45	
Number of Lanes	2	
Width (pave/row)	24'	
1- or 2- way	2	
Grade	HILLY	
Bus Stops	Ø	
Stoplights	Ø	
Motorcycles	Ø	
Automobiles	28	
Medium Trucks	1	
Heavy Trucks	2	
Buses	Ø	
Count duration	15 MIN	

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No 8

Additional Notes/Comments:

I-80

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/23/15 Page ___ of ___

Monitoring Location: ST-01 ROUTE 940 (PIZZA RESIDENCE) Analyst: JDD

Sound Level Meter

Model #: LD820

Serial #: 1736

Weighting: A / C / Flat

Response: Slow / Fast / Impl

Windscreen: Yes / No (explain)

Field Calibration (REAR)

Model #: CAL 200

Serial #: 5789

Calibration Level (dBA): 94 / 114

Pre-Test 114.0 dBA

Post-Test 114.2 dBA

Weather Data

Model #: 43500

Serial #: 1703474

Wind: Steady/Gusty/Calm

Precipitation: Yes (explain) / No

Avg Wind Speed/Direction: 4-6 MPH E

Temp (°F): 41.8 RH (%): 68.2

Bar Psr (Hg): 942.2 Cloud Cover (%):

Topo: Flat / Hilly

Terrain: Hard/Soft/Mixed/Snow

GPS Coordinates (at SLM location)#

SEE OTHER SHEET

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	10:54	11:13							1 MIN INTERVALS
	18:52	19:09							1 MIN INTERVALS
									38° 2-4MPH S 57.8% RH
									942.6 PRESS CLOUDS 60%
									AUTO 30 MT 1 HT 0 15 MIN
	NO NIGHT	TIME	READING						TOO REMOTE
		DUE TO	SAFETY						

Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	24'	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	Ø	N/A
Stoplights	Ø	N/A
Motorcycles	Ø	
Automobiles	36	
Medium Trucks	Ø	
Heavy Trucks	1	
Buses	Ø	
Count duration	15 MIN	

compass

Site Diagram:

SEE OTHER SHEET

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No SEE OTHER SHEET

Additional Notes/Comments:

I-80

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENN EAST PIPELINE Project #: 20000363 Date: 4/23/15 Page ___ of ___

Monitoring Location: ST-02 ROUTE 940 (PIZZA RESIDENCE) Analyst: JDD

Sound Level Meter

Model #: LD820

Serial #: 1736

Weighting: A / C / Flat

Response: Slow / Fast / Impl

Windscreen: Yes / No (explain)

Field Calibration (FRONT)

Model #: CAL 200

Serial #: 5789

Calibration Level (dBA): 94 / 114

Pre-Test 114.0 dBA

Post-Test 114.2 dBA

Weather Data

Model #: K3500

Serial #: 1703474

Wind: Steady/Gusty/Calm

Precipitation: Yes (explain) / No

Avg Wind Speed/Direction: 4-6 N GUSTS 10

Temp (°F): 36.7° RH (%): 79.1%

Bar Psr (Hg): 941.1 Cloud Cover (%): 100%

Topo: Flat / Hilly

Terrain: Hard/Soft/Mixed/Snow

GPS Coordinates (at SLM location)#: SEE OTHER SHEET

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	10:29	10:48							1 MIN INTERVALS
	19:14	19:31							1 MIN INTERVALS
									38° 2-4 MPH S 57.8% RH
									942.6 PRESS CLOUDS 60%
									AUTO 27 MT 1 HT Ø 15MIN
	22:55	23:11							1 MIN INTERVALS
									34° CALM WINDS 56.7% RH
									944.3 PRESS CLOUDS N/A
									AUTO 8 MT 1 HT 6 15MIN

Roadway Name/Dir	RTE 940	I-80
Speed (post/obs)*	45	70
Number of Lanes	2	4
Width (pave/row)	24'	N/A
1- or 2- way	2	2
Grade	HILLY	HILLY
Bus Stops	Ø	N/A
Stoplights	Ø	N/A
Motorcycles	Ø	
Automobiles	36	
Medium Trucks	4	
Heavy Trucks	Ø	
Buses	Ø	
Count duration	15MIN	

compass

Site Diagram:

SEE OTHER SHEET

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No SEE OTHER SHEET

Additional Notes/Comments:

I-80

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/23/15 Page ___ of ___

Monitoring Location: ST-03 ECONOLODGE (FRONT) Analyst: JDD

Sound Level Meter

Model #: LD820

Serial #: 1736

Weighting: A / C / Flat

Response: Slow / Fast / Impl

Windscreen: Yes / No (explain)

Field Calibration

Model #: CAL 200

Serial #: 5789

Calibration Level (dBA): 94 / 114

Pre-Test 114.0 dBA

Post-Test 114.2 dBA

Weather Data

Model #: 43500

Serial #: 1703474

Wind: Steady/Gusty/Calm

Precipitation: Yes (explain) No

Avg Wind Speed/Direction: 4-6 S w/GUSTS 10

Temp (°F): 46.7° RH (%): 60.2%

Bar Psr (Hg): 939.5 Cloud Cover (%): 100%

Topo: Flat / Hilly

Terrain: Hard/Soft/Mixed/Snow

GPS Coordinates (at SLM location)#: SEE OTHER SHEET

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	11:52	12:08							1 MIN INTERVALS
	20:03	20:19							1 MIN INTERVALS
									36° 4-6 MPH S 61.1% RH
									942.3 PRESS CLOUDS 100%
									AUTO 18 MT Ø HT Ø 15 MIN
	23:41	23:57							1 MIN INTERVALS
									34° 2.3 MPH S 56.8% RH
									944.5 PRESS CLOUDS N/A
									AUTO 4 MT Ø HT 3 15 MIN

Roadway Name/Dir	RTE 940	
Speed (post/obs)*	45	
Number of Lanes	2	
Width (pave/row)	24'	
1- or 2- way	2	
Grade	HILLY	
Bus Stops	Ø	
Stoplights	Ø	
Motorcycles	Ø	
Automobiles	41	
Medium Trucks	3	
Heavy Trucks	3	
Buses	Ø	
Count duration	15 MIN	

compass

Site Diagram:

SEE OTHER SHEET

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No

Additional Notes/Comments: SEE OTHER SHEET

I-80

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: PENNEAST PIPELINE Project #: 20000363 Date: 4/28/15 Page ___ of ___

Monitoring Location: ST-04 ECONOLODGE (REAR) Analyst: JDD

Sound Level Meter

Model #: LD820

Serial #: 1736

Weighting: A / C / Flat

Response: Slow / Fast / Impl

Windscreen: Yes / No (explain)

Field Calibration

Model #: CAL 200

Serial #: 5789

Calibration Level (dBA): 94 / 114

Pre-Test 114.0 dBA

Post-Test 114.2 dBA

Weather Data

Model #: K3500

Serial #: 1703474

Wind: Steady/Gusty/Calm

Precipitation: Yes (explain) / No

Avg Wind Speed/Direction: 4-6 N

Temp (°F): 41.1 RH (%): 67.0

Bar Psr (Hg): 938.0 Cloud Cover (%): 100%

Topo: Flat / Hilly

Terrain: Hard/Soft/Mixed/Snow

GPS Coordinates (at SLM location)#: SEE OTHER SHEET

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
	11:26	11:45							1 MIN INTERVALS
	19:38	19:53							1 MIN INTERVALS
									37° 2-3 MPH S 64.0% RH
									940.5 PRESS CLOUDS 85%
									AUTO 2Ø MT Ø HT Ø 15 MIN
	23:19	23:36							1 MIN INTERVALS
									34° 2-3 MPH S 56.8% RH
									944.5 PRESS CLOUDS N/A
									AUTO 14 MT Ø HT Ø 15 MIN

Roadway Name/Dir	RTE 940	
Speed (post/obs)*	45	
Number of Lanes	2	
Width (pave/row)	24'	
1- or 2- way	2	
Grade	MILD	
Bus Stops	Ø	
Stoplights	Ø	
Motorcycles	Ø	
Automobiles	48	
Medium Trucks	2	
Heavy Trucks	1	
Buses	0	
Count duration	15 MIN	

compass

Site Diagram:

SEE OTHER SHEET

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No

Additional Notes/Comments: SEE OTHER SHEET

Other Noise Sources: distant: aircraft/roadway traffic/I-80/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

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Appendix L-5

Fugitive Dust Plan

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PennEast Pipeline Company, LLC
PennEastPennEast Pipeline Project

Docket No. PF15-1-000

Fugitive Dust Control Plan

July 2015

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1. Introduction 1
2. Applicability 1
3. Dust Emissions and Control Measures 1
4. Responsibility and Authority 2
5. Recordkeeping and Monitoring 2

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1. Introduction

PennEast Pipeline Company, LLC (PennEast) is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) pursuant to Section 7(c) of the Natural Gas Act to implement the proposed PennEast Pipeline Project (PennEast) to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production area in northeastern Pennsylvania (PA) to growing natural gas markets in eastern PA, southeastern PA, New Jersey (NJ) and surrounding states with the capability of providing approximately 1.0 billion dekatherms per day of year-round natural gas transportation service. The Project will include the construction of approximately 113.8 miles of new 36-inch pipeline spanning Luzerne County, PA to Mercer County, NJ. The Project includes 0.3 miles of new 12-inch diameter lateral in Hunterdon County to transport natural gas to Elizabethtown Gas and the Gilbert Power Station. The Project will involve an addition 1.4 miles of new 36-inch diameter lateral in Hunterdon County, NJ to transport natural gas to an interconnection with Algonquin Gas Transmission, LLC and Texas Eastern Transmission, LP. The Project also includes the construction of one new compressor station in Carbon County, PA.

The purpose of this Dust Control Plan (Plan) is to inform the contractor and its subcontractors of required measures to reduce the impact of dust on the nearby community (i.e., off-site receptors including residences, businesses) and on-site workers as a result of construction and soil handling activities. Additionally, this plan helps prevent the off-site spread of dust that may result from Project construction activity. This Plan describes control measures to be implemented before, after, and while conducting any dust generating operation. The Plan requires monitoring, corrective actions to abate emission of dust and documentation of control measures taken.

2. Applicability

The Plan is applicable to the PennEast pipeline construction activities that may generate fugitive dust emissions. These activities include construction vehicle movement on paved and unpaved roads and pipeline construction equipment operations such as trenching, backfilling, and other earthmoving activities, including routine use of unpaved roads, soil excavation, and the handling of soil, aggregate or materials that may generate air emissions of particulate matter.

3. Dust Emissions and Control Measures

During the construction or installation, the contractor shall not cause or permit any materials or property to be handled, transported, stored, used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Reasonable precautions to control fugitive dust emissions may include the following:

1. Where possible, use of water for control of dust in the construction operations, the grading of roads, or the clearing of land;

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2. Application of water, or suitable dust suppression chemicals on dirt roads, materials stockpiles, and other surfaces which may create significant airborne dust;

3. Where possible, paving/grading of roadways and maintaining them in a clean condition;

4. Removal of spilled or tracked dirt or other materials from paved streets, and of dried sediments resulting from soil erosion; and/or

5. Reducing the speed of vehicular traffic to a point below that at which significant dust emissions are created.

4. Responsibility and Authority

The Contractor, Construction Superintendent, the Field Project Manager (FPM) and Environmental Inspector (EI) will share the authority to determine if/when water needs to be reapplied for dust control and to determine if/when additional mitigation will be needed.

The Construction Contractor will furnish, operate and maintain equipment and employ methods to minimize the migration of dust beyond the boundaries of the work site. The Contractor also will provide a copy of the Dust Control Plan to all applicable site subcontractors. The Contractor Construction Superintendent will be responsible for implementing the Dust Control Plan. The Field Project Manager (FPM) and Environmental Inspector (EI) shall determine when it is necessary to apply water to control fugitive dust during construction activities. Additionally, they have the authority over the Contractor to stop work on any activity that does not comply with the dust control measures outlined in this plan.

5. Recordkeeping and Monitoring

PennEast's Contractor will document in their daily report the actual application or implementation of the control measures delineated in the Fugitive Dust Control Plan.

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Appendix P

Reroute Analysis Tables and Figures

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Appendix P

Reroute Analysis Tables and Figures

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Appendix P should be reviewed in conjunction with Resource Report 10, Alternatives. A range of deviations to the proposed route have been examined to date and are continuing to be developed as survey access and additional engineering and environmental information becomes available. Table 10.3-12 presents a summary of the major route adjustments that were adopted during PennEast's alternatives analysis and are contributing components to the Key Alternatives described in Section 10.3.1 above. Table 10.3-18 presents a summary of the minor adjustments to the proposed route that were adopted or considered and the justification for the changes. Appendix P includes details on the alternative assessment for the Proposed Route, Alternatives Rejected (the variations requested, evaluated and rejected) and Prior Alternatives (the segments of the prior alternative that was superseded by the variation adopted into the Proposed Route). Although there are several iterations of alternatives and deviations that have been considered, PennEast will endeavor to reformat for continuity of the naming convention, Appendix P for the September 2015 filing.

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Appendix P-1

Route Variation No. 1

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 01 – Arch Exclusion Area 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	59.05		N/A	
End		60.55			
Length	Ft	8,093.00		9,562.00	
Area	Acres *	23.22		27.44	
Land requirements:					
Construction	Acres *	13.93		16.46	
Permanent		9.29		10.98	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.2	0.1
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.2	0.1
Waterbodies / Streams affected	#	3		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	11.37	7.58	15.65	10.43
Forested		0.59	0.39	0.50	0.33
Open		0.83	0.55	0.02	0.01
Residential/Commercial		1.14	0.76	0.30	0.20
Open Water		0.00	0.00	0.00	0.00
Total ****		13.93	9.29	16.46	10.98
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		1		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	12		12	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Route Variation No. 01

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Appendix P-2

Route Variation No. 2

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 02 – ConEd Solar Farm

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	88.35		N/A	
End		89.50			
Length	Ft	6125		6951	
Area	Acres *	17.58		19.95	
Land requirements:					
Construction	Acres *	10.55		11.97	
Permanent		7.03		7.98	
Colocation:					
Power Line ROW	Ft	0.00		2375	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		2375	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.84	1.23	2.51	1.67
Forested		5.67	3.78	7.55	5.03
Open		0.00	0.00	0.28	0.19
Residential/Commercial		3.03	2.02	1.63	1.09
Open Water		0.00	0.00	0.00	0.00
Total ****		10.55	7.03	11.97	7.98
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Route Variation No. 02

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Appendix P-3

Route Variation No. 3

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 03 – Arch Exclusion Area 002

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	72.50		N/A	
End		73.85			
Length	Ft	8472		9707	
Area	Acres *	24.31		27.86	
Land requirements:					
Construction	Acres *	14.59		16.71	
Permanent		9.72		11.14	
Colocation:					
Power Line ROW	Ft	152		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		152		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	10.15	6.76	8.92	5.95
Forested		1.77	1.18	1.71	1.14
Open		1.93	1.29	5.48	3.65
Residential/Commercial		0.74	0.49	0.6	0.40
Open Water		0.00	0.00	0.00	0.00
Total ****		14.59	9.72	16.71	11.14
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		2	
Commercial		0		0	
Other (Barn, Shed, etc.)		1		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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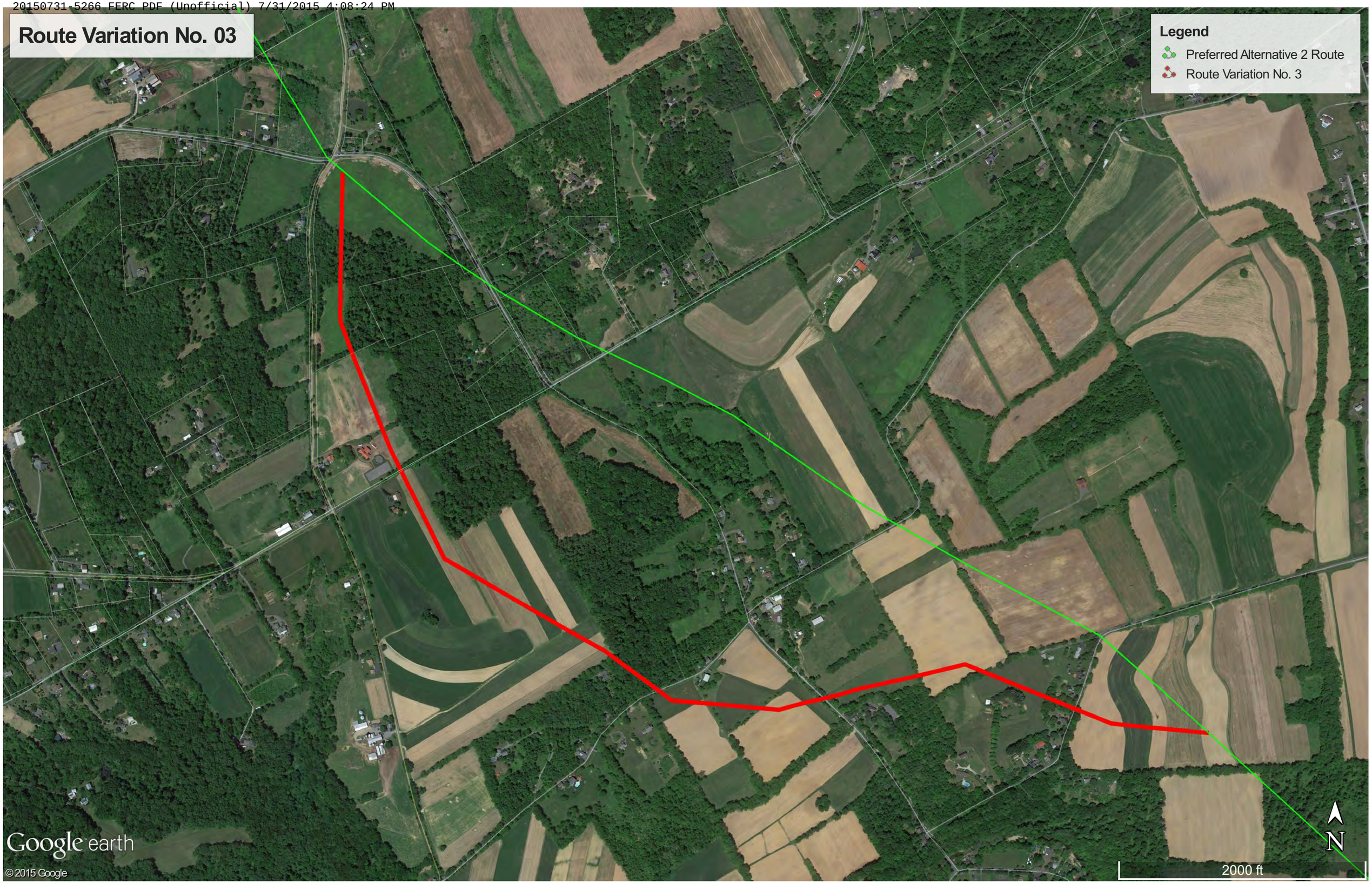

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Appendix P-4

Route Variation No. 4

(negated by Route Variation No. 6H. Reroute analysis not completed)

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Appendix P-5

Route Variation No. 5

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 05 – Mercer County Equestrian Center

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	107.60		N/A	
End		108.90			
Length	Ft	6749		7080	
Area	Acres *	19.37		20.32	
Land requirements:					
Construction	Acres *	11.62		12.19	
Permanent		7.75		8.13	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	6.27	4.18	0.00	0.00
Forested		1.80	1.20	3.22	2.15
Open		3.36	2.24	8.38	5.59
Residential/Commercial		0.19	0.13	0.59	0.39
Open Water		0.00	0.00	0.00	0.00
Total ****		11.62	7.75	12.19	8.13
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		0	
Commercial		3		0	
Other (Barn, Shed, etc.)		3		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-6A

Route Variation No. 6A

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6A – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	0.00		N/A	
End		0.98			
Length	Ft	5507		5142	
Area	Acres *	15.8		14.76	
Land requirements:					
Construction	Acres *	9.48		8.85	
Permanent		6.32		5.9	
Colocation:					
Power Line ROW	Ft	0.00		1292	
Pipeline ROW		0.00		1251	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		2543	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		8.79	5.86	8.42	5.61
Open		0.70	0.46	0.44	0.29
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		9.48	6.32	8.85	5.90
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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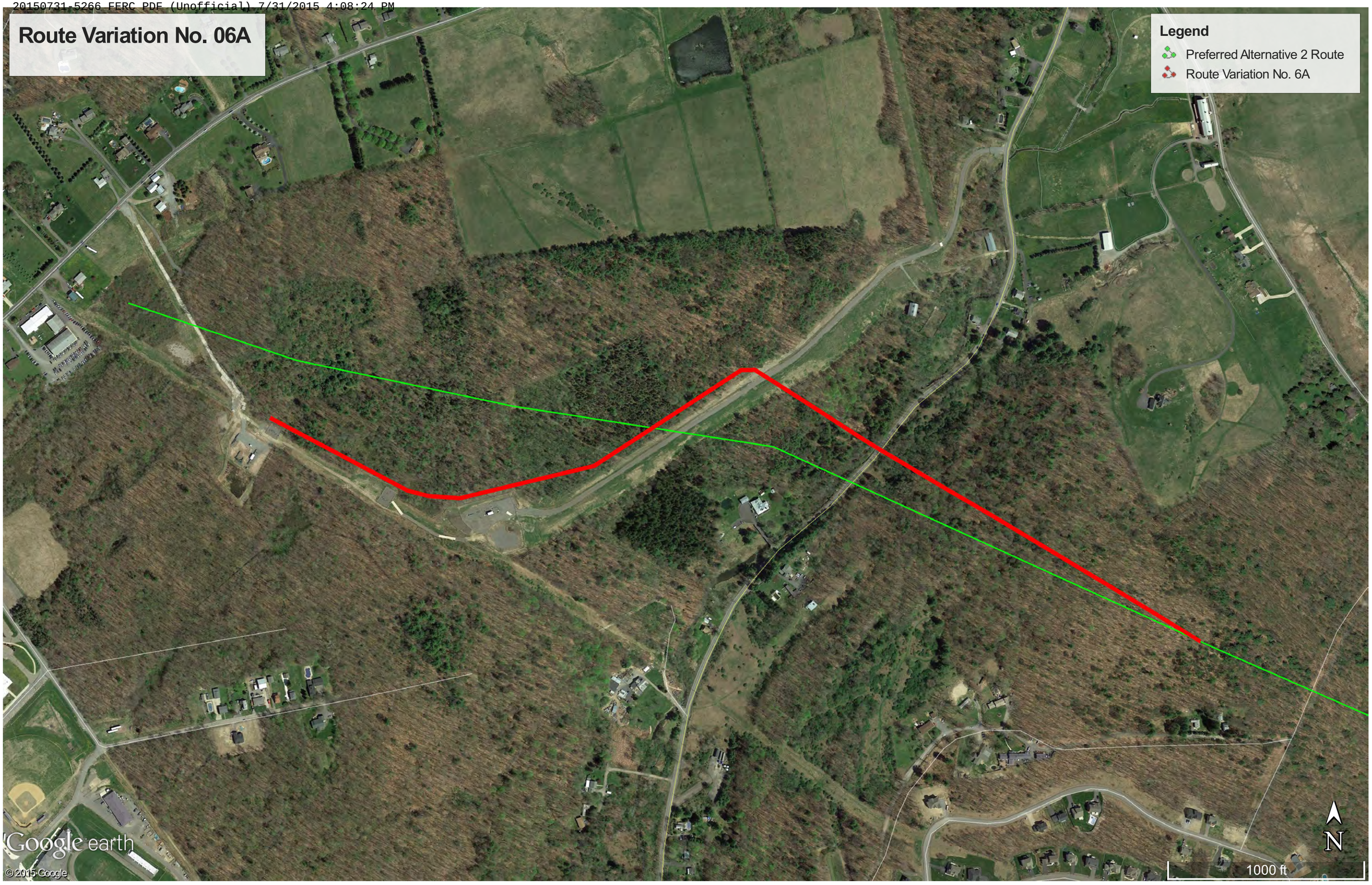

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Appendix P-6B

Route Variation No. 6B

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6B – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	5.05		N/A	
End		5.58			
Length	Ft	3407		3032	
Area	Acres *	9.78		8.7	
Land requirements:					
Construction	Acres *	5.87		5.22	
Permanent		3.91		3.48	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		4.56	3.04	4.06	2.71
Open		0.92	0.61	0.00	0.00
Residential/Commercial		0.39	0.26	1.16	0.77
Open Water		0.00	0.00	0.00	0.00
Total ****		5.87	3.91	5.22	3.48
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		1	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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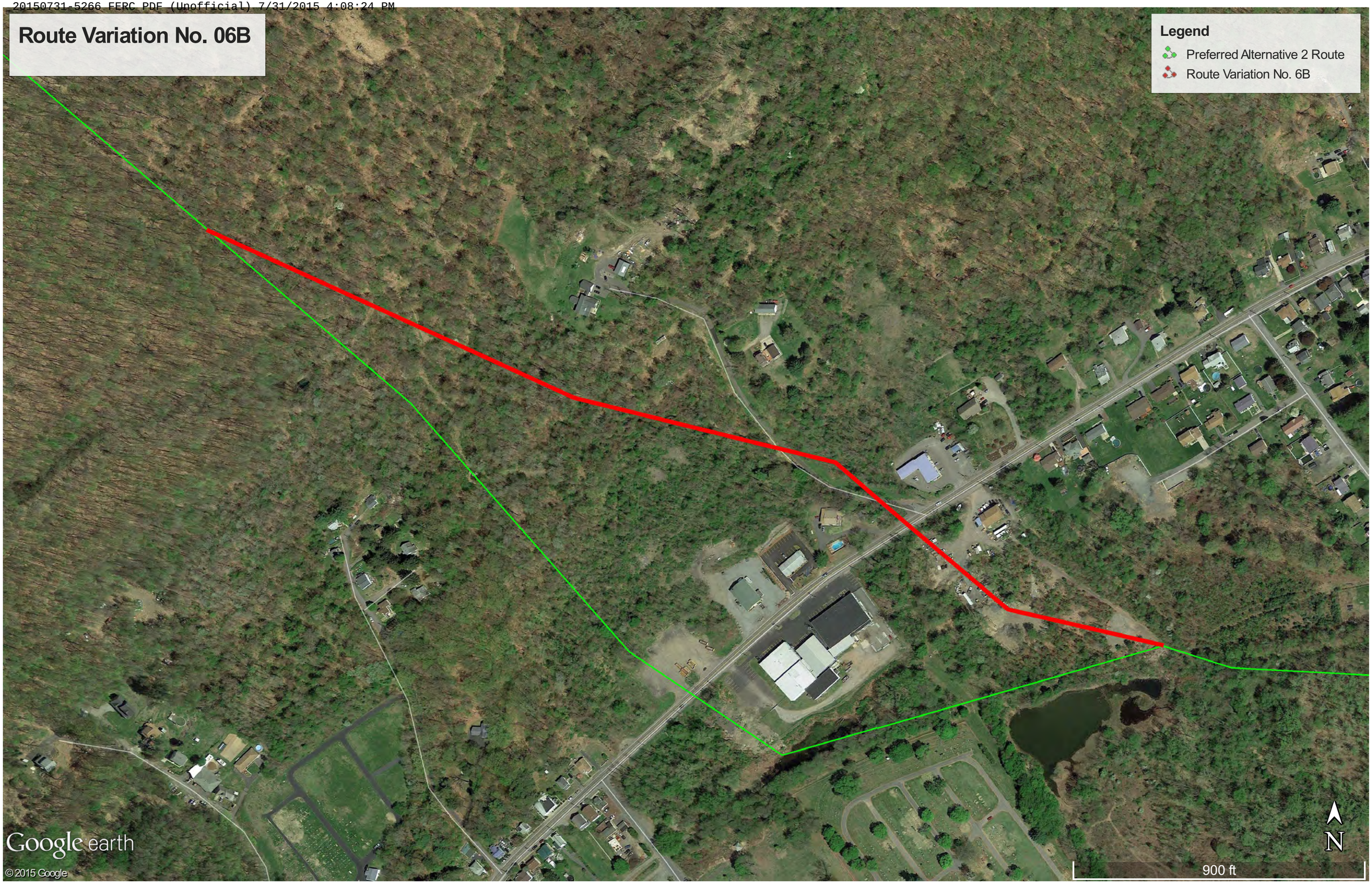

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Appendix P-6C

Route Variation No. 6C

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6C – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	5.94		N/A	
End		6.65			
Length	Ft	3530		3775	
Area	Acres *	10.13		10.83	
Land requirements:					
Construction	Acres *	6.08		6.5	
Permanent		4.05		4.33	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.53	1.69	2.06	1.37
Forested		1.09	0.73	2.05	1.37
Open		1.27	0.85	1.61	1.07
Residential/Commercial		1.19	0.79	0.78	0.52
Open Water		0.00	0.00	0.00	0.00
Total ****		6.08	4.05	6.50	4.33
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		2		0	
Other (Barn, Shed, etc.)		1		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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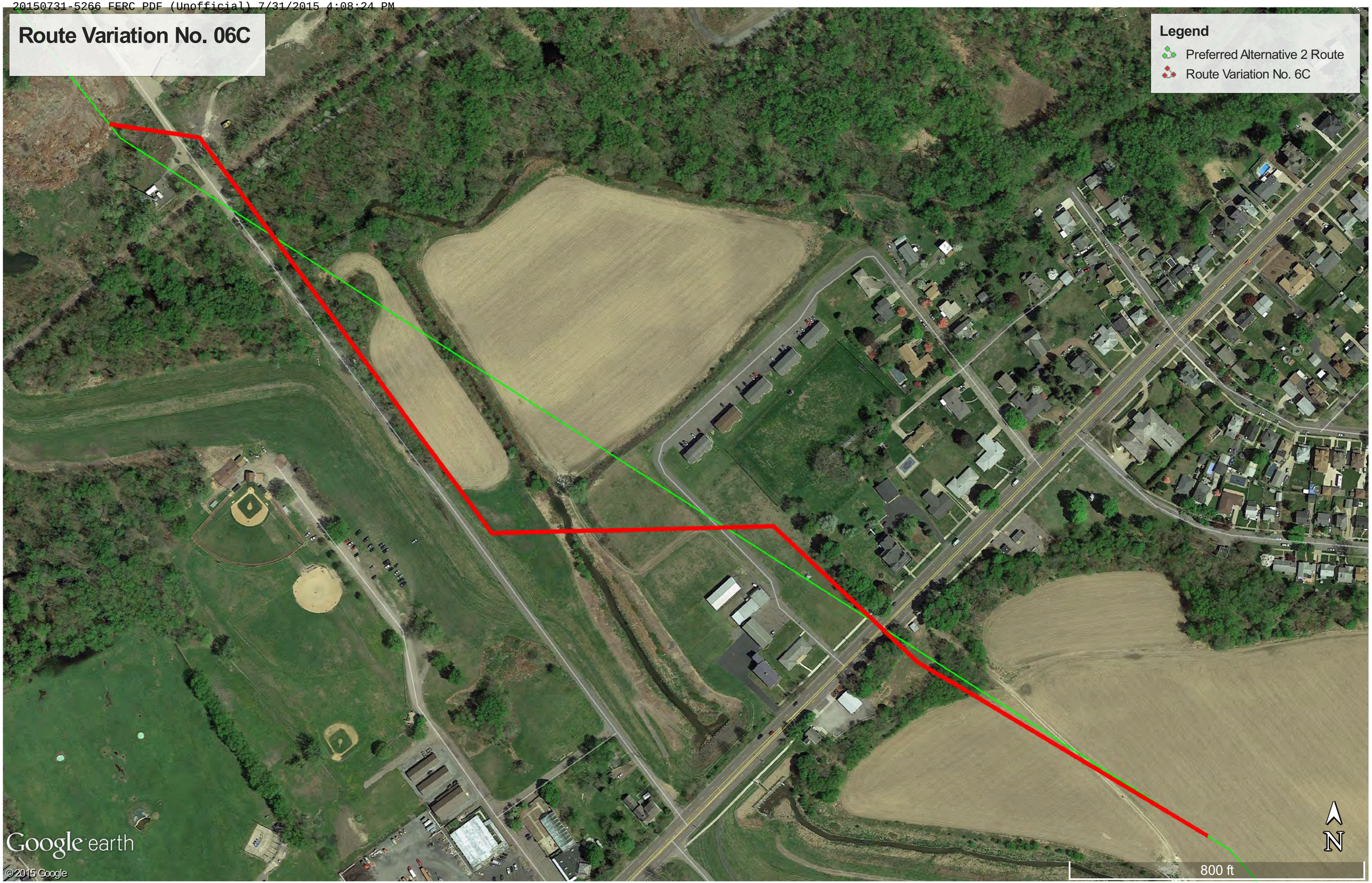

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Appendix P-6D

Route Variation No. 6D

(negated by Route Variation No. 37. Reroute analysis not completed)

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Appendix P-6E

Route Variation No. 6E

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6E – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	9.02		N/A	
End		9.77			
Length	Ft	4013		3944	
Area	Acres *	11.52		11.32	
Land requirements:					
Construction	Acres *	6.91		6.79	
Permanent		4.61		4.53	
Colocation:					
Power Line ROW	Ft	0.00		2734	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		2734	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		5.79	3.86	6.00	4.00
Open		0.04	0.03	0.26	0.17
Residential/Commercial		1.08	0.72	0.53	0.35
Open Water		0.00	0.00	0.00	0.00
Total ****		6.91	4.61	6.79	4.53
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		6		0	
Other (Barn, Shed, etc.)		0		3	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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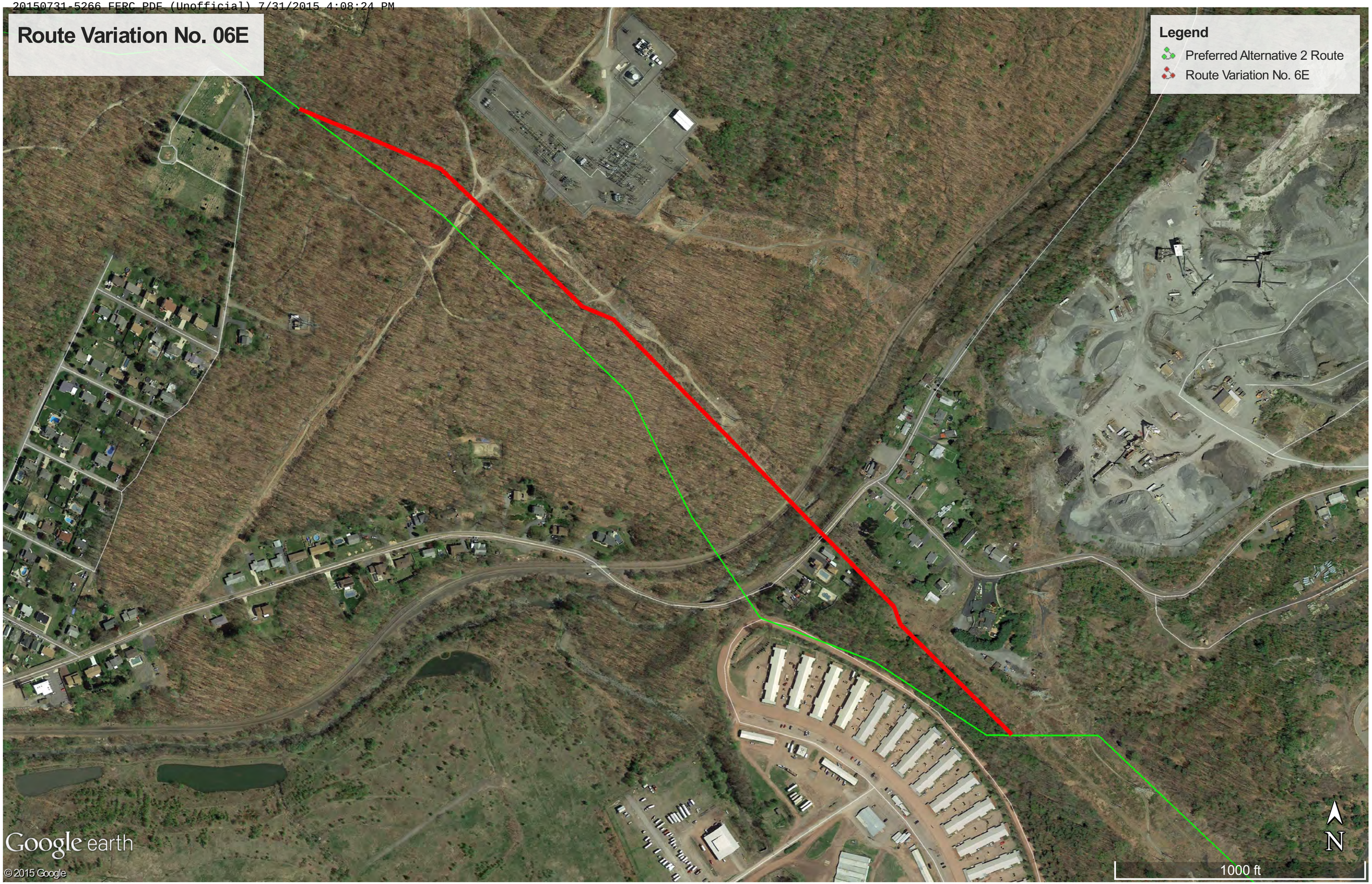

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Appendix P-6F

Route Variation No. 6F

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6F – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	9.77		N/A	
End		10.70			
Length	Ft	5101		4896	
Area	Acres *	14.64		14.05	
Land requirements:					
Construction	Acres *	8.78		8.43	
Permanent		5.86		5.62	
Colocation:					
Power Line ROW	Ft	4477		1232	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		4477		1232	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		3.84	2.56	7.60	5.07
Open		4.15	2.76	0.00	0.00
Residential/Commercial		0.79	0.53	0.83	0.55
Open Water		0.00	0.00	0.00	0.00
Total ****		8.78	5.86	8.43	5.62
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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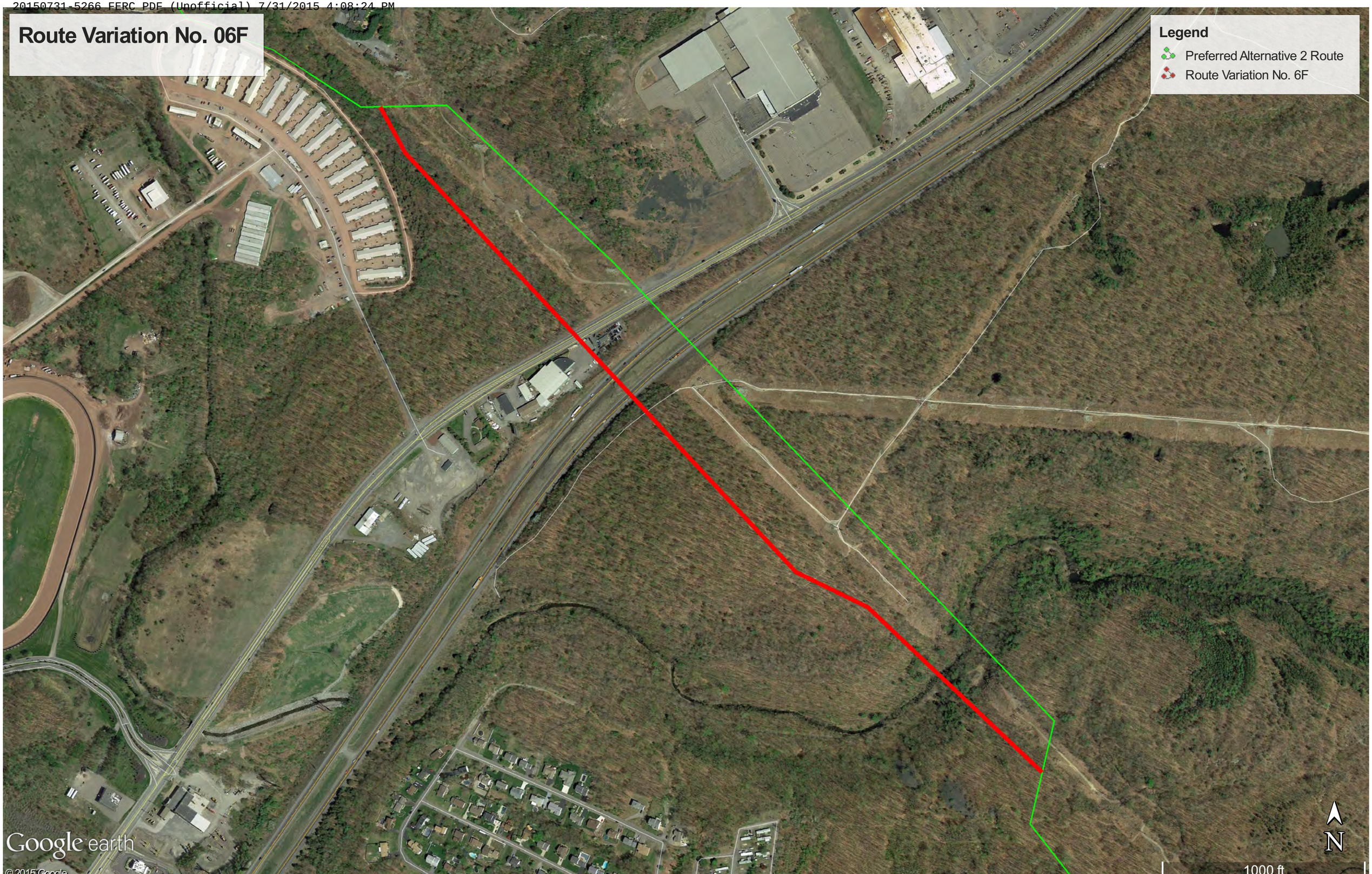

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Appendix P-6G

Route Variation No. 6G

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6G – Route Review Tweaks 001

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	40.30		N/A	
End		41.65			
Length	Ft	7538		7406	
Area	Acres *	21.63		21.25	
Land requirements:					
Construction	Acres *	12.98		12.75	
Permanent		8.65		8.5	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		11.28	7.52	11.84	7.90
Open		0.29	0.19	0.76	0.50
Residential/Commercial		1.41	0.94	0.15	0.10
Open Water		0.00	0.00	0.00	0.00
Total ****		12.98	8.65	12.75	8.50
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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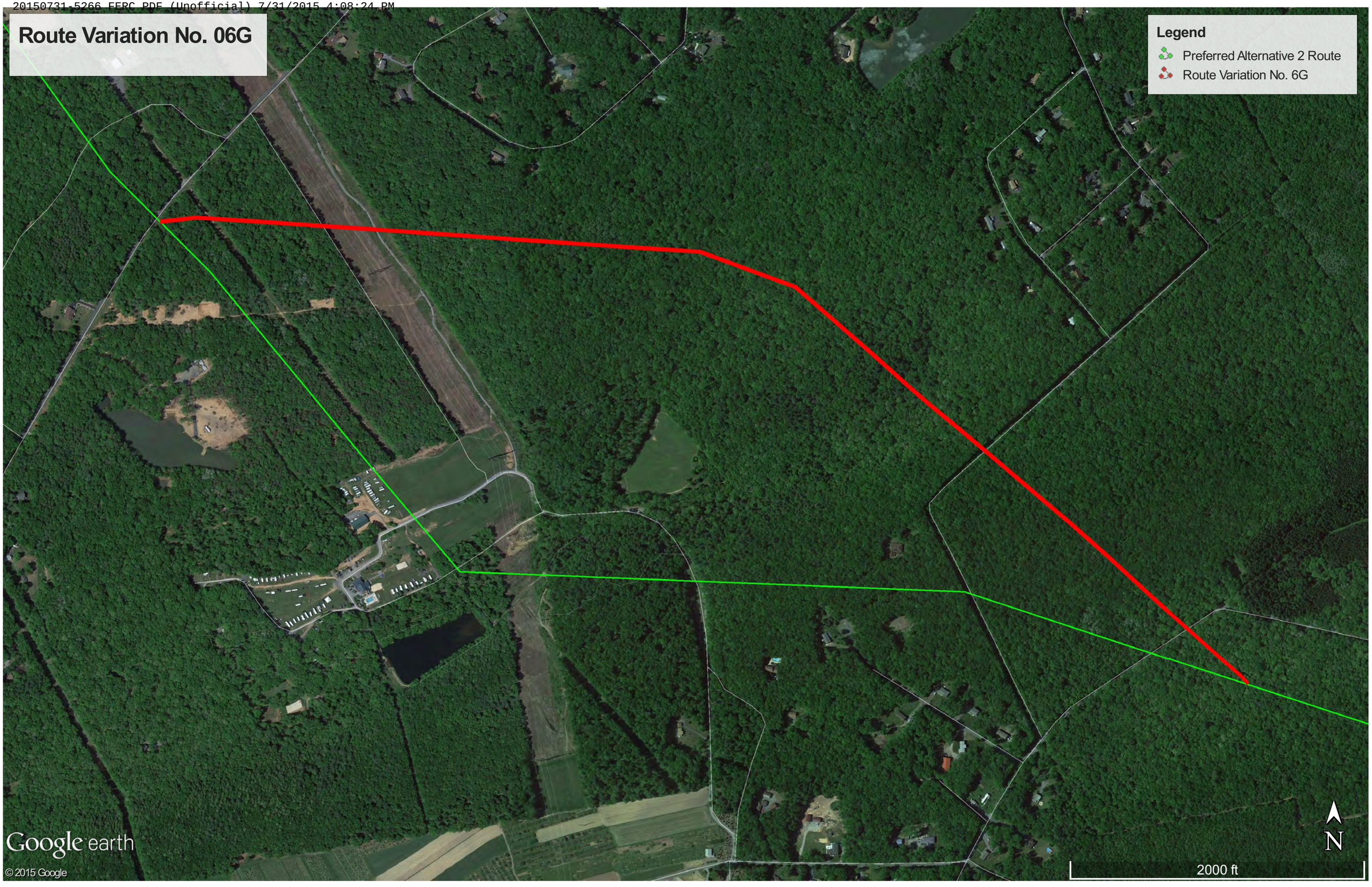

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Appendix P-6H

Route Variation No. 6H

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 6H – Align With PA State Game Property Line

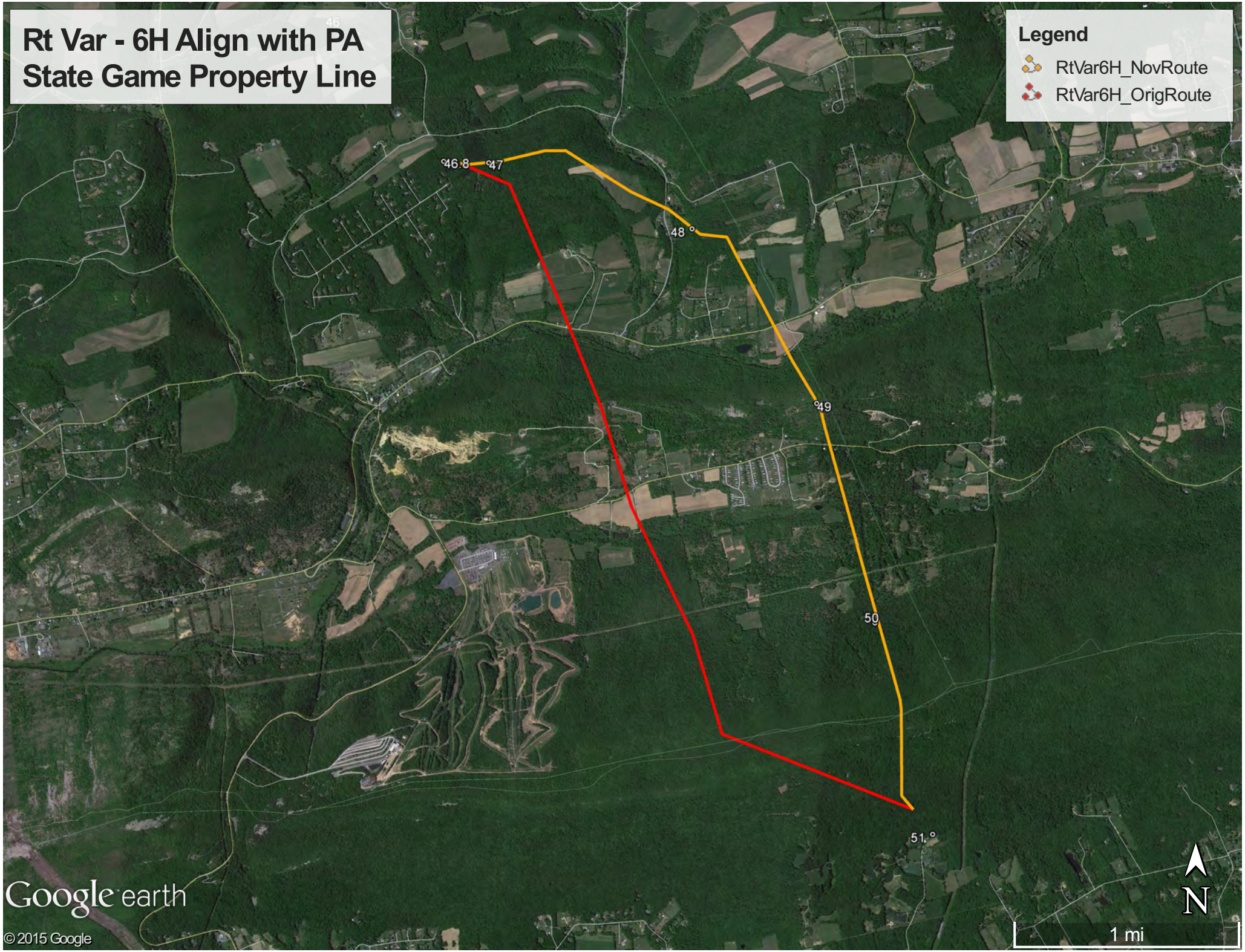
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	46.85		N/A	
End		50.35			
Length	Ft	21,048		19,736	
Area	Acres *	60.40		56.63	
Land requirements:					
Construction	Acres *	36.24		33.98	
Permanent		24.16		22.65	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Scrub-shrub wetlands	Acres/Acres **	0.2	0.1	0.3	0.2
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.2	0.1	0.3	0.2
Waterbodies / Streams affected	#	3		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	5.91	3.94	6.42	4.28
Forested		29.83	19.89	26.59	17.72
Open		0.32	0.21	0.50	0.33
Residential/Commercial		0.18	0.12	0.35	0.23
Open Water		0.00	0.00	0.12	0.08
Total ****		36.24	24.16	33.98	22.65
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	1	1	1	1
	Ft	2376.4	2376.4	985.6	985.6
	Acres	4.1	2.7	1.7	1.1
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		2	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	20		29	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var - 6H Align with PA State Game Property Line
Legend
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Appendix P-7

Route Variation No. 7

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 07 – Arch Exclusion Area 004

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	72.70		N/A	
End		73.20			
Length	Ft	11812		11691	
Area	Acres *	33.90		33.55	
Land requirements:					
Construction	Acres *	20.34		20.13	
Permanent		13.56		13.42	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	12.94	8.63	10.95	7.30
Forested		2.58	1.72	4.35	2.90
Open		3.79	2.53	4.24	2.83
Residential/Commercial		1.03	0.69	0.59	0.39
Open Water		0.00	0.00	0.00	0.00
Total ****		20.34	13.56	20.13	13.42
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		2		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		1		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-8

Route Variation No. 8

(negated by Route Variation No. 12. Reroute analysis not completed)

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Appendix P-9

Route Variation No. 9

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 09 – Reroute to Collocate With Transco and Buckeye

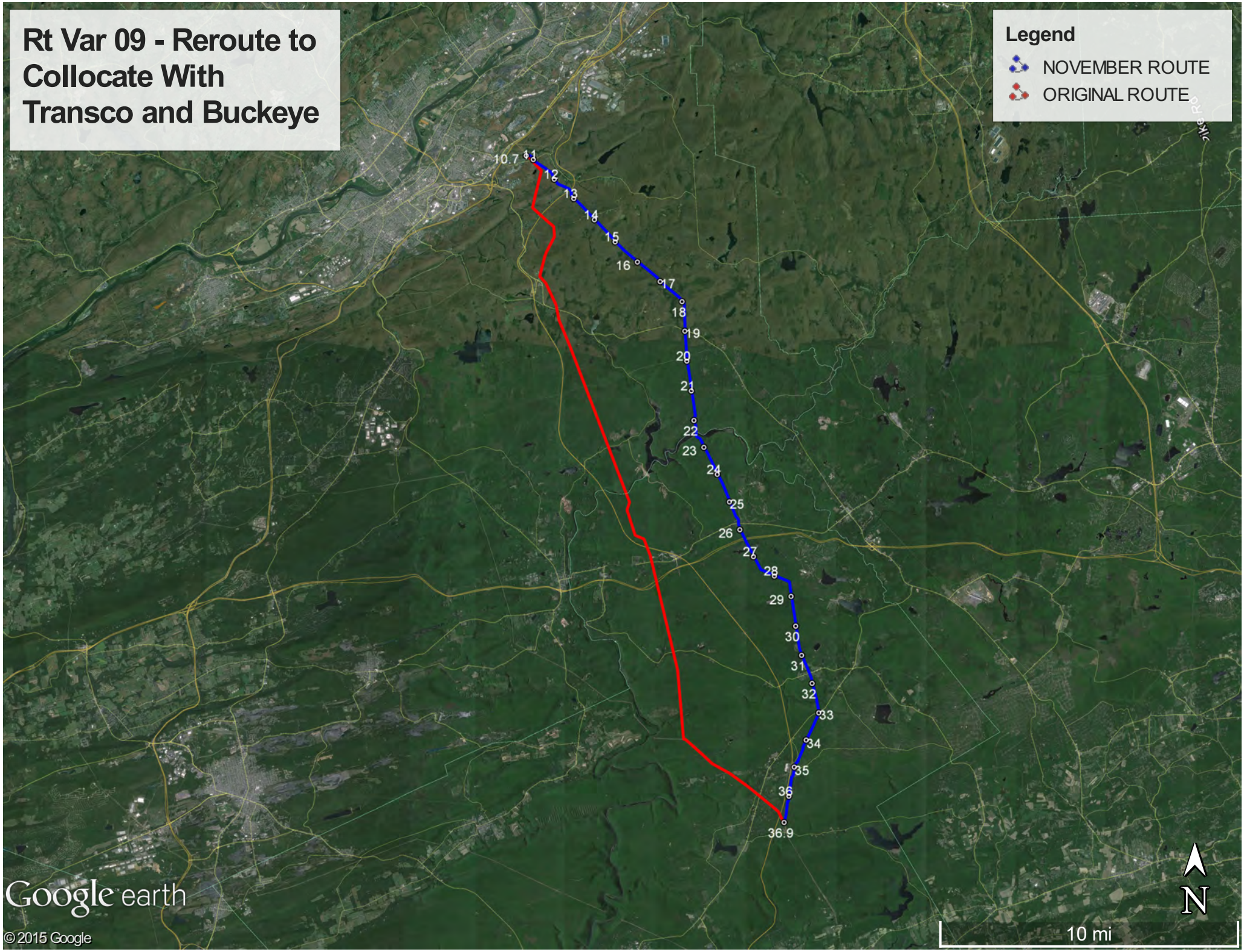
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	10.70		N/A	
End		37.08			
Length	Ft	138,539		134,455	
Area	Acres *	397.55		385.83	
Land requirements:					
Construction	Acres *	238.53		231.50	
Permanent		159.02		154.33	
Colocation:					
Power Line ROW	Ft	0.00		44,368	
Pipeline ROW		121,843		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		121,843		44,368	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Scrub-shrub wetlands	Acres/Acres **	9.4	6.3	5.4	3.6
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		9.4	6.3	5.4	3.6
Waterbodies / Streams affected	#	22		33	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.03	2.02	0.59	0.39
Forested		225.49	150.32	219.83	146.55
Open		2.95	1.97	6.98	4.65
Residential/Commercial		6.14	4.09	3.90	2.60
Open Water		0.92	0.61	0.20	0.14
Total ****		238.53	159.02	231.50	154.33
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	5	5	6	6
	Ft	43604.1	43604.1	64026.1	64026.1
	Acres	74.6	49.7	110.3	73.5
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		4	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	80		110	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var 09 - Reroute to Collocate With Transco and Buckeye
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Appendix P-10

Route Variation No. 10

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 10 – PA Game Land 168

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	50.32		N/A	
End		51.50			
Length	Ft	5,346		5,976	
Area	Acres *	15.34		17.15	
Land requirements:					
Construction	Acres *	9.20		10.29	
Permanent		6.14		6.86	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.96	0.64	2.66	1.78
Forested		8.01	5.34	7.55	5.03
Open		0.23	0.15	0.07	0.05
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		9.20	6.14	10.29	6.86
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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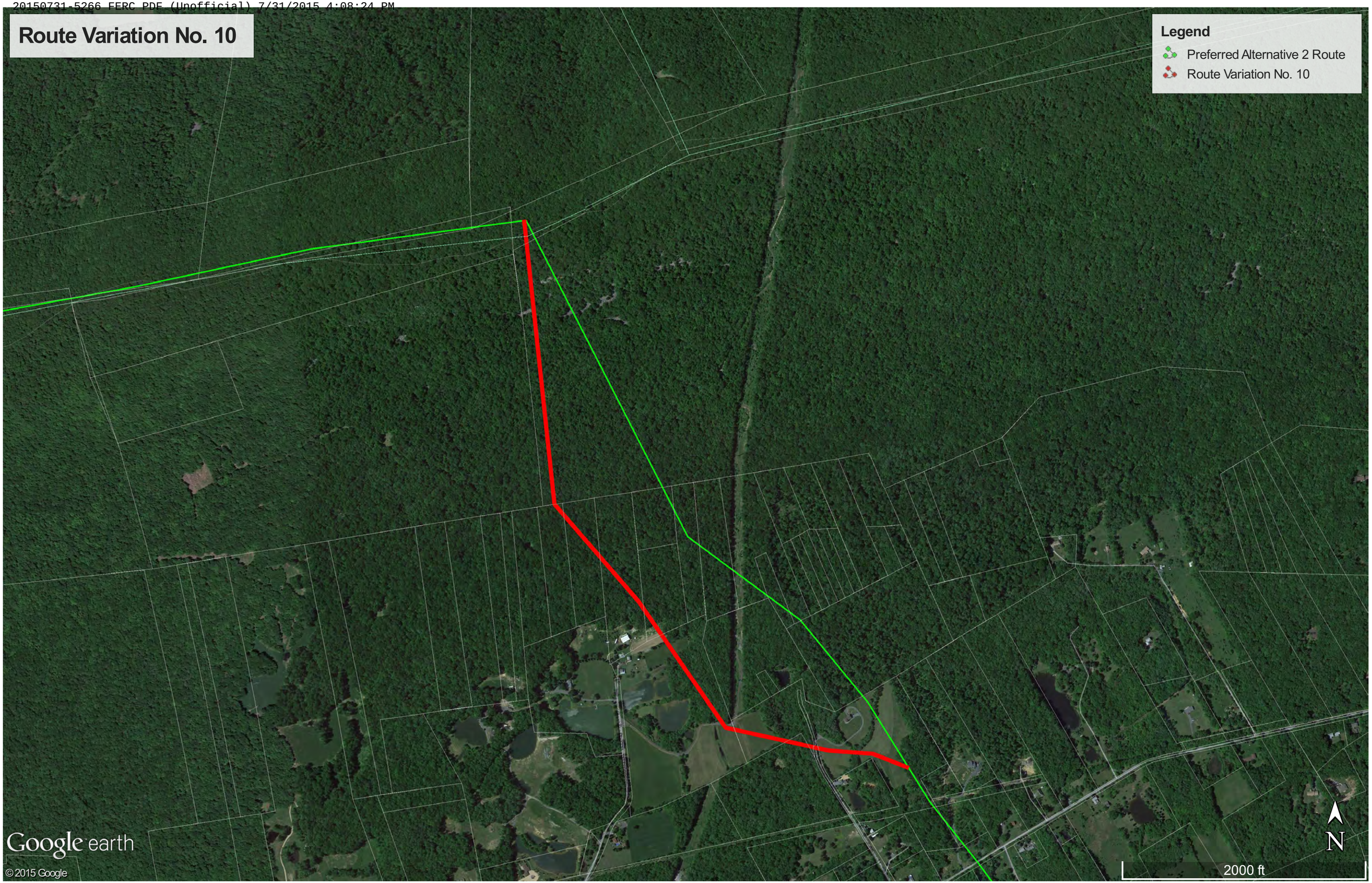

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Appendix P-11

Route Variation No. 11

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 11 – Trio Farms Subdivision

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	60.50		N/A	
End		61.15			
Length	Ft	2,683.00		3,302.00	
Area	Acres *	7.70		9.48	
Land requirements:					
Construction	Acres *	4.62		5.69	
Permanent		3.08		3.79	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.57	3.05	5.64	3.76
Forested		0.00	0.00	0.00	0.00
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.05	0.03	0.05	0.03
Open Water		0.00	0.00	0.00	0.00
Total ****		4.62	3.08	5.69	3.79
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-12

Route Variation No. 12

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 12 – Bethlehem Area

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	64.45		N/A	
End		68.70			
Length	Ft	20,073.00		22,307.00	
Area	Acres *	57.60		64.01	
Land requirements:					
Construction	Acres *	34.56		38.41	
Permanent		23.04		25.60	
Colocation:					
Power Line ROW	Ft	1,776		0.00	
Pipeline ROW		0.00		1,372	
Road / Railroad ROW		0.00		0.00	
Total colocation		1,776		1,372	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	21.25	14.17	23.43	15.62
Forested		2.63	1.75	5.92	3.94
Open		1.22	0.81	5.73	3.82
Residential/Commercial		9.46	6.30	3.33	2.22
Open Water		0.38	0.25	0.76	0.51
Total ****		34.94	23.29	39.17	26.11
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		3		4	
Other (Barn, Shed, etc.)		0		3	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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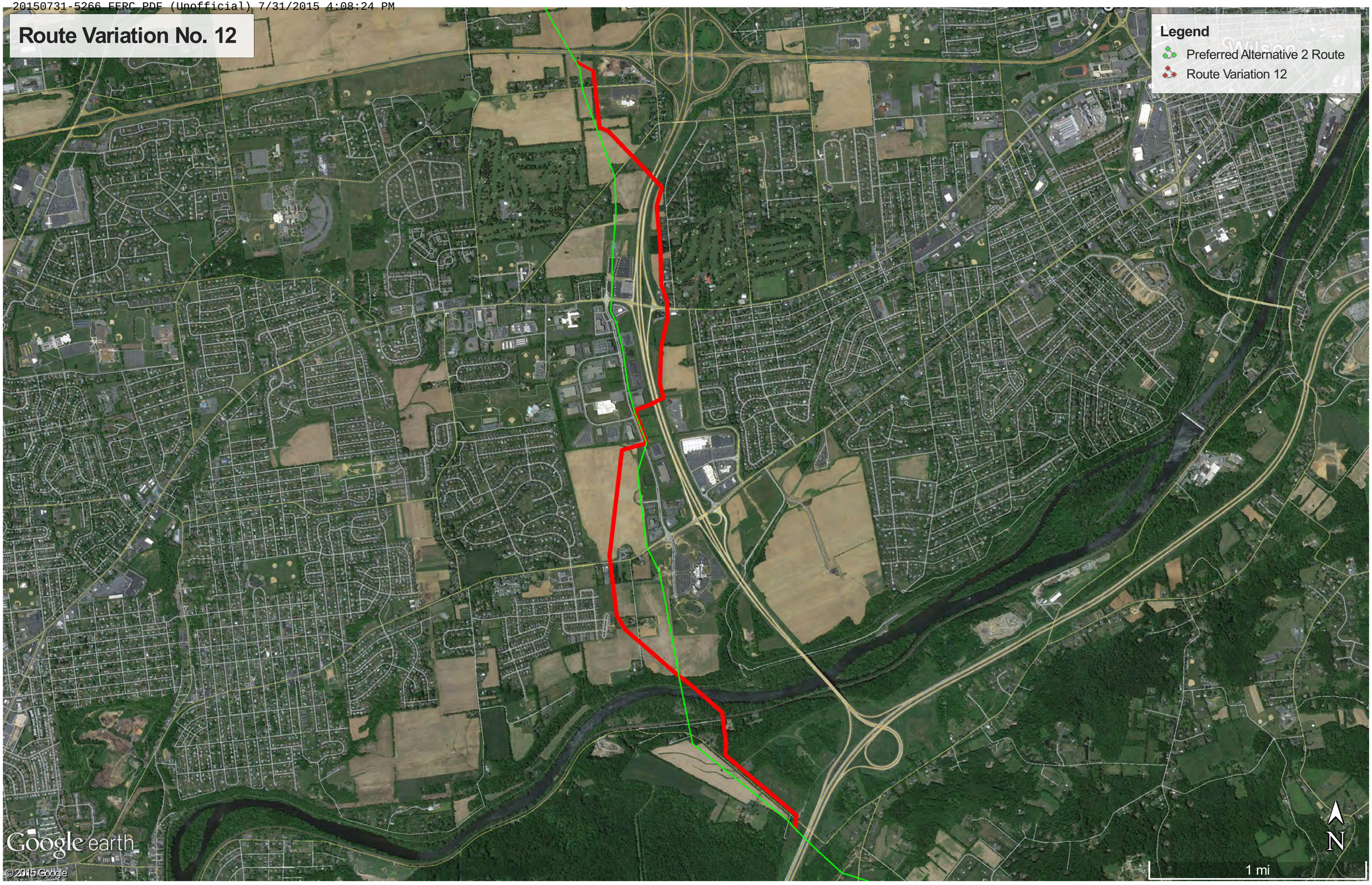

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Appendix P-13

Route Variation No. 13

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 13 – Mericle Development & Cultural Resource Site (Susquehanna River Crossing)

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	6.86		N/A	
End		7.74			
Length	Ft	4,646		5,665	
Area	Acres *	13.33		16.26	
Land requirements:					
Construction	Acres *	8.00		9.75	
Permanent		5.33		6.50	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		500	
Total colocation		0		9%	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/shrub wetlands	Acres/Acres **	0.5	0.3	0.3	0.2
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.5	0.3	0.3	0.2
Waterbodies / Streams affected	#	1		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.52	0.35	0.48	0.32
Forested		2.24	1.50	3.97	2.65
Open		3.41	2.28	3.05	2.03
Residential/Commercial		0.00	0.00	0.56	0.38
Open Water		1.83	1.22	1.69	1.13
Total ****		8.00	5.33	9.75	6.50
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0	0	0	0
	Acres	0	0	0	0
Preserved Farm Land	#	0	0	0	0
	Ft	0	0	0	0
	Acres	0	0	0	0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Parcels Crossed	Number	7		7	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 13

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Appendix P-14

Route Variation No. 14

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 14 – Arch Exclusion Area 006

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	70.41		N/A	
End		71.36			
Length	Ft	5,055		0.00	
Area	Acres *	14.51		0.00	
Land requirements:					
Construction	Acres *	8.70		0.00	
Permanent		5.80		0.00	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	7.53	5.02	5.09	3.39
Forested		0.89	0.59	4.31	2.88
Open		0.22	0.15	1.81	1.20
Residential/Commercial		0.06	0.04	0.20	0.13
Open Water		0.00	0.00	0.00	0.00
Total ****		8.70	5.80	11.41	7.61
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-15

Route Variation No. 15

(Route variation implemented in field during initial environmental investigations prior to Pre-Filing)

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Appendix P-16

Route Variation No. 16

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 16 – Liberty Warehouse

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	61.55		N/A	
End		62.23			
Length	Ft	3,590.40		3,904.00	
Area	Acres *	10.30		11.20	
Land requirements:					
Construction	Acres *	6.18		6.72	
Permanent		4.12		4.48	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		515.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		515.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	5.38	3.58	6.10	4.06
Forested		0.00	0.00	0.00	0.00
Open		0.63	0.42	0.06	0.04
Residential/Commercial		0.17	0.11	0.56	0.38
Open Water		0.00	0.00	0.00	0.00
Total ****		6.18	4.12	6.72	4.48
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		2	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		1	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Liberty Warehouses Reroute

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Appendix P-17A

Route Variation No. 17A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 17A – Preserved Farmland Avoidance

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	74.80		N/A	
End		76.30			
Length	Ft	7,878		7,378	
Area	Acres *	22.61		21.17	
Land requirements:					
Construction	Acres *	13.56		12.70	
Permanent		9.04		8.47	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.33	0.88	1.61	1.07
Forested		10.32	6.88	8.03	5.35
Open		1.78	1.19	2.95	1.96
Residential/Commercial		0.14	0.09	0.12	0.08
Open Water		0.00	0.00	0.00	0.00
Total ****		13.56	9.04	12.70	8.47
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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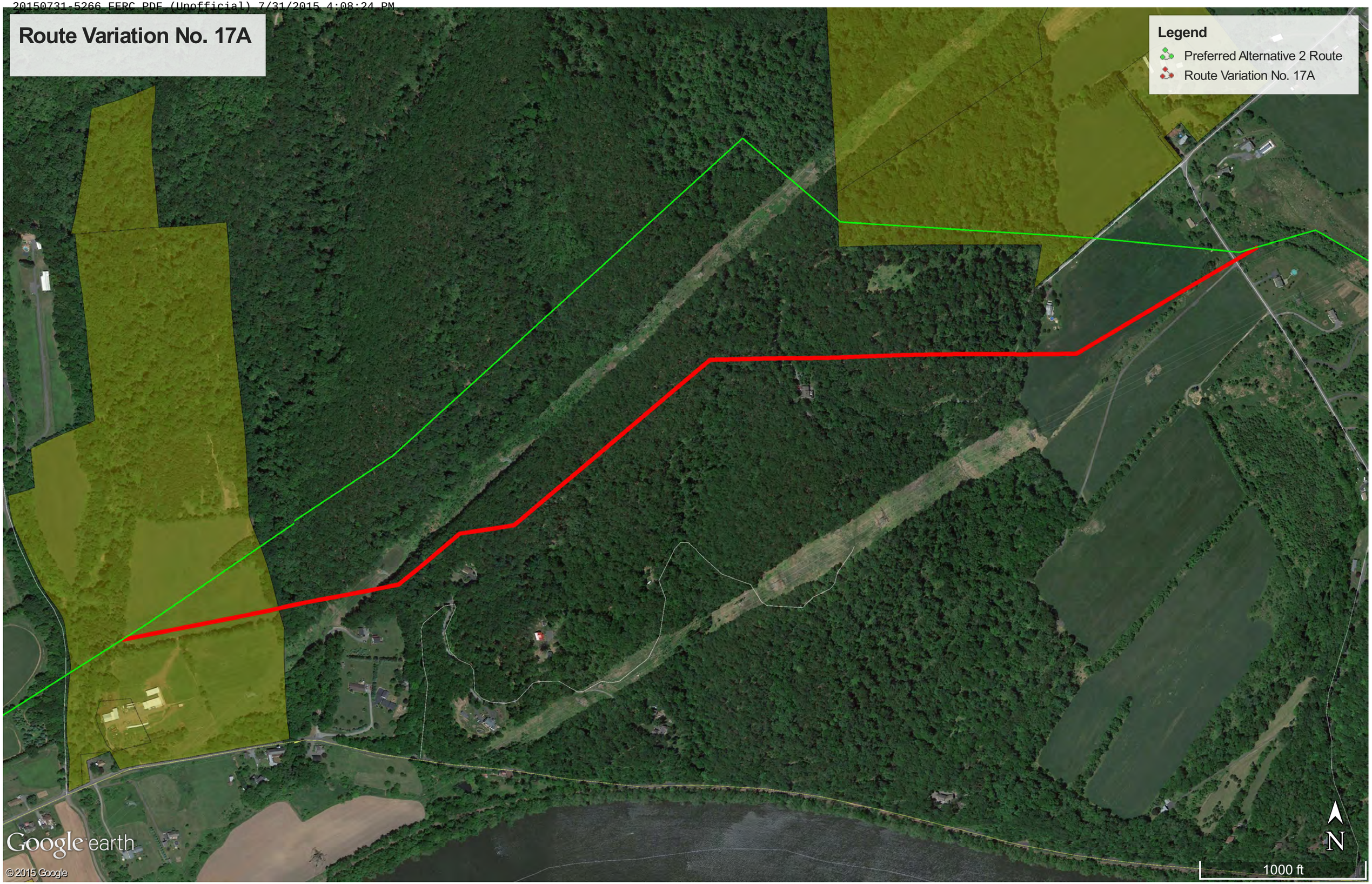

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Appendix P-17B

Route Variation No. 17B

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 17B – Preserved Farmland Avoidance

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	87.85		N/A	
End		88.35			
Length	Ft	2,778		3,012	
Area	Acres *	7.97		8.64	
Land requirements:					
Construction	Acres *	4.78		5.19	
Permanent		3.19		3.46	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.26	1.50	0.96	0.64
Forested		2.38	1.59	2.93	1.95
Open		0.01	0.01	0.39	0.26
Residential/Commercial		0.13	0.09	0.90	0.60
Open Water		0.00	0.00	0.00	0.00
Total ****		4.78	3.19	5.19	3.46
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-17C

Route Variation No. 17C

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 17C – Preserved Farmland Avoidance

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	102.29		N/A	
End		103.27			
Length	Ft	5,258		5,451	
Area	Acres *	15.09		15.64	
Land requirements:					
Construction	Acres *	9.05		9.39	
Permanent		6.04		6.26	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	6.55	4.37	5.45	3.63
Forested		1.52	1.01	2.79	1.86
Open		0.90	0.60	0.46	0.30
Residential/Commercial		0.09	0.06	0.69	0.46
Open Water		0.00	0.00	0.00	0.00
Total ****		9.05	6.04	9.39	6.26
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		2	
Other (Barn, Shed, etc.)		1		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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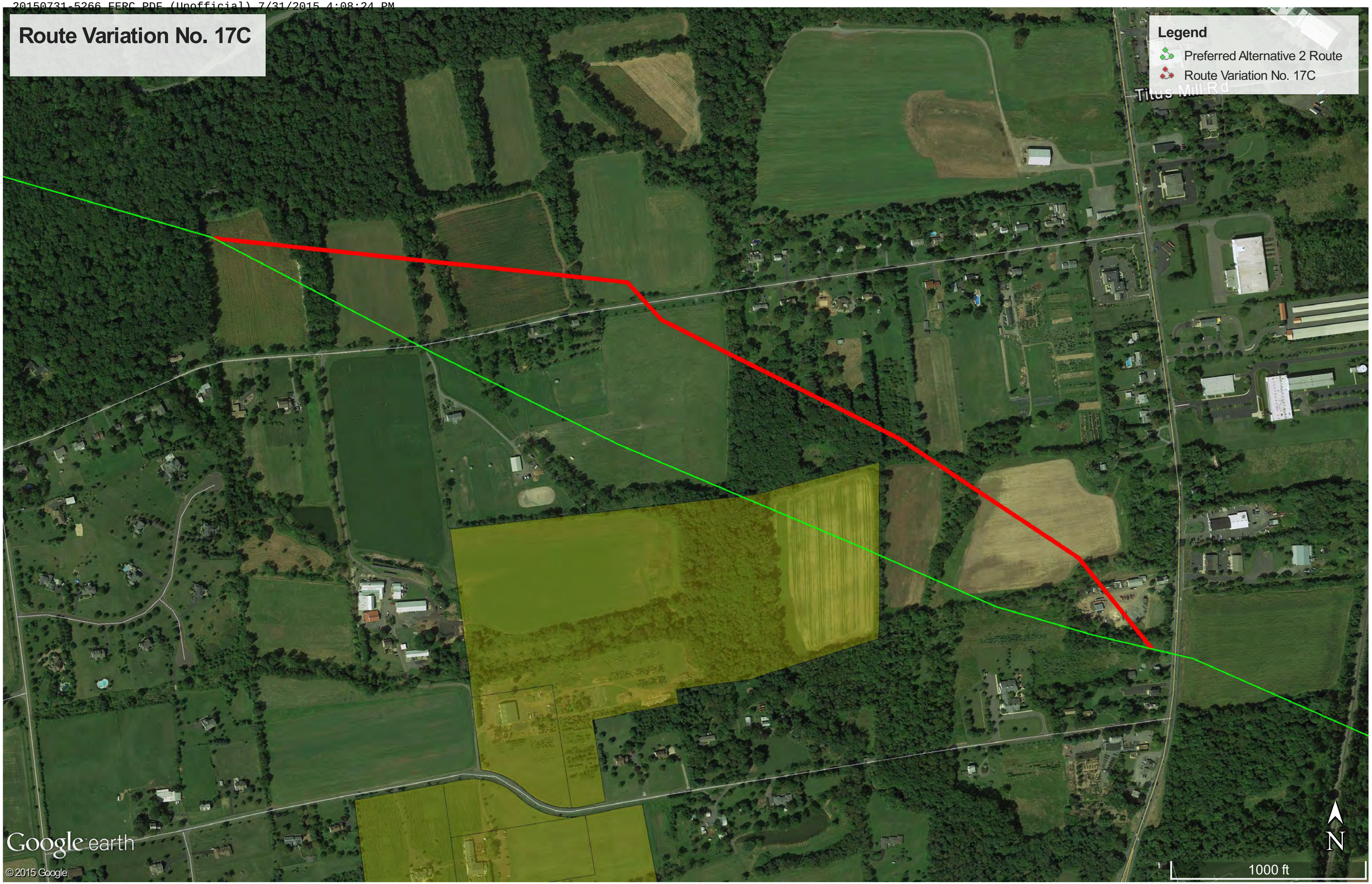

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Appendix P-18

Route Variation No. 18

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 18 – Belvidere & Delaware River Railway

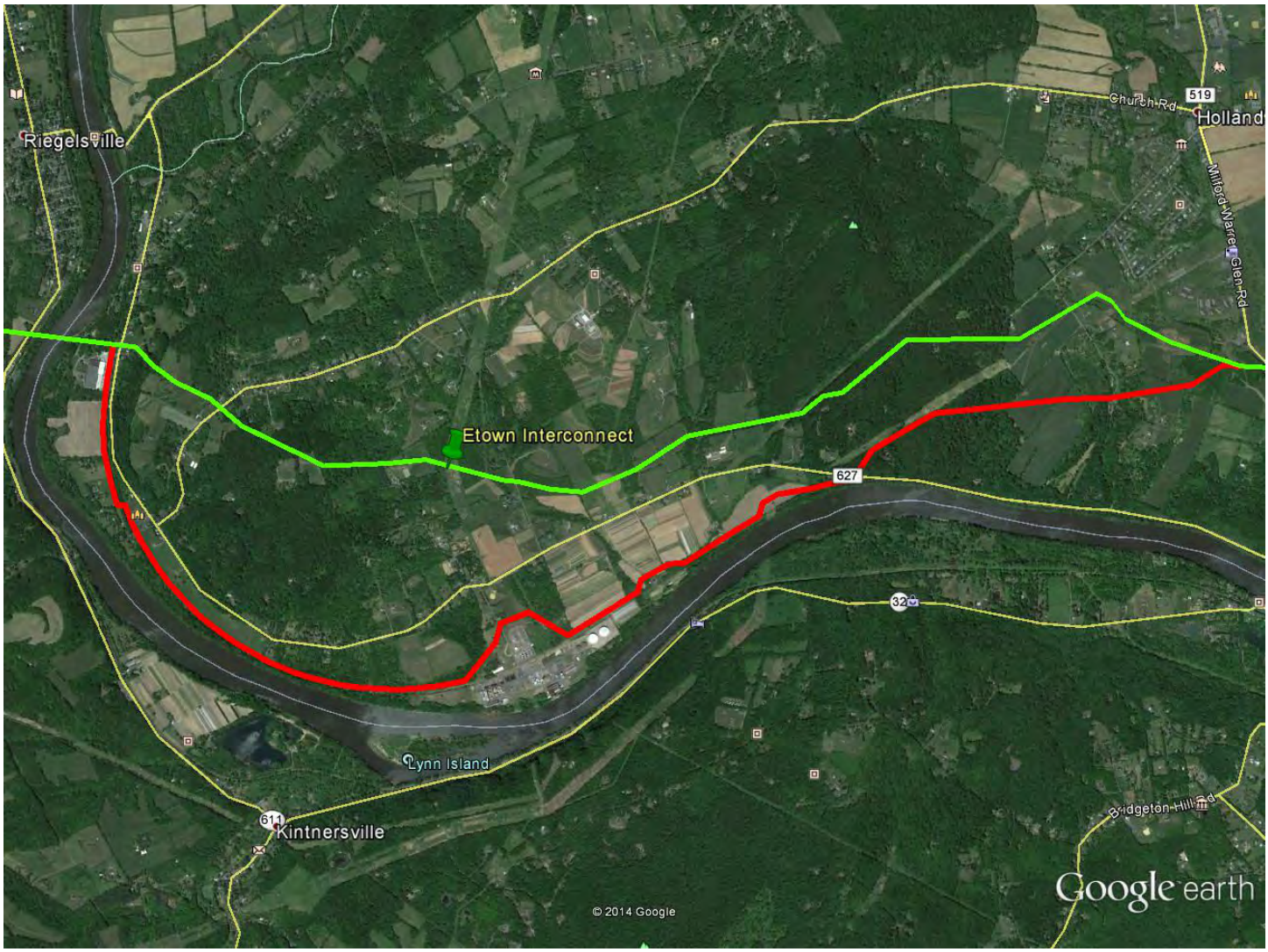
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	75.05		N/A	
End		79.41			
Length	Ft	23,033		27,775	
Area	Acres *	66.10		79.70	
Land requirements:					
Construction	Acres *	39.66		47.82	
Permanent		26.44		31.88	
Colocation:					
Power Line ROW	Ft	525		1,274	
Pipeline ROW		0		0	
Road / Railroad ROW		0		14,935	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Shrub wetlands	Acres/Acres **	0.0	0.0	0.3	0.1
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.3	0.1
Waterbodies / Streams affected	#	7		10	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.74	2.50	10.19	6.79
Forested		18.33	12.22	21.27	14.18
Open		17.59	11.72	10.76	7.18
Residential/Commercial		0.0	0.0	5.60	3.73
Open Water		0.0	0.0	0.0	0.0
Total ****		39.66	26.44	47.82	31.88
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	5	5	5	5
	Ft	3323.70	3323.70	3626.39	3626.39
	Acres	5.68	3.80	5.80	4.01
Preserved Farm Land	#	4	4	2	2
	Ft	3,889	3,889	2439.16	2349.16
	Acres	6.70	4.46	3.88	2.81
Structures within 50 ft of construction work area	Number				
Residences		0		2	
Commercial		0		1	
Other (Barn, Shed, etc.)		1		2	
Landowners affected	Number	41		47****	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

miles 2
km 3

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Appendix P-19

Route Variation No. 19

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 19 – St. Luke's Re-route

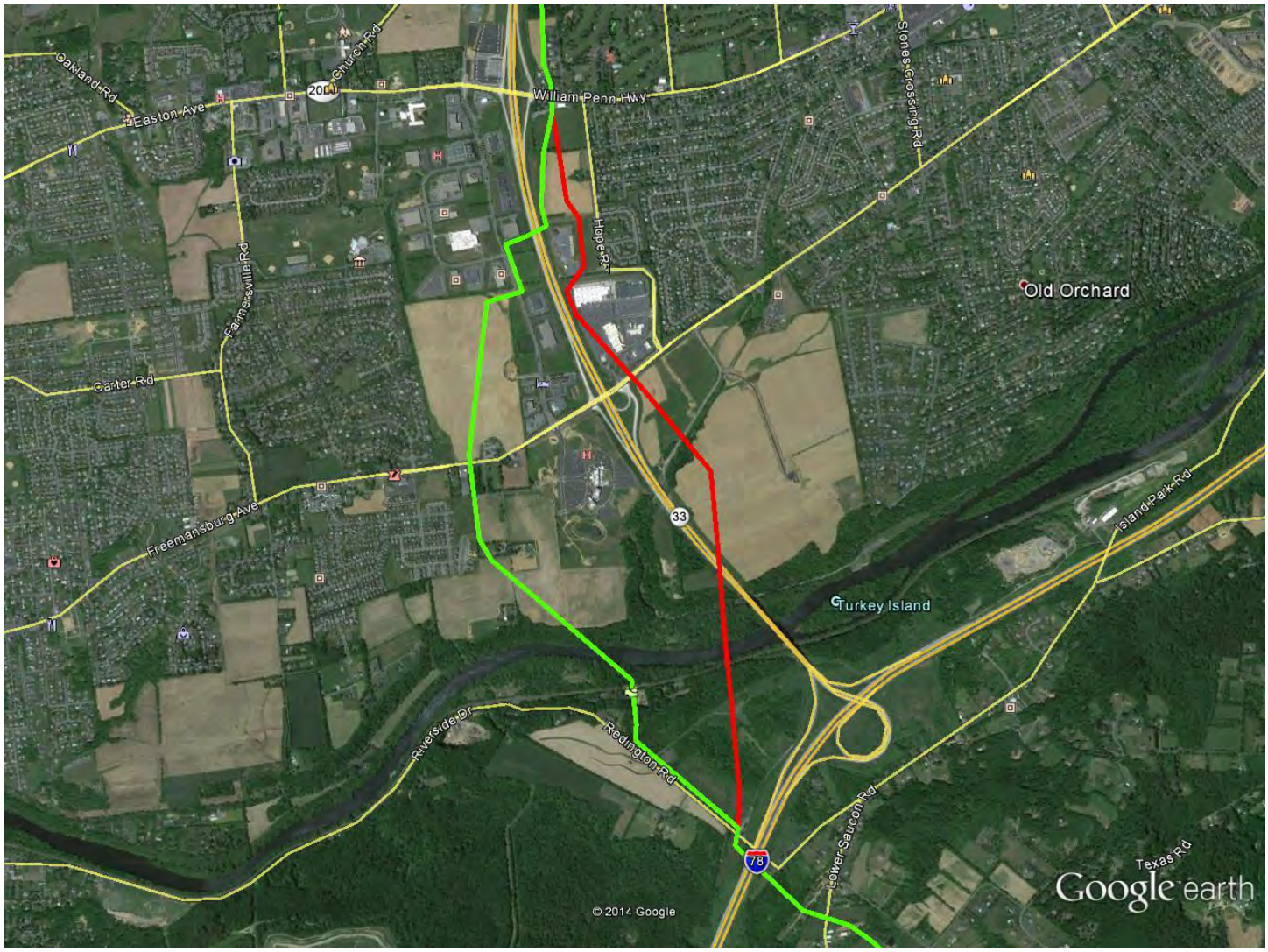
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	66.09		N/A	
End		68.91			
Length	Ft	14,889.60		12,985.00	
Area	Acres *	42.73		37.26	
Land requirements:					
Construction	Acres *	25.64		22.36	
Permanent		17.09		14.90	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		3,399		0.00	
Total colocation		3,399		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Shrub wetlands	Acres/Acres **	0	0	0	0
Emergent wetlands		0	0	0	0
Total ****		0	0	0	0
Waterbodies / Streams affected	#	2		4	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	13.26	8.84	8.88	5.92
Forested		3.49	2.33	4.38	2.92
Open		4.00	2.67	3.28	2.19
Residential/Commercial		4.11	2.74	5.28	3.52
Open Water		0.77	0.51	0.54	0.36
Total ****		25.64	17.09	22.36	14.90
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		5		6	
Other (Barn, Shed, etc.)		4		2	
Landowners affected	Number	32		14	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

miles 2

km 3

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Appendix P-20A

Route Variation No. 20A

(negated by Route Variation No. 26. Reroute analysis not completed)

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Appendix P-21

Route Variation No. 21

(negated by Route Variation No. 26. Reroute analysis not completed)

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Appendix P-22

Route Variation No. 22

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 22 – Arch Exclusion Area 8 – PANh72-Site 1

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	60.28		N/A	
End		60.62			
Length	Ft	2,217.60		2,166.00	
Area	Acres *	6.36		6.22	
Land requirements:					
Construction	Acres *	3.82		3.73	
Permanent		2.55		2.49	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.59	2.40	3.73	2.49
Forested		0.00	0.00	0.00	0.00
Open		0.22	0.15	0.00	0.00
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		3.82	2.55	3.73	2.49
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	5		5	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Google earth

feet 1000
meters 400

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Appendix P-23

Route Variation No. 23

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 23 – Mineo Springs

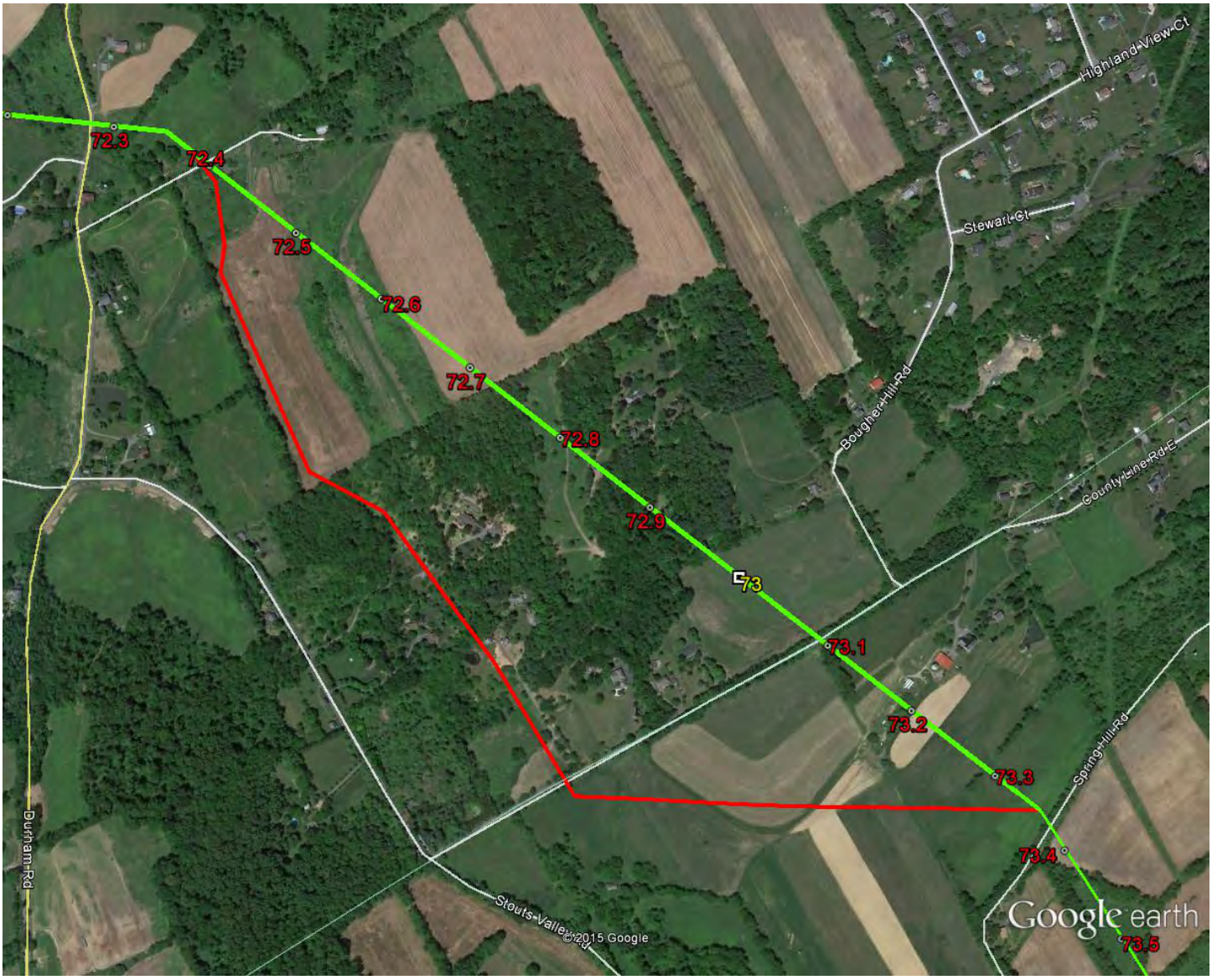
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	72.38		N/A	
End		73.35			
Length	Ft	5,121.60		5,948.00	
Area	Acres *	14.70		17.07	
Land requirements:					
Construction	Acres *	8.82		10.24	
Permanent		5.88		6.83	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.90	3.27	6.18	4.12
Forested		1.41	0.94	0.90	0.60
Open		2.51	1.67	1.59	1.06
Residential/Commercial		0.00	0.00	1.57	1.05
Open Water		0.00	0.00	0.00	0.00
Total ****		8.82	5.88	10.24	6.83
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		3		0	
Landowners affected	Number	6		8	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

feet 2000

meters 800

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Appendix P-23A

Route Variation No. 23A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 23A – Mineo Springs

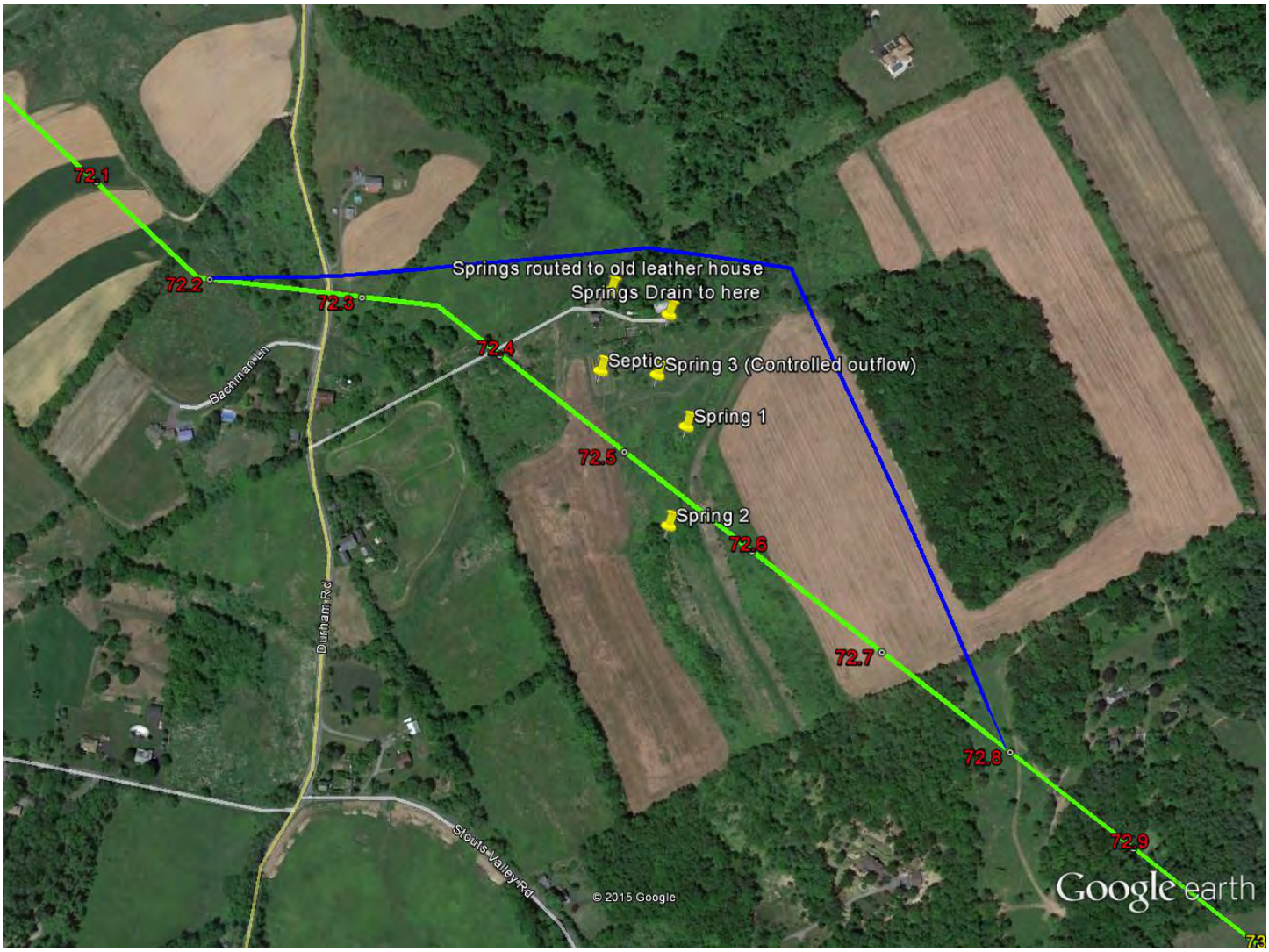
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	72.20		N/A	
End		72.80			
Length	Ft	3,168.00		3,668.00	
Area	Acres *	9.09		10.53	
Land requirements:					
Construction	Acres *	5.45		6.32	
Permanent		3.64		4.21	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.39	0.93	2.46	1.64
Forested		0.33	0.22	0.80	0.54
Open		3.73	2.49	3.06	2.04
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		5.45	3.64	6.32	4.21
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	7		7	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

feet 2000
meters 600

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Appendix P-24

Route Variation No. 24

(negated by Route Variation No. 26. Reroute analysis not completed)

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Appendix P-25

Route Variation No. 25

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 25 – Green Pond Reroute

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	64.92		N/A	
End		65.31			
Length	Ft	2059.20		1990.00	
Area	Acres *	5.91		5.71	
Land requirements:					
Construction	Acres *	3.55		3.43	
Permanent		2.36		2.28	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.13	1.42	1.90	1.27
Forested		0.00	0.00	0.00	0.00
Open		0.00	0.00	0.23	0.16
Residential/Commercial		1.41	0.94	1.29	0.86
Open Water		0.00	0.00	0.00	0.00
Total ****		3.55	2.36	3.43	2.28
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	4		4	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Google earth

feet 1000
meters 300

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-25A

Route Variation No. 25A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 25A – Green Pond Reroute

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	64.83		N/A	
End		65.14			
Length	Ft	1,636.80		1,597.00	
Area	Acres *	4.70		4.58	
Land requirements:					
Construction	Acres *	2.82		2.75	
Permanent		1.88		1.83	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		1,335.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.00	0.67	1.39	0.93
Forested		0.00	0.00	0.00	0.00
Open		0.14	0.09	0.06	0.04
Residential/Commercial		1.68	1.12	1.30	0.87
Open Water		0.00	0.00	0.00	0.00
Total ****		2.82	1.88	2.75	1.83
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	5		4	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Google earth

feet 1000
meters 400

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Appendix P-26

Route Variation No. 26

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 26 – Mercer County Power Line and Lambertville Lateral

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	90.18		N/A	
End		108.9			
Length	Ft	98,842		116,747	
Area	Acres *	283.64		335.02	
Land requirements:					
Construction	Acres *	170.18		201.01	
Permanent		113.45		134.01	
Colocation:					
Power Line ROW	Ft	0.00		86,463	
Pipeline ROW		0.00		2,753.0	
Road / Railroad ROW		0.00		0	
Total colocation		0.00		89,216	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Shrub wetlands	Acres/Acres **	4.65	3.05	5.44	3.65
Emergent wetlands		3.07	2.05	0.81	0.56
				-	-
Total wetlands		7.72	5.10	6.25	4.21
Waterbodies / Streams affected	#	28		48	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	65.74	43.82	52.09	34.73
Forested		57.45	38.30	83.45	55.63
Open		42.25	28.17	56.63	37.75
Residential/Commercial		4.75	3.16	8.84	5.89
Open Water		0.00	0.00	-	-
Total ****		170.18	113.45	201.01	134.01
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks (Open Space)	#	18	18	13	13
	Ft	14550.55	14550.55	23104.89	23104.89
	Acres	25.10	16.72	39.75	26.52
Preserved Farm Land	#	17	17	14	14
	Ft	24139.81	24139.81	16688.98	16688.98
	Acres	41.54	27.70	28.88	19.16
Structures within 50 ft of construction work area	Number				
Residences		16		13	
Commercial		5		4	
Other (Barn, Shed, etc.)		12		9	
Landowners affected	Number	179		183	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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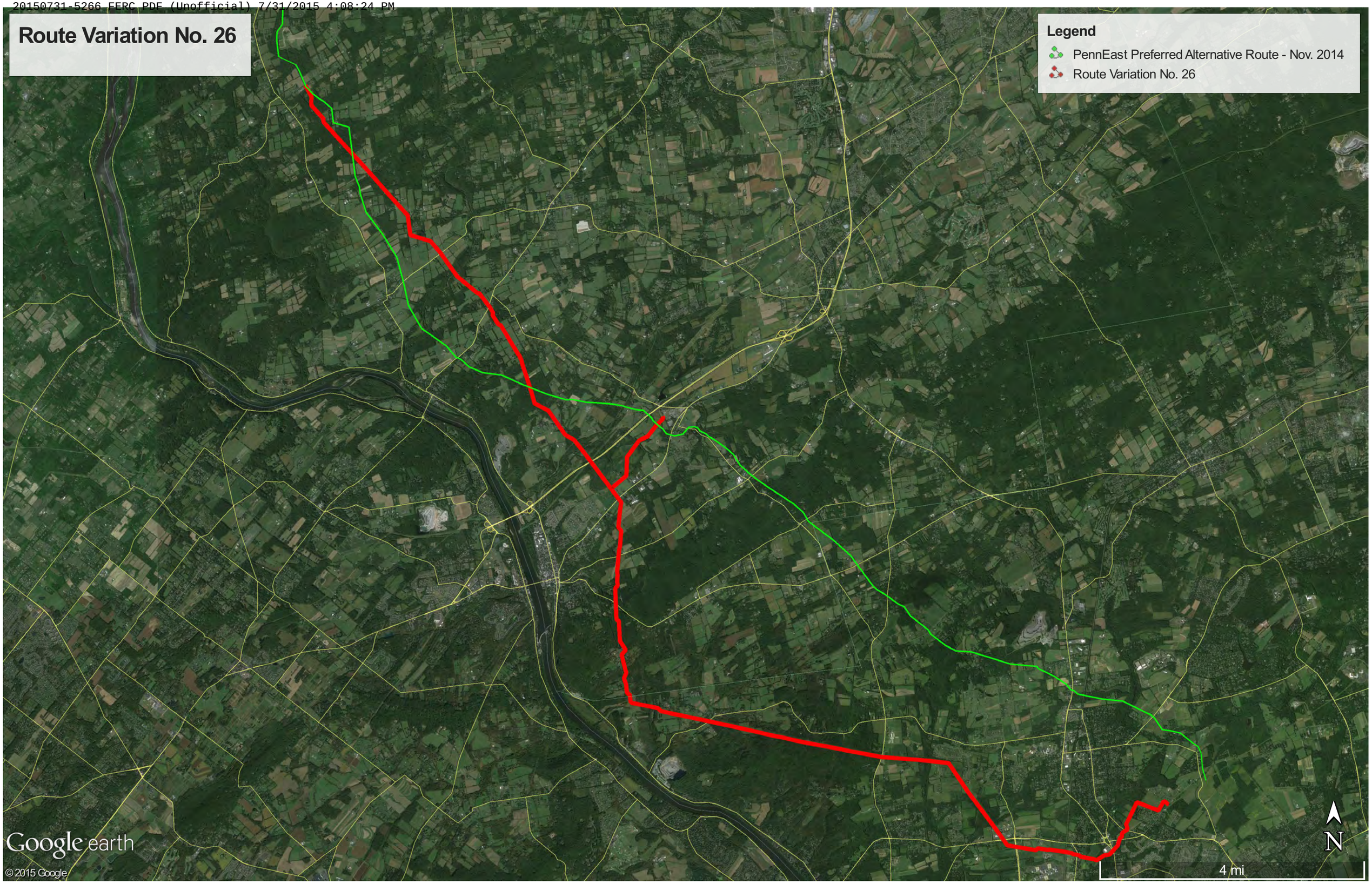

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Appendix P-26A

Route Variation No. 26A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 26A – Mercer County Power Line and Lateral (Variant)

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	90.18		N/A	
End		108.9			
Length	Ft	98,842		116,490	
Area	Acres *	283.64		334.28	
Land requirements:					
Construction	Acres *	170.18		200.57	
Permanent		113.45		133.71	
Colocation:					
Power Line ROW	Ft	0.00		86,463	
Pipeline ROW		0.00		5,932	
Road / Railroad ROW		0.00		0	
Total colocation		0.00		92,395	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Shrub wetlands	Acres/Acres **	4.65	3.05	5.44	3.65
Emergent wetlands		3.07	2.05	0.81	0.56
Total wetlands		7.72	5.10	6.25	4.21
Waterbodies / Streams affected	#	28		50	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	65.74	43.82	47.79	31.86
Forested		57.45	38.30	88.57	59.05
Open		42.25	28.17	55.36	36.91
Residential/Commercial		4.75	3.16	8.84	5.89
Open Water		0.00	0.00	-	-
Total ****		170.18	113.45	200.57	133.71
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks (Open Space)	#	18	18	13	13
	Ft	14550.55	14550.55	23104.89	23104.89
	Acres	25.10	16.72	39.75	26.52
Preserved Farm Land	#	17	17	14	14
	Ft	24139.81	24139.81	16688.98	16688.98
	Acres	41.54	27.70	28.88	19.16
Structures within 50 ft of construction work area	Number				
Residences		16		13	
Commercial		5		4	
Other (Barn, Shed, etc.)		12		9	
Landowners affected	Number	179		180	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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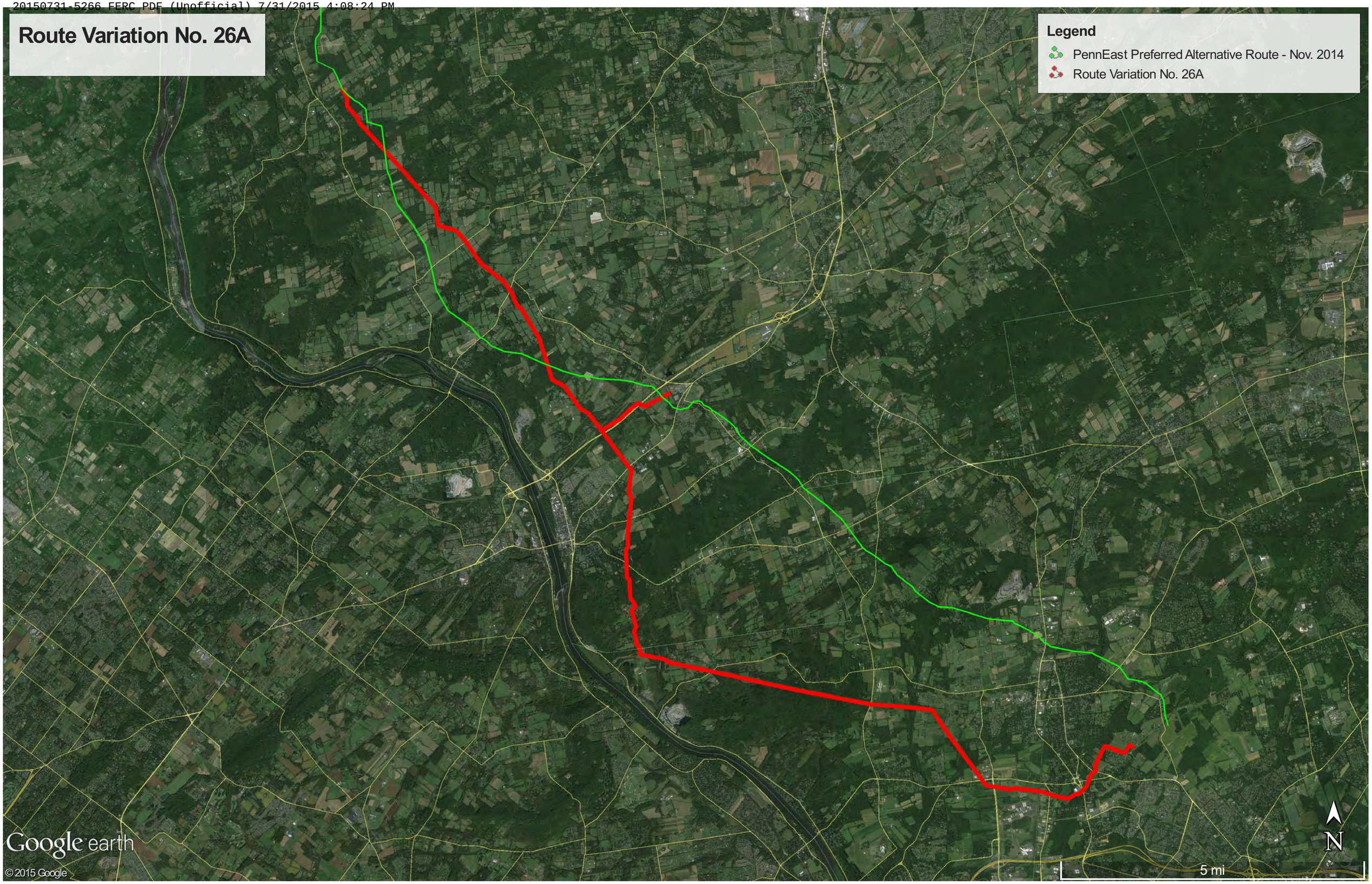

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Appendix P-27

Route Variation No. 27

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 27 – Fox Diehl Reroute

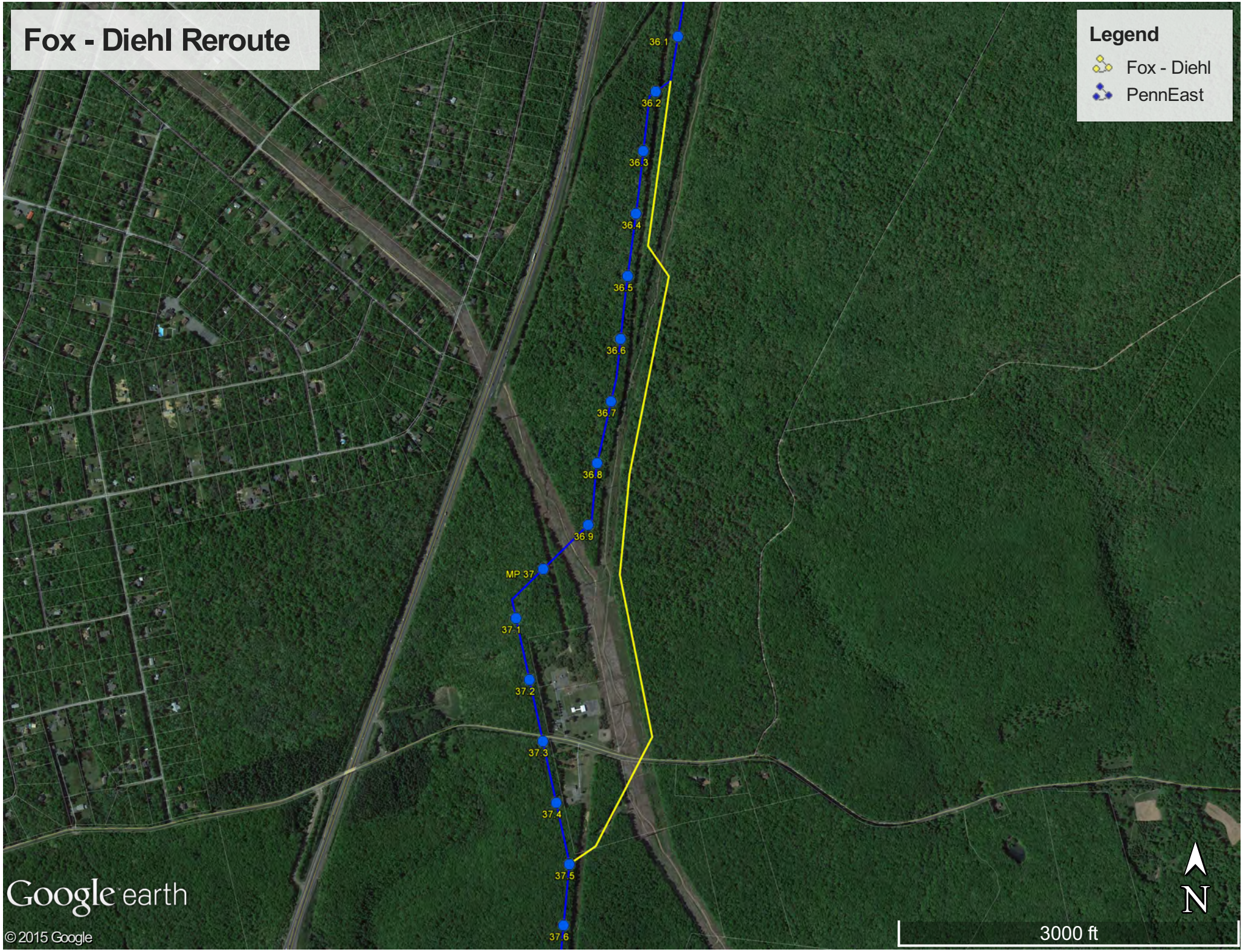
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	36.17		N/A	
End		37.50			
Length	Ft	7,022.40		6,920.00	
Area	Acres *	20.15		19.86	
Land requirements:					
Construction	Acres *	12.09		11.91	
Permanent		8.06		7.94	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Shrub wetlands	Acres/Acres **	1.45	0.96	0.67	0.43
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		1.45	0.96	0.67	0.43
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		11.72	7.82	10.98	7.32
Open		0.37	0.24	0.93	0.62
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		12.09	8.06	11.91	7.94
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	1	1	1	1
	Ft	2360	2360	2506	2506
	Acres	4.11	2.73	4.36	2.89
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		4	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Fox - Diehl Reroute
Legend
Fox - Diehl
PennEast
36.1
36.2
36.3
36.4
36.5
36.6
36.7
36.8
36.9
MP 37
37.1
37.2
37.3
37.4
37.5
37.6
Google earth
© 2015 Google
N
3000 ft

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Appendix P-28

Route Variation No. 28

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 28 – Vollers, Matthew S & Laura P8-8-2

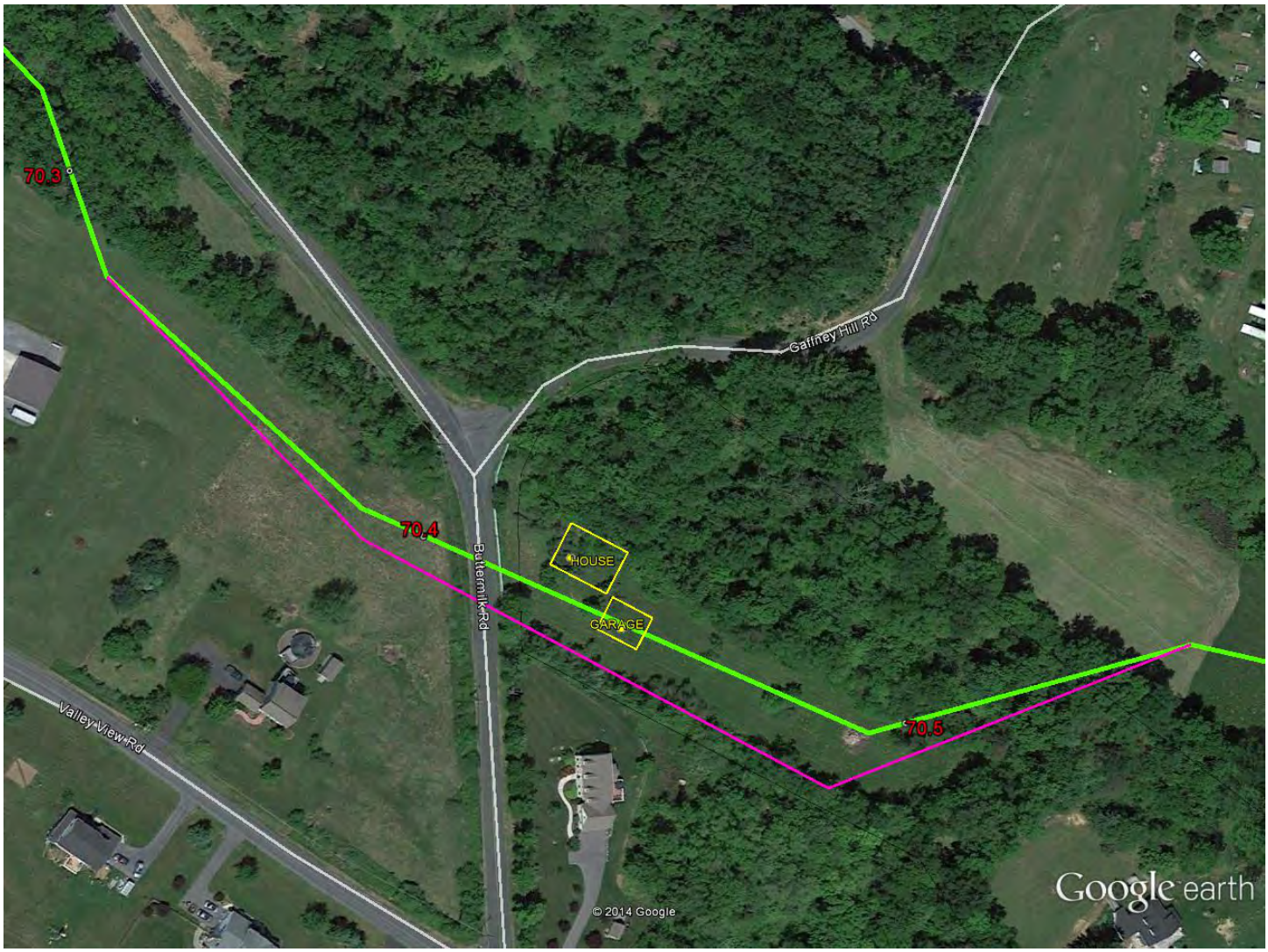
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	70.32		N/A	
End		70.56			
Length	Ft	1267.20		1293.35	
Area	Acres *	3.64		3.71	
Land requirements:					
Construction	Acres *	2.18		2.23	
Permanent		1.45		1.48	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.11	0.07	0.12	0.08
Forested		0.34	0.23	0.30	0.20
Open		0.00	0.00	0.00	0.00
Residential/Commercial		1.73	1.16	1.80	1.20
Open Water		0.00	0.00	0.00	0.00
Total ****		2.18	1.45	2.23	1.48
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		1		3	
Landowners affected	Number	1		1	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

feet 600
meters 100

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Appendix P-29

Route Variation No. 29

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 29, 29A, 29B, 29C, 29D – Jiovino Property Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C		Variation Route D	
Location Begin End	Mile Post	77.83 79.92		N/A		N/A		N/A		N/A		N/A	
Length	Ft	11,058		10,658		10,279		11,213		12,092		12,098	
Area	Acres *	31.73		30.58		29.50		32.18		34.70		34.72	
Land requirements:													
Construction	Acres *	19.04		18.35		17.70		19.31		20.82		20.83	
Permanent		12.69		12.23		11.80		12.87		13.88		13.89	
Colocation:													
Power Line ROW	Ft	0.00		0.00		0.00		0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	6.59	4.40	4.69	3.13	0.74	0.49	6.01	4.00	6.01	4.00
Forested		7.38	4.92	7.67	5.12	8.58	5.72	7.91	5.27	8.47	5.65	5.67	3.78
Open		9.84	6.56	3.37	2.25	4.09	2.72	10.29	6.86	5.33	3.55	9.15	6.10
Residential/Commercial		0.12	0.08	0.71	0.47	0.34	0.23	0.37	0.24	1.02	0.68	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		19.04	12.69	18.35	12.23	17.70	11.80	19.31	12.87	20.82	13.88	20.83	13.89
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number												
Residences		0		0		0		0		0		0	
Commercial		0		0		0		0		2		0	
Other (Barn, Shed, etc.)		0		2		0		0		0		0	
Landowners affected	Number	0		0		0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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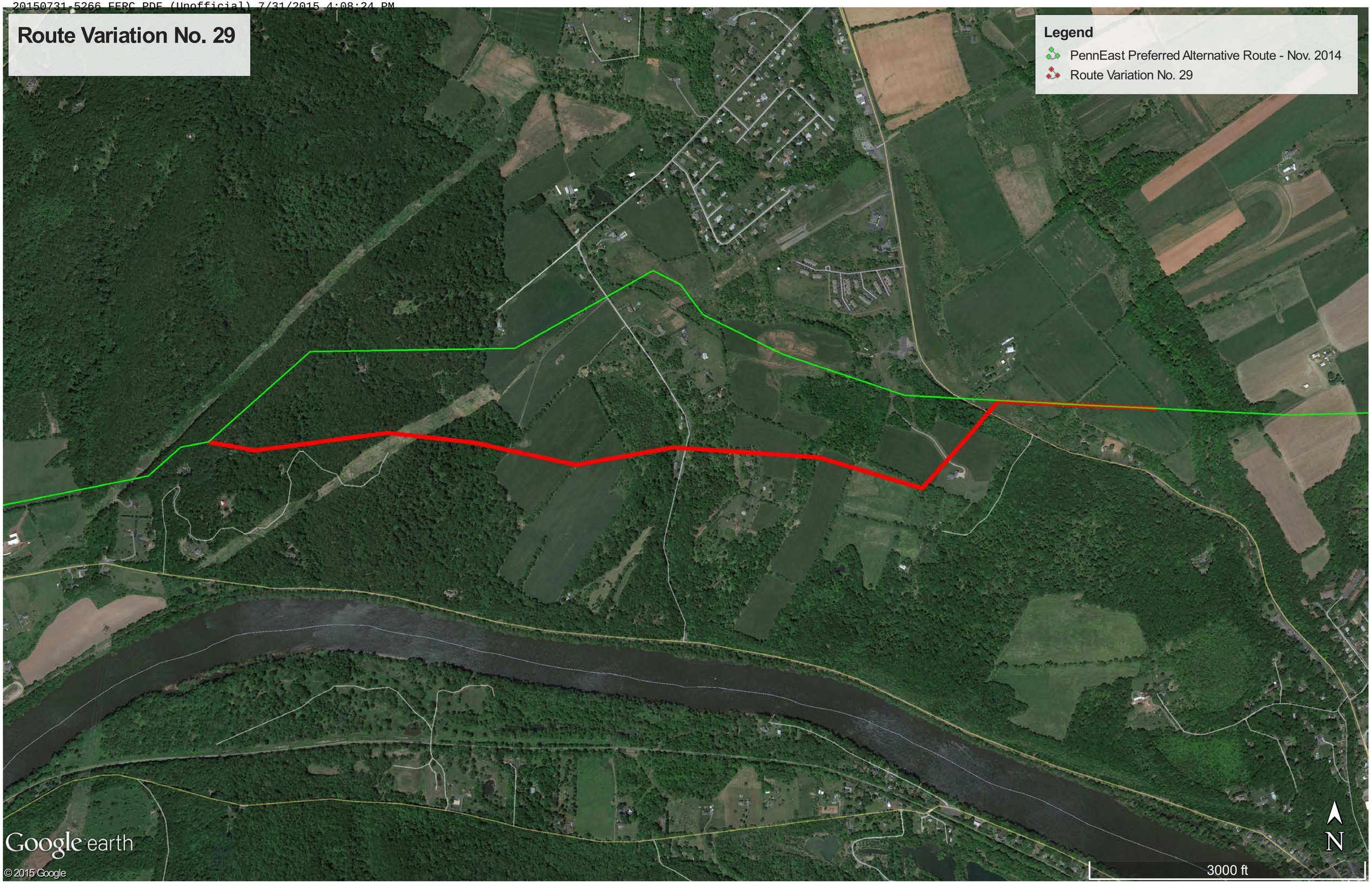

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Appendix P-29A

Route Variation No. 29A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 29, 29A, 29B, 29C, 29D – Jiovino Property Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C		Variation Route D	
Location Begin End	Mile Post	77.83 79.92		N/A		N/A		N/A		N/A		N/A	
Length	Ft	11,058		10,658		10,279		11,213		12,092		12,098	
Area	Acres *	31.73		30.58		29.50		32.18		34.70		34.72	
Land requirements:													
Construction	Acres *	19.04		18.35		17.70		19.31		20.82		20.83	
Permanent		12.69		12.23		11.80		12.87		13.88		13.89	
Colocation:													
Power Line ROW	Ft	0.00		0.00		0.00		0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	6.59	4.40	4.69	3.13	0.74	0.49	6.01	4.00	6.01	4.00
Forested		7.38	4.92	7.67	5.12	8.58	5.72	7.91	5.27	8.47	5.65	5.67	3.78
Open		9.84	6.56	3.37	2.25	4.09	2.72	10.29	6.86	5.33	3.55	9.15	6.10
Residential/Commercial		0.12	0.08	0.71	0.47	0.34	0.23	0.37	0.24	1.02	0.68	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		19.04	12.69	18.35	12.23	17.70	11.80	19.31	12.87	20.82	13.88	20.83	13.89
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number												
Residences		0		0		0		0		0		0	
Commercial		0		0		0		0		2		0	
Other (Barn, Shed, etc.)		0		2		0		0		0		0	
Landowners affected	Number	0		0		0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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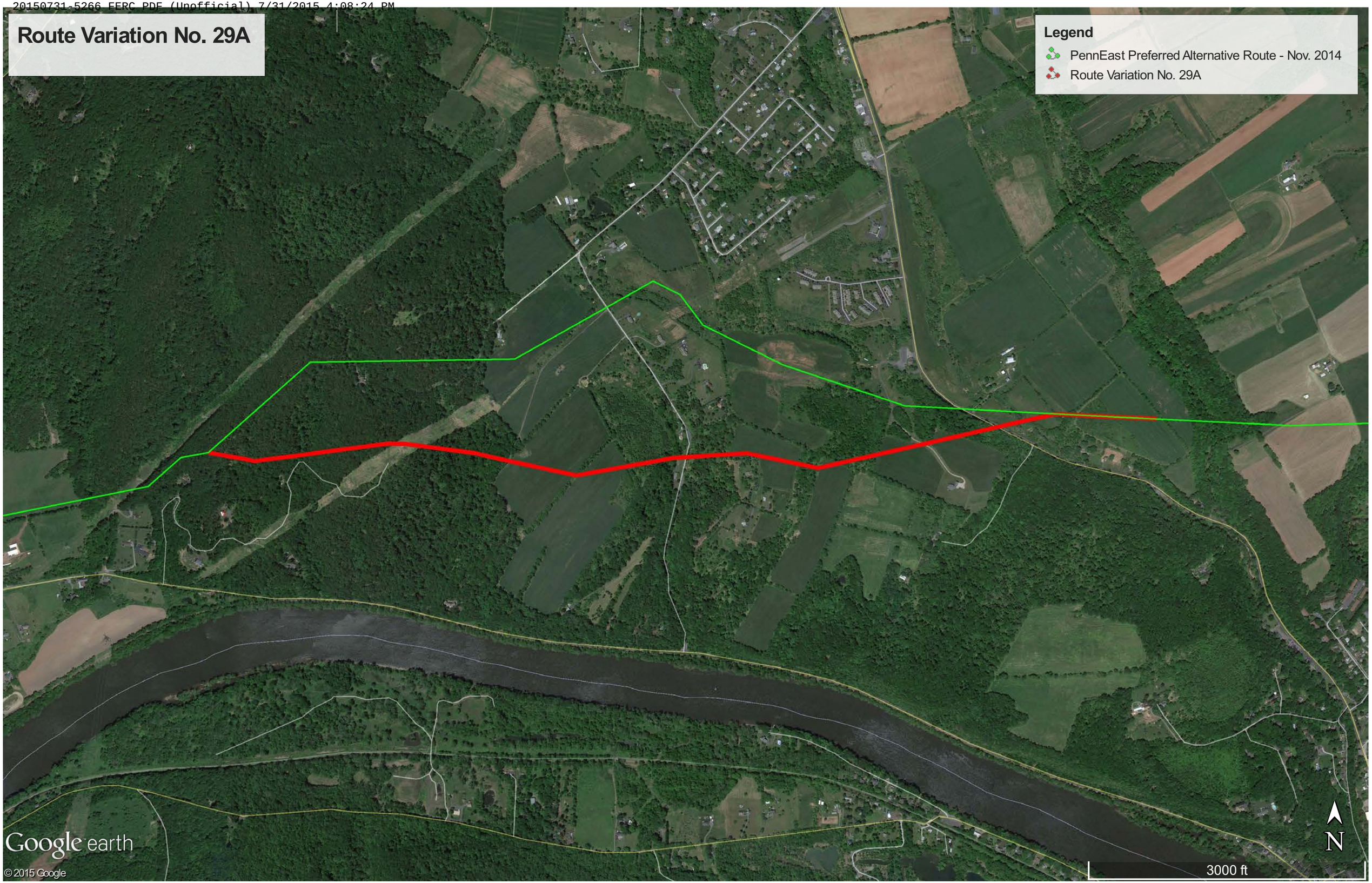
Route Variation No. 29A



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Appendix P-29B

Route Variation No. 29B

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 29, 29A, 29B, 29C, 29D – Jiovino Property Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C		Variation Route D	
Location Begin End	Mile Post	77.83 79.92		N/A		N/A		N/A		N/A		N/A	
Length	Ft	11,058		10,658		10,279		11,213		12,092		12,098	
Area	Acres *	31.73		30.58		29.50		32.18		34.70		34.72	
Land requirements:													
Construction	Acres *	19.04		18.35		17.70		19.31		20.82		20.83	
Permanent		12.69		12.23		11.80		12.87		13.88		13.89	
Colocation:													
Power Line ROW	Ft	0.00		0.00		0.00		0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	6.59	4.40	4.69	3.13	0.74	0.49	6.01	4.00	6.01	4.00
Forested		7.38	4.92	7.67	5.12	8.58	5.72	7.91	5.27	8.47	5.65	5.67	3.78
Open		9.84	6.56	3.37	2.25	4.09	2.72	10.29	6.86	5.33	3.55	9.15	6.10
Residential/Commercial		0.12	0.08	0.71	0.47	0.34	0.23	0.37	0.24	1.02	0.68	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		19.04	12.69	18.35	12.23	17.70	11.80	19.31	12.87	20.82	13.88	20.83	13.89
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number												
Residences		0		0		0		0		0		0	
Commercial		0		0		0		0		2		0	
Other (Barn, Shed, etc.)		0		2		0		0		0		0	
Landowners affected	Number	0		0		0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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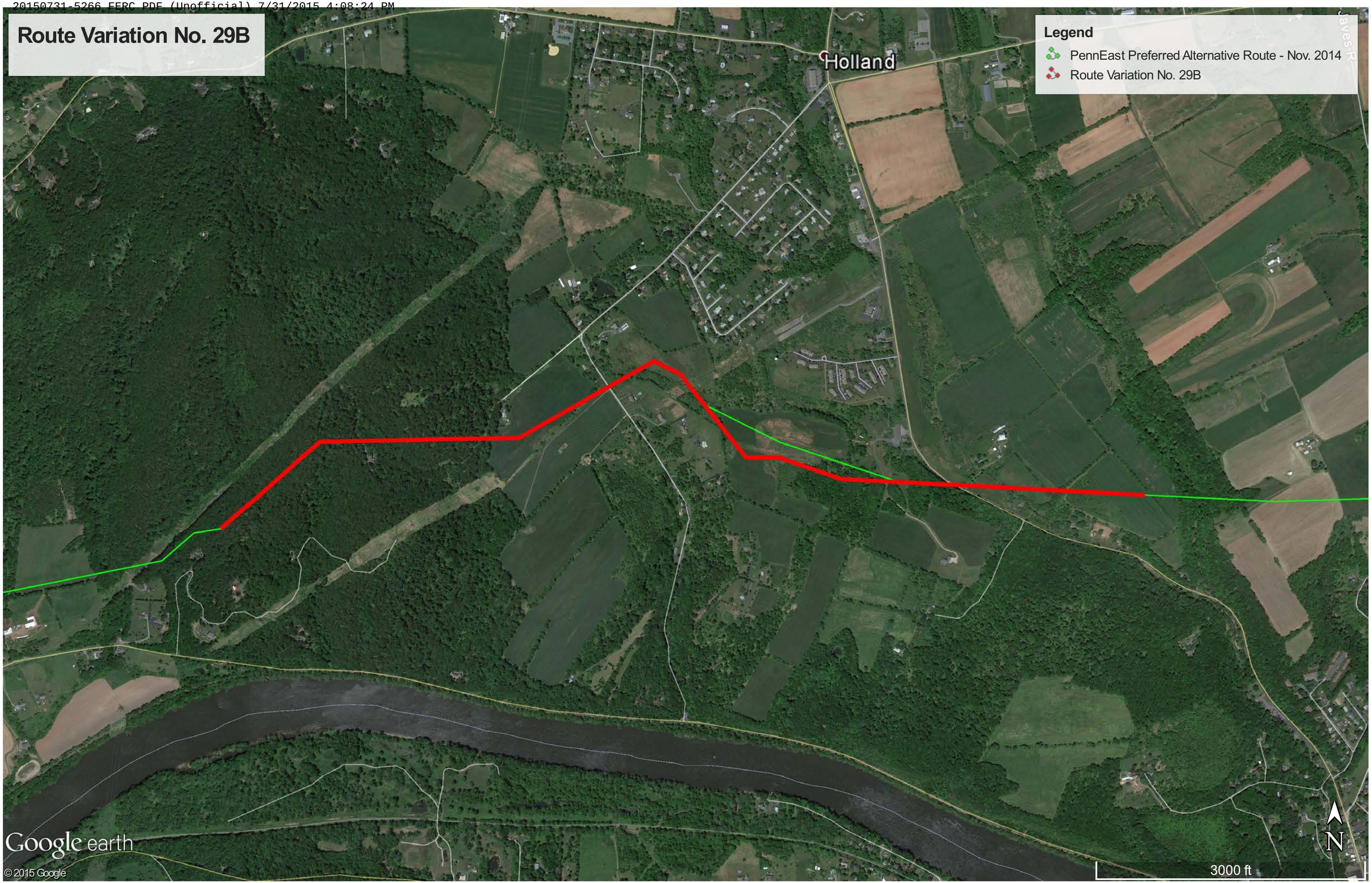

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Appendix P-29C

Route Variation No. 29C

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 29, 29A, 29B, 29C, 29D – Jiovino Property Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C		Variation Route D	
Location Begin End	Mile Post	77.83 79.92		N/A		N/A		N/A		N/A		N/A	
Length	Ft	11,058		10,658		10,279		11,213		12,092		12,098	
Area	Acres *	31.73		30.58		29.50		32.18		34.70		34.72	
Land requirements:													
Construction	Acres *	19.04		18.35		17.70		19.31		20.82		20.83	
Permanent		12.69		12.23		11.80		12.87		13.88		13.89	
Colocation:													
Power Line ROW	Ft	0.00		0.00		0.00		0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	6.59	4.40	4.69	3.13	0.74	0.49	6.01	4.00	6.01	4.00
Forested		7.38	4.92	7.67	5.12	8.58	5.72	7.91	5.27	8.47	5.65	5.67	3.78
Open		9.84	6.56	3.37	2.25	4.09	2.72	10.29	6.86	5.33	3.55	9.15	6.10
Residential/Commercial		0.12	0.08	0.71	0.47	0.34	0.23	0.37	0.24	1.02	0.68	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		19.04	12.69	18.35	12.23	17.70	11.80	19.31	12.87	20.82	13.88	20.83	13.89
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number												
Residences		0		0		0		0		0		0	
Commercial		0		0		0		0		2		0	
Other (Barn, Shed, etc.)		0		2		0		0		0		0	
Landowners affected	Number	0		0		0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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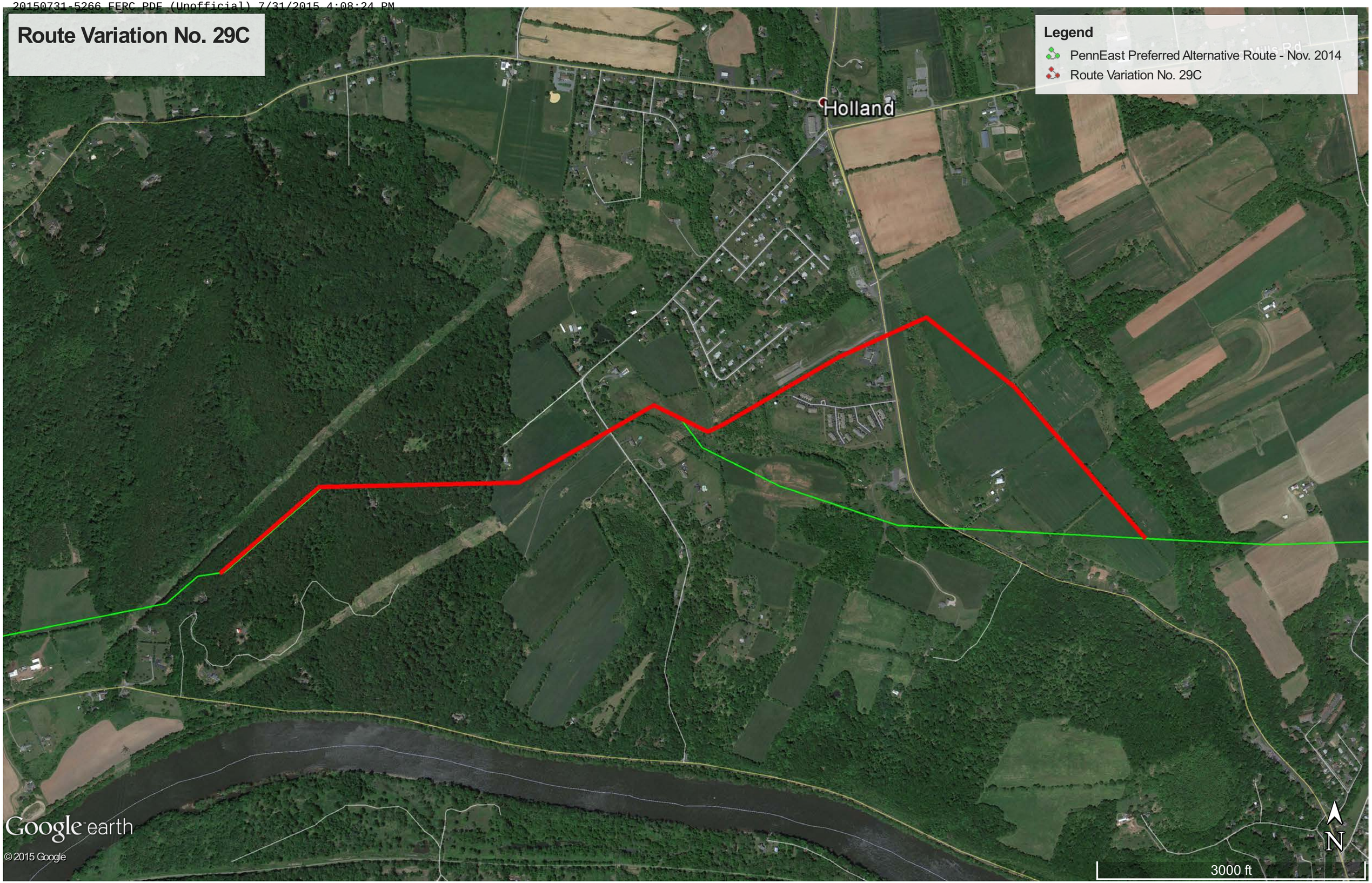

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Appendix P-29D

Route Variation No. 29D

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 29, 29A, 29B, 29C, 29D – Jiovino Property Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C		Variation Route D	
Location Begin End	Mile Post	77.83 79.92		N/A		N/A		N/A		N/A		N/A	
Length	Ft	11,058		10,658		10,279		11,213		12,092		12,098	
Area	Acres *	31.73		30.58		29.50		32.18		34.70		34.72	
Land requirements:													
Construction	Acres *	19.04		18.35		17.70		19.31		20.82		20.83	
Permanent		12.69		12.23		11.80		12.87		13.88		13.89	
Colocation:													
Power Line ROW	Ft	0.00		0.00		0.00		0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	6.59	4.40	4.69	3.13	0.74	0.49	6.01	4.00	6.01	4.00
Forested		7.38	4.92	7.67	5.12	8.58	5.72	7.91	5.27	8.47	5.65	5.67	3.78
Open		9.84	6.56	3.37	2.25	4.09	2.72	10.29	6.86	5.33	3.55	9.15	6.10
Residential/Commercial		0.12	0.08	0.71	0.47	0.34	0.23	0.37	0.24	1.02	0.68	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		19.04	12.69	18.35	12.23	17.70	11.80	19.31	12.87	20.82	13.88	20.83	13.89
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number												
Residences		0		0		0		0		0		0	
Commercial		0		0		0		0		2		0	
Other (Barn, Shed, etc.)		0		2		0		0		0		0	
Landowners affected	Number	0		0		0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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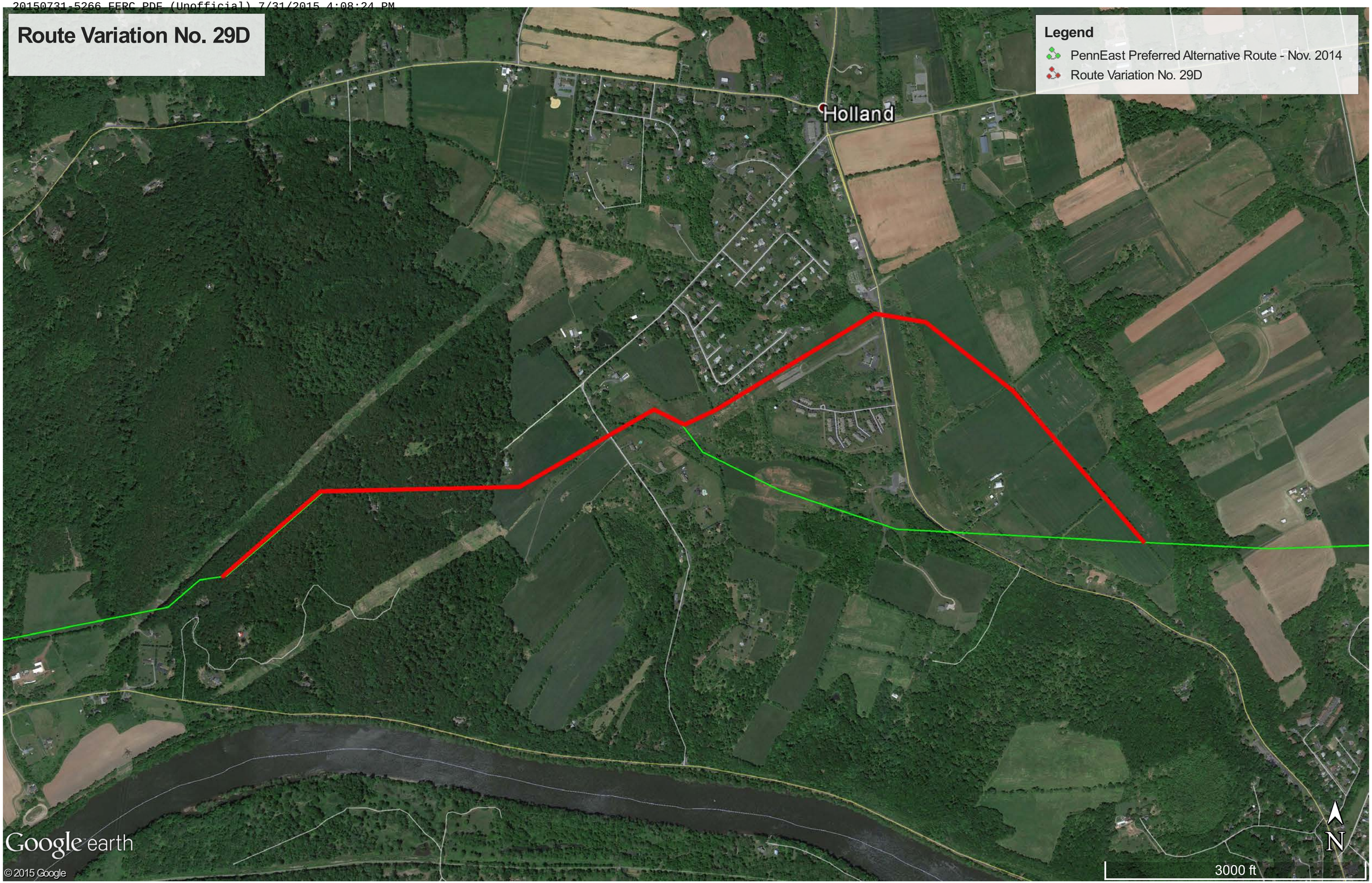

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Appendix P-30

Route Variation No. 30

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 30 – Hopewell Township

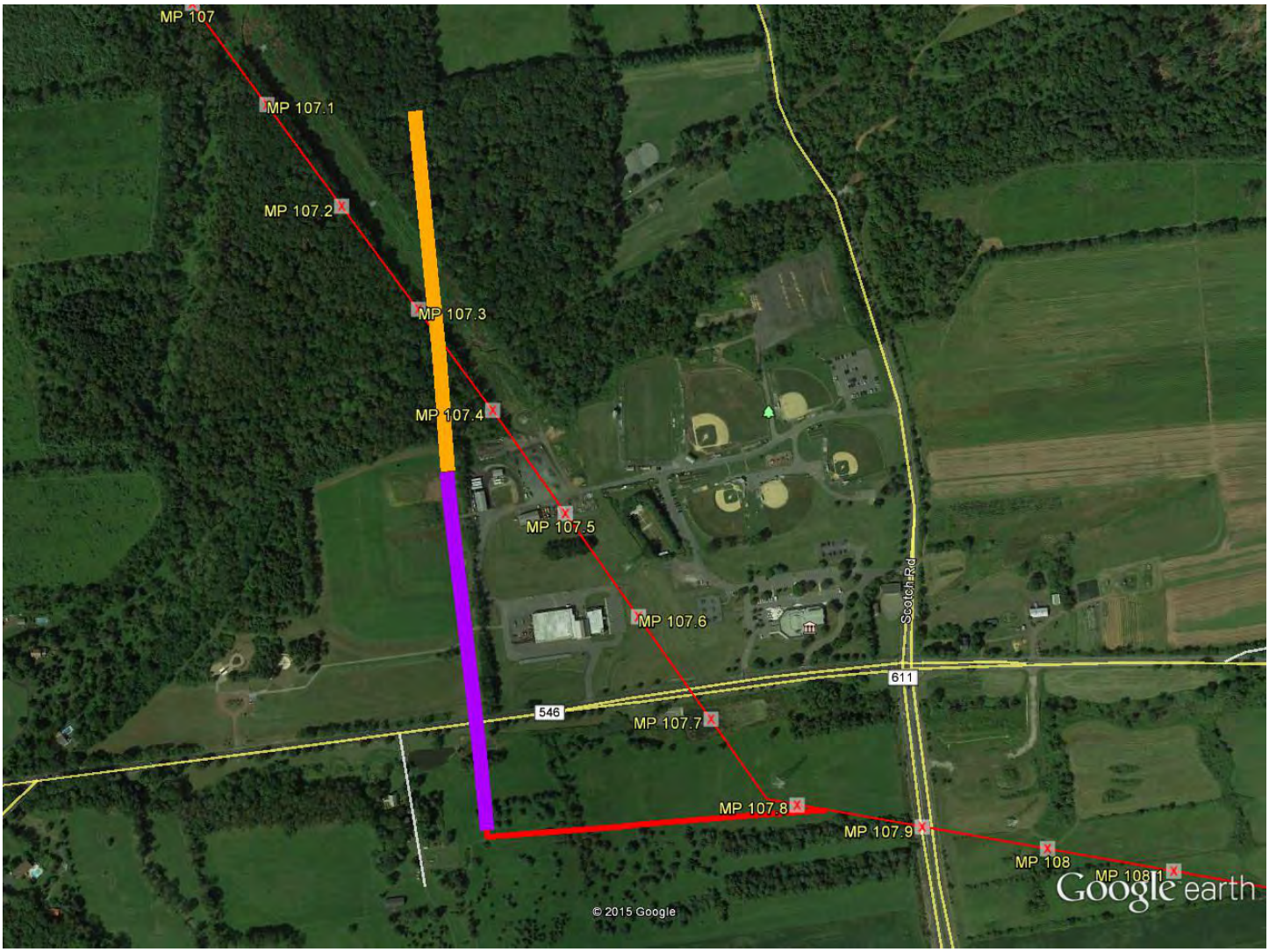
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	107.33		N/A	
End		107.82			
Length	Ft	2,587.20		3,520.00	
Area	Acres *	7.42		10.10	
Land requirements:					
Construction	Acres *	4.45		6.06	
Permanent		2.97		4.04	
Colocation:					
Power Line ROW	Ft	2,629.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	3		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		0.86	0.57	0.78	0.52
Open		3.59	2.40	5.28	3.52
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		4.45	2.97	6.06	4.04
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	2	2	1	1
	Ft	1808.69	1808.69	1602.42	1602.42
	Acres	3.17	2.10	2.8	1.86
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		3		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		2	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

feet 2000

meters 800

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Appendix P-31

Route Variation No. 31

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 31 – Frenchtown Run LLC

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	87.01		N/A	
End		87.41			
Length	Ft	2,112		2,328	
Area	Acres *	6.06		6.68	
Land requirements:					
Construction	Acres *	3.64		4.01	
Permanent		2.42		2.67	
Colocation:					
Power Line ROW	Ft	1,731		1,790	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		1,731		1,790	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/shrub wetlands	Acres/Acres **	0.05	0.03	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.05	0.03	0.0	0.0
Waterbodies / Streams affected	#	1		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.73	0.49	0.69	0.46
Forested		2.90	1.94	3.32	2.21
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		3.64	2.42	4.01	2.67
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1
	Ft	0.0	0.0	695.7	695.7
	Acres	0.0	0.0	1.26	0.83
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Appendix P-32

Route Variation No. 32

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 32 – Penn Dixie Road

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	58.28		N/A	
End		58.79			
Length	Ft	2,693		2,964	
Area	Acres *	7.73		8.51	
Land requirements:					
Construction	Acres *	4.64		5.10	
Permanent		3.09		3.40	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		1	
	Name(s)	East Branch Monocacy Creek		East Branch Monocacy Creek	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.67	1.78	4.34	2.89
Forested		0.69	0.46	0.77	0.51
Open		1.00	0.67	0.00	0.00
Residential/Commercial		0.27	0.18	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		4.64	3.09	5.10	3.40
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0	0	0	0
	Acres	0	0	0	0
Preserved Farm Land	#	0	0	0	0
	Ft	0	0	0	0
	Acres	0	0	0	0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Parcels Crossed	Number	3		3	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 32
Legend
Current Route
Variation Route
Penn Dixie Rd
Sterner Rd
58.3
58.4
58.5
58.6
58.7
58.8
Westminster Way
Google earth
©2015 Google
N
900 ft

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Appendix P-33

Route Variation No. 33

(negated by workspace avoidance. Reroute analysis not completed)

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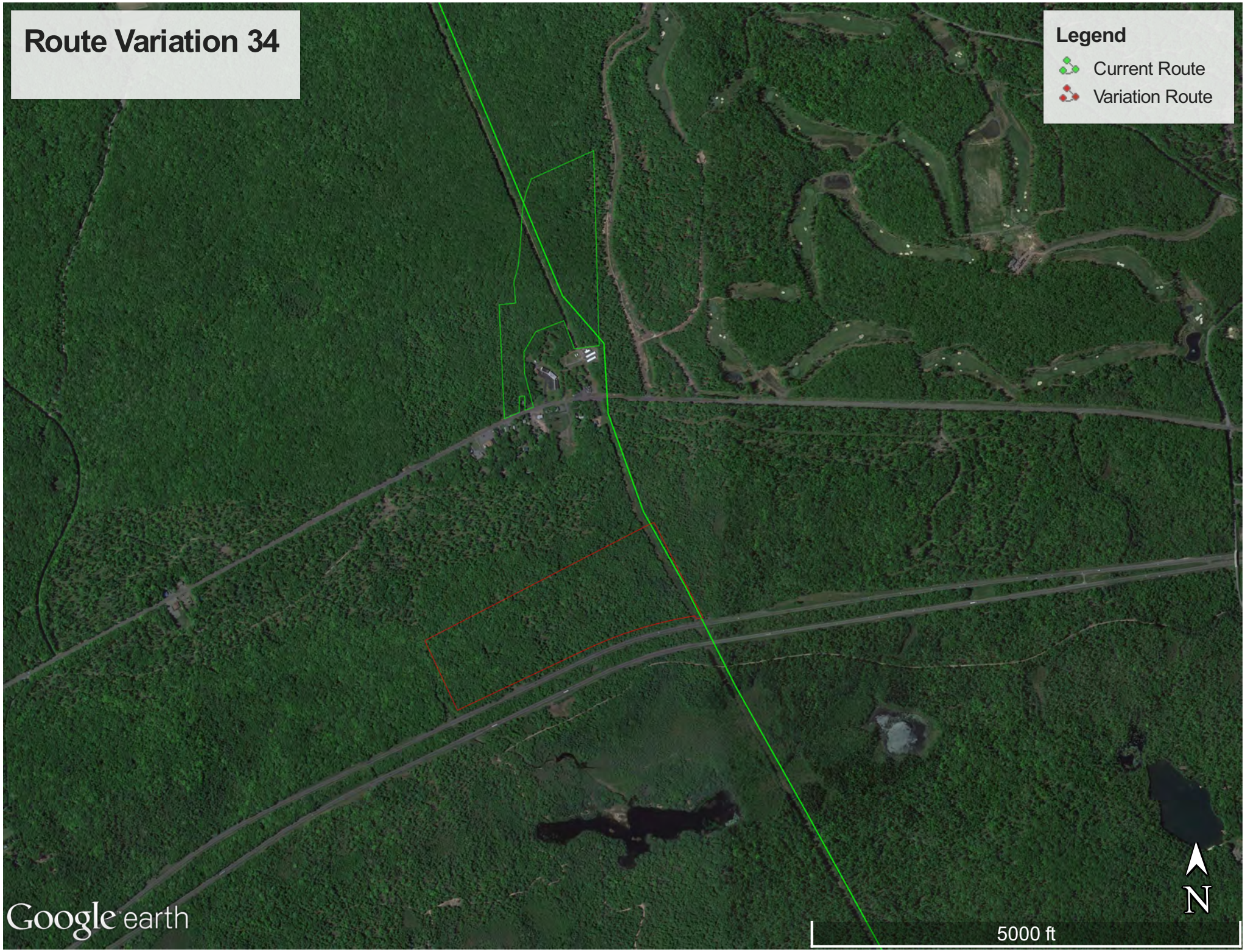
Appendix P-34

Route Variation No. 34


Route Variation 34
Legend
Current Route
Variation Route
Google earth
N
5000 ft

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Appendix P-35

Route Variation No. 35

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 35 – Hope Road Commercial Development

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	66.00		N/A	
End		66.61			
Length	Ft	3,220.80		3,966.00	
Area	Acres *	9.24		11.38	
Land requirements:					
Construction	Acres *	5.55		6.83	
Permanent		3.70		4.55	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.91	1.27	1.86	1.24
Forested		0.00	0.00	0.00	0.00
Open		2.91	1.94	3.75	2.50
Residential/Commercial		0.73	0.48	1.22	0.81
Open Water		0.00	0.00	0.00	0.00
Total ****		5.55	3.70	6.83	4.55
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		1		1	
Other (Barn, Shed, etc.)		0		1	
Landowners affected	Number	6		5	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Hope Road Development - Overview

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Appendix P-35A

Route Variation No. 35A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 35A – Hope Road Commercial Development

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	66.00		N/A	
End		66.69			
Length	Ft	3,643.20		3,900.00	
Area	Acres *	10.45		11.19	
Land requirements:					
Construction	Acres *	6.27		6.71	
Permanent		4.18		4.48	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.90	1.27	1.86	1.24
Forested		0.00	0.00	0.00	0.00
Open		3.64	2.43	3.64	2.43
Residential/Commercial		0.73	0.48	1.22	0.81
Open Water		0.00	0.00	0.00	0.00
Total ****		6.27	4.18	6.71	4.48
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		1		1	
Other (Barn, Shed, etc.)		0		4	
Landowners affected	Number	7		8	

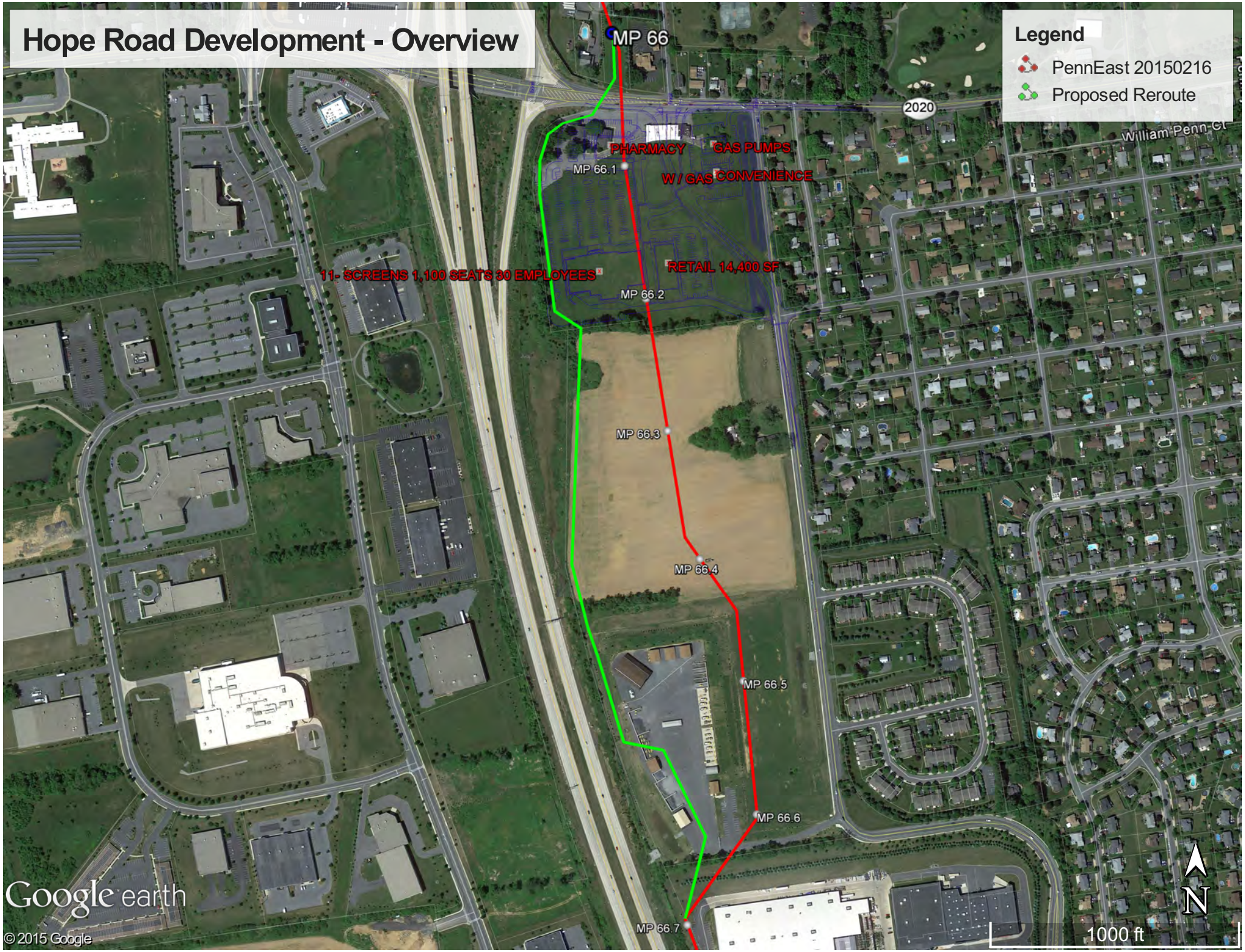
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Hope Road Development - Overview



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Appendix P-36

Route Variation No. 36

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 36 – Mohawk Real Estate

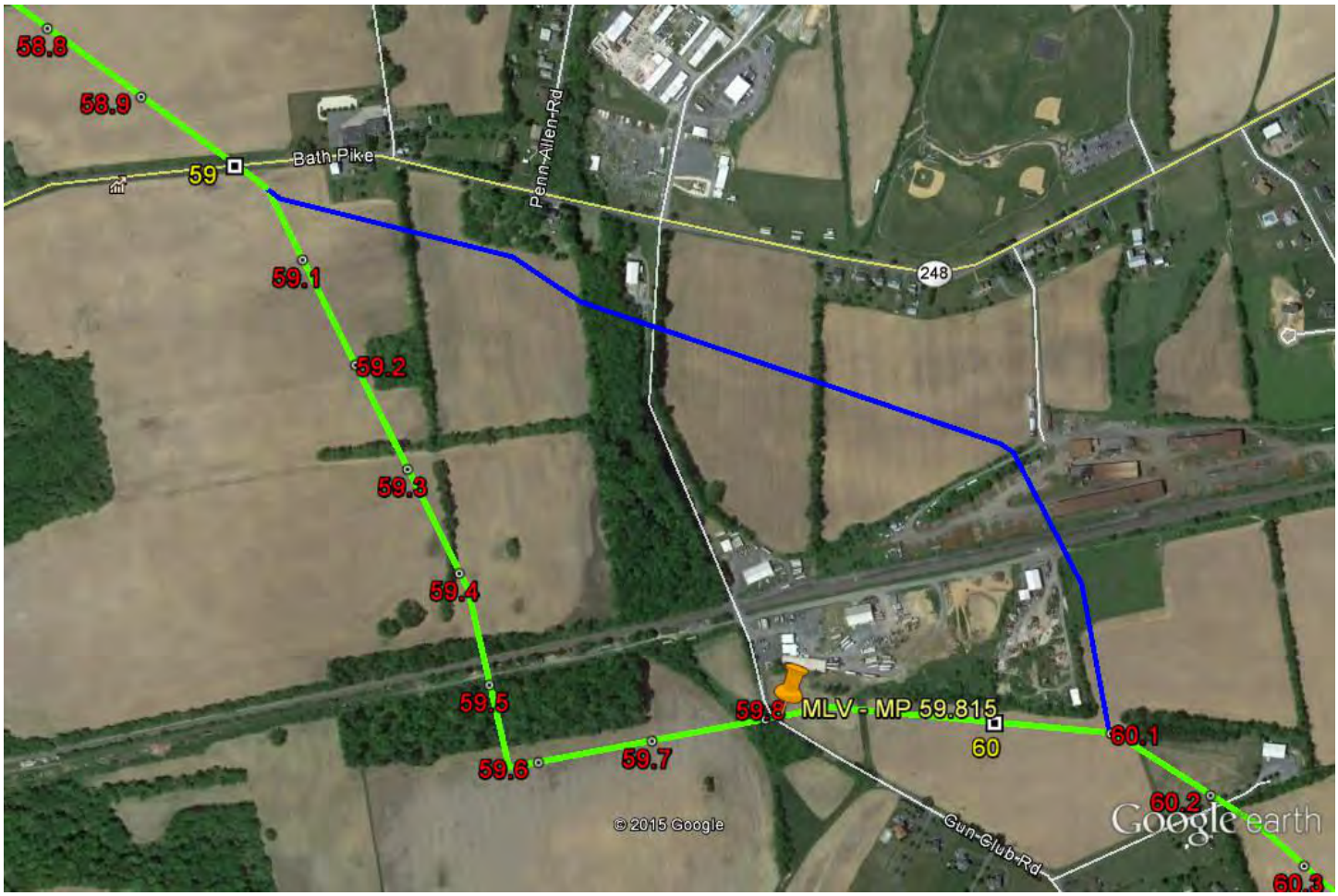
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	59.03		N/A	
End		60.10			
Length	Ft	5,649.60		4,988.00	
Area	Acres *	16.21		14.31	
Land requirements:					
Construction	Acres *	9.73		8.59	
Permanent		6.48		5.73	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/shrub wetlands	Acres/Acres **	0.15	0.06	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.15	0.06	0.0	0.0
Waterbodies / Streams affected	#	2		2	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	8.54	5.69	6.39	4.26
Forested		1.19	0.79	0.67	0.45
Open		0.00	0.00	0.54	0.36
Residential/Commercial		0.00	0.00	0.99	0.66
Open Water		0.00	0.00	0.00	0.00
Total ****		9.73	6.48	8.59	5.73
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		1	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	6		10	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



Google earth

feet 3000
meters 900

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Appendix P-37

Route Variation No. 37

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 37 – Reroute for Quarry Expansion

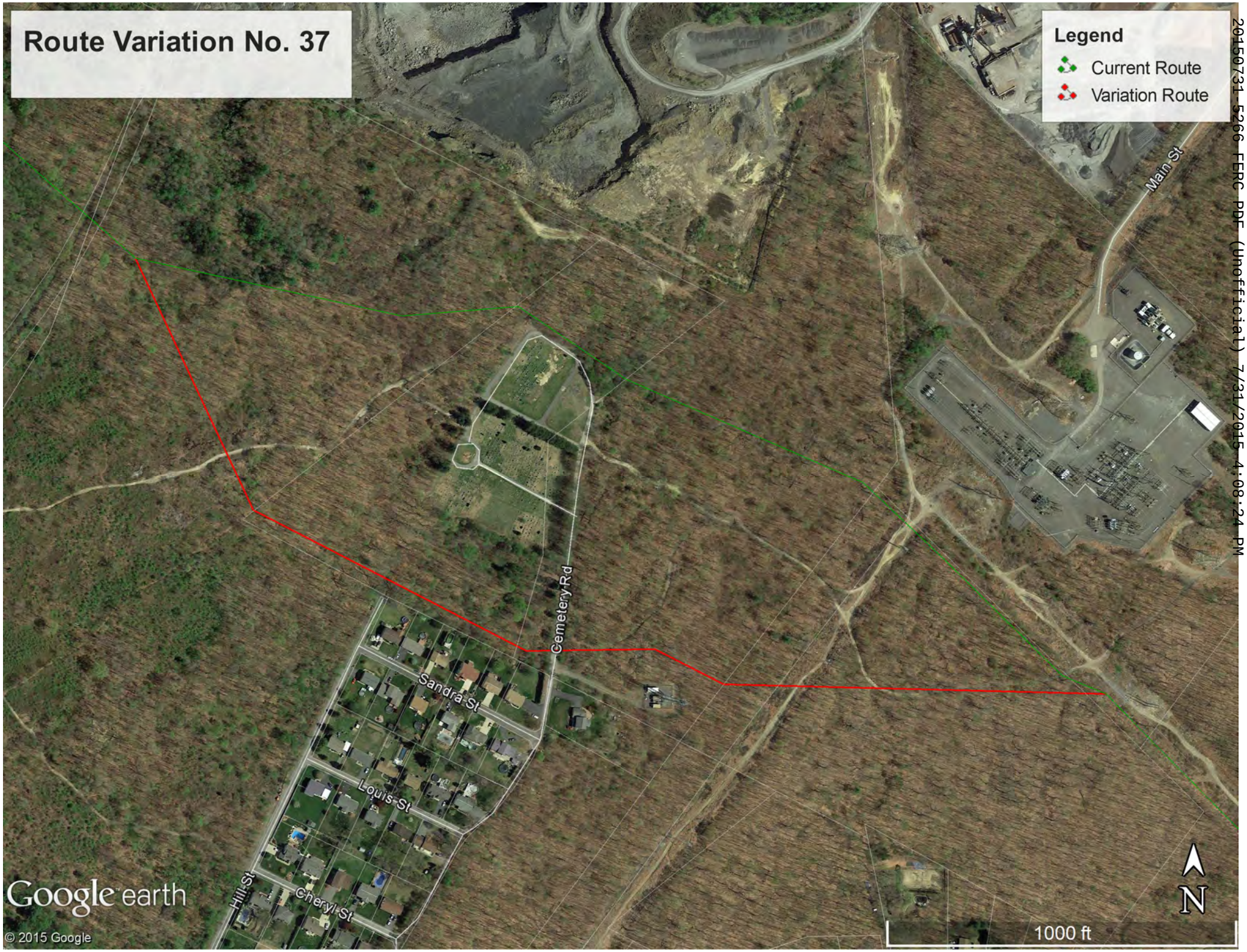
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	8.73		N/A	
End		9.33			
Length	Ft	3,168.00		3,351.00	
Area	Acres *	9.09		9.62	
Land requirements:					
Construction	Acres *	5.45		5.77	
Permanent		3.64		3.85	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		4.83	3.22	4.62	3.08
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.63	0.42	1.14	0.76
Open Water		0.00	0.00	0.00	0.00
Total ****		5.45	3.64	5.77	3.85
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	5		12	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.



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Appendix P-38

Route Variation No. 38

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 38 – Etown Lateral

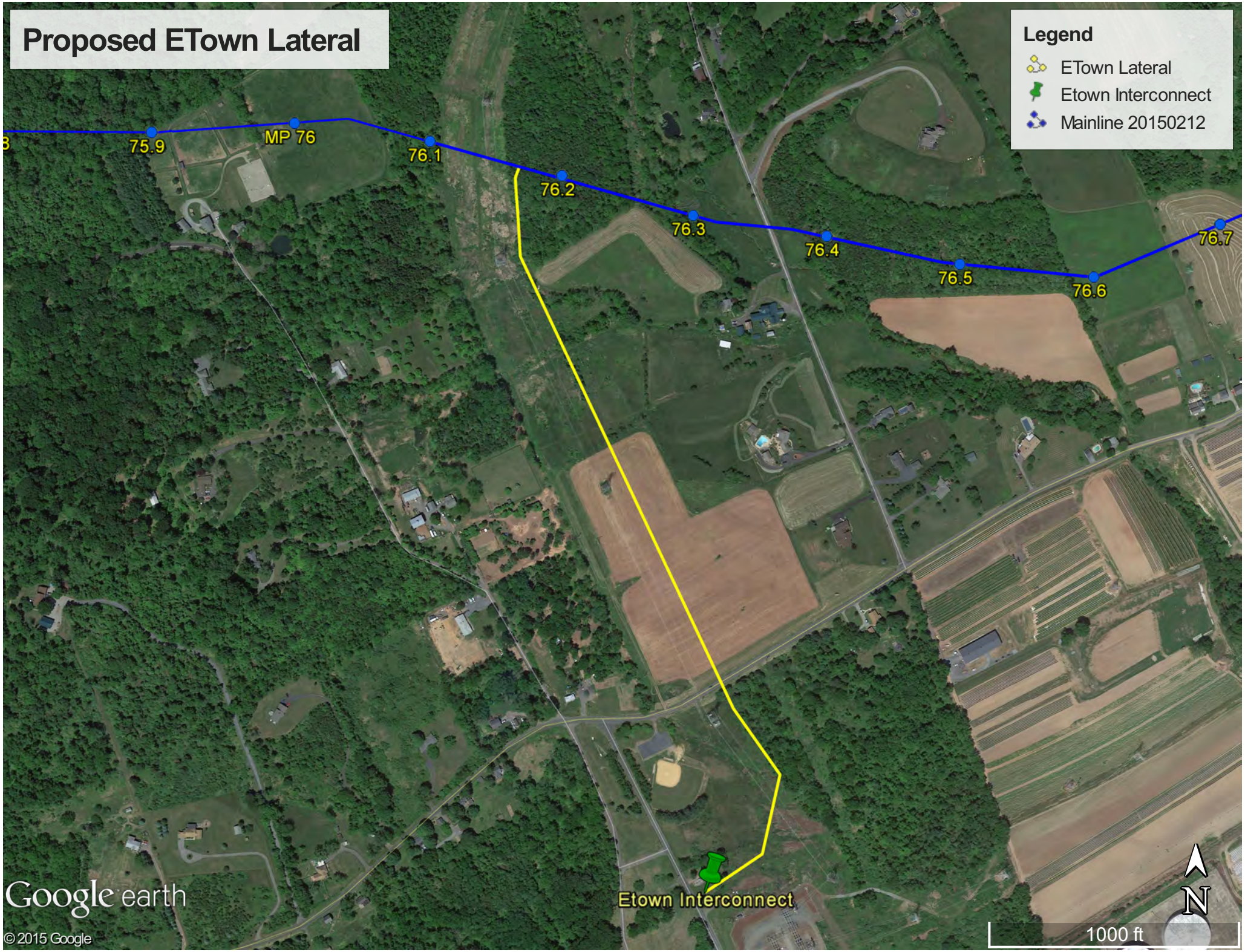
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	0.00		N/A	
End		0.00			
Length	Ft	0.00		3,193.00	
Area	Acres *	0.00		9.16	
Land requirements:					
Construction	Acres *	0.00		5.50	
Permanent		0.00		3.67	
Colocation:					
Power Line ROW	Ft	0.00		2,552	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	1.62	1.08
Forested		0.00	0.00	1.40	0.93
Open		0.00	0.00	2.48	1.65
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		0.00	0.00	5.50	3.67
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1
	Ft	0.0	0.0	686	686
	Acres	0.0	0.0	1.2	0.8
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		6	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Proposed ETown Lateral
Legend
ETown Lateral
Etown Interconnect
Mainline 20150212
75.9
MP 76
76.1
76.2
76.3
76.4
76.5
76.6
76.7
Etown Interconnect
Google earth
© 2015 Google
1000 ft
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Appendix P-38A

Route Variation No. 38A

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 38, 38A – Gilbert Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location							
Begin	Mile Post	0.00		N/A		N/A	
End		0.00					
Length	Ft	0.00		3,193.00		3,305.00	
Area	Acres *	0.00		9.16		9.48	
Land requirements:							
Construction	Acres *	0.00		5.50		5.69	
Permanent		0.00		3.67		3.79	
Colocation:							
Power Line ROW	Ft	0.00		2,552		1,562	
Pipeline ROW		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00	
Total colocation		0.00		2,552		1,562	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		1		3	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***			
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	1.62	1.08	1.62	1.08
Forested		0.00	0.00	1.40	0.93	0.78	0.52
Open		0.00	0.00	2.48	1.65	2.73	1.82
Residential/Commercial		0.00	0.00	0.00	0.00	0.57	0.38
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		0.00	0.00	5.50	3.67	5.69	3.79
Public / Preserved Land:		Construction	Permanent	Permanent	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	1	1
	Ft	0.0	0.0	686	686	893	893
	Acres	0.0	0.0	1.2	0.8	1.3	0.9
Structures within 50 ft of construction work area	Number						
Residences		0		0		0	
Commercial		0		0		0	
Other (Barn, Shed, etc.)		0		0		0	
Landowners affected	Number	0		6		6	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

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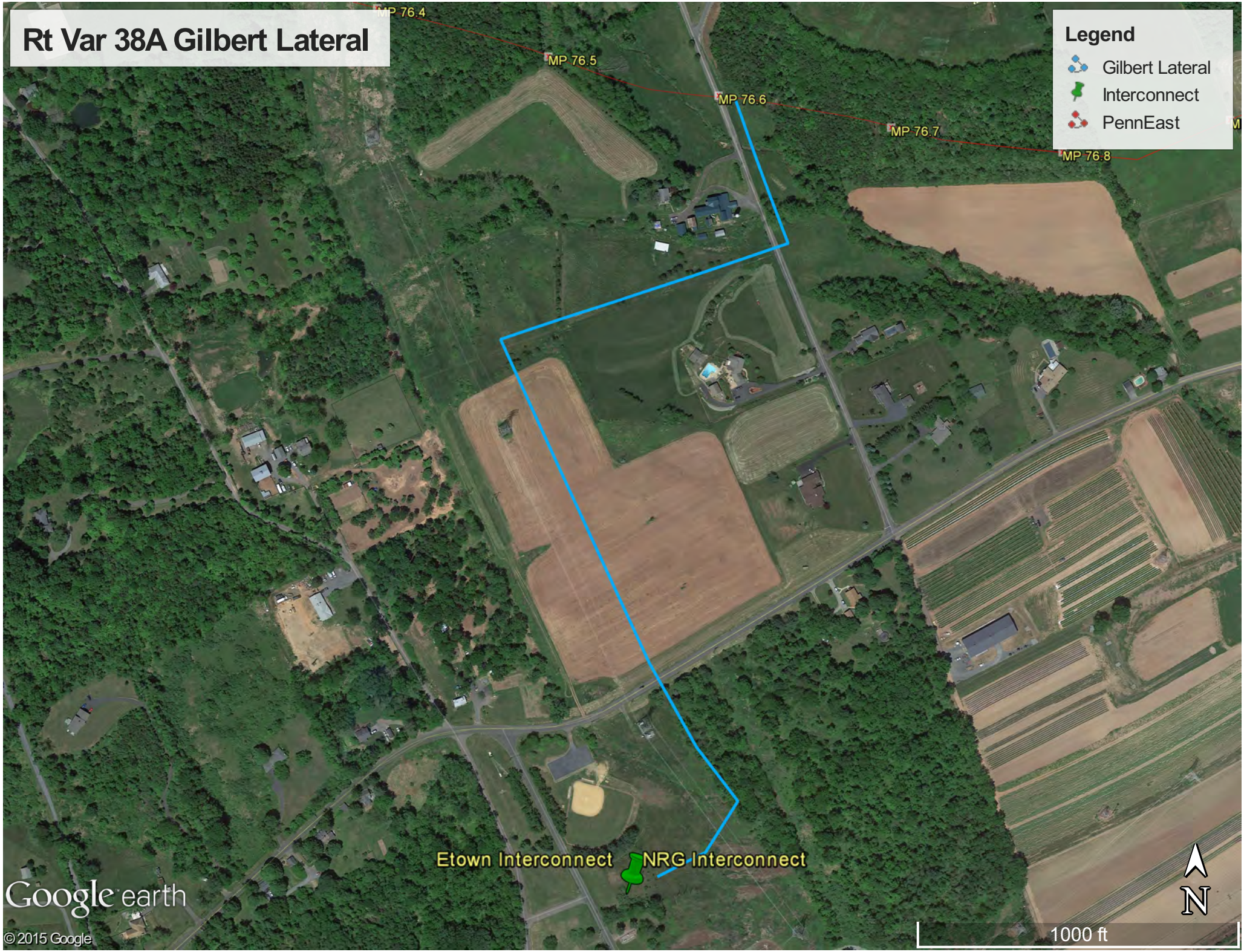
Rt Var 38A Gilbert Lateral



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Appendix P-38B

Route Variation No. 38B

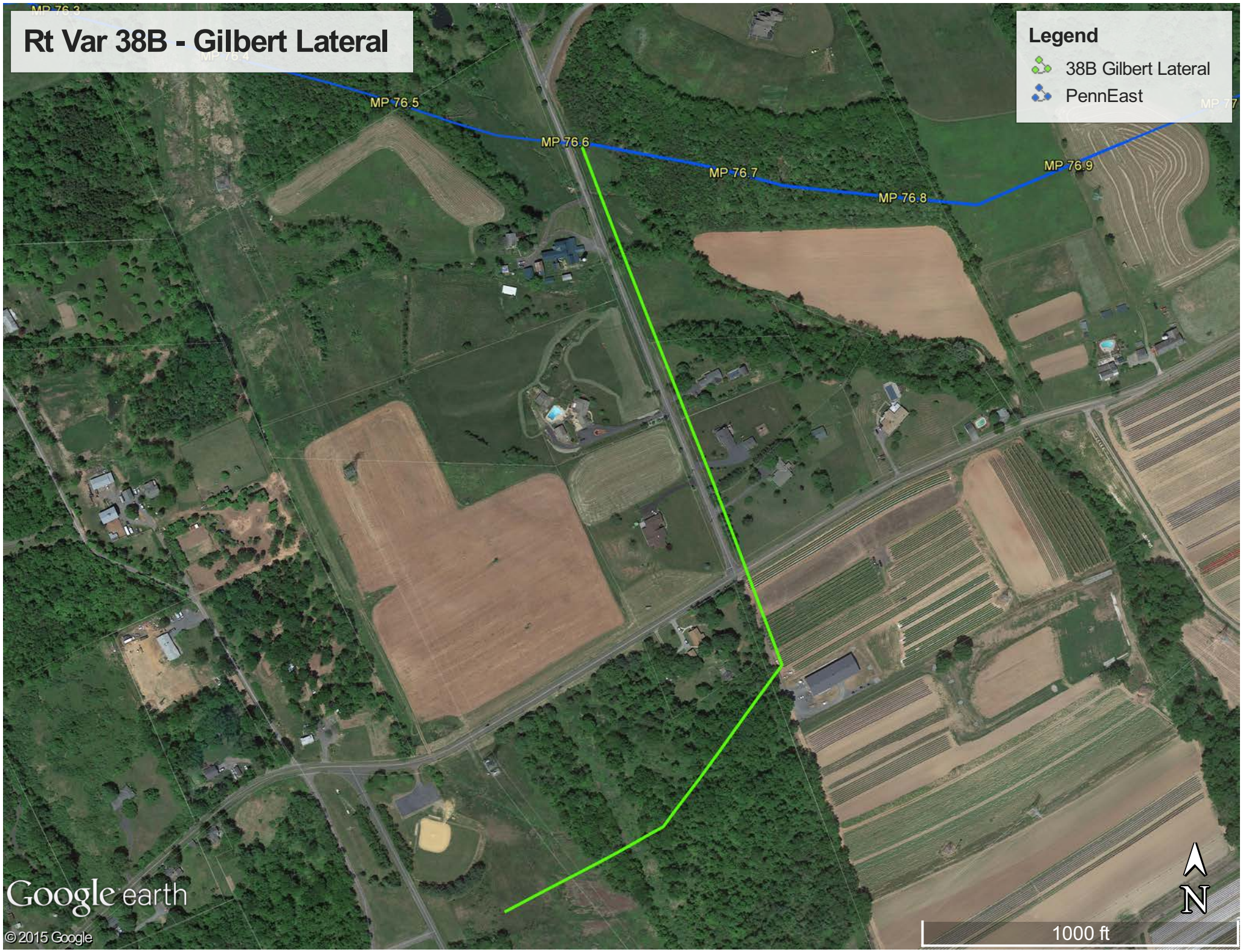
20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 38, 38A, 38B – Gilbert Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B	
Location									
Begin	Mile Post	0.00		N/A		N/A		N/A	
End		0.00							
Length	Ft	0.00		3,193.00		3,305.00		2,889.00	
Area	Acres *	0.00		9.16		9.48		8.29	
Land requirements:									
Construction	Acres *	0.00		5.50		5.69		4.97	
Permanent		0.00		3.67		3.79		3.32	
Colocation:									
Power Line ROW	Ft	0.00		2,552		1,562		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		0.00		2,552		1,562		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		1		3		0	
	Name(s)	N/A		N/A					
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	1.62	1.08	1.62	1.08	0.55	0.37
Forested		0.00	0.00	1.40	0.93	0.78	0.52	1.45	0.97
Open		0.00	0.00	2.48	1.65	2.73	1.82	1.75	1.17
Residential/Commercial		0.00	0.00	0.00	0.00	0.57	0.38	1.22	0.81
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		0.00	0.00	5.50	3.67	5.69	3.79	4.97	3.32
Public / Preserved Land:		Construction	Permanent	Permanent	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	1	1	0	0
	Ft	0.0	0.0	686	686	894	894	0.0	0.0
	Acres	0.0	0.0	1.2	0.8	1.3	1.0	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		0		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	0		6		6		6	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

Rt Var 38B - Gilbert Lateral



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Appendix P-38C

Route Variation No. 38C

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 38, 38A, 38B, 38C – Gilbert Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B		Variation Route C	
Location											
Begin	Mile Post	0.00		N/A		N/A		N/A		N/A	
End		0.00									
Length	Ft	0.00		3,193.00		3,305.00		2,889.00		3,828	
Area	Acres *	0.00		9.16		9.48		8.29		10.98	
Land requirements:											
Construction	Acres *	0.00		5.50		5.69		4.97		0.00	
Permanent		0.00		3.67		3.79		3.32		0.00	
Colocation:											
Power Line ROW	Ft	0.00		2,552		1,562		0.00		1,562	
Pipeline ROW		0.00		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00		0.00	
Total colocation		0.00		2,552		1,562		0.00		1,562	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Forested /Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0
Waterbodies / Streams affected	#	0		1		3		2		2	
	Name(s)	N/A		N/A							
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	1.62	1.08	1.62	1.08	0.55	0.37	2.85	1.90
Forested		0.00	0.00	1.40	0.93	0.78	0.52	1.45	0.97	0.90	0.60
Open		0.00	0.00	2.48	1.65	2.73	1.82	1.75	1.17	2.27	1.51
Residential/Commercial		0.00	0.00	0.00	0.00	0.57	0.38	1.22	0.81	0.57	0.38
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		0.00	0.00	5.50	3.67	5.69	3.79	4.97	3.32	6.59	4.39
Public / Preserved Land:		Construction	Permanent	Permanent	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	1	1	2	2	2	2
	Ft	0.0	0.0	686	686	894	894	350	350	869	869
	Acres	0.0	0.0	1.2	0.8	1.3	1.0	0.6	0.4	1.03	0.75
Structures within 50 ft of construction work area	Number										
Residences		0		0		0		0		0	
Commercial		0		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0		0	
Landowners affected	Number	0		6		6		6		7	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

Route Variation No. 38C

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Appendix P-39

Route Variation No. 39

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Appendix P-39

Route Variation No. 39

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 39 – Valley View Manor Water Well

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	84.03		N/A	
End		85.37			
Length	Ft	7075.00		7,581.00	
Area	Acres *	20.30		21.75	
Land requirements:					
Construction	Acres *	12.18		13.05	
Permanent		8.12		8.70	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		1.2	0.8	0.8	0.5
Total wetlands		1.2	0.8	0.8	0.5
Waterbodies / Streams affected	#	4		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.72	1.15	1.00	0.67
Forested		9.26	6.17	8.61	5.74
Open		0.32	0.21	2.75	1.83
Residential/Commercial		0.88	0.59	0.69	0.46
Open Water		0.00	0.00	0.00	0.00
Total ****		12.18	8.12	13.05	8.70
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	1	1	0	0
	Ft	1410	1410	1431	1431
	Acres	2.4	1.6	2.5	1.6
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0	0
	Acres	0.0	0.0	0	0
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		1		1	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	8		8	

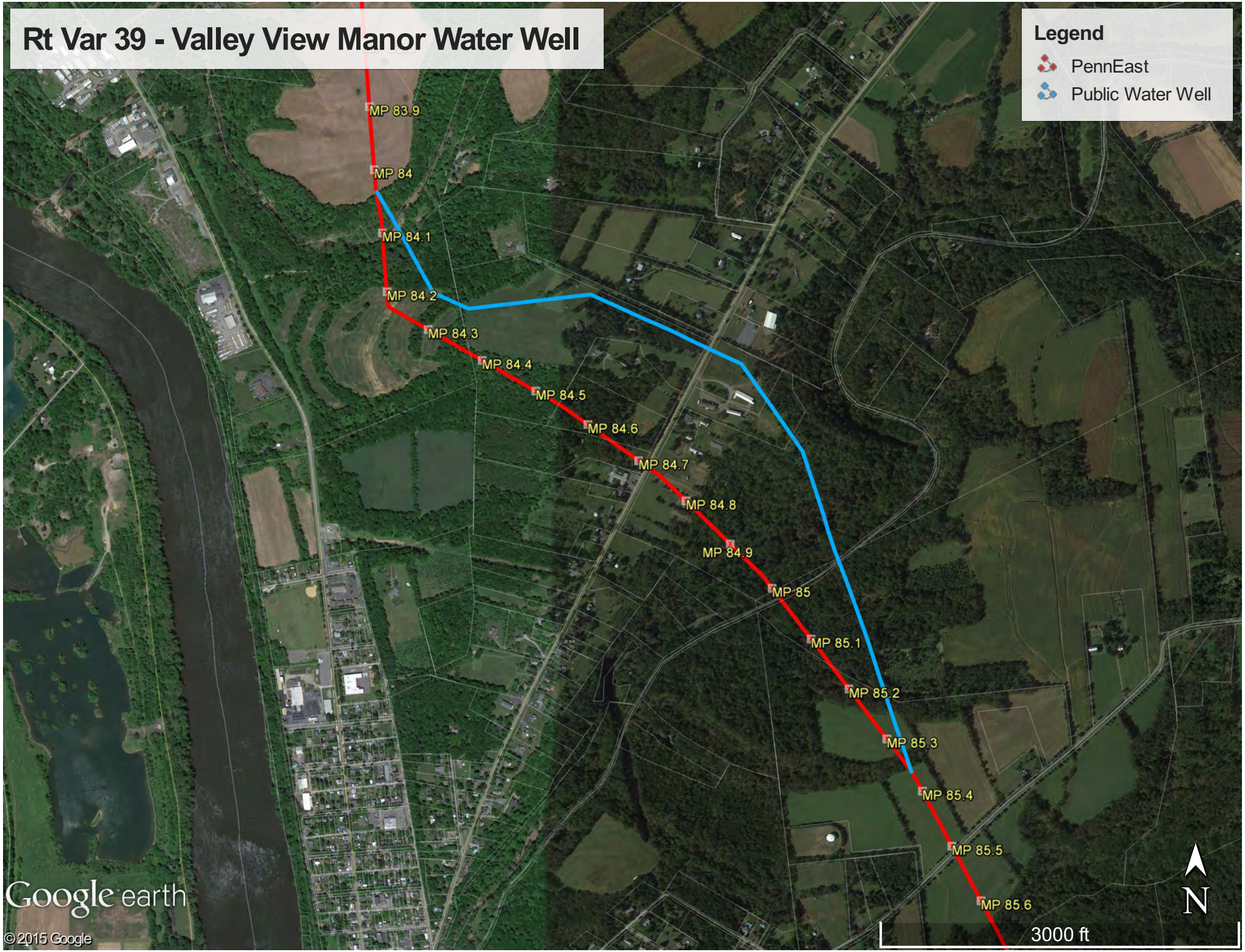
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Var 39 - Valley View Manor Water Well



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Appendix P-40

Route Variation No. 40

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40 – Con Ed Solar Farm

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	88.68		N/A	
End		90.04			
Length	Ft	7,180.80		9,839	
Area	Acres *	20.61		28.23	
Land requirements:					
Construction	Acres *	12.36		16.94	
Permanent		8.24		11.29	
Colocation:					
Power Line ROW	Ft	2,167		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.1	0.0	1.1	0.7
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		4.7	3.2	2.6	1.8
Total wetlands		4.8	3.2	3.7	2.5
Waterbodies / Streams affected	#	3		2	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.89	2.59	11.64	7.76
Forested		8.47	5.65	4.39	2.93
Open		0.00	0.00	0.91	0.61
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		12.36	8.24	16.94	11.29
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	6		14	

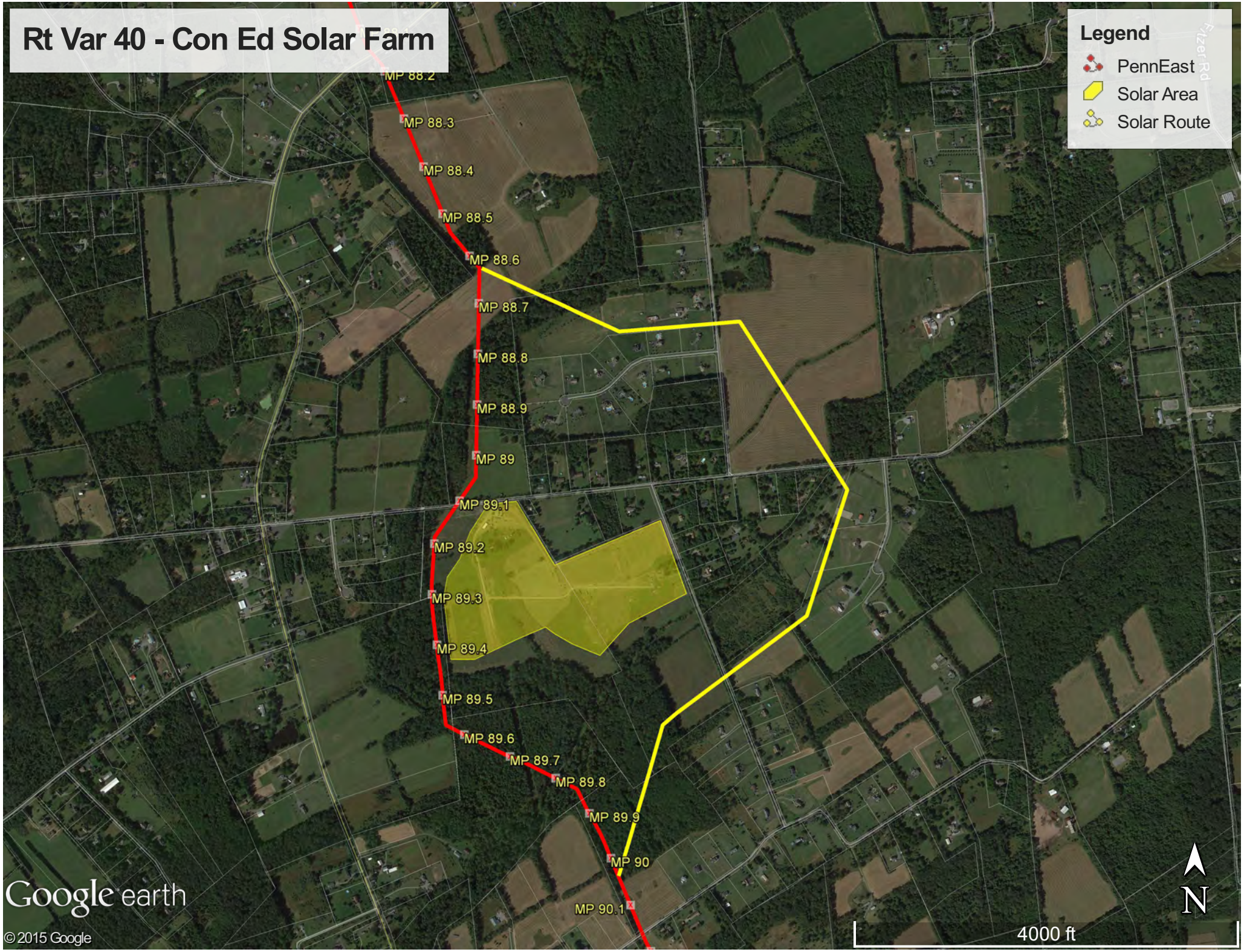
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Var 40 - Con Ed Solar Farm



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Appendix P-40A

Route Variation No. 40A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40A – Con Ed Solar Farm

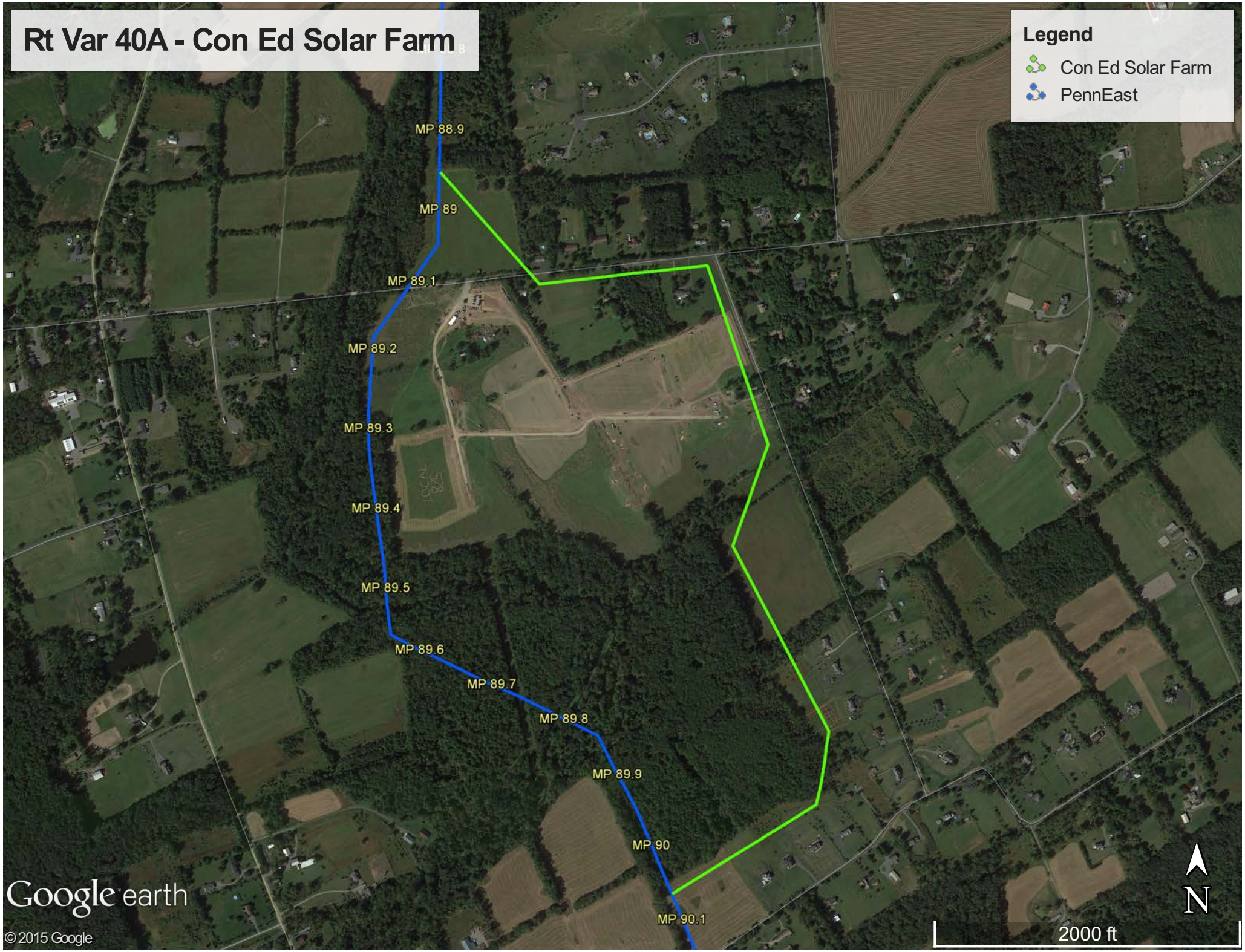
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	88.95		N/A	
End		90.07			
Length	Ft	5,913.60		7,049.00	
Area	Acres *	16.97		20.23	
Land requirements:					
Construction	Acres *	10.18		12.14	
Permanent		6.79		8.09	
Colocation:					
Power Line ROW	Ft	477.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.1	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		3.9	2.6	0.6	0.4
Total wetlands		4.0	2.6	0.6	0.4
Waterbodies / Streams affected	#	2		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.56	1.04	2.19	1.46
Forested		6.89	4.59	1.14	0.76
Open		1.74	1.16	6.54	4.36
Residential/Commercial		0.00	0.00	2.27	1.51
Open Water		0.00	0.00	0.00	0.00
Total ****		10.18	6.79	12.14	8.09
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	5		15	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var 40A - Con Ed Solar Farm
Legend
Con Ed Solar Farm
PennEast
MP 88.9
MP 89
MP 89.1
MP 89.2
MP 89.3
MP 89.4
MP 89.5
MP 89.6
MP 89.7
MP 89.8
MP 89.9
MP 90
MP 90.1
Google earth
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Appendix P-40B

Route Variation No. 40B

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40B – Con Ed Solar Farm

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	88.95		N/A	
End		90.15			
Length	Ft	6,303		6,099	
Area	Acres *	18.09		17.50	
Land requirements:					
Construction	Acres *	10.85		10.50	
Permanent		7.23		7.00	
Colocation:					
Power Line ROW	Ft	481		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		481		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.07	0.0	0.44	0.29
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		3.98	2.63	2.72	1.81
Total wetlands		4.1	2.6	3.2	2.1
Waterbodies / Streams affected	#	2		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.19	1.46	4.74	3.16
Forested		6.77	4.51	3.74	2.49
Open		0.34	0.23	0.06	0.04
Residential/Commercial		1.56	1.04	1.97	1.31
Open Water		0.00	0.00	0.00	0.00
Total ****		10.85	7.23	10.50	7.00
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	6		10	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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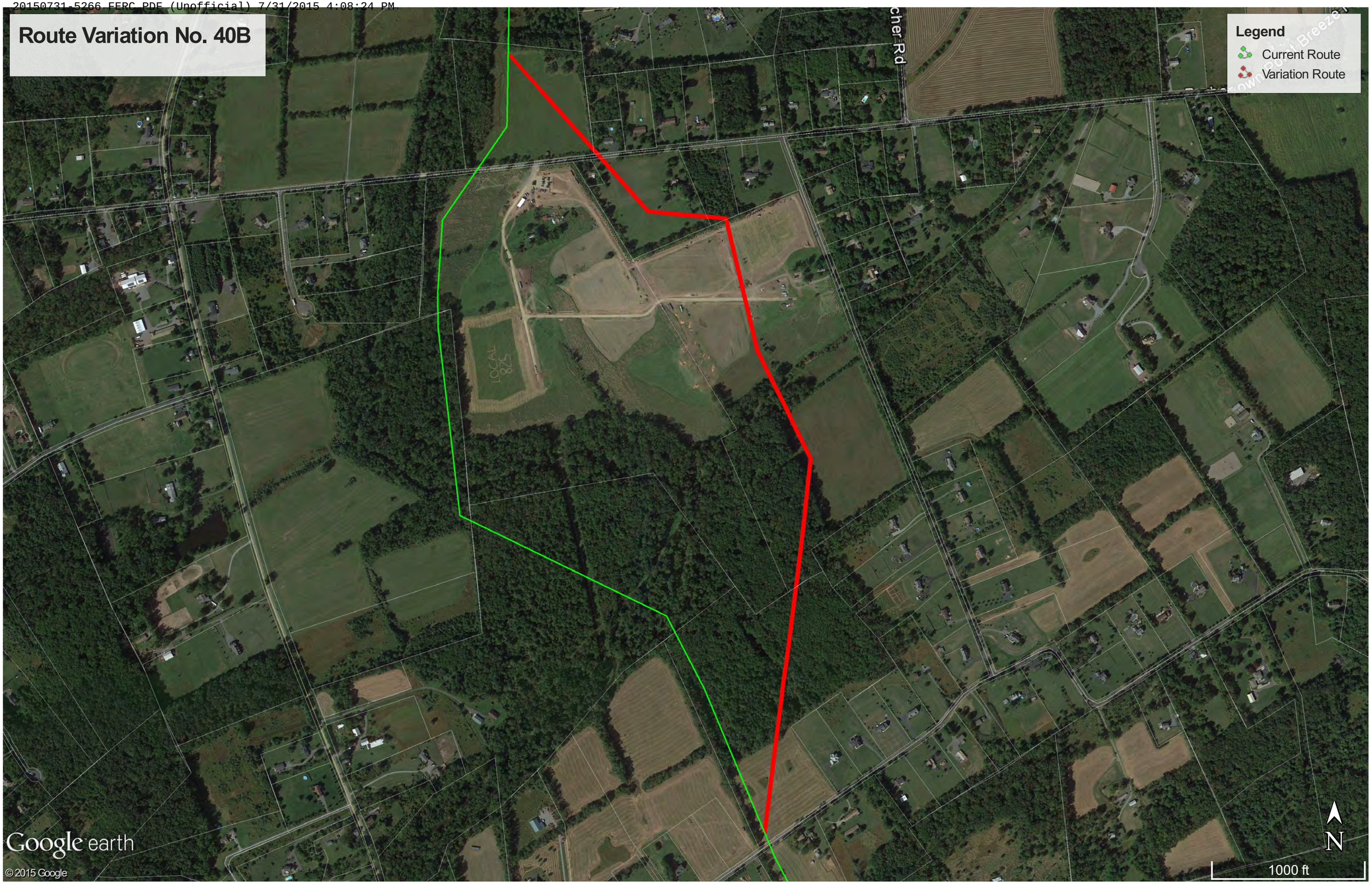

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Appendix P-40C

Route Variation No. 40C

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40C-40E – Con Ed Solar Farm

Attribute	Units	Current Route		Variation Route C		Variation Route D		Variation Route E	
Location									
Begin	Mile Post	88.66		N/A		N/A		N/A	
End		90.15							
Length	Ft	7,861		8,359		7,319		9,075	
Area	Acres *	22.56		23.99		21.00		26.04	
Land requirements:									
Construction	Acres *	13.54		14.39		12.60		15.63	
Permanent		9.02		9.60		8.40		10.42	
Colocation:									
Power Line ROW	Ft	2,043		1,559		2,043		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		2,043		1,559		2,043		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.18	2.12	5.48	3.66	3.08	2.05	11.31	7.54
Forested		8.68	5.79	4.44	2.96	5.36	3.58	2.20	1.47
Open		1.57	1.05	1.72	1.14	2.29	1.53	0.04	0.03
Residential/Commercial		0.10	0.07	2.75	1.83	1.87	1.25	2.07	1.38
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		13.54	9.02	14.39	9.60	12.60	8.40	15.63	10.42
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		3		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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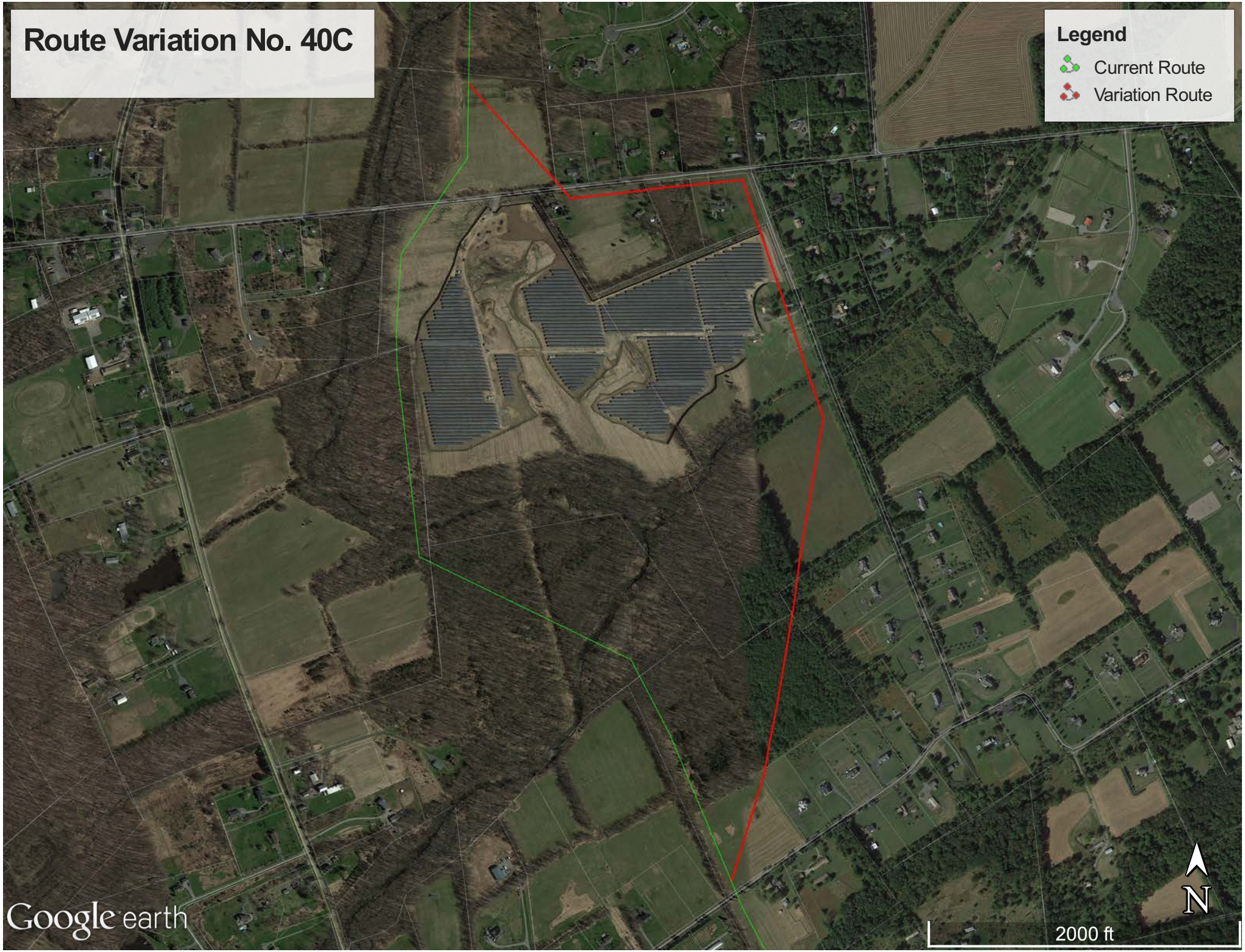
Route Variation No. 40C



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Appendix P-40D

Route Variation No. 40D

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40C-40E – Con Ed Solar Farm

Attribute	Units	Current Route		Variation Route C		Variation Route D		Variation Route E	
Location									
Begin	Mile Post	88.66		N/A		N/A		N/A	
End		90.15							
Length	Ft	7,861		8,359		7,319		9,075	
Area	Acres *	22.56		23.99		21.00		26.04	
Land requirements:									
Construction	Acres *	13.54		14.39		12.60		15.63	
Permanent		9.02		9.60		8.40		10.42	
Colocation:									
Power Line ROW	Ft	2,043		1,559		2,043		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		2,043		1,559		2,043		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.18	2.12	5.48	3.66	3.08	2.05	11.31	7.54
Forested		8.68	5.79	4.44	2.96	5.36	3.58	2.20	1.47
Open		1.57	1.05	1.72	1.14	2.29	1.53	0.04	0.03
Residential/Commercial		0.10	0.07	2.75	1.83	1.87	1.25	2.07	1.38
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		13.54	9.02	14.39	9.60	12.60	8.40	15.63	10.42
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		3		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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Route Variation No. 40D

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Appendix P-40E

Route Variation No. 40E

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 40C-40E – Con Ed Solar Farm

Attribute	Units	Current Route		Variation Route C		Variation Route D		Variation Route E	
Location									
Begin	Mile Post	88.66		N/A		N/A		N/A	
End		90.15							
Length	Ft	7,861		8,359		7,319		9,075	
Area	Acres *	22.56		23.99		21.00		26.04	
Land requirements:									
Construction	Acres *	13.54		14.39		12.60		15.63	
Permanent		9.02		9.60		8.40		10.42	
Colocation:									
Power Line ROW	Ft	2,043		1,559		2,043		0.00	
Pipeline ROW		0.00		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		2,043		1,559		2,043		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.18	2.12	5.48	3.66	3.08	2.05	11.31	7.54
Forested		8.68	5.79	4.44	2.96	5.36	3.58	2.20	1.47
Open		1.57	1.05	1.72	1.14	2.29	1.53	0.04	0.03
Residential/Commercial		0.10	0.07	2.75	1.83	1.87	1.25	2.07	1.38
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		13.54	9.02	14.39	9.60	12.60	8.40	15.63	10.42
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		3		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	0		0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

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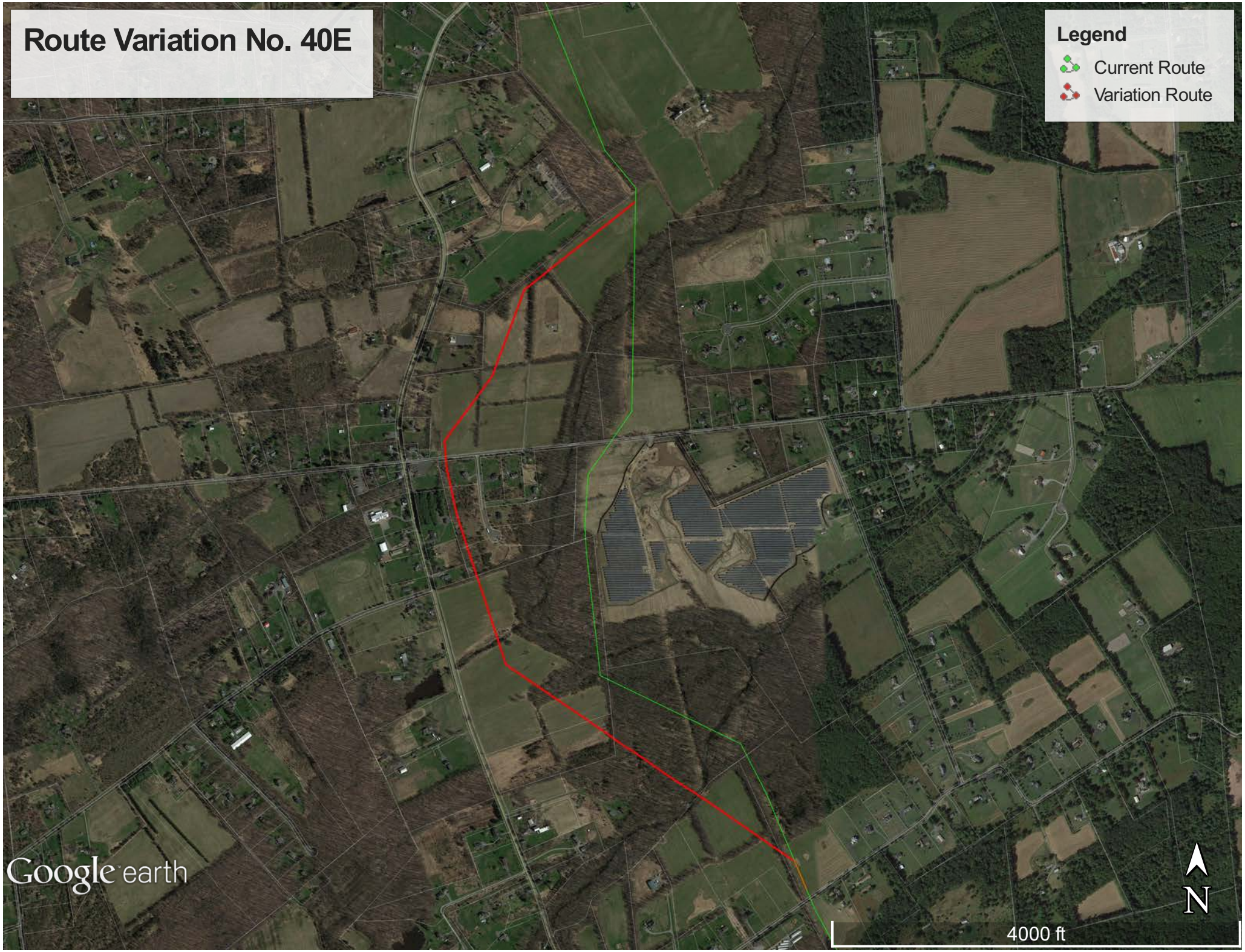
Route Variation No. 40E



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Appendix P-41, P-41A, P41B

Route Variation No. 41, 41A, 41B

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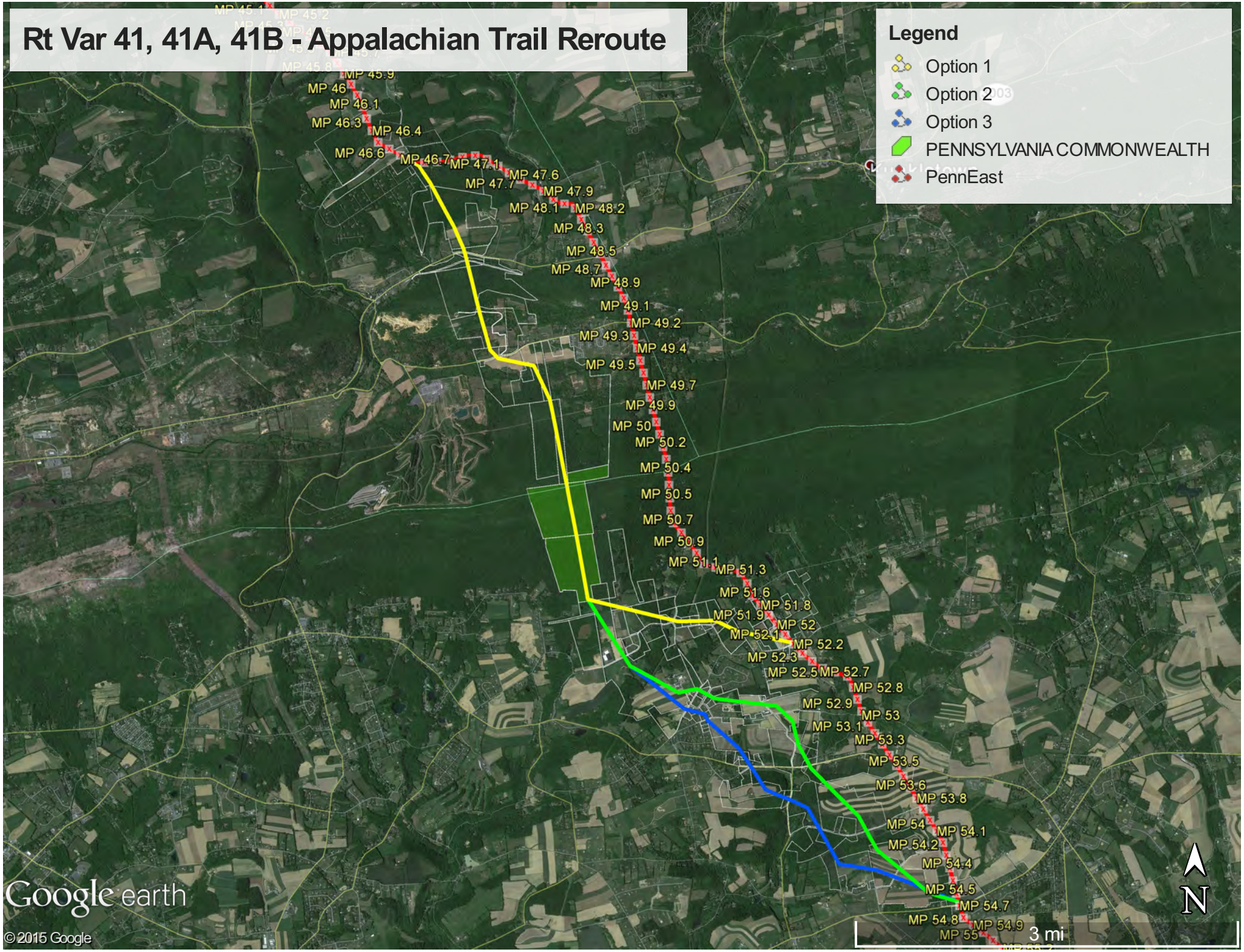
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 41, 41A, 41B – Appalachian Trail

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B	
Location									
Begin	Mile Post	46.78		N/A		N/A		N/A	
End		54.66							
Length	Ft	41,606		42,274		41,557		41,123	
Area	Acres *	119.39		121.31		119.25		118.01	
Land requirements:									
Construction	Acres *	71.64		72.79		71.55		71.55	
Permanent		47.76		48.52		47.7		47.7	
Colocation:									
Power Line ROW	Ft	720		0		0		0	
Pipeline ROW		0		0		0		0	
Road / Railroad ROW		0		0		0		0	
Total colocation		0		0		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Forested wetlands / Scrub-shrub wetlands	Acres/Acres **	0.18	0.12	0	0	0.57	0.37	0.43	0.29
Emergent wetlands		0	0	0	0	0	0	0	0
Total wetlands		0.18	0.12	0	0	0.57	0.37	0.43	0.29
Waterbodies / Streams affected	#	7		8		6		7	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	26.51	17.67	30.52	20.35	28.66	19.11	25.22	16.81
Forested		40.85	27.23	39.51	26.34	36.24	24.16	37.53	25.02
Open		2.39	1.59	2.15	1.43	5.1	3.4	4.61	3.07
Residential/Commercial		1	1.26	0.6	0.4	1.55	1.03	3.44	2.3
Open Water		0	0	0	0	0	0	0	0
Total ****		71.64	47.76	72.79	48.52	71.55	47.7	70.8	47.2
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	1	1	1	1	1	1	1	1
	Ft	2376	2376	4983	4983	4942	4942	4929	4929
	Acres	4.08	2.73	8.58	5.72	8.49	5.66	8.49	5.66
Preserved Farm Land	#	1	1	1	1	3	3	3	3
	Ft	172	172	172	172	6223	6223	8774	8774
	Acres	0.30	0.20	0.30	0.20	10.62	7.08	15.06	10.05
Structures within 50 ft of construction work area									
Residences	Number	0		0		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	46		41		34		37	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

Rt Var 41, 41A, 41B - Appalachian Trail Reroute



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Appendix P-42

Route Variation No. 42

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 42 – Trio Farms

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	59.85		N/A	
End		61.07			
Length	Ft	6,441.60		6,127.00	
Area	Acres *	18.48		17.58	
Land requirements:					
Construction	Acres *	11.09		10.55	
Permanent		7.39		7.03	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	7.74	5.16	8.52	5.68
Forested		0.09	0.06	1.21	0.80
Open		3.09	2.06	0.48	0.32
Residential/Commercial		0.17	0.11	0.34	0.23
Open Water		0.00	0.00	0.00	0.00
Total ****		11.09	7.39	10.55	7.03
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	1	1	1	1
	Ft	3362	3362	1586	1586
	Acres	5.8	3.9	2.7	1.8
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		9	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Variation 42 - Trio Farms

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Appendix P-43

Route Variation No. 43

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 43 – Bethlehem Water Authority

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.06		N/A	
End		44.92			
Length	Ft	4,540.80		4,538.00	
Area	Acres *	13.03		13.02	
Land requirements:					
Construction	Acres *	7.82		7.81	
Permanent		5.21		5.21	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	2		2	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.13	2.09	2.54	1.69
Forested		3.45	2.30	4.02	2.68
Open		1.24	0.83	1.25	0.84
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		7.82	5.21	7.81	5.21
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	1	1	1	1
	Ft	637.4	637.4	513.9	513.9
	Acres	1.1	0.8	0.9	0.6
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	11		14	

* Based on standard 125 Ft ROW width for worst case impacts.

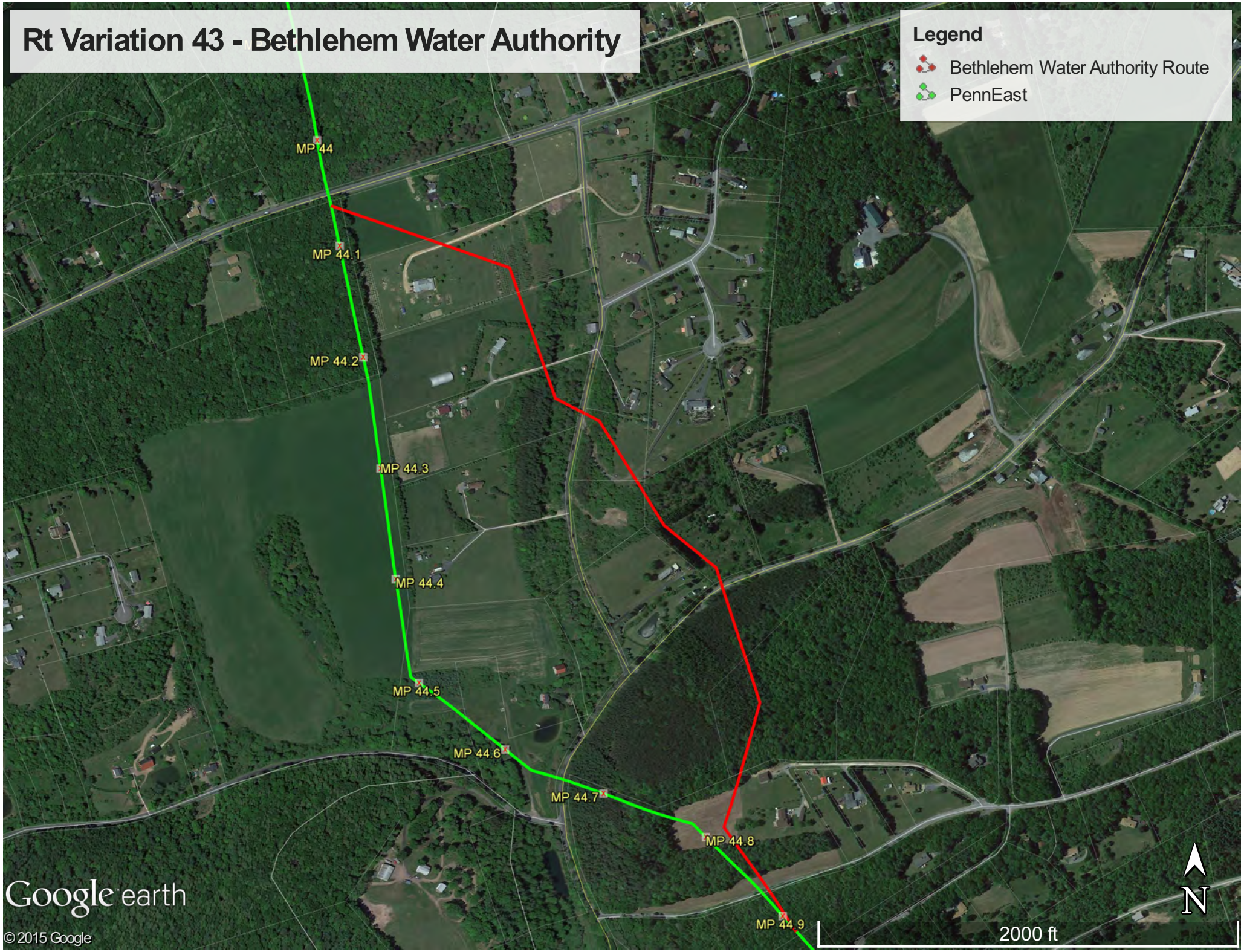
** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Note: The additional trees and other impacts minimize the risk to the local water utility infrastructure.

Rt Variation 43 - Bethlehem Water Authority



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Appendix P-44

Route Variation No. 44

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 44, 44A, 44B – Lambertville Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B	
Location									
Begin	Mile Post	0.00		N/A		N/A		N/A	
End		1.33							
Length	Ft	7,015		6,843		8,130		6,849	
Area	Acres *	20.13		19.64		23.33		19.65	
Land requirements:									
Construction	Acres *	12.08		11.78		14.00		11.79	
Permanent		8.05		7.85		9.33		7.86	
Colocation:									
Power Line ROW	Ft	0.00		0.00		100.00		0.00	
Pipeline ROW		3,179		0.00		0.00		3,179	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		3,179		0.00		100.00		3,179	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	3		2		2		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	5.77	3.85	4.99	3.33	8.61	5.74	4.47	2.98
Forested		6.11	4.07	6.37	4.25	3.40	2.27	5.72	3.82
Open		0.20	0.13	0.42	0.28	1.99	1.33	1.38	0.92
Residential/Commercial		0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.15
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		12.08	8.05	11.78	7.85	14.00	9.33	11.79	7.86
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	3	2	0	0
	Ft	0.0	0.0	3498.4	3498.4	2540.7	2540.7	0.0	0.0
	Acres	0.0	0.0	6.0	4.0	4.4	2.9	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		0		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	5		4		8		0	

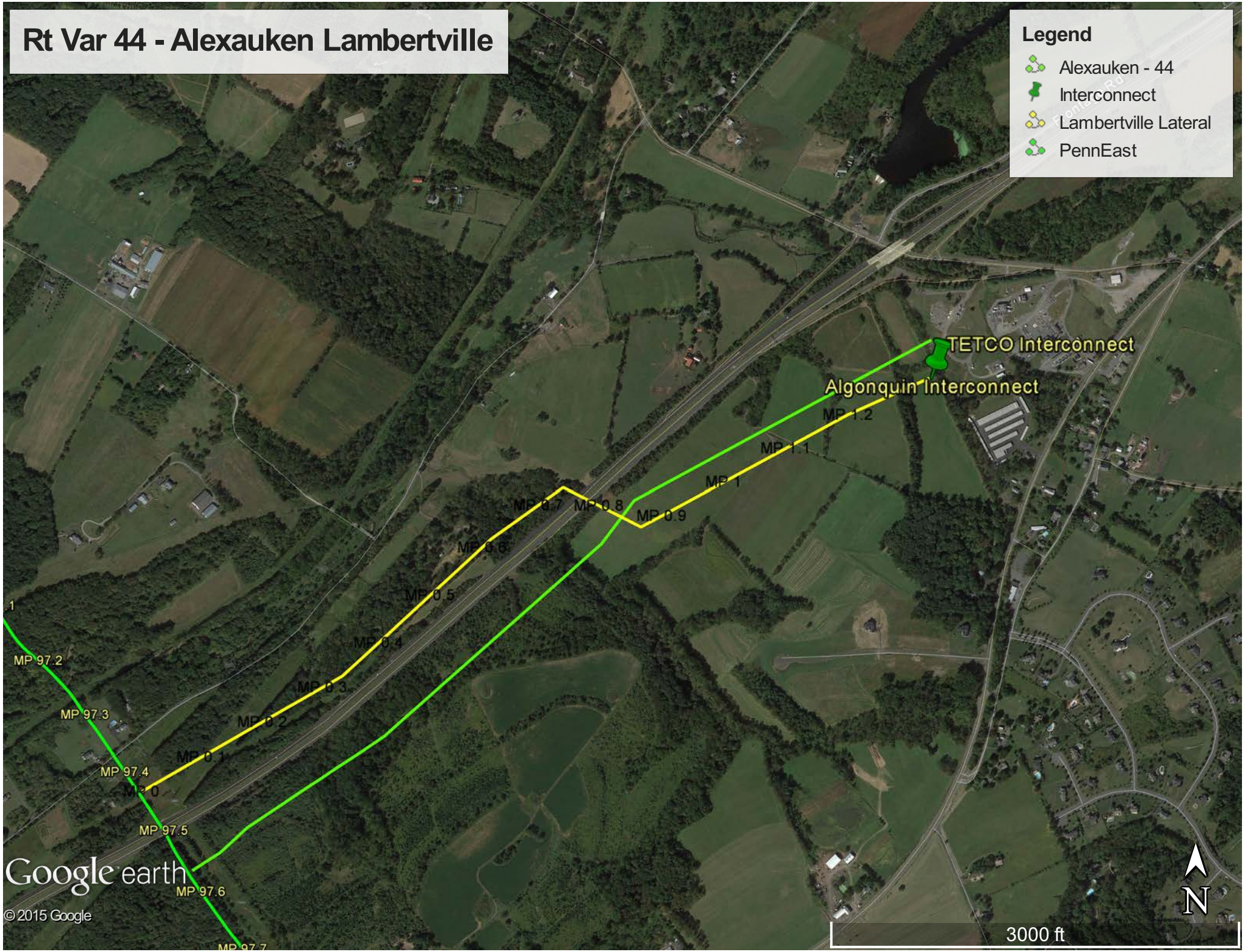
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Var 44 - Alexauken Lambertville



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Appendix P-44A

Route Variation No. 44A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 44, 44A, 44B – Lambertville Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B	
Location									
Begin	Mile Post	0.00		N/A		N/A		N/A	
End		1.33							
Length	Ft	7,015		6,843		8,130		6,849	
Area	Acres *	20.13		19.64		23.33		19.65	
Land requirements:									
Construction	Acres *	12.08		11.78		14.00		11.79	
Permanent		8.05		7.85		9.33		7.86	
Colocation:									
Power Line ROW	Ft	0.00		0.00		100.00		0.00	
Pipeline ROW		3,179		0.00		0.00		3,179	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		3,179		0.00		100.00		3,179	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	3		2		2		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	5.77	3.85	4.99	3.33	8.61	5.74	4.47	2.98
Forested		6.11	4.07	6.37	4.25	3.40	2.27	5.72	3.82
Open		0.20	0.13	0.42	0.28	1.99	1.33	1.38	0.92
Residential/Commercial		0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.15
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		12.08	8.05	11.78	7.85	14.00	9.33	11.79	7.86
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	3	2	0	0
	Ft	0.0	0.0	3498.4	3498.4	2540.7	2540.7	0.0	0.0
	Acres	0.0	0.0	6.0	4.0	4.4	2.9	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		0		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	5		4		8		0	

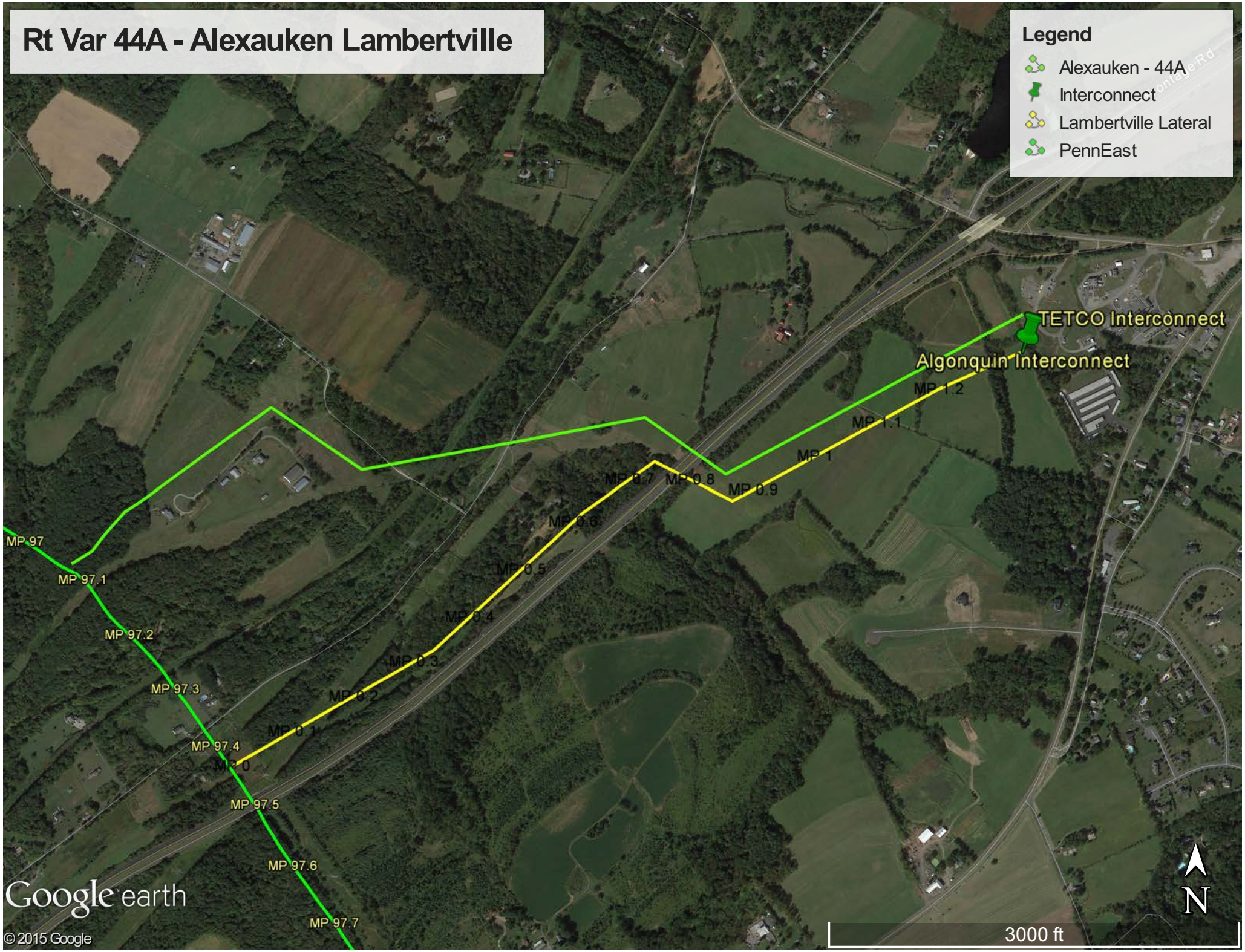
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Var 44A - Alexauken Lambertville



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Appendix P-44B

Route Variation No. 44B

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 44, 44A, 44B – Lambertville Lateral

Attribute	Units	Current Route		Variation Route		Variation Route A		Variation Route B	
Location									
Begin	Mile Post	0.00		N/A		N/A		N/A	
End		1.33							
Length	Ft	7,015		6,843		8,130		6,849	
Area	Acres *	20.13		19.64		23.33		19.65	
Land requirements:									
Construction	Acres *	12.08		11.78		14.00		11.79	
Permanent		8.05		7.85		9.33		7.86	
Colocation:									
Power Line ROW	Ft	0.00		0.00		100.00		0.00	
Pipeline ROW		3,179		0.00		0.00		3,179	
Road / Railroad ROW		0.00		0.00		0.00		0.00	
Total colocation		3,179		0.00		100.00		3,179	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	3		2		2		0	
	Name(s)	N/A		N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	5.77	3.85	4.99	3.33	8.61	5.74	4.47	2.98
Forested		6.11	4.07	6.37	4.25	3.40	2.27	5.72	3.82
Open		0.20	0.13	0.42	0.28	1.99	1.33	1.38	0.92
Residential/Commercial		0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.15
Open Water		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total ****		12.08	8.05	11.78	7.85	14.00	9.33	11.79	7.86
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	1	1	3	2	0	0
	Ft	0.0	0.0	3498.4	3498.4	2540.7	2540.7	0.0	0.0
	Acres	0.0	0.0	6.0	4.0	4.4	2.9	0.0	0.0
Structures within 50 ft of construction work area	Number								
Residences		0		0		0		0	
Commercial		0		0		0		0	
Other (Barn, Shed, etc.)		0		0		0		0	
Landowners affected	Number	5		4		8		0	

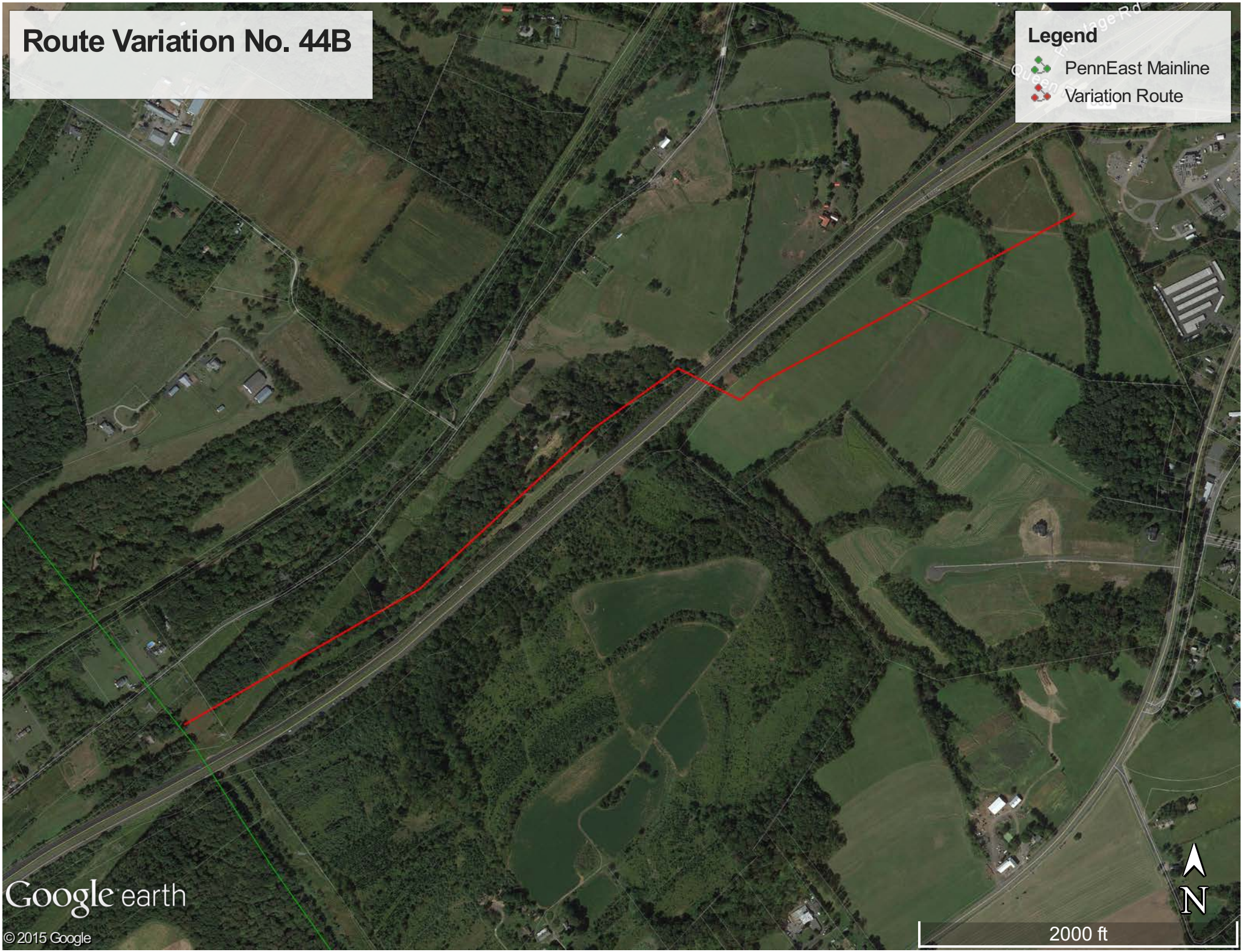
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 44B



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Appendix P-45

Route Variation No. 45

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 45 – Hewitt Road House

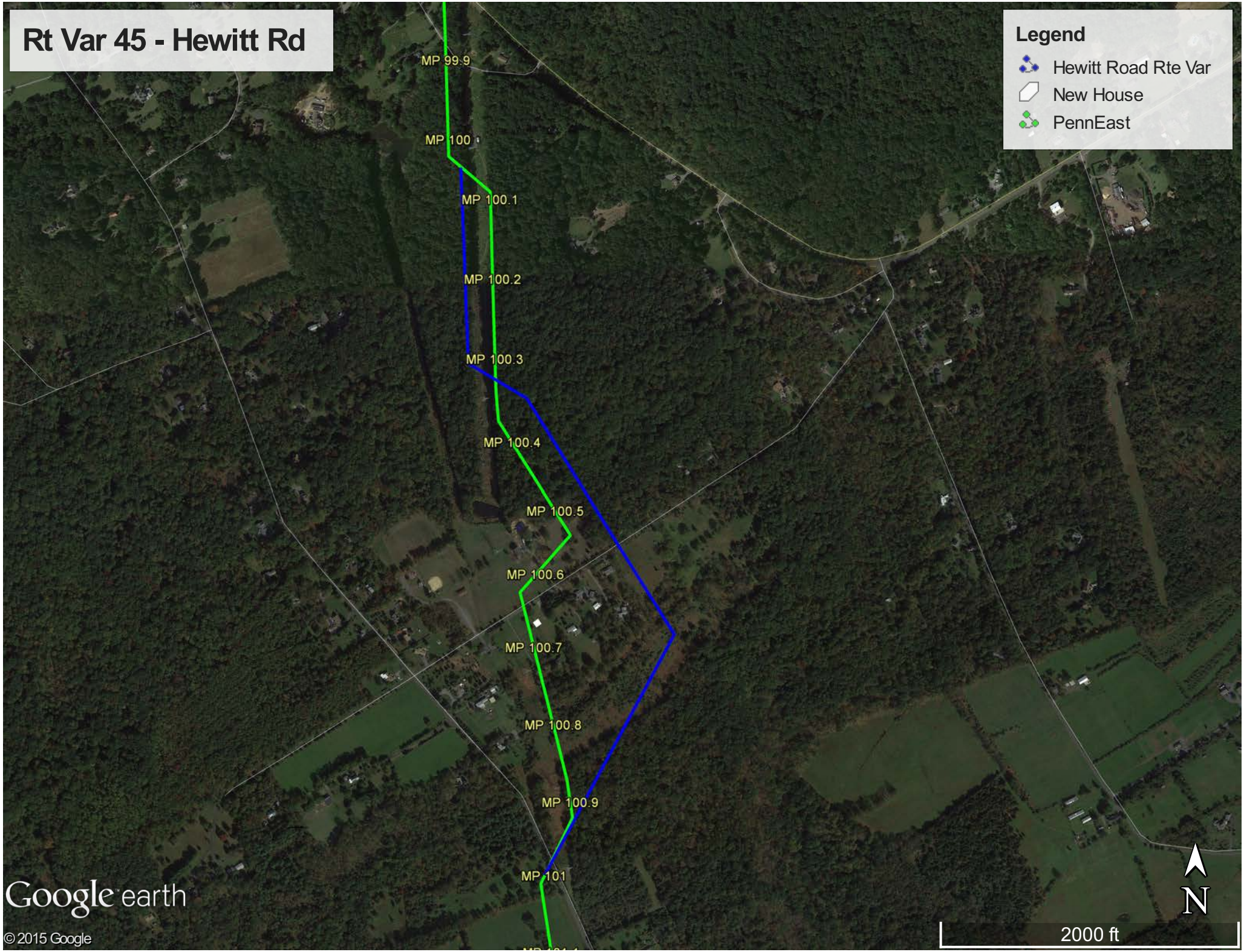
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	100.04		N/A	
End		101.00			
Length	Ft	5,068		5,733	
Area	Acres *	14.55		15.43	
Land requirements:					
Construction	Acres *	8.73		9.26	
Permanent		5.82		6.17	
Colocation:					
Power Line ROW	Ft	3,035		1,306	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		3,035		1,306	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.08	0.72	0.00	0.00
Forested		5.85	3.90	6.97	4.65
Open		1.80	1.20	2.28	1.52
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		8.73	5.82	9.26	6.17
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var 45 - Hewitt Rd
Legend
Hewitt Road Rte Var
New House
PennEast
MP 99.9
MP 100
MP 100.1
MP 100.2
MP 100.3
MP 100.4
MP 100.5
MP 100.6
MP 100.7
MP 100.8
MP 100.9
MP 101
Google earth
© 2015 Google
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2000 ft

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Appendix P-45A

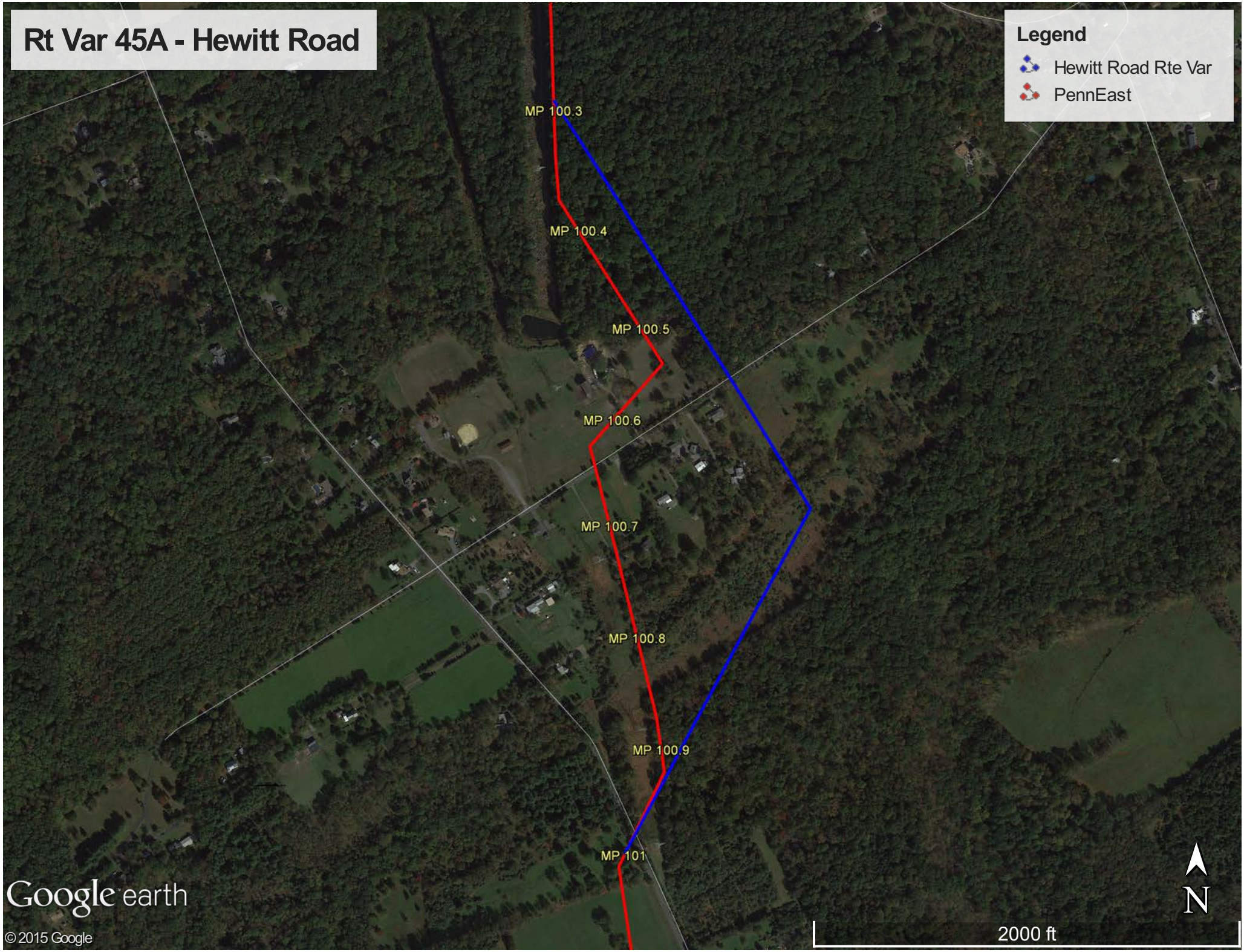
Route Variation No. 45A

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 45, 45A – Hewitt Road House

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location							
Begin	Mile Post	100.04		N/A		N/A	
End		101.00					
Length	Ft	5,068		5,377		5,310	
Area	Acres *	14.55		15.43		15.24	
Land requirements:							
Construction	Acres *	8.73		9.26		9.14	
Permanent		5.82		6.17		6.10	
Colocation:							
Power Line ROW	Ft	3,100.00		1,300.00		1,090.00	
Pipeline ROW		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00	
Total colocation		3,100.00		1,300.00		1,090.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.2	0.1	1.6	1.1	0.2	0.1
Total wetlands		0.2	0.1	1.6	1.1	0.2	0.1
Waterbodies / Streams affected	#	0		0		0	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.08	0.72	0.00	0.00	0.00	0.00
Forested		5.85	3.90	6.97	4.65	6.80	4.53
Open		1.80	1.20	2.28	1.52	2.34	1.56
Residential/Commercial		0.00	0.00	0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		8.73	5.82	9.26	6.17	9.14	6.10
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0.00	0.00	0.00	0.00	0.00	0.00
	Ft	0.00	0.00	0.00	0.00	0.00	0.00
	Acres	0.00	0.00	0.00	0.00	0.00	0.00
Preserved Farm Land	#	0.00	0.00	0.00	0.00	0.00	0.00
	Ft	0.00	0.00	0.00	0.00	0.00	0.00
	Acres	0.00	0.00	0.00	0.00	0.00	0.00
Structures within 50 ft of construction work area							
Residences	Number	0		0		0	
Commercial		0		0		0	
Other (Barn, Shed, etc.)		0		0		0	
Landowners affected	Number	8		6		5	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.


Rt Var 45A - Hewitt Road
Legend
Hewitt Road Rte Var
PennEast
MP 100.3
MP 100.4
MP 100.5
MP 100.6
MP 100.7
MP 100.8
MP 100.9
MP 101
Google earth
© 2015 Google
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2000 ft

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Appendix P-46

Route Variation No. 46

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 46 – Pond Route

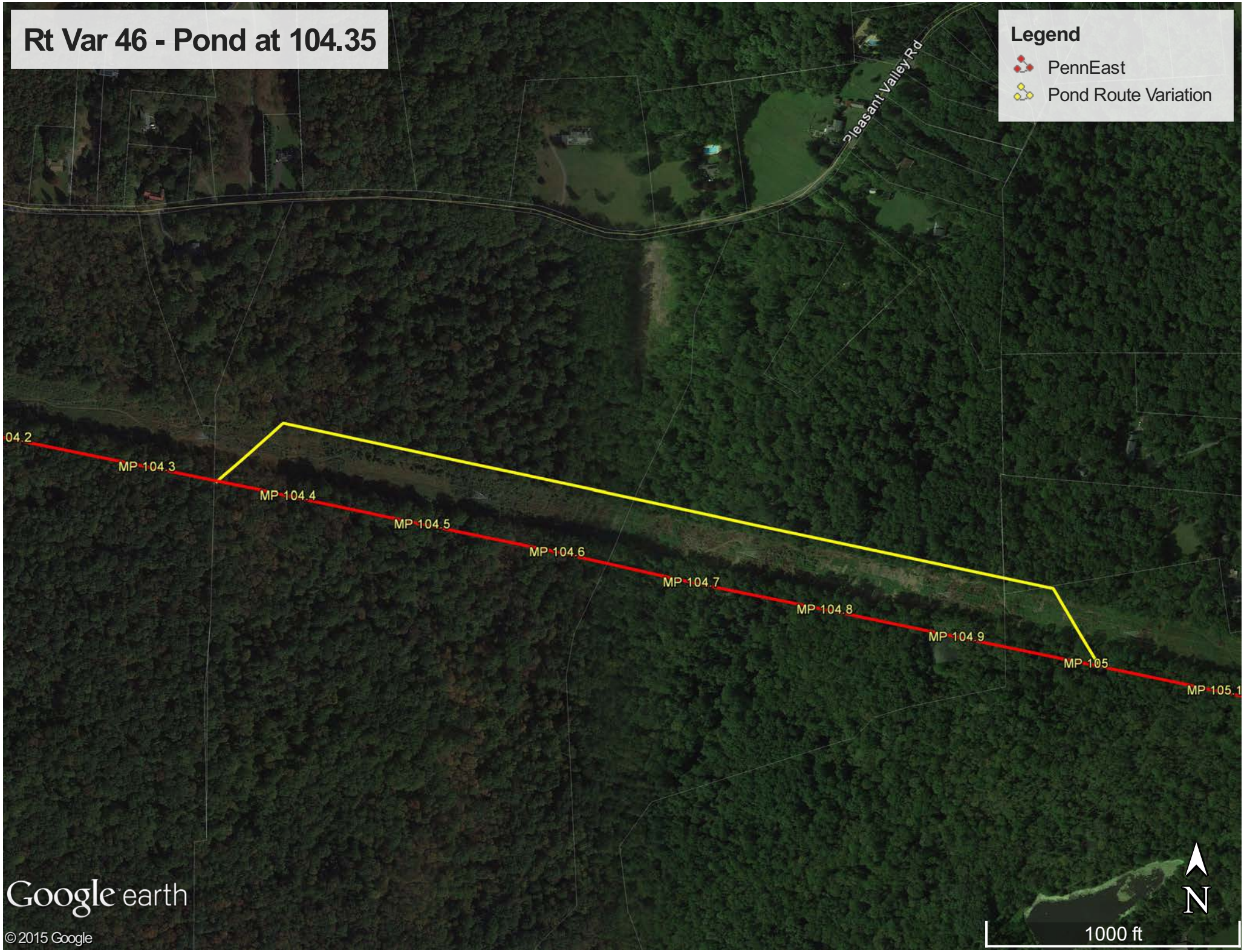
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	104.35		N/A	
End		105.01			
Length	Ft	3,484.80		3,752.00	
Area	Acres *	10.00		10.77	
Land requirements:					
Construction	Acres *	6.00		6.46	
Permanent		4.00		4.31	
Colocation:					
Power Line ROW	Ft	3,484.80		3,752.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		3,484.80		3,752.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		5.83	3.89	5.85	3.90
Open		0.00	0.00	0.61	0.41
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.17	0.11	0.00	0.00
Total ****		6.00	4.00	6.46	4.31
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	2	2	2	2
	Ft	1522	1522	1718	1718
	Acres	2.7	1.8	3.0	2.0
Preserved Farm Land	#	2	2	2	2
	Ft	2136	2136	1992	1992
	Acres	3.7	2.5	3.5	2.3
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		3	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var 46 - Pond at 104.35
Legend
PennEast
Pond Route Variation
Pleasant Valley Rd
04.2
MP 104.3
MP 104.4
MP 104.5
MP 104.6
MP 104.7
MP 104.8
MP 104.9
MP 105
MP 105.1
Google earth
© 2015 Google
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1000 ft

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Appendix P-47

Route Variation No. 47

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 47 – Rocktown Lambertville Rd

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	99.10		N/A	
End		100.10			
Length	Ft	5,280.00		5,360,00	
Area	Acres *	15.15		15.38	
Land requirements:					
Construction	Acres *	9.09		9.23	
Permanent		6.06		6.15	
Colocation:					
Power Line ROW	Ft	5,280.00		5,360.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		5,280.00		5,360.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.81	1.21	2.93	1.95
Forested		6.71	4.48	5.97	3.98
Open		0.56	0.38	0.33	0.22
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		9.09	6.06	9.23	6.15
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		1		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	8		8	

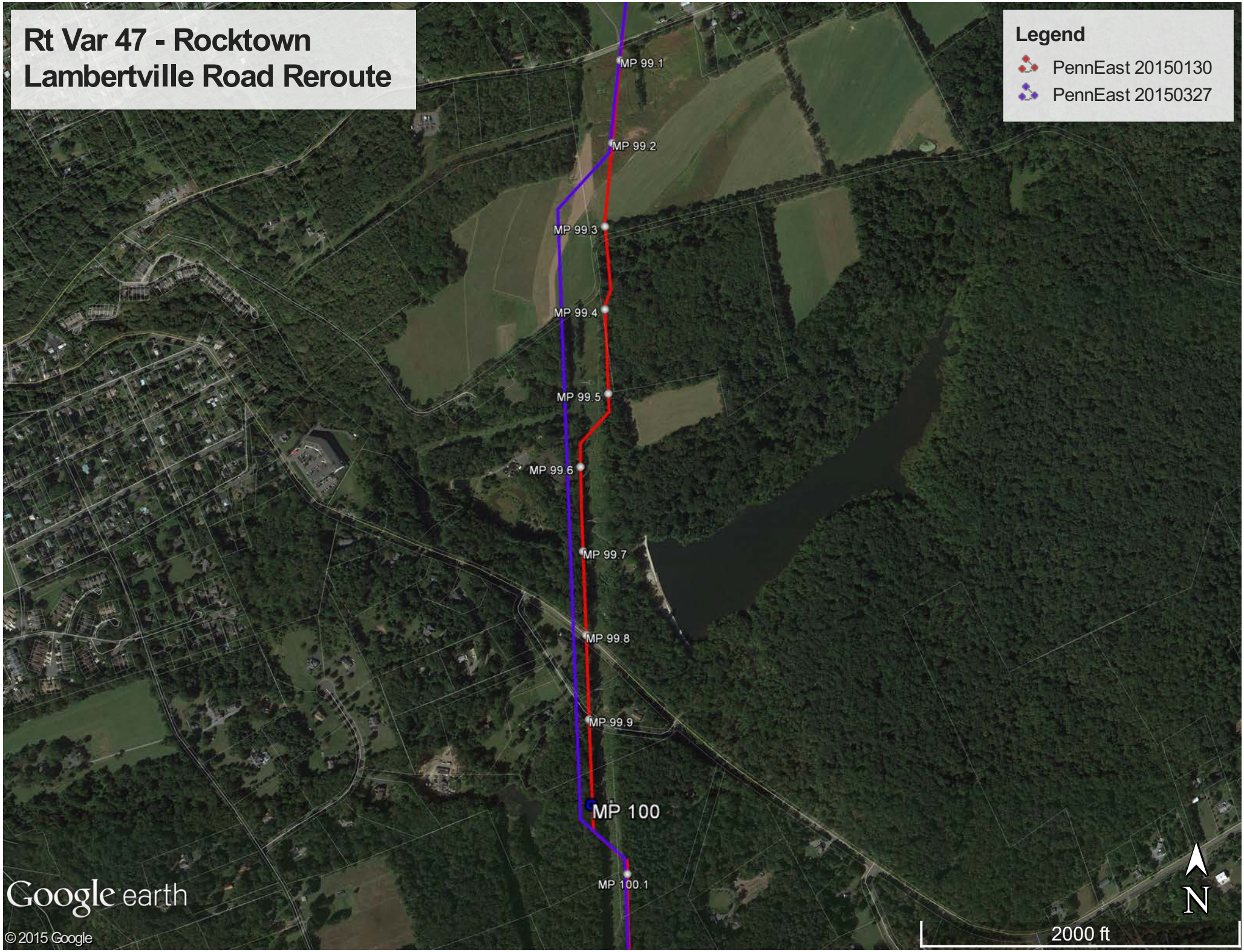
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Rt Var 47 - Rocktown Lambertville Road Reroute



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Appendix P-48

Route Variation No. 48

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segments (Pennsylvania and New Jersey)
Route Variation 48 – PreFERC Alt 1

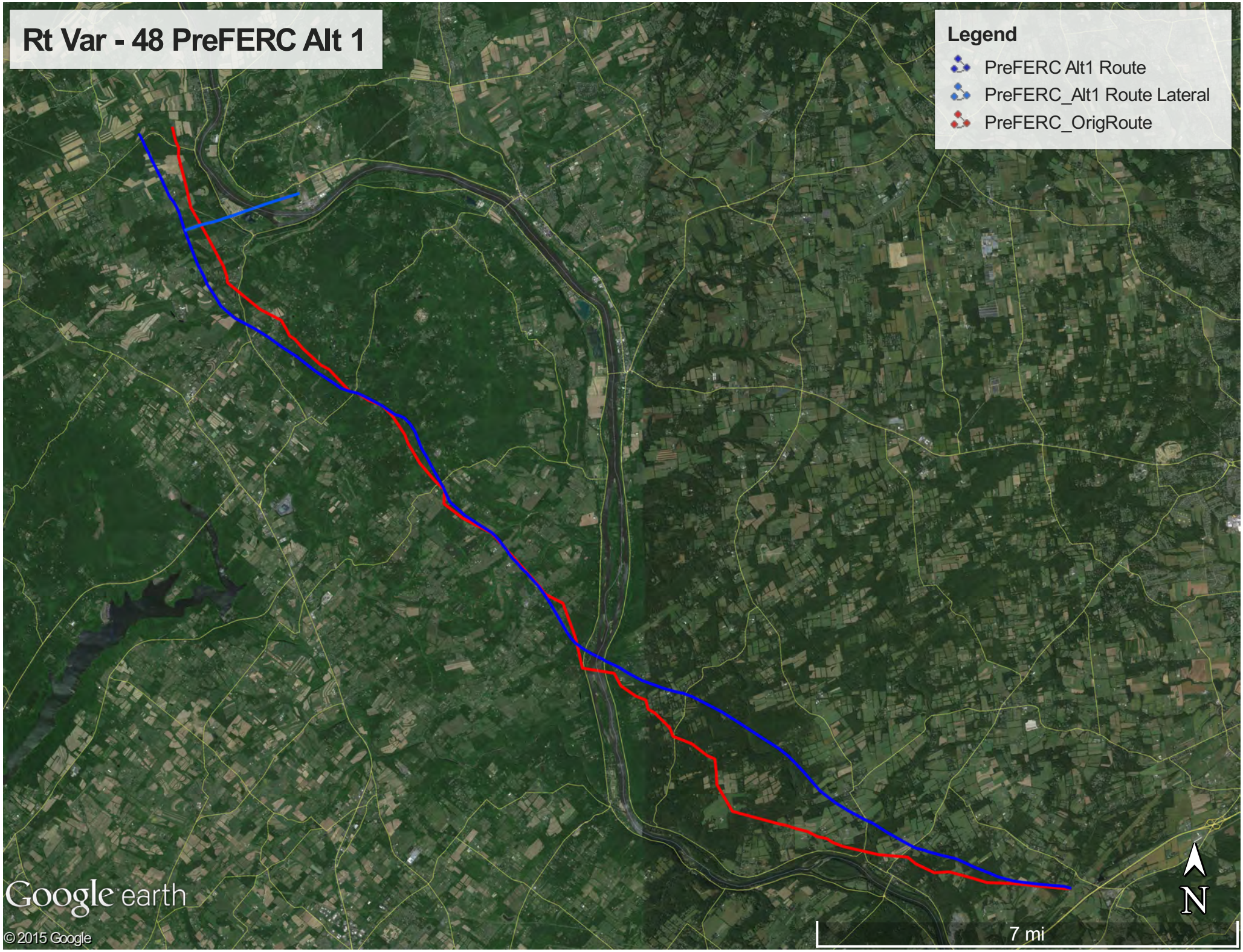
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	72.6		N/A	
End		94.0			
Length	Ft	112,873		120,407	
Area	Acres *	323.90		345.52	
Land requirements:					
Construction	Acres *	194.34		207.31	
Permanent		129.56		138.21	
Colocation:					
Power Line ROW	Ft	7,262		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		7,262		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Forested/Scrub-shrub wetlands	Acres/Acres **	7.4	5.0	5.2	3.4
Emergent wetlands		0.0	0.0	0.0	0.0
Total wetlands		7.4	5.0	5.2	3.4
Waterbodies / Streams affected	#	34		40	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	63.24	42.16	73.38	48.92
Forested		122.53	81.69	128.33	85.55
Open		2.20	1.47	1.18	0.78
Residential/Commercial		4.08	2.72	1.32	0.88
Open Water		2.30	1.53	3.11	2.07
Total ****		194.34	129.56	207.31	138.21
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	10	10	8	8
	Ft	5350.0	5350.0	4284.3	4284.3
	Acres	9.2	6.1	7.4	4.9
Preserved Farm Land	#	14	14	17	17
	Ft	18508.4	18508.4	21968.5	21968.5
	Acres	31.8	21.2	37.8	25.2
Structures within 50 ft of construction work area	Number				
Residences		4		4	
Commercial		0		0	
Other (Barn, Shed, etc.)		13		4	
Landowners affected	Number	290		267	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Rt Var - 48 PreFERC Alt 1
Legend
PreFERC Alt1 Route
PreFERC_Alt1 Route Lateral
PreFERC_OrigRoute
Google earth
© 2015 Google
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Appendix P-49

Route Variation No. 49

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 49 – Alexauken Creek

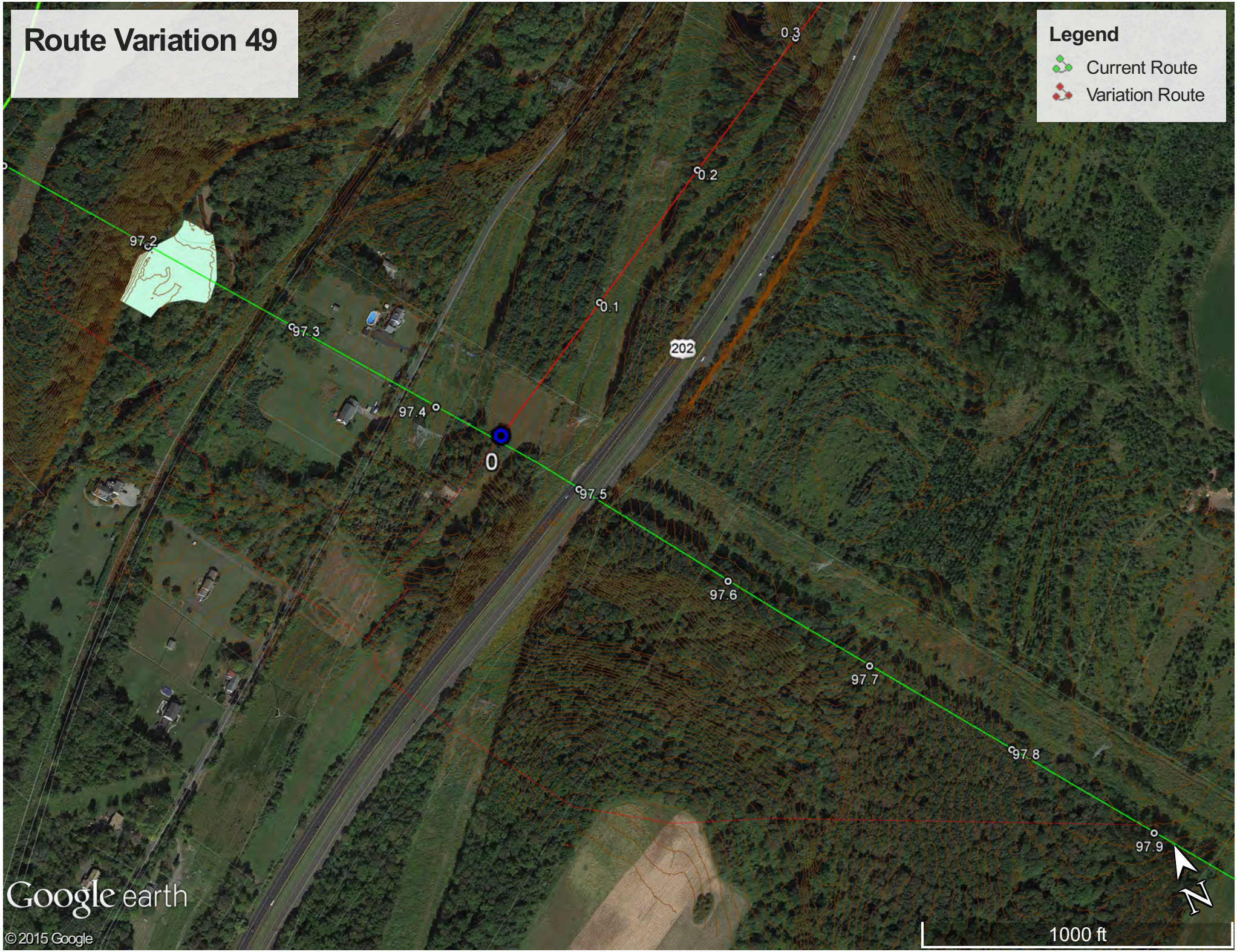
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	97.13		N/A	
End		97.89			
Length	Ft	4,013		4,662	
Area	Acres *	11.52		13.38	
Land requirements:					
Construction	Acres *	6.91		8.03	
Permanent		4.61		5.35	
Colocation:					
Power Line ROW	Ft	4,000		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		4,000		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.40	0.27	0.19	0.12
Total wetlands		0.40	0.27	0.19	0.12
Waterbodies / Streams affected	#	1		3	
	Name(s)	Alexauken Creek		Alexauken Creek, Alexauken Creek UNT (2x)	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.59	0.39
Forested		5.03	3.35	5.60	3.74
Open		1.39	0.92	1.33	0.89
Residential/Commercial		0.49	0.33	0.51	0.34
Open Water		0.00	0.00	0.00	0.00
Total ****		6.91	4.61	8.03	5.35
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	2	2	2	2
	Ft	753	753	1002	1002
	Acres	1.35	0.89	1.77	1.17
Structures within 50 ft of construction work area	Number				
Residences		3		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		10	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 49
Legend
Current Route
Variation Route
0.3
0.2
0.1
0
97.2
97.3
97.4
97.5
97.6
97.7
97.8
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1000 ft
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Appendix P-50

Route Variation No. 50

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 50, 50A – McAndrews Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location							
Begin	Mile Post	7.34		N/A		N/A	
End		8.13					
Length	Ft	4,157		6,254		4,174	
Area	Acres *	11.93		17.95		11.98	
Land requirements:							
Construction	Acres *	7.16		10.77		7.19	
Permanent		4.77		7.18		4.79	
Colocation:							
Power Line ROW	Ft	0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***			
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.10	0.73	1.16	0.77	1.10	0.73
Forested		3.26	2.17	5.15	3.43	1.72	1.15
Open		2.17	1.45	3.42	2.28	2.18	1.45
Residential/Commercial		0.63	0.42	1.03	0.69	2.18	1.46
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		7.16	4.77	10.77	7.18	7.19	4.79
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number						
Residences		3		3		4	
Commercial		0		1		1	
Other (Barn, Shed, etc.)		1		9		1	
Landowners affected	Number	39		65		38	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

Route Variation No. 50

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Appendix P-50

Route Variation No. 50

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 50, 50A – McAndrews Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location							
Begin	Mile Post	7.34		N/A		N/A	
End		8.13					
Length	Ft	4,157		6,254		4,174	
Area	Acres *	11.93		17.95		11.98	
Land requirements:							
Construction	Acres *	7.16		10.77		7.19	
Permanent		4.77		7.18		4.79	
Colocation:							
Power Line ROW	Ft	0.00		0.00		0.00	
Pipeline ROW		0.00		0.00		0.00	
Road / Railroad ROW		0.00		0.00		0.00	
Total colocation		0.00		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***			
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.10	0.73	1.16	0.77	1.10	0.73
Forested		3.26	2.17	5.15	3.43	1.72	1.15
Open		2.17	1.45	3.42	2.28	2.18	1.45
Residential/Commercial		0.63	0.42	1.03	0.69	2.18	1.46
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		7.16	4.77	10.77	7.18	7.19	4.79
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number						
Residences		3		3		4	
Commercial		0		1		1	
Other (Barn, Shed, etc.)		1		9		1	
Landowners affected	Number	39		65		38	

* Based on standard 125 Ft ROW width for worst case impacts.
** Based on 75 Ft wide necked down ROW through wetlands.
** Cultural resource surveys will be conducted if route variation is agreed to be preferred.
*** Includes both upland areas and wetlands.

Route Variation No. 50A

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Appendix P-51

Route Variation No. 51

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 51 – Plains Quarry (Poppel)

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	8.17		N/A	
End		11.76			
Length	Ft	19,198		20,777	
Area	Acres *	55.09		59.62	
Land requirements:					
Construction	Acres *	33.05		35.77	
Permanent		22.04		23.85	
Colocation:					
Power Line ROW	Ft	3,797		0.00	
Pipeline ROW		0.00		7,495	
Road / Railroad ROW		0.00		0.00	
Total colocation		3,797		7,495	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	4		3	
	Name(s)	Gardner Creek, Mill Creek, Unnamed, Deep Creek		Gardner Creek, Mill Creek, 1 NHD Waterbody	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		27.95	18.63	28.89	19.26
Open		3.26	2.17	2.65	1.77
Residential/Commercial		1.85	1.23	4.24	2.82
Open Water		0.00	0.00	0.00	0.00
Total ****		33.05	22.04	35.77	23.85
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		2		1	
Commercial		1		0	
Other (Barn, Shed, etc.)		5		4	
Landowners affected	Number	48		52	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 51

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Appendix P-52

Route Variation No. 52

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 52 – Mohawk Quarry

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	58.78		N/A	
End		59.71			
Length	Ft	4,916		5,251	
Area	Acres *	14.11		15.07	
Land requirements:					
Construction	Acres *	8.46		9.04	
Permanent		5.64		6.03	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	7.69	5.13	7.65	5.10
Forested		0.47	0.31	0.51	0.34
Open		0.02	0.01	0.05	0.03
Residential/Commercial		0.28	0.19	0.83	0.55
Open Water		0.00	0.00	0.00	0.00
Total ****		8.46	5.64	9.04	6.03
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

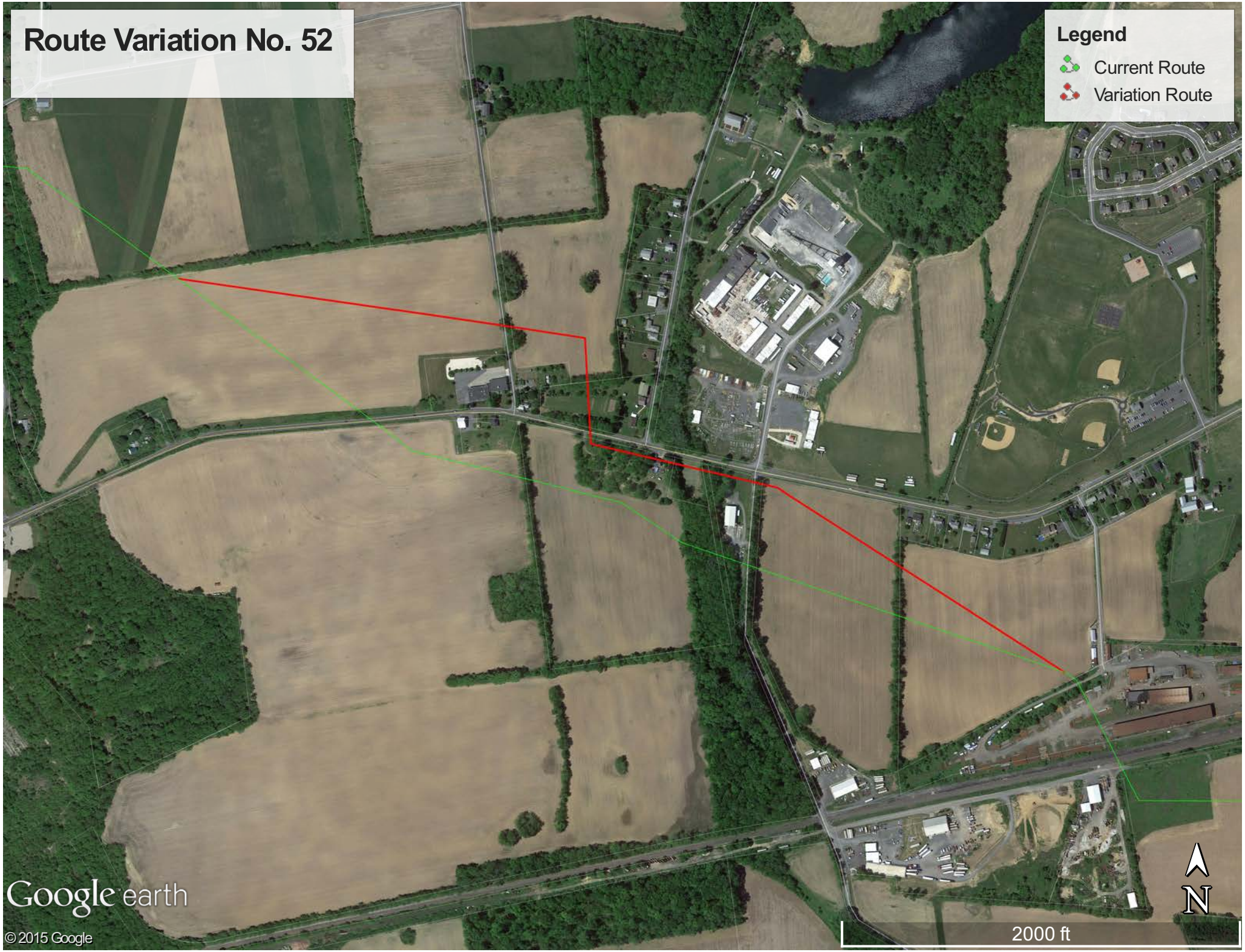
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 52



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Appendix P-53

Route Variation No. 53

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 53 – I-78 HDD Reroute

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	68.53		N/A	
End		69.10			
Length	Ft	2,743		2,456	
Area	Acres *	7.87		7.05	
Land requirements:					
Construction	Acres *	4.72		4.23	
Permanent		3.15		2.82	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.39	0.93	1.05	0.70
Forested		1.91	1.27	1.37	0.91
Open		0.37	0.24	0.88	0.58
Residential/Commercial		1.05	0.70	0.93	0.62
Open Water		0.00	0.00	0.00	0.00
Total ****		4.72	3.15	4.23	2.82
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		2		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	8		11	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 53

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Route Variation No. 54

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 54 – Italiani-TSAN Green Pond

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	64.75		N/A	
End		64.88			
Length	Ft	716		912	
Area	Acres *	2.05		2.62	
Land requirements:					
Construction	Acres *	1.23		1.57	
Permanent		0.82		1.05	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		306	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		306	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.82	0.55	0.74	0.49
Forested		0.00	0.00	0.00	0.00
Open		0.10	0.06	0.19	0.13
Residential/Commercial		0.31	0.21	0.65	0.43
Open Water		0.00	0.00	0.00	0.00
Total ****		1.23	0.82	1.57	1.05
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 54

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Appendix P-55

Route Variation No. 55

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 55-55A – Roosa Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location Begin End	Mile Post	96.06 96.55		N/A		N/A	
Length	Ft	2,574		2,885		2,556	
Area	Acres *	7.39		8.28		7.33	
Land requirements: Construction Permanent	Acres *	4.43 2.95		4.97 3.31		4.40 2.93	
Colocation: Power Line ROW Pipeline ROW Road / Railroad ROW Total colocation	Ft	1,134 0.00 0.00 1,134		1,038 0.00 0.00 1,038		0.00 0.00 0.00 0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands	**	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00	0.00	0.00
Forested		3.65	2.43	3.77	2.51	3.58	2.39
Open		0.68	0.45	1.09	0.73	0.71	0.47
Residential/Commercial		0.11	0.07	0.11	0.07	0.11	0.07
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		4.43	2.95	4.97	3.31	4.40	2.93
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number						
Residences		1		0		0	
Commercial		0		0		0	
Other (Barn, Shed, etc.)		0		0		0	
Landowners affected	Number	0		0		0	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 55

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Appendix P-55A

Route Variation No. 55A

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 55-55A – Roosa Reroute

Attribute	Units	Current Route		Variation Route		Variation Route A	
Location Begin End	Mile Post	96.06 96.55		N/A		N/A	
Length	Ft	2,574		2,885		2,556	
Area	Acres *	7.39		8.28		7.33	
Land requirements: Construction Permanent	Acres *	4.43 2.95		4.97 3.31		4.40 2.93	
Colocation: Power Line ROW Pipeline ROW Road / Railroad ROW Total colocation	Ft	1,134 0.00 0.00 1,134		1,038 0.00 0.00 1,038		0.00 0.00 0.00 0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres	0.0	0.0	0.0	0.0	0.0	0.0
Emergent wetlands	**	0.0	0.0	0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0		0	
	Name(s)	N/A		N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00	0.00	0.00
Forested		3.65	2.43	3.77	2.51	3.58	2.39
Open		0.68	0.45	1.09	0.73	0.71	0.47
Residential/Commercial		0.11	0.07	0.11	0.07	0.11	0.07
Open Water		0.00	0.00	0.00	0.00	0.00	0.00
Total ****		4.43	2.95	4.97	3.31	4.40	2.93
Public / Preserved Land:		Construction	Permanent	Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0	0	0
	Ft	0.0	0.0	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number						
Residences		1		0		0	
Commercial		0		0		0	
Other (Barn, Shed, etc.)		0		0		0	
Landowners affected	Number	0		0		0	

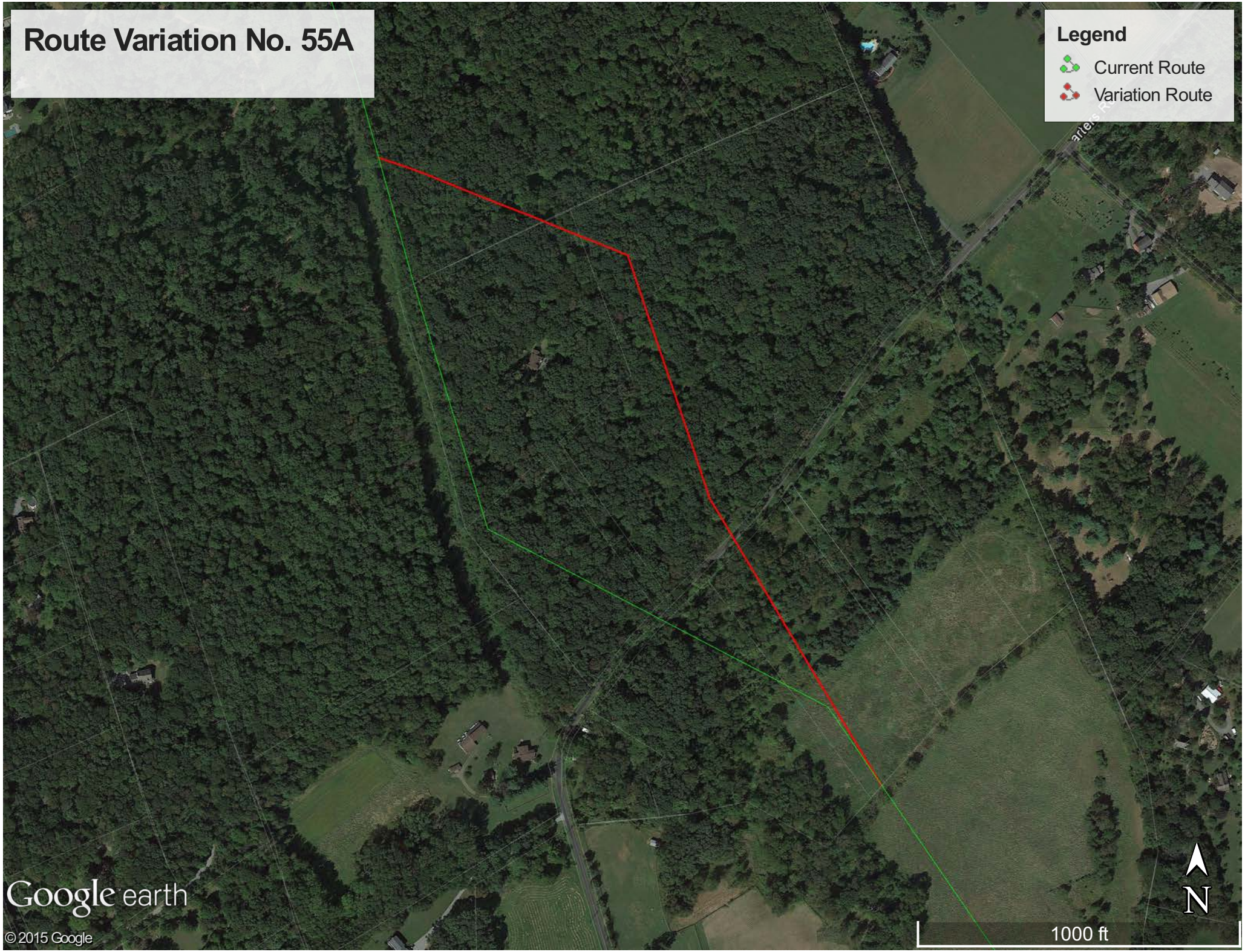
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 55A



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Appendix P-56

Route Variation No. 56

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 56 – Kocher Home Reroute

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	52.67		N/A	
End		53.10			
Length	Ft	2,313		2,305	
Area	Acres *	6.64		6.61	
Land requirements:					
Construction	Acres *	3.98		3.97	
Permanent		2.66		2.65	
Colocation:					
Power Line ROW	Ft	0.00		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		0.00		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.70	1.13	1.65	1.10
Forested		2.18	1.45	1.99	1.33
Open		0.02	0.01	0.26	0.17
Residential/Commercial		0.09	0.06	0.07	0.05
Open Water		0.00	0.00	0.00	0.00
Total ****		3.98	2.66	3.97	2.65
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

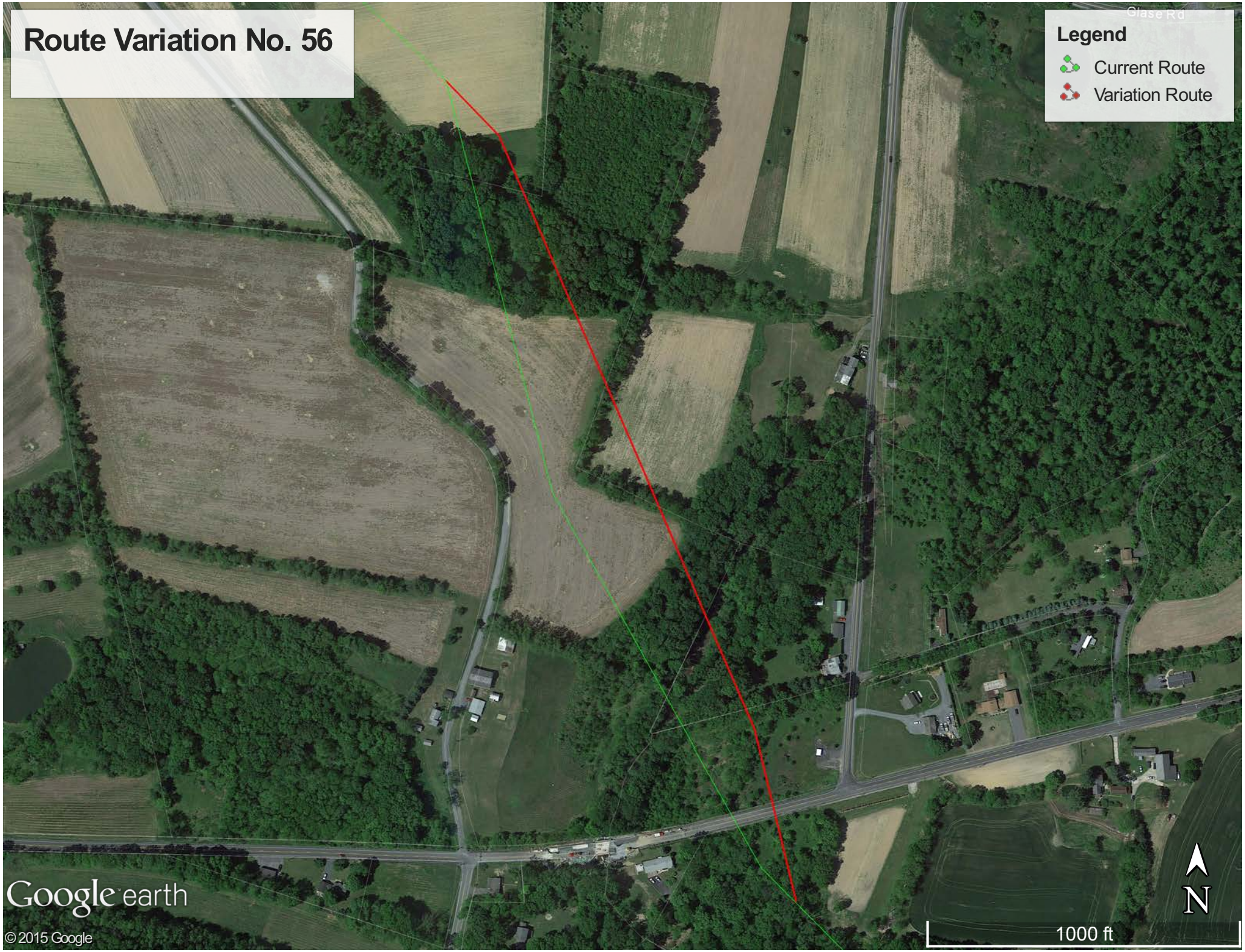
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 56



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Appendix P-57

Route Variation No. 57

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 57 – Hillcrest Home – MP 52.3

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	52.00		N/A	
End		52.39			
Length	Ft	2,059		2,203	
Area	Acres *	5.91		6.32	
Land requirements:					
Construction	Acres *	3.55		3.79	
Permanent		2.36		2.53	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.60	1.07	1.92	1.28
Forested		0.73	0.49	0.46	0.31
Open		0.00	0.00	0.00	0.00
Residential/Commercial		1.22	0.81	1.41	0.94
Open Water		0.00	0.00	0.00	0.00
Total ****		3.55	2.36	3.79	2.53
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	1	1	1	1
	Ft	2039	2039	2202	2202
	Acres	1.38	0.91	1.69	1.11
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		2	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 57
Legend
Current Route
Variation Route
Applebutter Rd
52
52.1
52.2
52.3
52.4
Glase Rd
Google earth
© 2015 Google
800 ft
N

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-58

Route Variation No. 58

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 58 – Goat Hill Quarry

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	99.77		N/A	
End		100.70			
Length	Ft	4,964		5,356	
Area	Acres *	14.24		15.37	
Land requirements:					
Construction	Acres *	8.55		9.22	
Permanent		5.70		6.15	
Colocation:					
Power Line ROW	Ft	1,061		0.00	
Pipeline ROW		0.00		0.00	
Road / Railroad ROW		0.00		0.00	
Total colocation		1,061		0.00	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		6.40	4.27	8.63	5.75
Open		1.02	0.68	0.34	0.22
Residential/Commercial		1.12	0.75	0.26	0.17
Open Water		0.00	0.00	0.00	0.00
Total ****		8.55	5.70	9.22	6.15
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

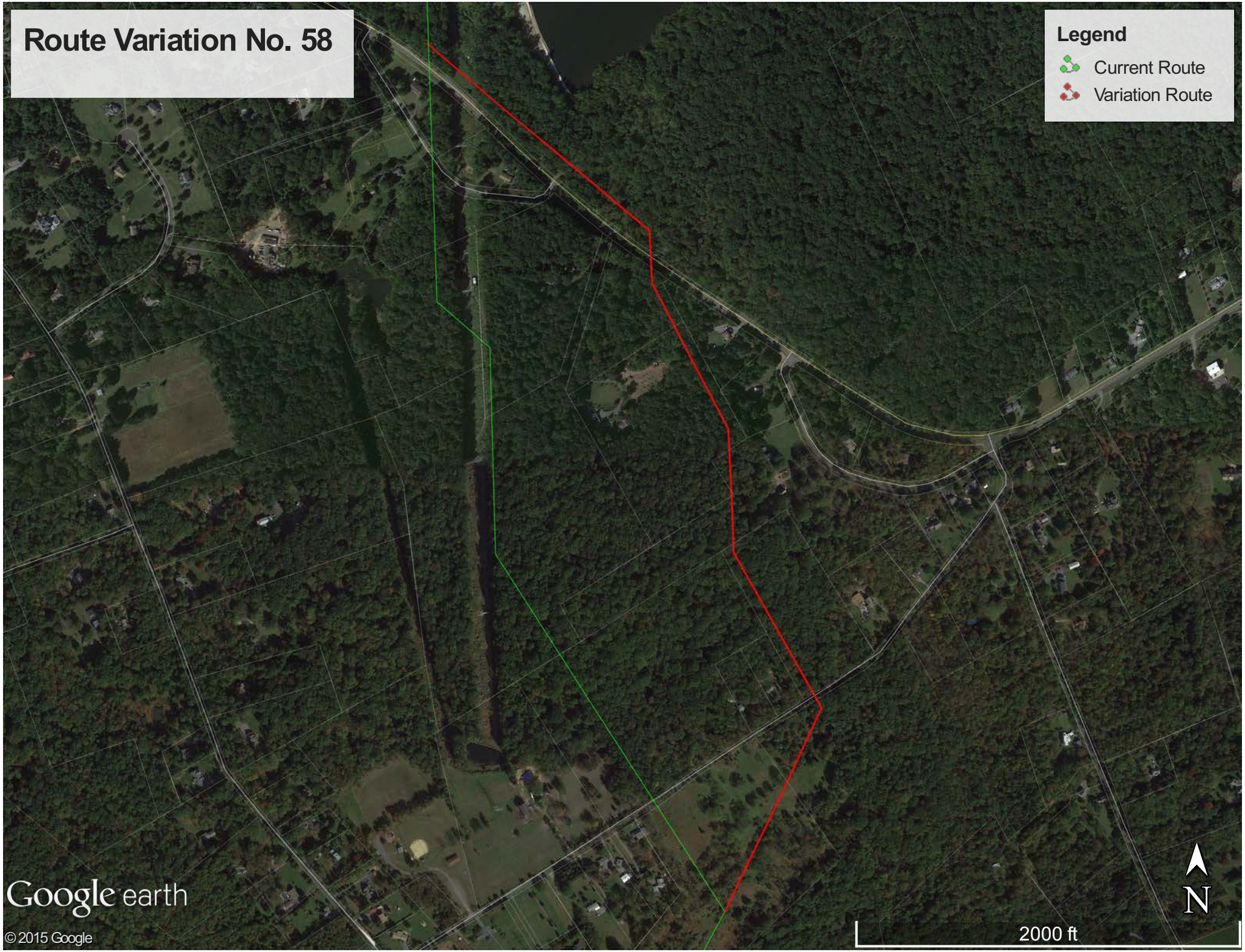
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation No. 58



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Appendix P-59

Route Variation No. 59

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 59 – Earl Davis Jr.

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	87.97		N/A	
End		88.54			
Length	Ft	3,010		3,031	
Area	Acres *	8.64		8.70	
Land requirements:					
Construction	Acres *	5.18		5.22	
Permanent		3.45		3.48	
Colocation:					
Power Line ROW	Ft	0		1,246	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		1,246	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.02	0.01	0.02	0.01
Total wetlands		0.02	0.01	0.02	0.01
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.10	2.73	3.85	2.57
Forested		0.91	0.61	0.00	0.00
Open		0.18	0.12	0.12	0.08
Residential/Commercial		0.00	0.00	1.25	0.83
Open Water		0.00	0.00	0.00	0.00
Total ****		5.18	3.46	5.22	3.48
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		1		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		1		1	
Parcels Crossed	Number	5		3	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 59
Legend
Current Route
Variation Route
88
88.1
88.2
88.3
88.4
88.5
88.6
Google earth
© 2015 Google
1000 ft
N

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Appendix P-60

Route Variation No. 60

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 60 – Phillips Road

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	76.67		N/A	
End		76.84			
Length	Ft	989		1,028	
Area	Acres *	2.58		2.95	
Land requirements:					
Construction	Acres *	1.55		1.77	
Permanent		1.03		1.18	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.19	0.13	1.40	0.94
Forested		1.35	0.90	0.37	0.24
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		1.55	1.03	1.77	1.18
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	1	1	1	1
	Ft	107	107	89	89
	Acres	0.24	0.15	0.21	0.13
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Parcels Crossed	Number	2		2	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 60
Legend
Current Route
Variation Route
76.6
76.7
76.8
0.1
Google earth
© 2015 Google
500 ft
N

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-61

Route Variation No. 61

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 61 – Reliant ROW

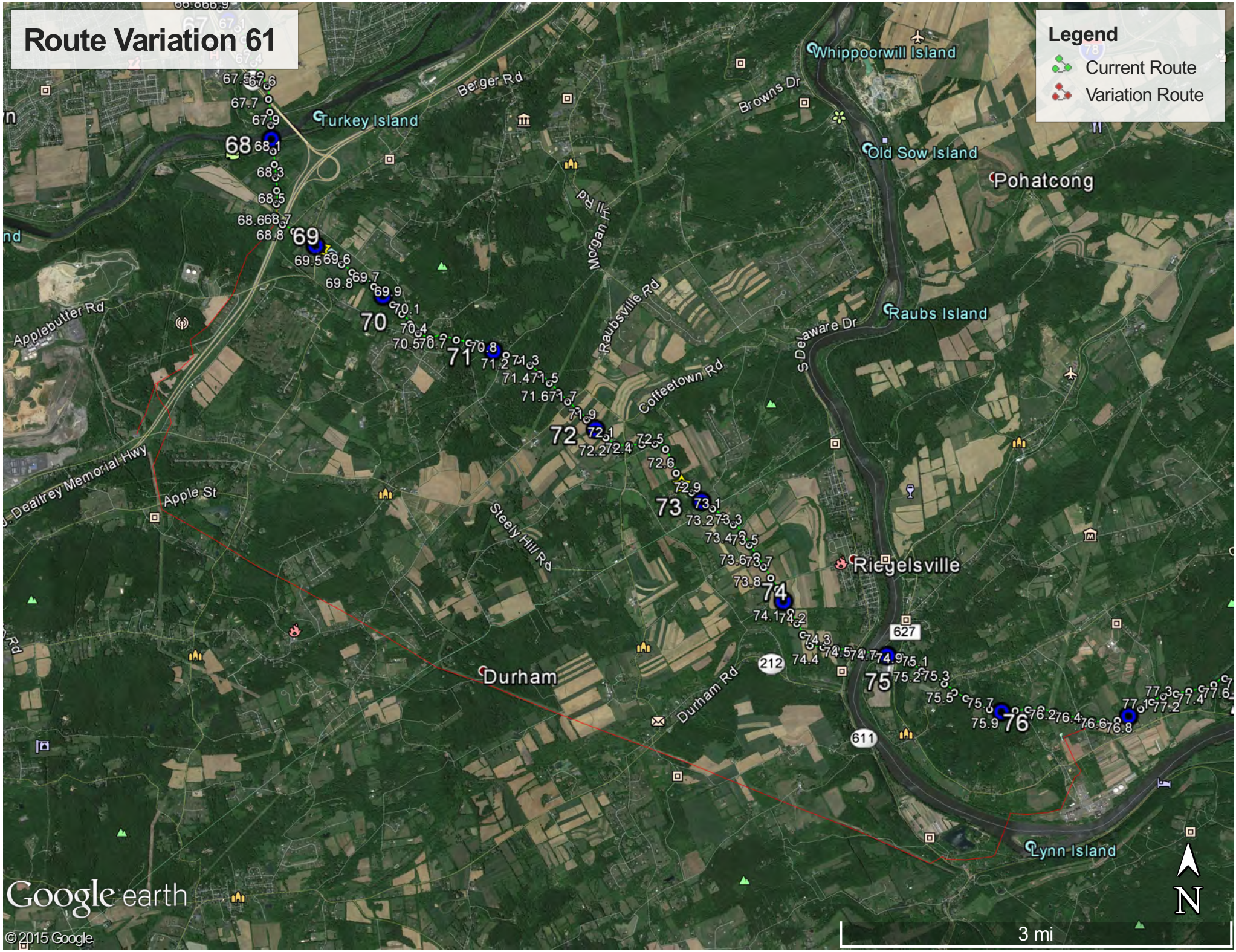
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	68.83		N/A	
End		76.61			
Length	Ft	41,078		63,130	
Area	Acres *	117.88		181.16	
Land requirements:					
Construction	Acres *	70.73		108.69	
Permanent		47.15		72.46	
Colocation:					
Power Line ROW	Ft	0		1,560	
Pipeline ROW		0		52,948	
Road / Railroad ROW		0		0	
Total colocation		0		54,508	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	1.21	0.81
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	1.21	0.81
Waterbodies / Streams affected	#	7		19	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	18.32	12.21	17.10	11.40
Forested		28.91	19.27	28.31	18.87
Open		17.53	11.69	45.72	30.48
Residential/Commercial		5.11	3.40	15.72	10.48
Open Water		0.86	0.58	1.85	1.23
Total ****		70.73	47.15	108.69	72.46
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	1	1	1	1
	Ft	78	78	69	69
	Acres	0.14	0.09	0.12	0.08
Preserved Farm Land	#	2	2	3	3
	Ft	2300	2300	2884	2884
	Acres	3.46	2.38	4.46	3.04
Structures within 50 ft of construction work area	Number				
Residences		13		22	
Commercial		0		0	
Other (Barn, Shed, etc.)		1		0	
Parcels Crossed	Number	52		70+	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 61
Legend
Current Route
Variation Route
Whippoorwill Island
Turkey Island
Old Sow Island
Pohatcong
Raubs Island
Riegelsville
Durham
Lynn Island
Berger Rd
Browns Dr
Morgan Hill Rd
Raubsville Rd
S Delaware Dr
Coffeetown Rd
Applebutter Rd
Dealtrey Memorial Hwy
Apple St
Steely Hill Rd
Durham Rd
627
212
611
68
69
70
71
72
73
74
75
76
Google earth
© 2015 Google
3 mi
N

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Appendix P-62

Route Variation No. 62

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 62 – Georgetown Road

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	59.85		N/A	
End		60.97			
Length	Ft	5,914		5,324	
Area	Acres *	16.97		15.28	
Land requirements:					
Construction	Acres *	10.18		9.17	
Permanent		6.79		6.11	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		1	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	7.92	5.28	6.81	4.54
Forested		1.01	0.67	1.79	1.19
Open		0.70	0.46	0.57	0.38
Residential/Commercial		0.56	0.37	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		10.18	6.79	9.17	6.11
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	1	1	1	1
	Ft	1589	1589	2543	2543
	Acres	2.74	1.82	4.38	2.92
Structures within 50 ft of construction work area	Number				
Residences		2		1	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		6	

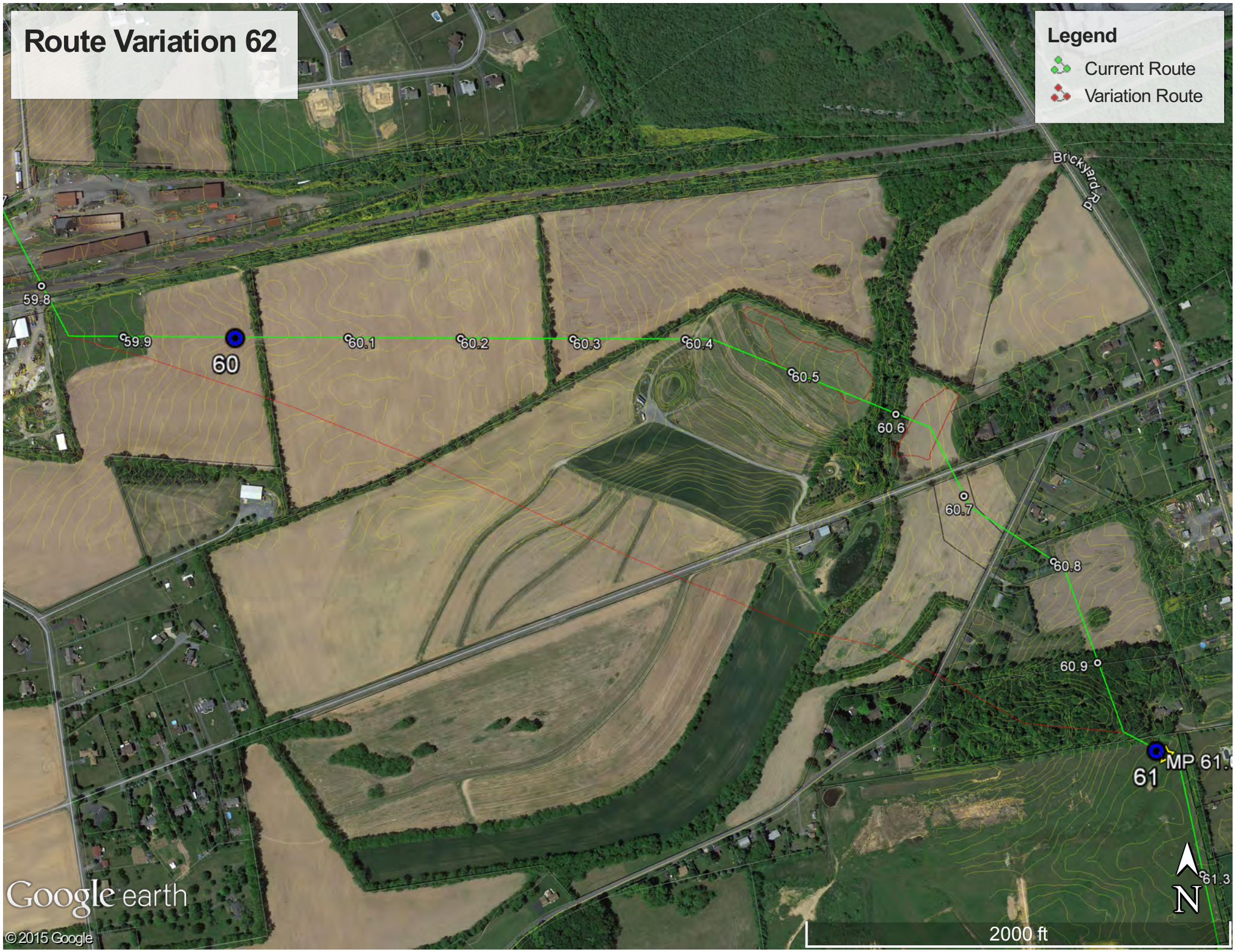
* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 62



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Appendix P-63

Route Variation No. 63

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 63 – Lower Smith Gap Road

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.28		N/A	
End		48.78			
Length	Ft	2,640		2,497	
Area	Acres *	7.58		7.17	
Land requirements:					
Construction	Acres *	4.55		4.30	
Permanent		3.03		2.87	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.43	1.62	3.57	2.38
Forested		1.33	0.89	0.42	0.28
Open		0.78	0.52	0.31	0.21
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		4.55	3.03	4.30	2.87
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	6		4	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 63

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Appendix P-64

Route Variation No. 64

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 64 – Cultural Resource

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	71.88		N/A	
End		71.96			
Length	Ft	422		1,632	
Area	Acres *	1.21		4.68	
Land requirements:					
Construction	Acres *	0.73		2.81	
Permanent		0.48		1.87	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.73	0.48	2.81	1.87
Forested		0.00	0.00	0.00	0.00
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		0.73	0.48	2.81	1.87
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	1		1	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 64
Legend
Current Route
Variation Route
71.8
71.9
72
72.1
Durham Rd
Google earth
© 2015 Google
600 ft
N

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Appendix P-65

Route Variation No. 65

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (Pennsylvania)
Route Variation 65 – Appalachian Trail Crossing

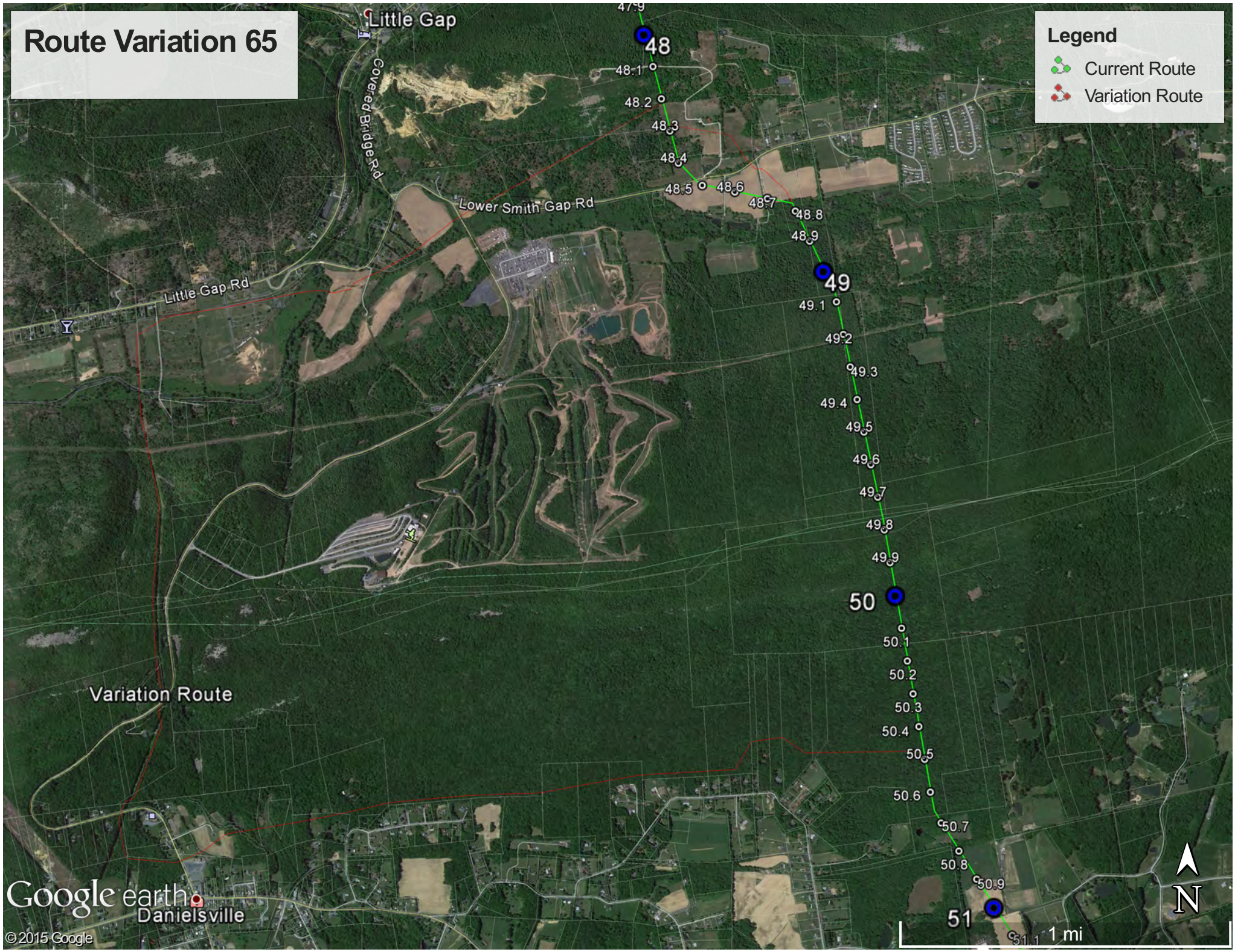
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.22		N/A	
End		50.51			
Length	Ft	12,091		31,210	
Area	Acres *	34.70		89.56	
Land requirements:					
Construction	Acres *	20.82		53.74	
Permanent		13.88		35.82	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		17,480	
Road / Railroad ROW		0		0	
Total colocation		0		17,480	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		3	
	Name(s)	Aquashicola Creek		Buckwha Creek, Aquashicola Creek, UNT	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.01	2.00	4.78	3.19
Forested		16.88	11.25	32.31	21.54
Open		0.87	0.58	15.26	10.18
Residential/Commercial		0.00	0.00	1.18	0.79
Open Water		0.07	0.04	0.20	0.13
Total ****		20.82	13.88	53.74	35.82
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	1	1	1	1
	Ft	4022	4022	7040	7040
	Acres	7.0	4.6	12.1	8.1
Preserved Farm Land	#	0	0	1	1
	Ft	0.0	0.0	82	82
	Acres	0.0	0.0	0.14	0.09
Structures within 50 ft of construction work area	Number				
Residences		0		12	
Commercial		0		1	
Other (Barn, Shed, etc.)		0		1	
Landowners affected	Number	10		46	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 65
Legend
Current Route
Variation Route
Little Gap
Covered Bridge Rd
Lower Smith Gap Rd
Little Gap Rd
Variation Route
Danielsville
47.9
48
48.1
48.2
48.3
48.4
48.5
48.6
48.7
48.8
48.9
49
49.1
49.2
49.3
49.4
49.5
49.6
49.7
49.8
49.9
50
50.1
50.2
50.3
50.4
50.5
50.6
50.7
50.8
50.9
51
51.1
1 mi
N
Google earth
© 2015 Google

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Appendix P-66

Route Variation No. 66

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 66 – USDA

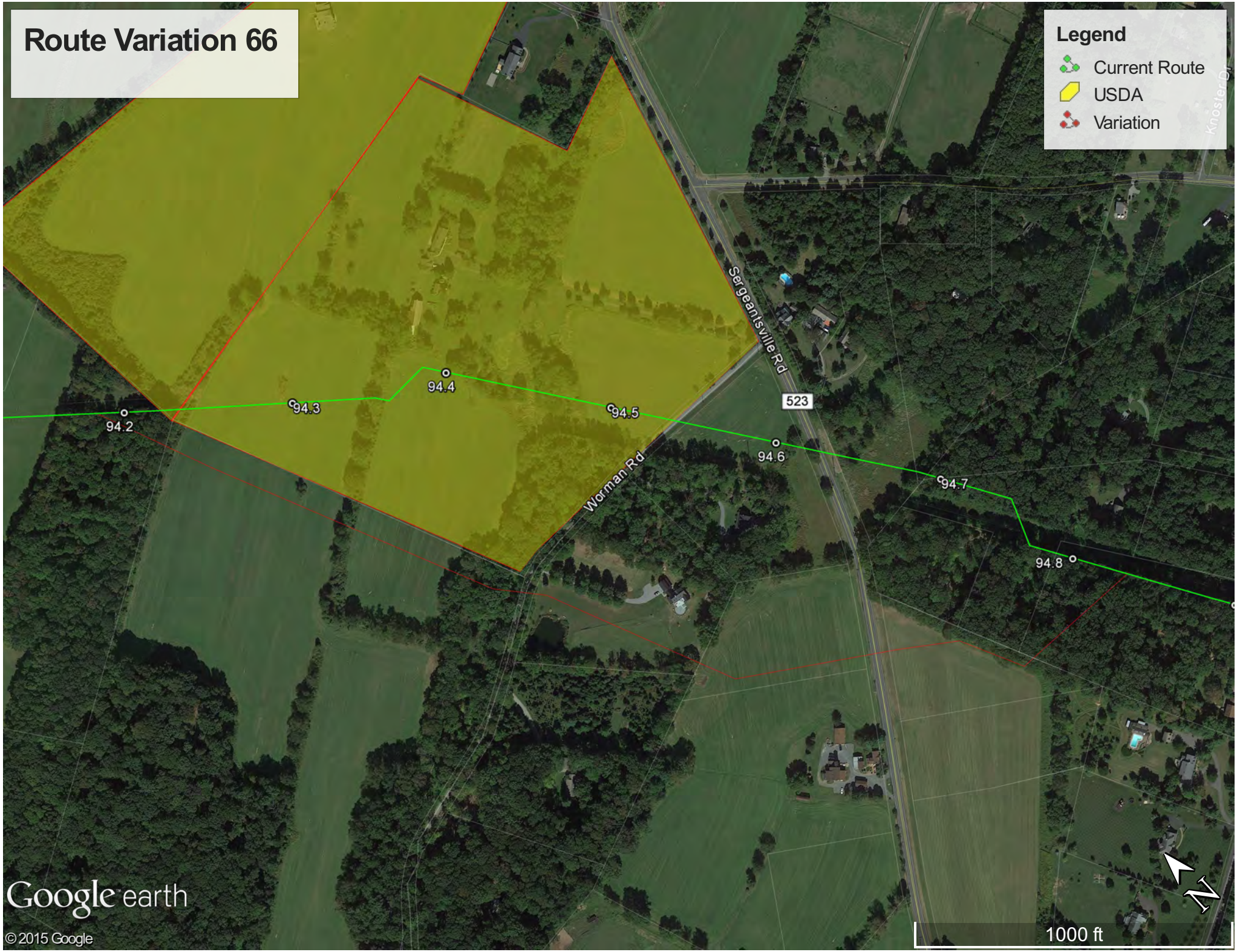
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	94.18		N/A	
End		94.83			
Length	Ft	3,432		3,547	
Area	Acres *	9.85		10.18	
Land requirements:					
Construction	Acres *	5.91		6.11	
Permanent		3.94		4.07	
Colocation:					
Power Line ROW	Ft	3,432		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		3,432		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.65	1.77	3.03	2.02
Forested		2.16	1.44	2.13	1.42
Open		1.04	0.69	0.95	0.63
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		5.91	3.94	6.11	4.07
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	9		5	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 66
Legend
Current Route
USDA
Variation
Sergeantsville Rd
523
Worman Rd
94.2
94.3
94.4
94.5
94.6
94.7
94.8
1000 ft
N
Google earth
© 2015 Google

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Appendix P-67

Route Variation No. 67

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ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment (New Jersey)
Route Variation 67 – USDA

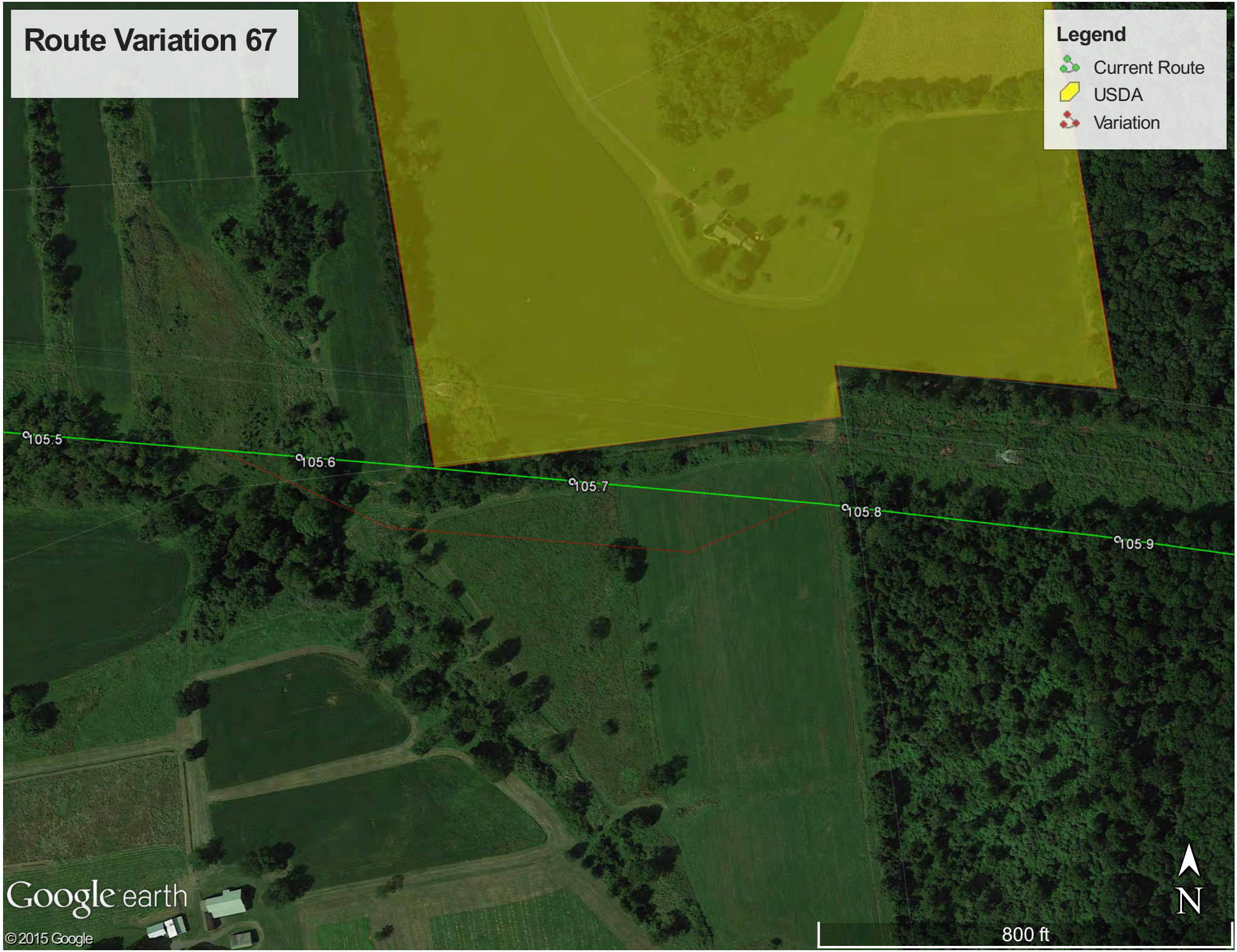
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	105.57		N/A	
End		105.79			
Length	Ft	1,162		1,195	
Area	Acres *	3.33		3.43	
Land requirements:					
Construction	Acres *	2.00		2.06	
Permanent		1.33		1.37	
Colocation:					
Power Line ROW	Ft	1,162		1,162	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		1,162		1,162	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	1.02	0.68	1.42	0.94
Forested		0.72	0.48	0.22	0.15
Open		0.25	0.17	0.42	0.28
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		2.00	1.33	2.06	1.37
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		2	

* Based on standard 125 Ft ROW width for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 67
Legend
Current Route
USDA
Variation
105.5
105.6
105.7
105.8
105.9
Google earth
© 2015 Google
N
800 ft

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Appendix P-68

Route Variation No. 68

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – (Pennsylvania)
Route Variation 68 –

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	42.55		0.00	
End		43.25		0.87	
Length	Ft	3,696		4,595	
Area	Acres *	10.61		13.19	
Land requirements:					
Construction	Acres *	6.36		7.91	
Permanent		4.24		5.27	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	3.69	2.46	1.40	0.94
Forested		2.39	1.59	6.51	4.34
Open		0.00	0.00	0.00	0.00
Residential/Commercial		0.29	0.19	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		6.36	4.24	7.91	5.27
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	8		5	

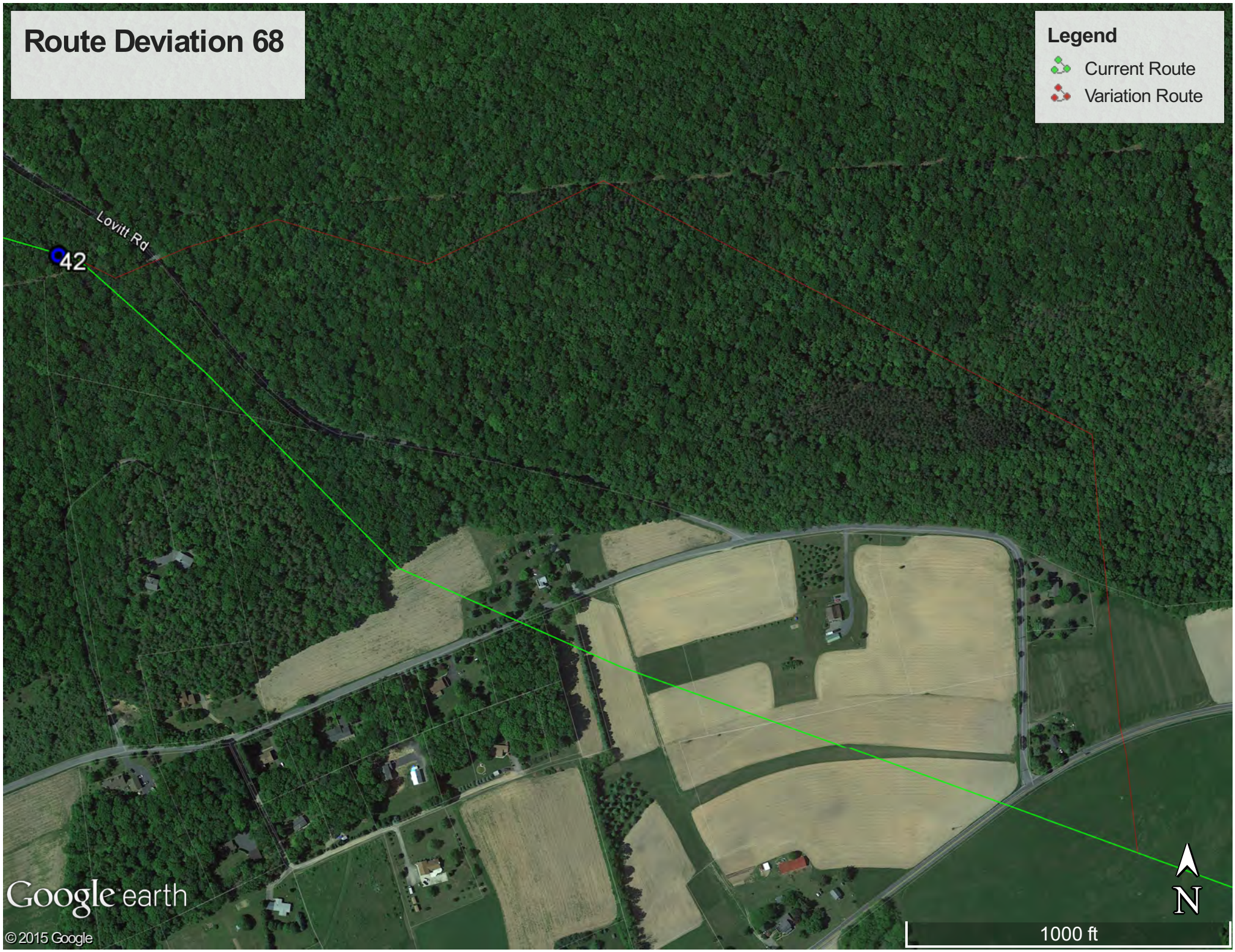
* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Deviation 68



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Appendix P-69

Route Variation No. 69

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – (Pennsylvania)
Route Variation 69 –

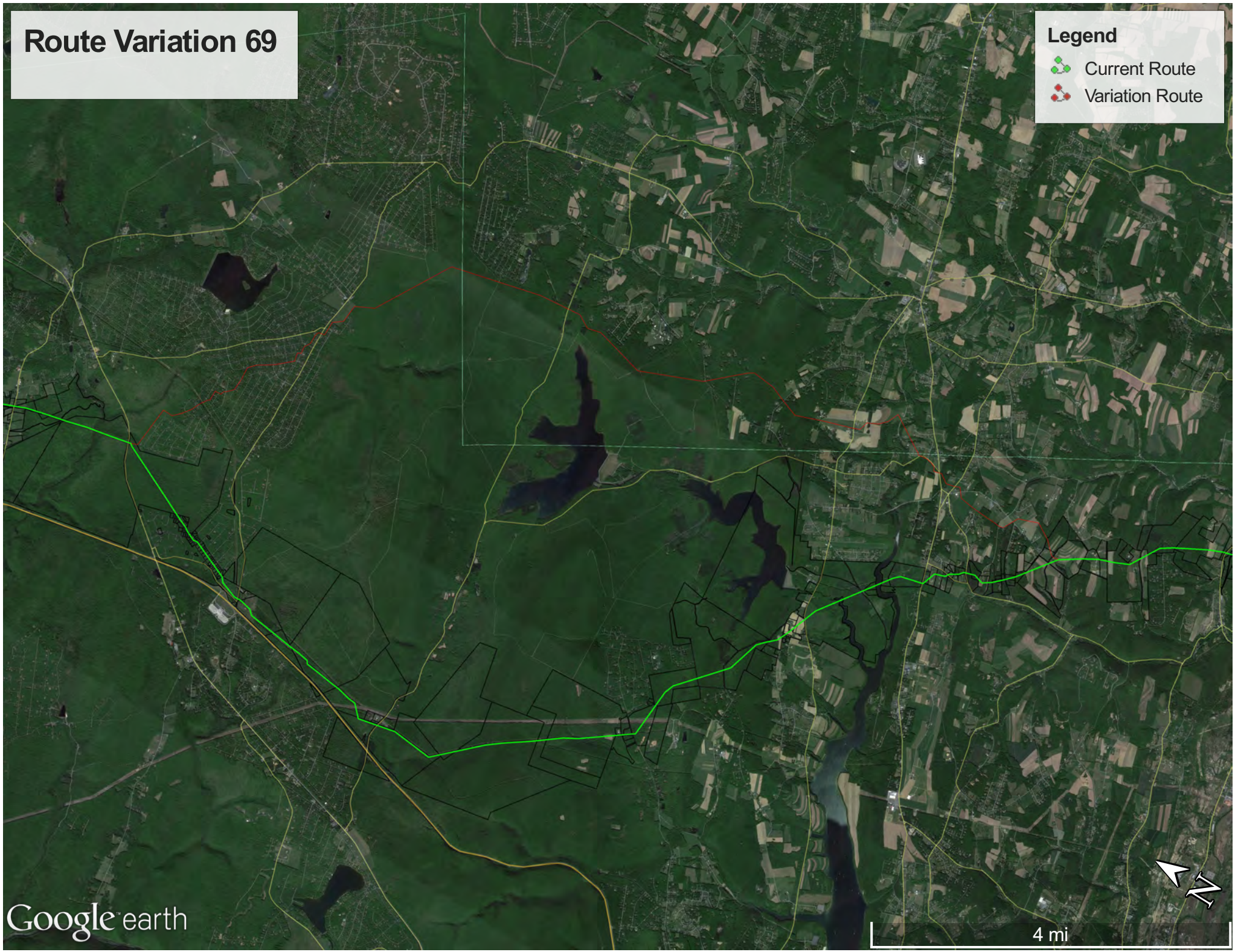
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	33.56		0.00	
End		46.24		12.87	
Length	Ft	66,950		67,963	
Area	Acres *	192.12		195.03	
Land requirements:					
Construction	Acres *	115.27		117.02	
Permanent		76.85		78.01	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	16		6	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	9.64	6.43	19.79	13.20
Forested		98.24	65.49	67.50	45.00
Open		2.89	1.93	8.49	5.66
Residential/Commercial		3.45	2.30	21.14	14.09
Open Water		1.06	0.71	0.10	0.06
Total ****		115.27	76.85	117.02	78.01
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	79		0	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 69
Legend
Current Route
Variation Route
Google earth
4 mi
N

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Appendix P-70

Route Variation No. 70

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – (New Jersey)
Route Variation 70 –

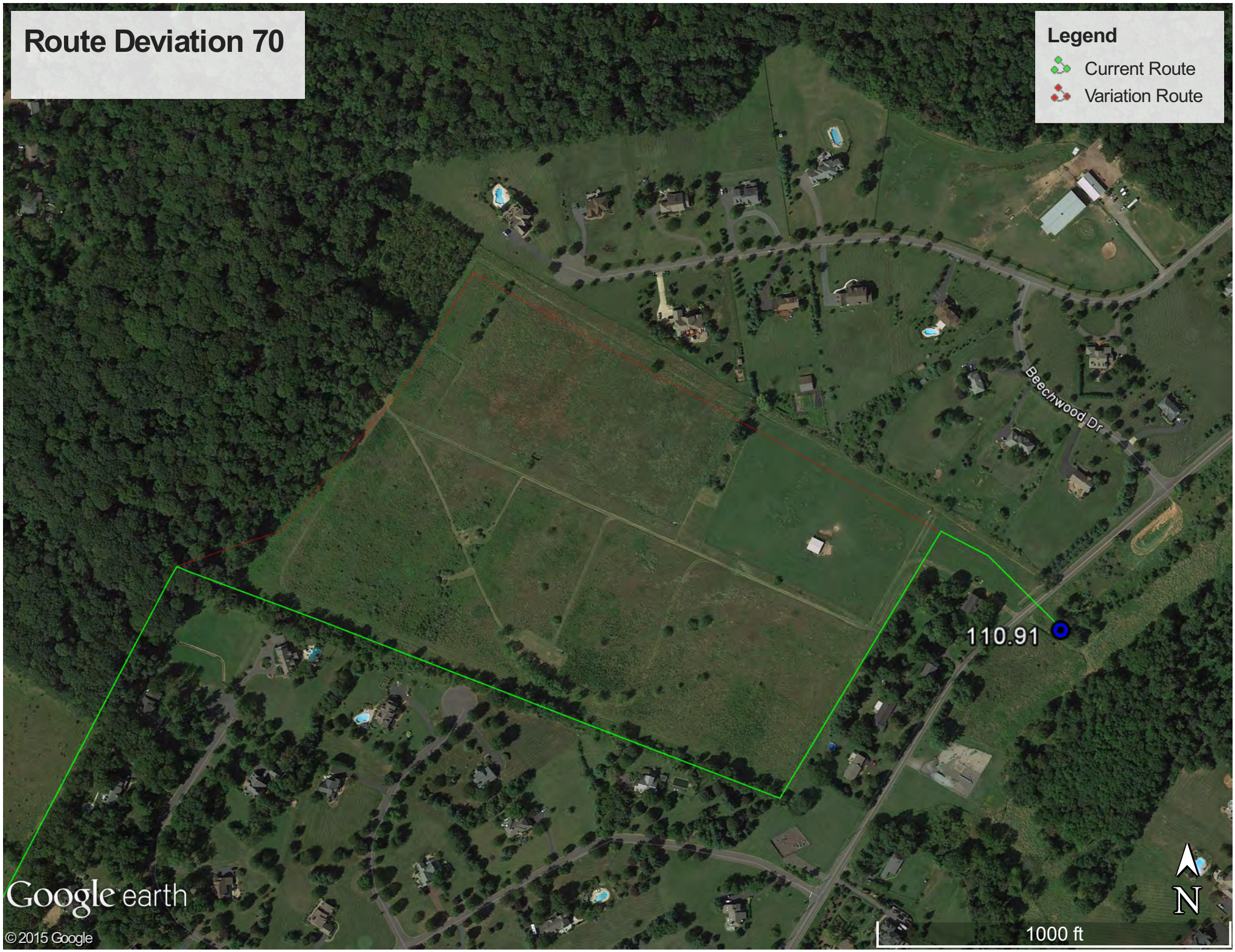
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	110.87		0.00	
End		111.38		0.52	
Length	Ft	2,693		2,724	
Area	Acres *	7.73		7.82	
Land requirements:					
Construction	Acres *	4.64		4.69	
Permanent		3.09		3.13	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		0	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		0.32	0.21	0.54	0.36
Open		4.32	2.88	4.15	2.77
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		4.64	3.09	4.69	3.13
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	2		2	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Deviation 70
Legend
Current Route
Variation Route
Beechwood Dr
110.91
Google earth
© 2015 Google
N
1000 ft

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-71

Route Variation No. 71

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 71 – Buckeye East Dansville

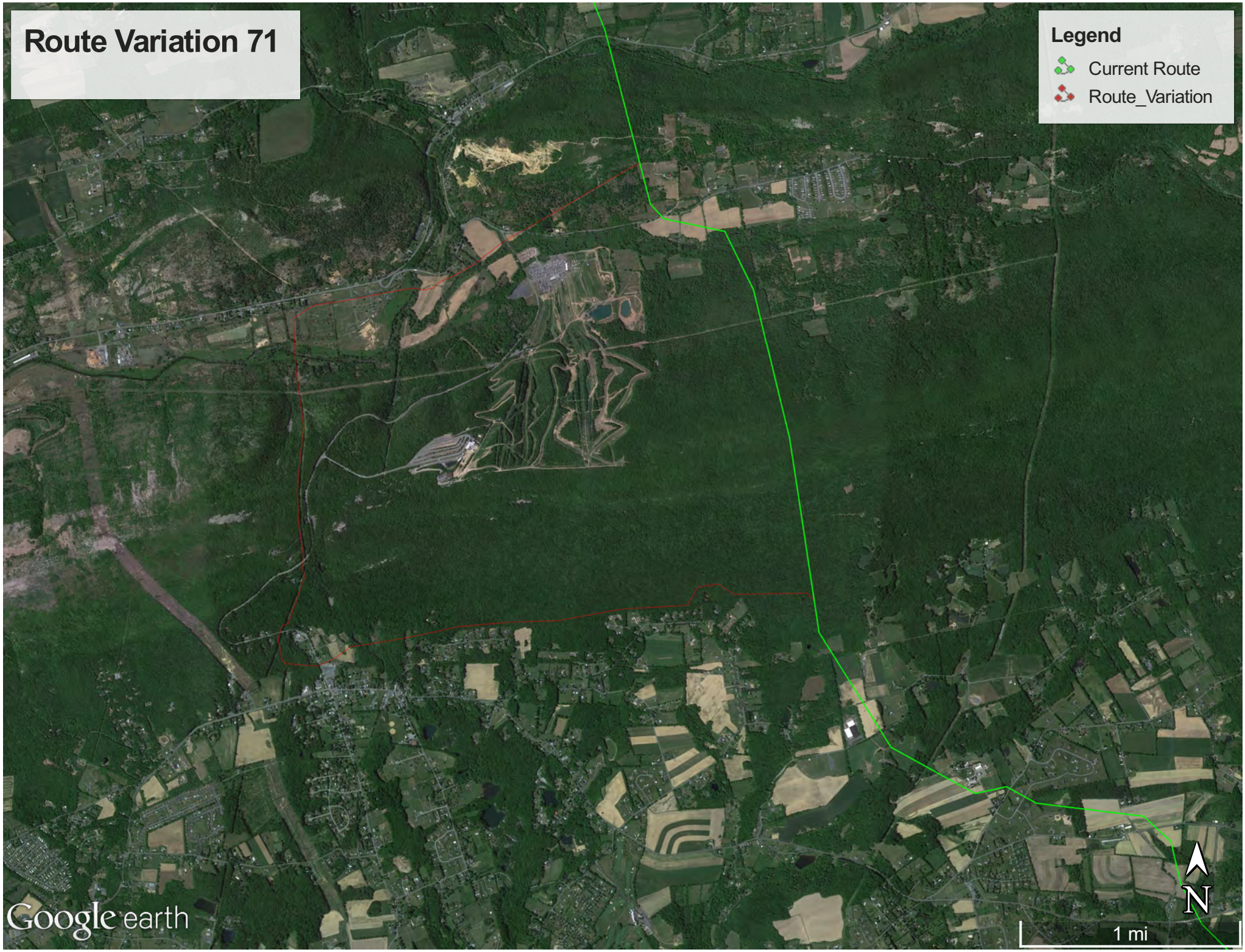
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		N/A	
End		57.83			
Length	Ft	69,802		85,957	
Area	Acres *	200.30		246.66	
Land requirements:					
Construction	Acres *	120.18		148.00	
Permanent		80.12		98.67	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.165	0.110
Forested wetlands		0.498	0.332	0.119	0.079
Total wetlands		0.498	0.332	0.284	0.189
Waterbodies / Streams affected	#	10		11	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	51.43	34.29	63.57	42.38
Forested		57.17	38.12	64.68	43.12
Open		7.62	5.08	11.45	7.64
Residential/Commercial		3.83	2.56	8.19	5.46
Open Water		0.12	0.08	0.10	0.07
Total ****		120.18	80.12	148.00	98.67
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	116		123	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 71
Legend
Current Route
Route_Variation
Google earth
N
1 mi

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Appendix P-72

Route Variation No. 72

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – (Pennsylvania)
Route Variation 72 – Wilkes-Barre Quarry

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	9.58		0.00	
End		10.39		1.06	
Length	Ft	4,277		5,573	
Area	Acres *	12.27		15.99	
Land requirements:					
Construction	Acres *	7.36		9.60	
Permanent		4.91		6.40	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	0		4	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	0.00	0.00	0.00	0.00
Forested		7.29	4.86	9.29	6.20
Open		0.08	0.05	0.30	0.20
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.00	0.00	0.00	0.00
Total ****		7.36	4.91	9.60	6.40
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	0		0	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 72
Legend
Current Route
Variation Route
Google earth
N
2000 ft

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Appendix P-73

Route Variation No. 73

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 73 – Road

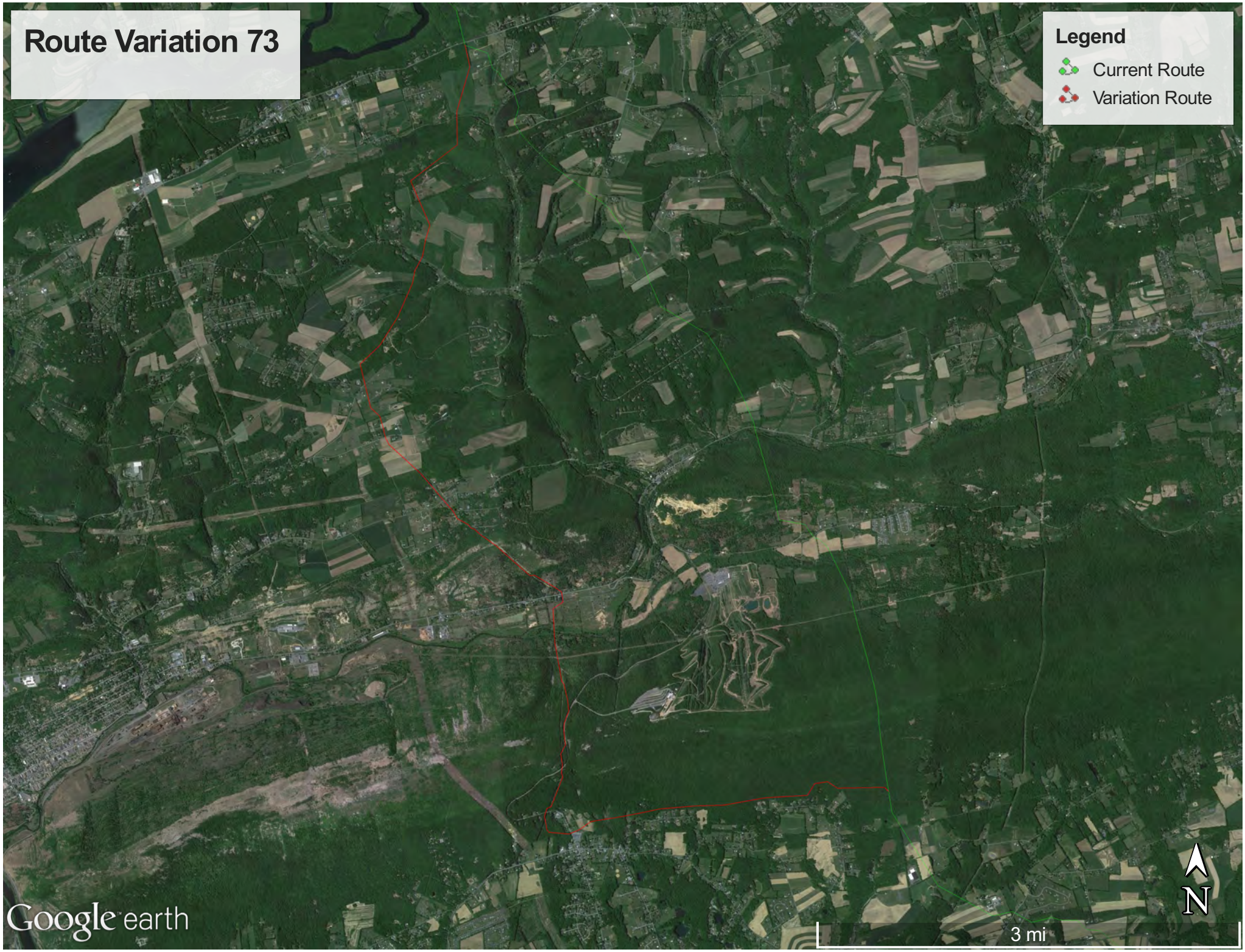
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		51.04		53.76	
Length	Ft	33,950		48,290	
Area	Acres *	97.42		138.57	
Land requirements:					
Construction	Acres *	58.45		83.14	
Permanent		38.97		55.43	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	6		5	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	17.26	11.51	9.78	6.52
Forested		36.29	24.19	56.84	37.89
Open		3.27	2.18	10.24	6.83
Residential/Commercial		1.52	1.01	6.18	4.12
Open Water		0.12	0.08	0.10	0.07
Total ****		58.45	38.97	83.14	55.43
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	55		95	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 73
Legend
Current Route
Variation Route
Google earth
3 mi
N

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Appendix P-74

Route Variation No. 74

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 74 – Buckeye West

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		51.04		53.59	
Length	Ft	33,950		47,409	
Area	Acres *	97.42		136.05	
Land requirements:					
Construction	Acres *	58.45		81.63	
Permanent		38.97		54.42	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	6		5	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	17.26	11.51	9.75	6.50
Forested		36.29	24.19	56.33	37.56
Open		3.27	2.18	10.13	6.76
Residential/Commercial		1.52	1.01	5.29	3.53
Open Water		0.12	0.08	0.13	0.08
Total ****		58.45	38.97	81.63	54.42
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	55		85	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 74
Legend
Current Route
Variation Route
Google earth
3 mi
N

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-75

Route Variation No. 75

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 75 – Blue Mountain WP

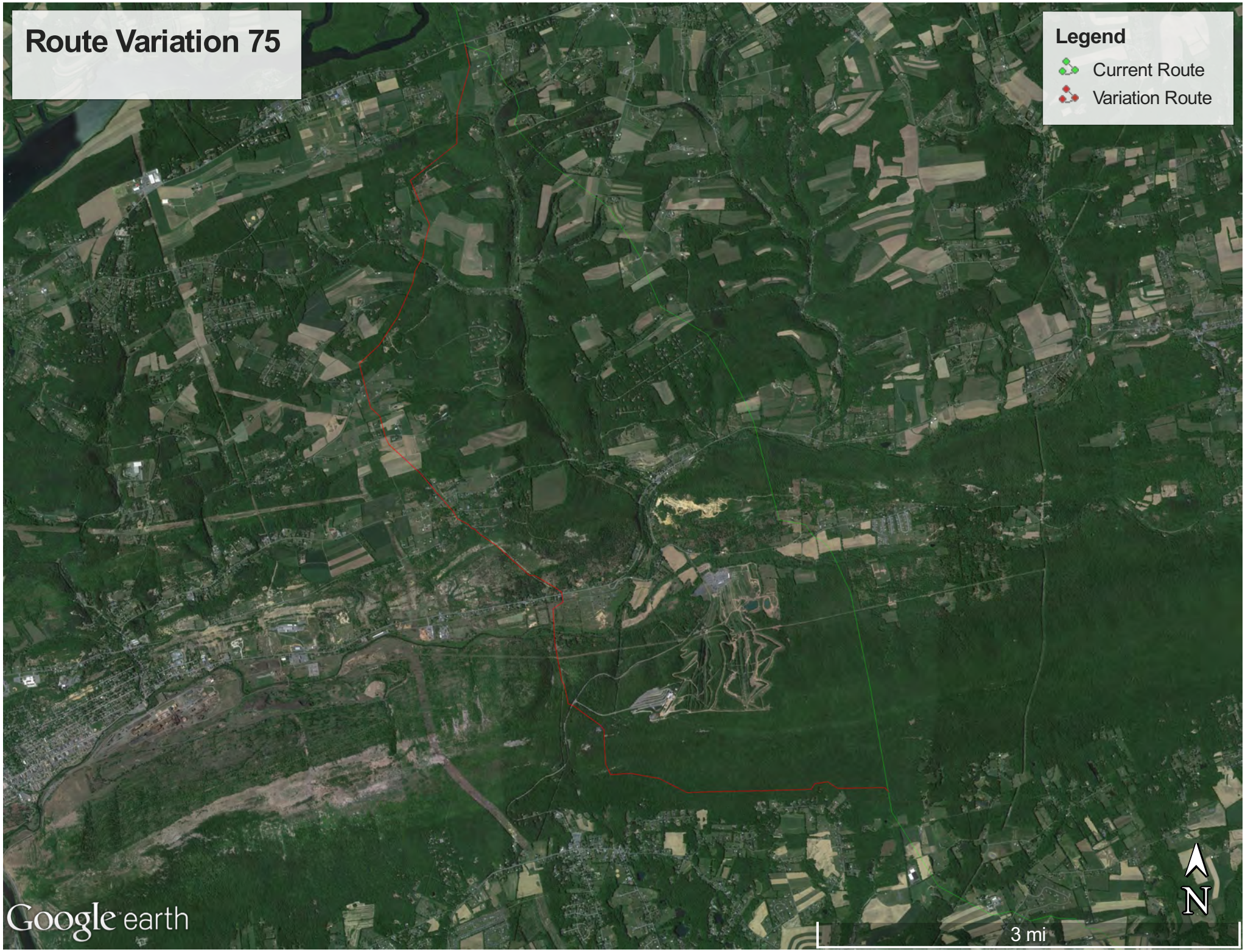
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		51.04		52.95	
Length	Ft	33,950		44,018	
Area	Acres *	97.42		126.31	
Land requirements:					
Construction	Acres *	58.45		75.79	
Permanent		38.97		50.53	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	6		4	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	17.26	11.51	9.78	6.52
Forested		36.29	24.19	53.27	35.51
Open		3.27	2.18	7.07	4.72
Residential/Commercial		1.52	1.01	5.56	3.71
Open Water		0.12	0.08	0.10	0.07
Total ****		58.45	38.97	75.79	50.53
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	55		76	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 75
Legend
Current Route
Variation Route
Google earth
3 mi
N

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Appendix P-76

Route Variation No. 76

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 76 – Buckeye West

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.76		48.76	
End		51.04		55.57	
Length	Ft	12,038		35,974	
Area	Acres *	34.55		103.23	
Land requirements:					
Construction	Acres *	20.73		61.94	
Permanent		13.82		41.29	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.81	3.20	4.40	2.93
Forested		15.92	10.62	41.37	27.58
Open		0.00	0.00	14.90	9.93
Residential/Commercial		0.00	0.00	1.08	0.72
Open Water		0.00	0.00	0.19	0.13
Total ****		20.73	13.82	61.94	41.29
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		56	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 76
Legend
Current Route
Variation Route
Google earth
N
2 mi

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

Appendix P-77

Route Variation No. 77

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 77 – Buckeye East

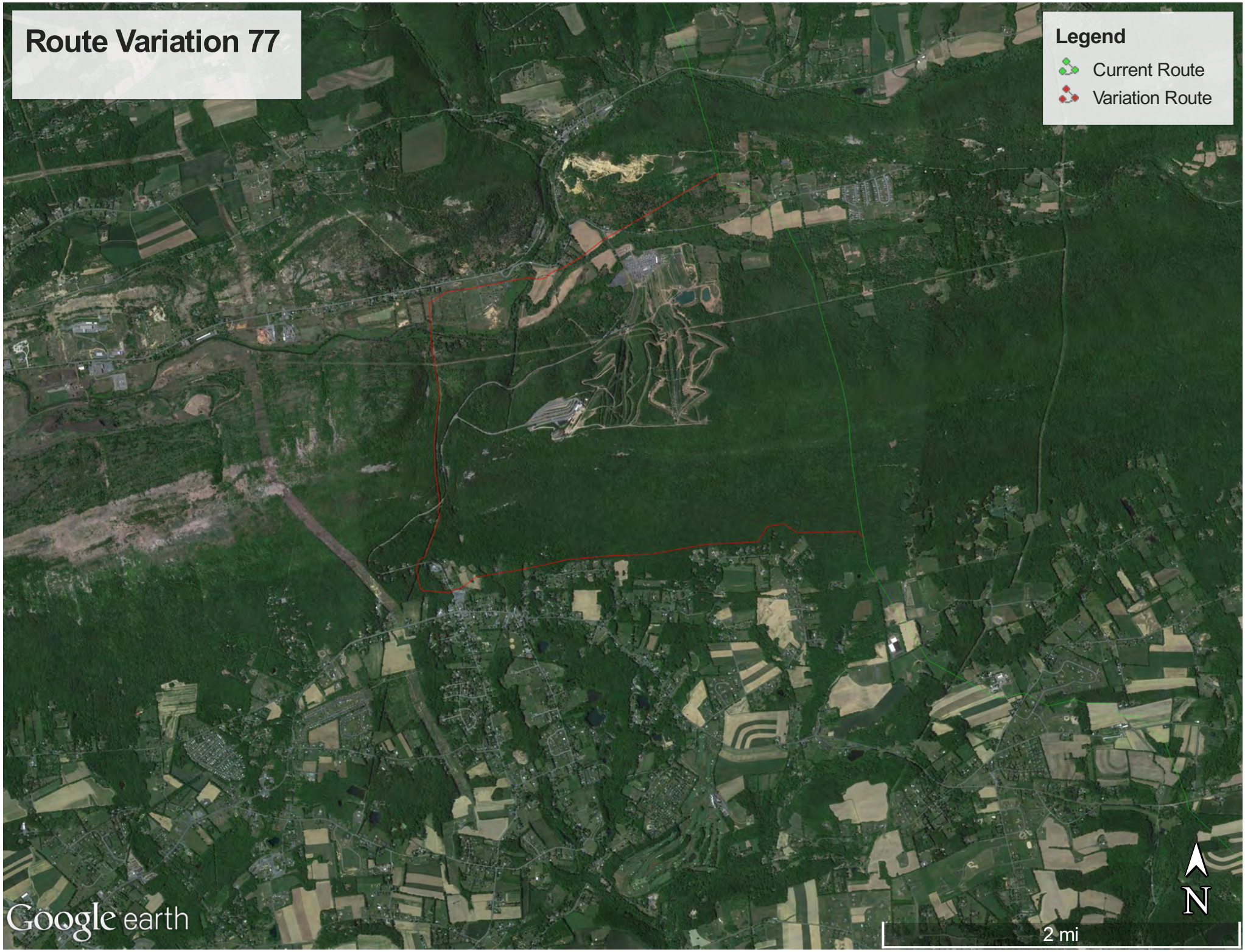
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.76		48.76	
End		51.04		54.67	
Length	Ft	12,038		31,210	
Area	Acres *	34.55		89.56	
Land requirements:					
Construction	Acres *	20.73		53.74	
Permanent		13.82		35.82	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.81	3.20	3.20	2.13
Forested		15.92	10.62	40.39	26.92
Open		0.00	0.00	8.90	5.94
Residential/Commercial		0.00	0.00	1.08	0.72
Open Water		0.00	0.00	0.17	0.11
Total ****		20.73	13.82	53.74	35.82
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		58	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 77
Legend
Current Route
Variation Route
Google earth
N
2 mi

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Appendix P-78

Route Variation No. 78

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 78 – Blue Mountain Road

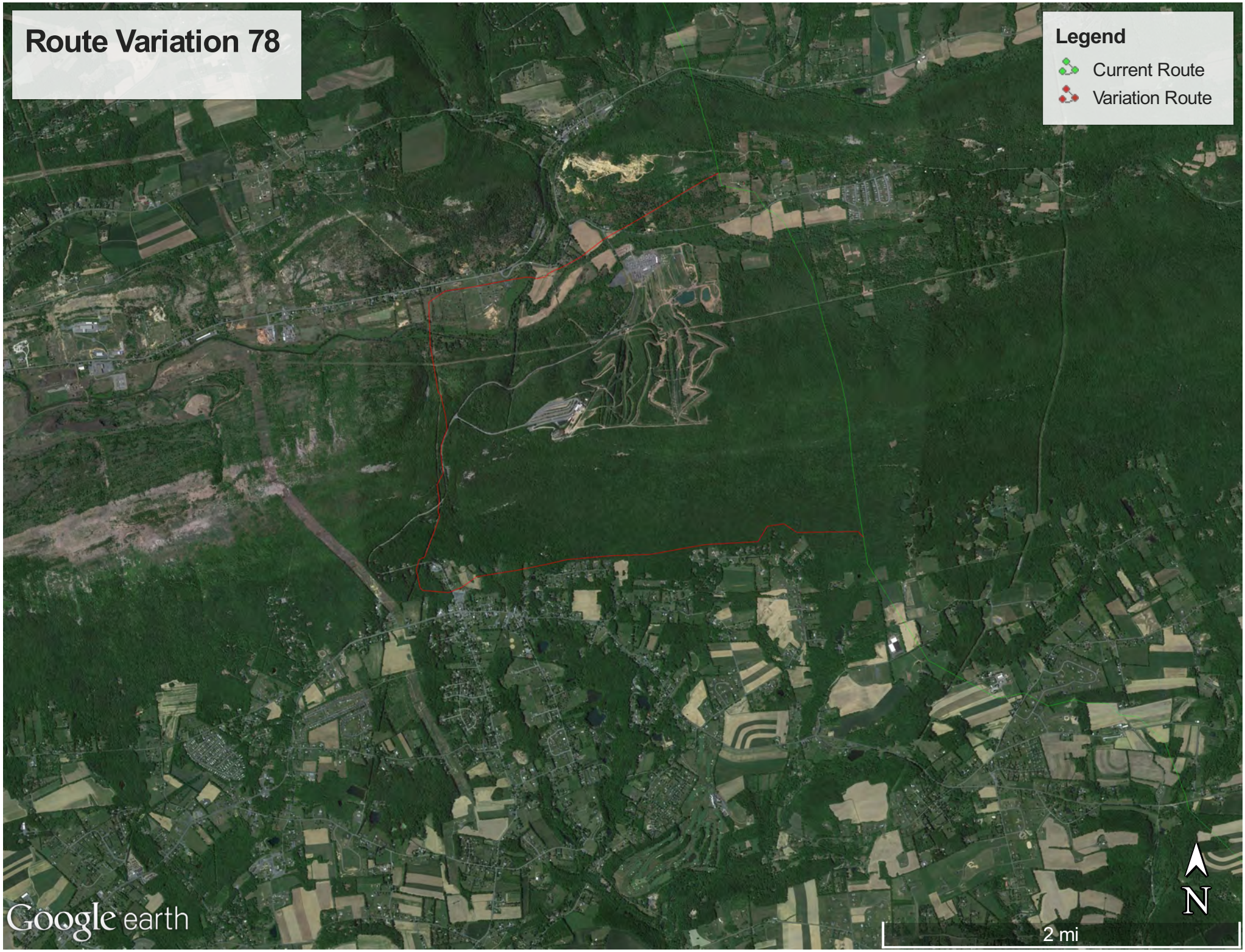
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.76		48.76	
End		51.04		54.69	
Length	Ft	12,038		31,329	
Area	Acres *	34.55		89.90	
Land requirements:					
Construction	Acres *	20.73		53.94	
Permanent		13.82		35.96	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		3	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.81	3.20	3.20	2.13
Forested		15.92	10.62	38.39	25.59
Open		0.00	0.00	11.10	7.40
Residential/Commercial		0.00	0.00	1.08	0.72
Open Water		0.00	0.00	0.17	0.11
Total ****		20.73	13.82	53.94	35.96
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		58	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 78
Legend
Current Route
Variation Route
Google earth
N
2 mi

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Appendix P-79

Route Variation No. 79

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 79 – Blue Mountain WP

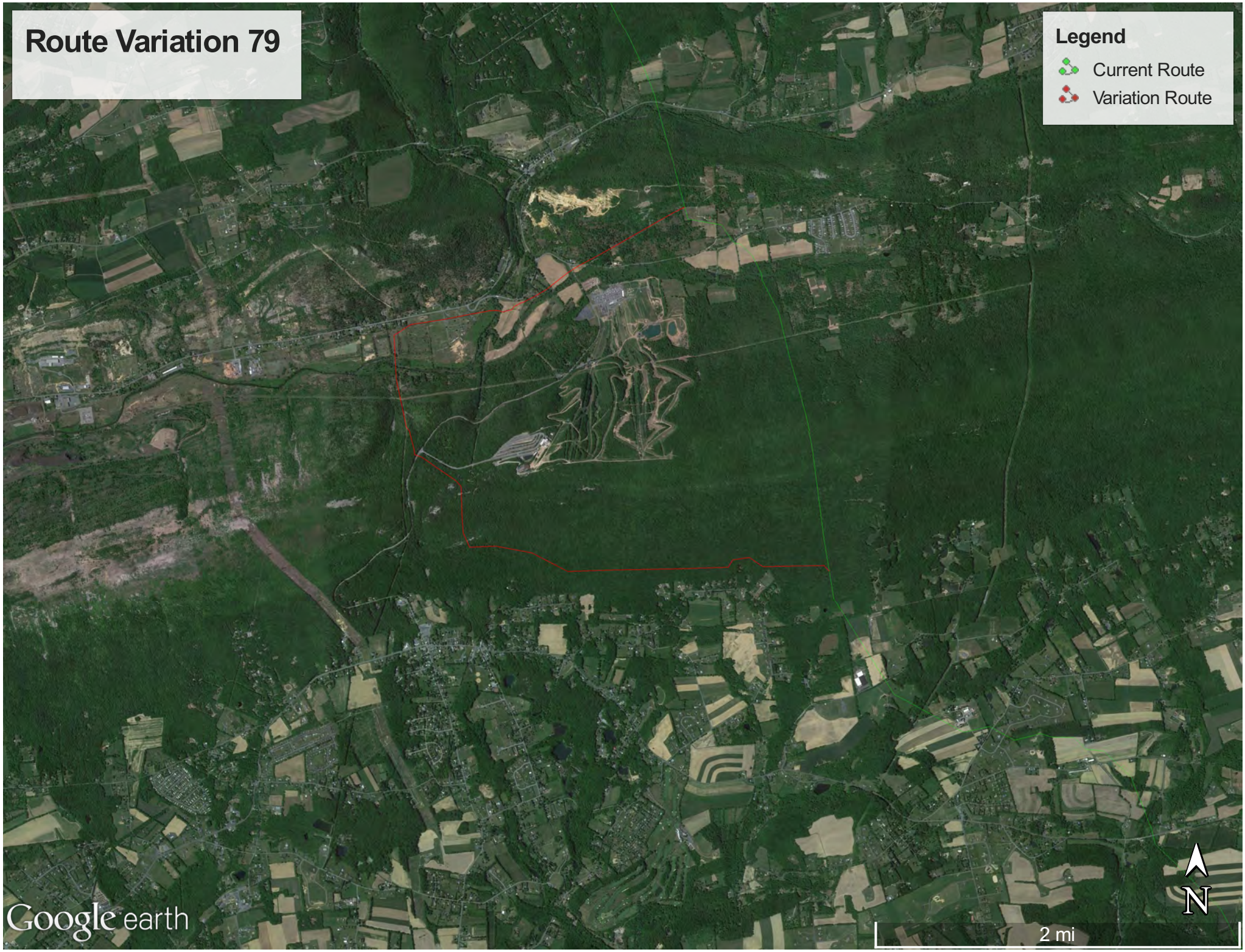
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.76		48.76	
End		51.04		53.88	
Length	Ft	12,038		27,057	
Area	Acres *	34.55		77.64	
Land requirements:					
Construction	Acres *	20.73		46.59	
Permanent		13.82		31.06	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		2	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	4.81	3.20	3.20	2.13
Forested		15.92	10.62	34.83	23.22
Open		0.00	0.00	7.93	5.29
Residential/Commercial		0.00	0.00	0.46	0.31
Open Water		0.00	0.00	0.17	0.11
Total ****		20.73	13.82	46.59	31.06
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	10		39	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 79
Legend
Current Route
Variation Route
Google earth
N
2 mi

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Appendix P-80

Route Variation No. 80

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 80 – Buckeye East

Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		51.04		53.73	
Length	Ft	33,950		48,164	
Area	Acres *	97.42		138.21	
Land requirements:					
Construction	Acres *	58.45		82.93	
Permanent		38.97		55.28	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	6		5	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	17.26	11.51	9.78	6.52
Forested		36.29	24.19	58.83	39.22
Open		3.27	2.18	8.03	5.35
Residential/Commercial		1.52	1.01	6.18	4.12
Open Water		0.12	0.08	0.10	0.07
Total ****		58.45	38.97	82.93	55.28
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	55		95	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.

Route Variation 80
Legend
Current Route
Variation Route
Google earth
N
3 mi

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Appendix P-81

Route Variation No. 81

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 81 – Buckeye East Road Dansville

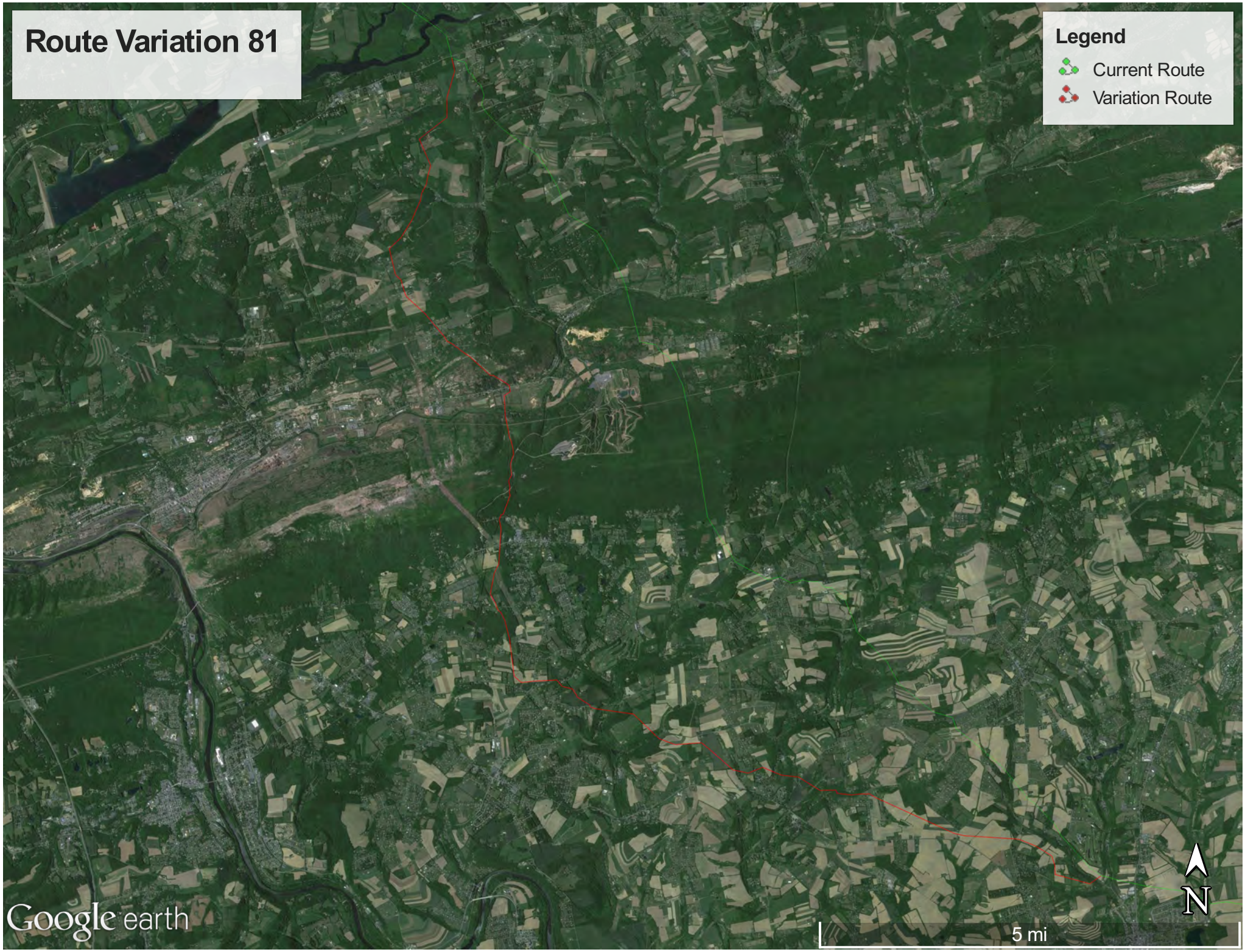
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		57.83		60.91	
Length	Ft	69,802		86,083	
Area	Acres *	200.30		247.02	
Land requirements:					
Construction	Acres *	120.18		148.21	
Permanent		80.12		98.81	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.165	0.110
Forested wetlands		0.498	0.332	0.119	0.079
Total wetlands		0.498	0.332	0.284	0.189
Waterbodies / Streams affected	#	10		11	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	51.43	34.29	63.57	42.38
Forested		57.17	38.12	62.69	41.79
Open		7.62	5.08	13.67	9.11
Residential/Commercial		3.83	2.56	8.19	5.46
Open Water		0.12	0.08	0.10	0.07
Total ****		120.18	80.12	148.21	98.81
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	116		123	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 81
Legend
Current Route
Variation Route
Google earth
5 mi
N

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Appendix P-82

Route Variation No. 82

20150731-5266 FERC PDF (Unofficial) 7/31/2015 4:08:24 PM

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 82 – Buckeye West Road Dansville

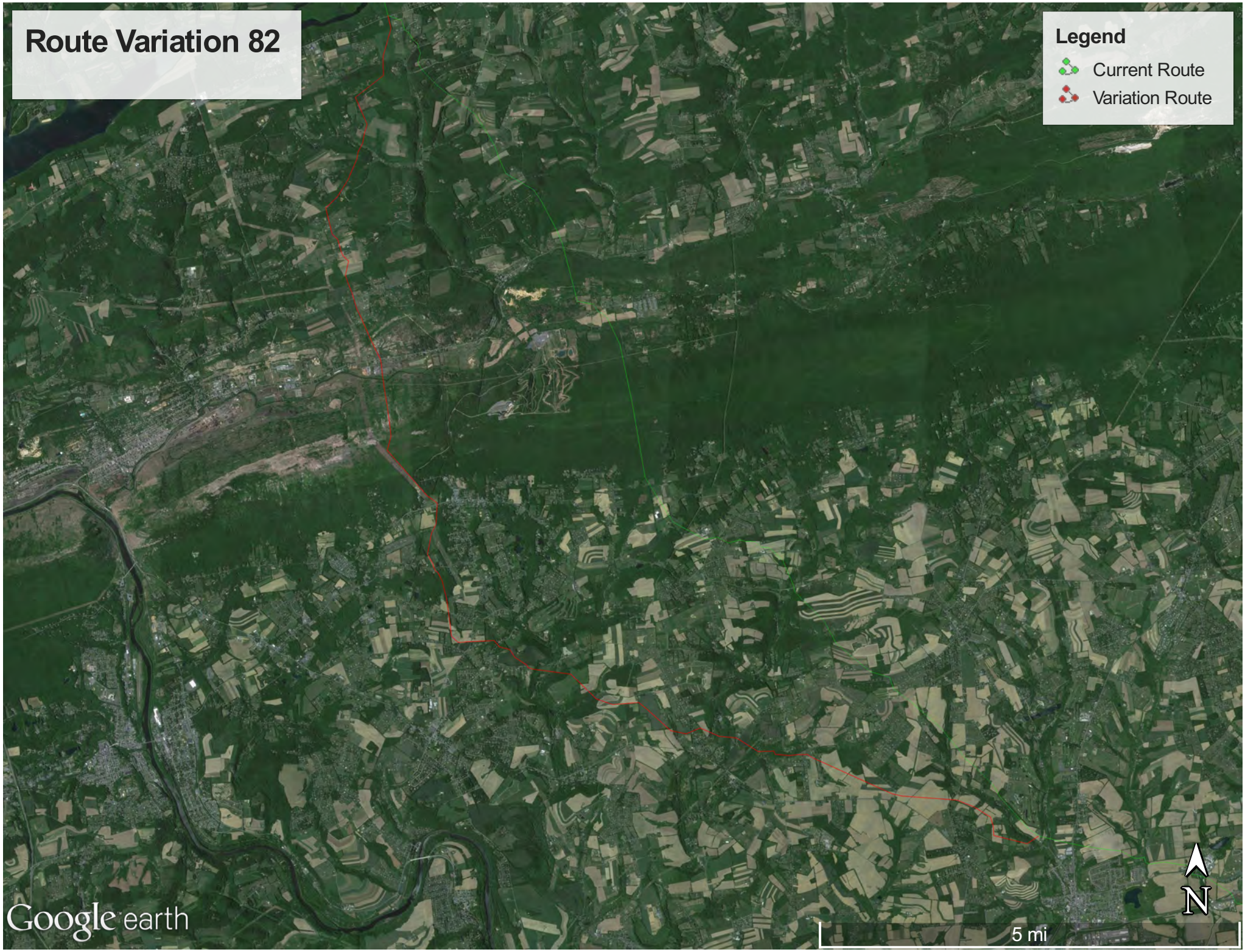
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		44.61	
End		57.83		60.59	
Length	Ft	69,802		84,368	
Area	Acres *	200.30		242.10	
Land requirements:					
Construction	Acres *	58.45		82.93	
Permanent		38.97		55.28	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.165	0.110
Forested wetlands		0.498	0.332	0.119	0.079
Total wetlands		0.498	0.332	0.284	0.189
Waterbodies / Streams affected	#	6		5	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	51.43	34.29	63.53	42.35
Forested		57.17	38.12	60.75	40.50
Open		7.62	5.08	13.56	9.04
Residential/Commercial		3.83	2.56	7.30	4.87
Open Water		0.12	0.08	0.13	0.08
Total ****		120.18	80.12	145.26	96.84
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	116		113	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 82
Legend
Current Route
Variation Route
Google earth
5 mi
N

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Appendix P-83

Route Variation No. 83

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – Appalachian Trail (Pennsylvania)
Route Variation 83 – Buckeye East Dansville

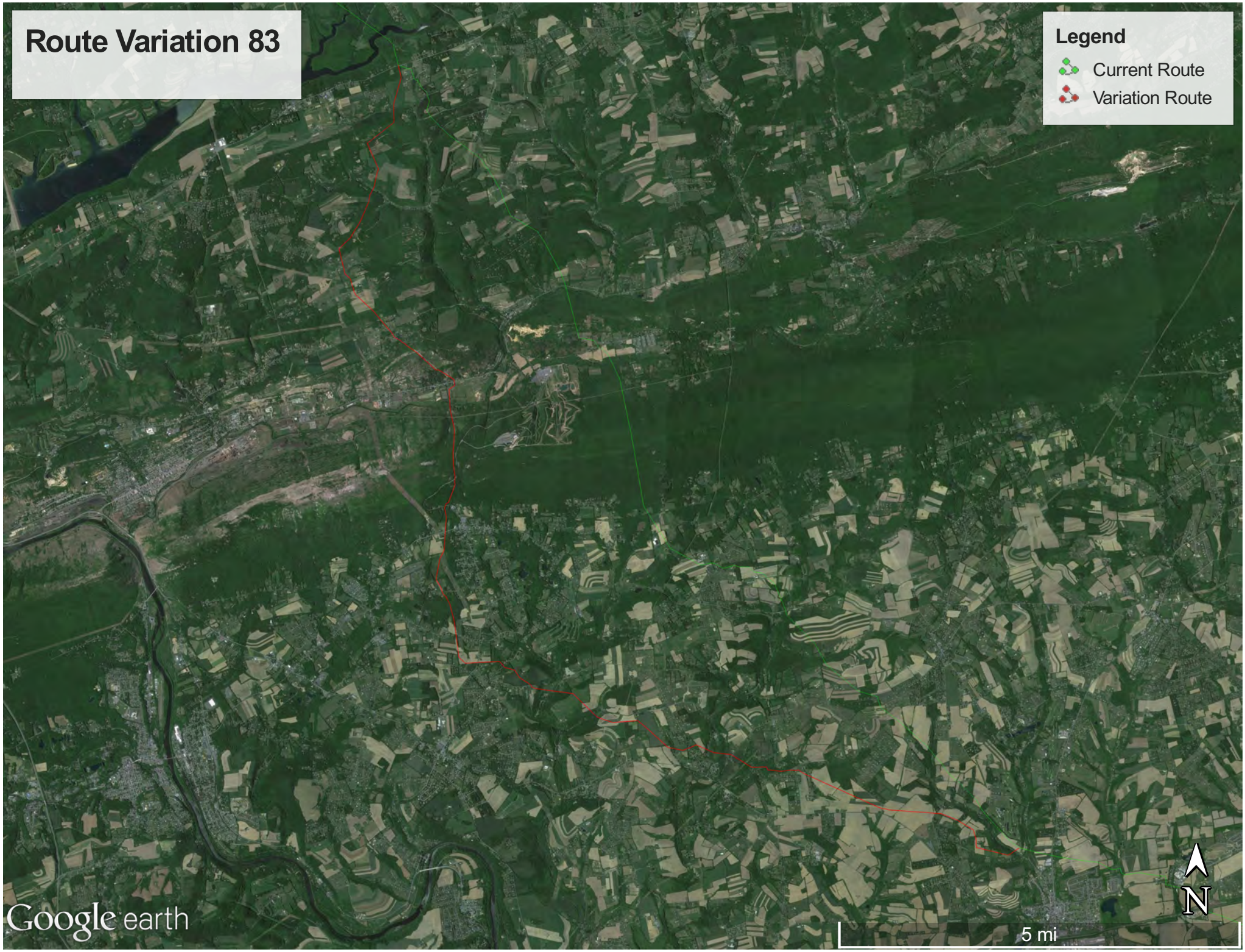
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	44.61		N/A	
End		57.83			
Length	Ft	69,802		85,957	
Area	Acres *	200.30		246.66	
Land requirements:					
Construction	Acres *	120.18		148.00	
Permanent		80.12		98.67	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.165	0.110
Forested wetlands		0.498	0.332	0.119	0.079
Total wetlands		0.498	0.332	0.284	0.189
Waterbodies / Streams affected	#	10		11	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	51.43	34.29	63.57	42.38
Forested		57.17	38.12	64.68	43.12
Open		7.62	5.08	11.45	7.64
Residential/Commercial		3.83	2.56	8.19	5.46
Open Water		0.12	0.08	0.10	0.07
Total ****		120.18	80.12	148.00	98.67
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	116		123	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 83
Legend
Current Route
Variation Route
Google earth
5 mi
N

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Appendix P-84

Route Variation No. 84

ROUTE VARIATION IMPACT TABLE
PennEast Pipeline Project
Mainline Segment – (Pennsylvania)
Route Variation 84 – Appalachian Trail – Blue Mountain

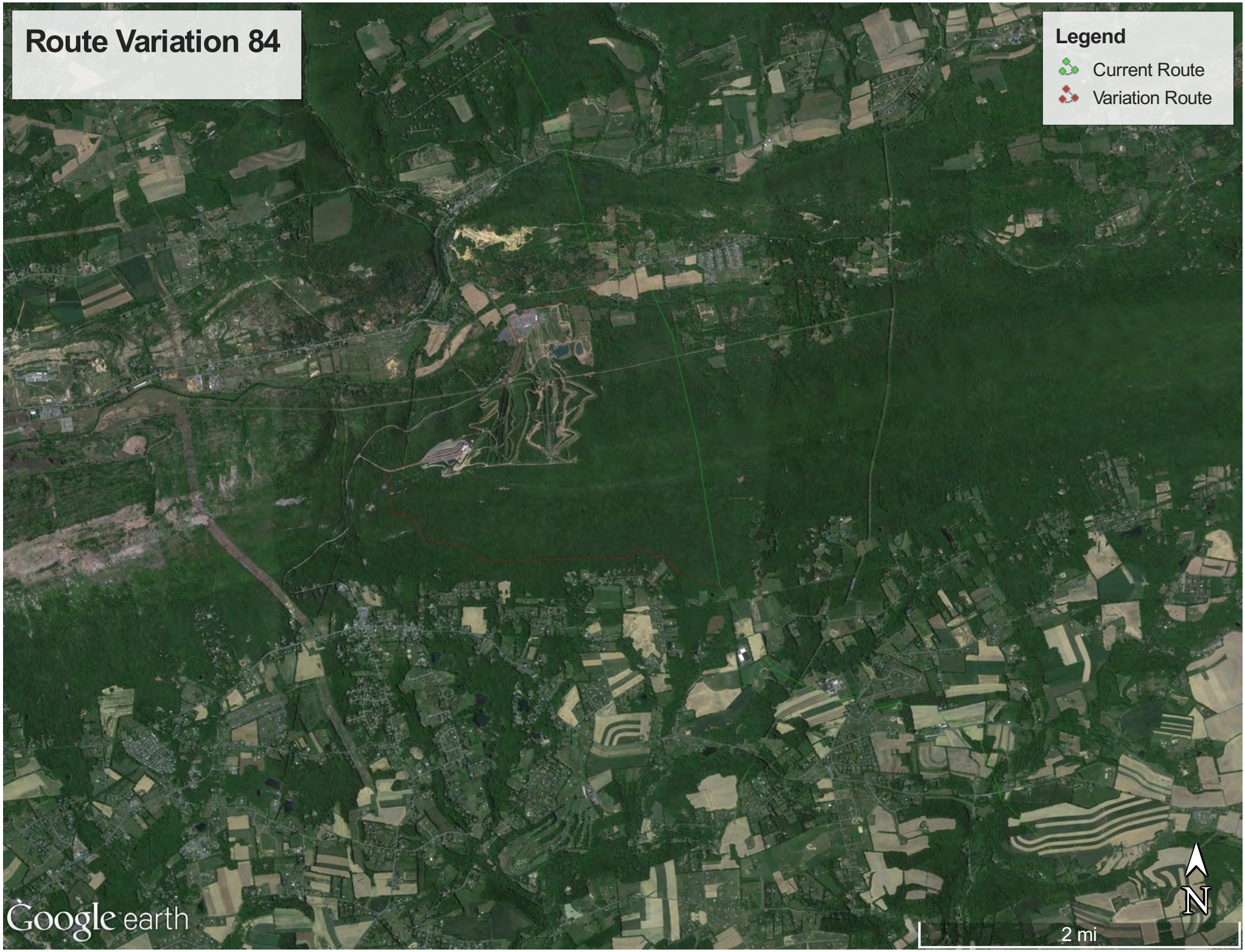
Attribute	Units	Current Route		Variation Route	
Location					
Begin	Mile Post	48.82		0.00	
End		51.20		4.69	
Length	Ft	12,566		24,783	
Area	Acres *	36.06		71.12	
Land requirements:					
Construction	Acres *	21.64		42.67	
Permanent		14.42		28.45	
Colocation:					
Power Line ROW	Ft	0		0	
Pipeline ROW		0		0	
Road / Railroad ROW		0		0	
Total colocation		0		0	
Wetlands affected:		Construction	Permanent	Construction	Permanent
Scrub-shrub wetlands	Acres/Acres **	0.0	0.0	0.0	0.0
Emergent wetlands		0.0	0.0	0.0	0.0
Forested wetlands		0.0	0.0	0.0	0.0
Total wetlands		0.0	0.0	0.0	0.0
Waterbodies / Streams affected	#	1		2	
	Name(s)	N/A		N/A	
Cultural resources sites	Number	Surveyed / 0 sites		N/A ***	
Land Use Impacts:		Construction	Permanent	Construction	Permanent
Cultivated	Acres *	2.40	1.60	0.72	0.48
Forested		17.32	11.55	29.16	19.44
Open		1.85	1.23	12.75	8.50
Residential/Commercial		0.00	0.00	0.00	0.00
Open Water		0.07	0.04	0.04	0.03
Total ****		21.64	14.42	42.67	28.45
Public / Preserved Land:		Construction	Permanent	Construction	Permanent
State Parks	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Preserved Farm Land	#	0	0	0	0
	Ft	0.0	0.0	0.0	0.0
	Acres	0.0	0.0	0.0	0.0
Structures within 50 ft of construction work area	Number				
Residences		0		0	
Commercial		0		0	
Other (Barn, Shed, etc.)		0		0	
Landowners affected	Number	9		0	

* Based on standard 100 Ft ROW widths for worst case impacts.

** Based on 75 Ft wide necked down ROW through wetlands.

** Cultural resource surveys will be conducted if route variation is agreed to be preferred.

*** Includes both upland areas and wetlands.


Route Variation 84
Legend
Current Route
Variation Route
Google earth
N
2 mi

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