Federal Energy Regulatory Commission

Office of Energy Projects

May 2016

Algonquin Gas Transmission, LLC
Maritimes & Northeast Pipeline, LLC

Docket No. CP16-9-000

ATLANTIC BRIDGE PROJECT

Environmental Assessment

Cooperating Agency:

U.S. Environmental Protection Agency

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 2
Algonquin Gas Transmission, LLC
Maritimes & Northeast Pipeline, LLC
Docket No. CP16-9-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Atlantic Bridge Project proposed by Algonquin Gas Transmission, LLC (Algonquin) and Maritimes & Northeast Pipeline, LLC (Maritimes), collectively referred to as the Applicants, in the above-referenced docket. The Applicants request authorization to expand existing pipeline systems to deliver up to 132,705 dekatherms per day of natural gas transportation service to the New England and Maritimes provinces of Canada markets.

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

The U.S. Environmental Protection Agency is a cooperating agency assisting us in the preparation of this EA because they have special expertise with respect to environmental impacts associated with the Applicants' proposals.

The proposed Atlantic Bridge Project includes the following facilities:

- 4.0 miles of 42-inch-diameter pipeline to replace existing 26-inch diameter pipeline in Westchester County, New York;
- 2.3 miles of 42-inch-diameter pipeline to replace existing 26-inch diameter pipeline in Fairfield County, Connecticut;
- a new 7,700 horsepower compressor station (Weymouth Compressor Station) in Norfolk County, Massachusetts;
- a new metering and regulating station in New London County, Connecticut;

- modifications to three existing compressor stations in Rockland County, New York and Windham and New Haven Counties, Connecticut;
- modifications to five existing metering and regulating stations and one regulator station in New York, Connecticut, Massachusetts, and Maine; and
- ancillary facilities associated with the new pipeline including mainline valves and pig launcher/receiver facilities.

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

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

Any person wishing to comment on the EA may do so. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before **June 1, 2016.**

For your convenience, there are three methods you can use to file your comments with the Commission. In all instances please reference the project docket number (CP16-9-000) with your submission. The Commission encourages electronic filing of comments and has expert staff available to assist you at 202-502-8258 or efiling@ferc.gov.

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

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

(3) You can file a paper copy of your comments by mailing them to the following address:

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

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (Title 18 Code of Federal Regulations Part 385.214).[1] Only intervenors have the right to seek rehearing of the Commission's decision. The Commission grants affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding that no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the project is available from the Commission's Office of External Affairs, at **(866) 208-FERC,** or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP16-9). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

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

[1] See the previous discussion on the methods for filing comments.

Algonquin Gas Transmission, LLC and Maritimes & Northeast Pipeline, LLC
ATLANTIC BRIDGE PROJECT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

TECHNICAL ACRONYMS

AAQS	ambient air quality standards
ACHP	Advisory Council on Historic Preservation
AIM Project	Algonquin Incremental Market Project
Algonquin	Algonquin Gas Transmission, LLC
ANE Project	Access Northeast Project
APE	area of potential effect
Applicants	Algonquin Gas Transmission, LLC and Maritimes & Northeast Pipeline, LLC, collectively
AQCR	air quality control regions
ATWS	additional temporary workspace
BDP Plan	Best Drilling Practices Plan & Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
CSL	Ceremonial Stone Landscapes
CTDEEP	Connecticut Department of Energy and Environmental Protection
CZMA	Coastal Zone Management Act
dB	decibels
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day
E&SCP	Erosion and Sediment Control Plan
EA	environmental assessment
EFH	essential fish habitat
EI	environmental inspector
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GIS	geographic information system
gpm	gallons per minute
GWP	global warming potential
HAP	hazardous air pollutant
HCA	high consequence area
HDD	horizontal directional drill
hp	horsepower
IPCC	Intergovernmental Panel on Climate Change
IPSCP	Invasive Plant Species Control Plan
Iroquois	Iroquois Gas Transmission

TECHNICAL ACRONYMS (cont'd)

L_{dn}	day-night sound level
L_{eq}	24-hour equivalent sound level
LNG	liquefied natural gas
M&R	metering and regulating
MACZM	Massachusetts Office of Coastal Zone Management
MAEEA	Massachusetts Executive Office of Energy and Environmental Affairs
MAOP	maximum allowable operating pressure
Maritimes	Maritimes & Northeast Pipeline, LLC
MassDEP	Massachusetts Department of Environmental Protection
MEFSB	Massachusetts Energy Facilities Siting Board
Memorandum	Memorandum of Understanding on Natural Gas Transportation Facilities
MEPA	Massachusetts Environmental Protection Act
MLV	mainline valve
MP	milepost
MWRA	Massachusetts Water Resource Authority
NAAQS	national ambient air quality standards
NED Project	Northeast Energy Direct Project
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NHESP	Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent to Prepare an Environmental Assessment for the Planned Atlantic Bridge Project, Request for Comments on Environmental Issue, and Notice of Public Scoping Meetings
NO_X	nitrogen oxides
NPU	Norwich Public Utilities
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise-sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NYCDEP	New York City Department of Environmental Protection
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OEP	Office of Energy Projects
PAR	permanent access road
pCI/L	picocuries per liter
PGA	peak ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PM_{10}	particulate matter less than or equal to 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PNGTS	Portland Natural Gas Transmission
Procedures	Wetland and Waterbody Construction and Mitigation Procedures

TECHNICAL ACRONYMS (cont'd)

Project	Atlantic Bridge Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
REC	Recognized Environmental Condition
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control and Countermeasure Plan/Preparedness, Prevention, and Contingency Plan for the Atlantic Bridge Project
SPL	sound pressure level
SSA	sole or principal source aquifer
SWAP	Source Water Assessment Program
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened and endangered
TAR	temporary access road
Tennessee	Tennessee Gas Pipeline Company
tpy	tons per year
Tribes	federally recognized Indian tribes
TSA	Transportation Safety Administration
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compounds

1.0 PROPOSED ACTION

1.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the potential environmental impact of the natural gas pipeline facilities proposed by Algonquin Gas Transmission, LLC (Algonquin) and Maritimes & Northeast Pipeline, LLC (Maritimes), collectively referred to as the Applicants. We[1] prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations [CFR], Parts 1500–1508 [40 CFR 1500–1508]), and the Commission's implementing regulations under 18 CFR 380.

On October 22, 2015, the Applicants filed an application in Docket No. CP16-9-000 under section 7 of the Natural Gas Act (NGA) and the certificate procedures of Part 157, Subpart F of the Commission regulations to construct, abandon, install, own, operate, and maintain expansions of its existing interstate natural gas pipeline systems in New York, Connecticut, Massachusetts, and Maine. These proposed facilities are referred to as the Atlantic Bridge Project (or Project) and are described in section 1.5.

Prior to filing their application, the Applicants participated in the Commission's pre-filing review process under Docket No. PF15-12-000.

Our principal purposes in preparing this EA are to:

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

FERC is the federal agency responsible for authorizing interstate natural gas transmission facilities under the NGA, and is the lead federal agency for the preparation of this EA in compliance with the requirements of NEPA. The U.S. Environmental Protection Agency (EPA) is a cooperating agency assisting us in the preparation of this EA because they have special expertise with respect to environmental impacts associated with the Applicants' proposals.

1.2 PROJECT PURPOSE AND NEED

The Applicants stated purpose of the Project is to eliminate capacity constraints on existing pipeline systems in New York State and New England, provide access to the growing supply areas in the Northeast region, and provide additional firm pipeline capacity needed to deliver natural gas supplies to meet the supply and load growth requirements in the Northeast market area. The Project would also facilitate south-to-north flow on the Maritimes system to provide additional gas supply to New England and the Maritime provinces of Canada. With the Project, Algonquin and Maritimes would provide a total of an additional 132,705 dekatherms per day (Dth/d) of capacity on their systems.

We received many comments during the scoping period about the purpose and need of the Project, including exporting gas to Canada. As discussed above, the Applicants are proposing to transport

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

natural gas to meet the demands for natural gas in the Northeast U.S. markets. Specifically, the Applicants are proposing to construct the Atlantic Bridge Project based on commitments from the Project shippers, which include four local distribution companies, two manufacturing companies, and a municipal utility. Under the precedent agreements, the Project shippers have primary delivery point entitlements for about 40 percent (26,426 Dth/d) of the incremental capacity at delivery points on Algonquin's system in Connecticut and Massachusetts. The remaining 60 percent (79,705 Dth/d) of capacity would be delivered to the Maritimes system at the Salem/Beverly Massachusetts interconnect.

Maritimes was issued a Presidential Permit in July 2009 which authorizes Maritimes to utilize its existing cross-border facilities to import or export natural gas between the United States and Canada. Maritimes is authorized to deliver gas into Canada, and portions of the gas associated with the Project would be delivered into Canada. Moving from the Maritimes interconnect, the 79,705 Dth/d of incremental capacity plus an additional 26,574 Dth/d of existing capacity would move north through Maritimes' system. Under Maritimes' precedent agreements, about 14,500 Dth/d of the total 106,276 Dth/d would be delivered to seven different delivery points in Maine, while 91,776 Dth/d would continue into Canada. While there are currently several proposals to export liquefied natural gas (LNG) from the United States and Canada to overseas countries, the Applicants are not constructing the Atlantic Bridge Project for this purpose. The Project customers receiving gas in Canada are industrial and commercial users of natural gas within Canada, not companies involved in the export of LNG.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

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

The environmental consequences of constructing and operating the Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impact generally occurs during construction with the resource returning to preconstruction condition immediately after or within a few months following construction. Short-term impacts could continue for up to 3 years following construction. Long-term impacts would last more than 3 years, but the affected resource would recover to preconstruction conditions during the life of the Project. A permanent impact could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project, such as the construction of aboveground facilities. An impact would be considered significant if it would result in a substantial adverse change in the physical or human environment.

We received comments requesting that we evaluate the indirect and cumulative impacts from Marcellus shale production activity. The Project does not include the production of natural gas. Similar to many past projects where this issue has been raised, the Commission has previously determined that shale gas development is not caused by the proposed action and is not reasonably foreseeable to be considered an indirect impact under NEPA. Shale development, which is regulated by the states, continues to drive the need for takeaway interstate pipeline capacity to allow the gas to reach markets. Therefore, companies are planning and building interstate transmission facilities in response to this new source of gas supply. In addition, many production facilities have already been permitted and/or constructed in the Marcellus shale region, creating a network through which natural gas may flow along various pathways to local users or the interstate pipeline system. As identified in section 2.10 of this EA, shale production facilities would not occur within the area encompassed by Project's geographic scope; therefore, the shale production facilities would not result in cumulative impacts in the project area.

Comments were also received regarding the Atlantic Bridge Project's potential relationship to the Algonquin Incremental Market (AIM) Project and Access Northeast (ANE) Project and possible improper project segmentation. The Atlantic Bridge Project is an unconnected single action that has independent utility irrespective of any other projects, including the AIM and ANE Projects. As discussed in section 1.2, the Applicants have executed precedent agreements with seven shippers who account for the entire Atlantic Bridge capacity. These are firm commitments to meet Project shippers' deliveries beginning in November 2017. Therefore, the scope of this EA is limited to the Atlantic Bridge Project. However, because of the proximity of these projects to each other, section 2.10 of this EA addresses the potential for cumulative impacts of this Project with the AIM and ANE Projects.

Additionally, improper segmentation is usually concerned with projects that have reached the proposal stage, which is not the case for the ANE Project. Algonquin has initiated the pre-filing process with FERC but have not filed an application with the Commission for the ANE Project. Rather, the ANE Project is in the development phase and Algonquin is still evaluating the potential market for the ANE Project based on interest for additional natural gas supplies in New England and/or the Canadian Maritime provinces. The AIM Project is currently under construction with an anticipated in-service date of November 2016. The entire 342,000 Dth/d capacity of the AIM Project is accounted for by precedent agreements with 10 shippers.

We received comments during the scoping period recommending that an environmental impact statement (EIS), rather than an EA, be prepared to assess the impact of the Project. An EA is a concise public document that serves to provide sufficient evidence and analysis for determining a finding of no significant impact. Pursuant to 18 CFR 380.6(b) "If the Commission believes that a proposed action…may not be a major federal action significantly affecting the quality of human environment, an EA, rather than and EIS, will be prepared first. Depending on the outcome of the EA, an EIS may or may not be prepared." In preparing this EA, we are fulfilling our obligation under NEPA to consider and disclose the environmental impacts of the Project. As noted above, this EA addresses the impacts that could occur on a wide range of resources, should the Project be approved and constructed. Based on our analysis, the extent and content of comments received during the scoping period, and considering that the Project would primarily involve take-up and relay and modifications to existing facilities, we conclude in section 4.0 that the impacts associated with this Project can be mitigated to support a finding of no significant impact. Thus, an EIS is not warranted.

1.4 PUBLIC REVIEW AND COMMENT

On January 30, 2015, the Applicants requested approval to initiate our pre-filing review process for the Project. The Commission approved the Applicants' request on February 20, 2015 in Docket No. PF15-12-000. We participated in 13 open houses sponsored by the Applicants, during the weeks of March 2, 9, 16, and 23, 2015, to explain our environmental review process to interested stakeholders. On April 27, 2015, we issued a *Notice of Intent to Prepare an Environmental Assessment for the Planned Atlantic Bridge Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI). The NOI was published in the Federal Register[2] and was sent to interested parties including federal, state, and local officials; agency representatives; conservation organizations; local libraries and newspapers; Native American groups; and property owners affected by the proposed facilities.

We conducted four public scoping meetings in the Project area to provide an opportunity for agencies and the general public to learn more about the Project and to participate in the environmental analysis by identifying issues to be addressed in the EA. Meetings were held between May 11 and May 14, 2015, in Yorktown Heights, New York; Glastonbury, Connecticut; Weymouth, Massachusetts; and

[2] See Federal Register Volume 80, Number 91 issued on May 12, 2015.

Franklin, Massachusetts. The meetings were attended by about 450 individuals, 113 of whom provided verbal comments on the Project. The transcripts of the public scoping meetings and all written scoping comments are part of the public record for the Project and are available for viewing on the FERC Internet website (http://www.ferc.gov).[3]

Following the scoping meetings, Algonquin reduced the scope of the Project to those facilities identified in section 1.5 A Supplemental NOI was issued on November 19, 2015, to provide an opportunity for affected landowners to comment on the proposed Project who were not on the original Project mailing list due to changes in scope. The Supplemental NOI was sent to the entire FERC environmental mailing list.

During the two scoping periods and throughout the preparation of the EA we received about 317 comment letters. We received 4 letters from federal agencies; 14 from state agencies and officials; 18 from local government bodies and officials; 17 from non-governmental organizations; 1 from Native American tribes; 255 comments from individuals, and 8 unique form letters.

The substantive environmental issues raised during the public scoping process are addressed in the relevant sections of this EA, as indicated in table 1.4-1.

1.5 PROPOSED FACILITIES AND LOCATION

The Applicants propose to expand their existing natural gas transmission pipeline system in New York, Connecticut, Massachusetts, and Maine. The Project would involve construction and operation of about 6.3 miles of 42-inch-diameter pipeline to replace existing 26-inch-diameter pipeline (Stony Point Discharge Take-up and Relay and Southeast Discharge Take-Up and Relay segments); construction of a new compressor station and modifications to three existing compressor stations to install an additional total of 26,500 horsepower (hp) for the Project; modifications to five existing metering and regulating (M&R) stations and one existing regulator station; and construction of one new M&R station as described below. An overview map of the Project locations and facilities is provided on figure 1.5-1. Detailed maps showing the pipeline routes and aboveground facilities are contained in appendix A.

1.5.1 Pipeline Facilities

For the Stony Point Discharge Take-up and Relay segment, Algonquin would replace about 4.0 miles of the existing 26-inch-diameter mainline pipeline in the Towns of Yorktown and Somers in Westchester County, New York with new 42-inch-diameter mainline pipeline. The replacement pipeline would begin at the existing Algonquin mainline valve (MLV) 15B (milepost [MP] 0.0) in the Town of Yorktown and end at MP 4.0 south of Route 6 and west of the Muscoot River. The new pipeline would be installed in the same location (typically the same ditch) as the existing pipeline that is removed, except for two locations in Yorktown. The first is where Algonquin would install the new pipeline across the Taconic Parkway using the horizontal directional drill (HDD) method and would acquire a 10-foot-wide permanent easement, and the second is a short segment near Willow Pond where the new pipeline would shift to minimize impacts on the pond. At both of these locations, the existing pipeline would be taken out of service (abandoned) and left in the ground as more fully described in section 1.9.1. The current maximum allowable operating pressure (MAOP) of the existing 26-inch-diameter mainline is 674 pounds per square inch gauge (psig) and the proposed MAOP of the 42-inch-diameter mainline pipeline is 850 psig.

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[3] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF15-12 and CP16-9). Select an appropriate date range.

TABLE 1.4-1

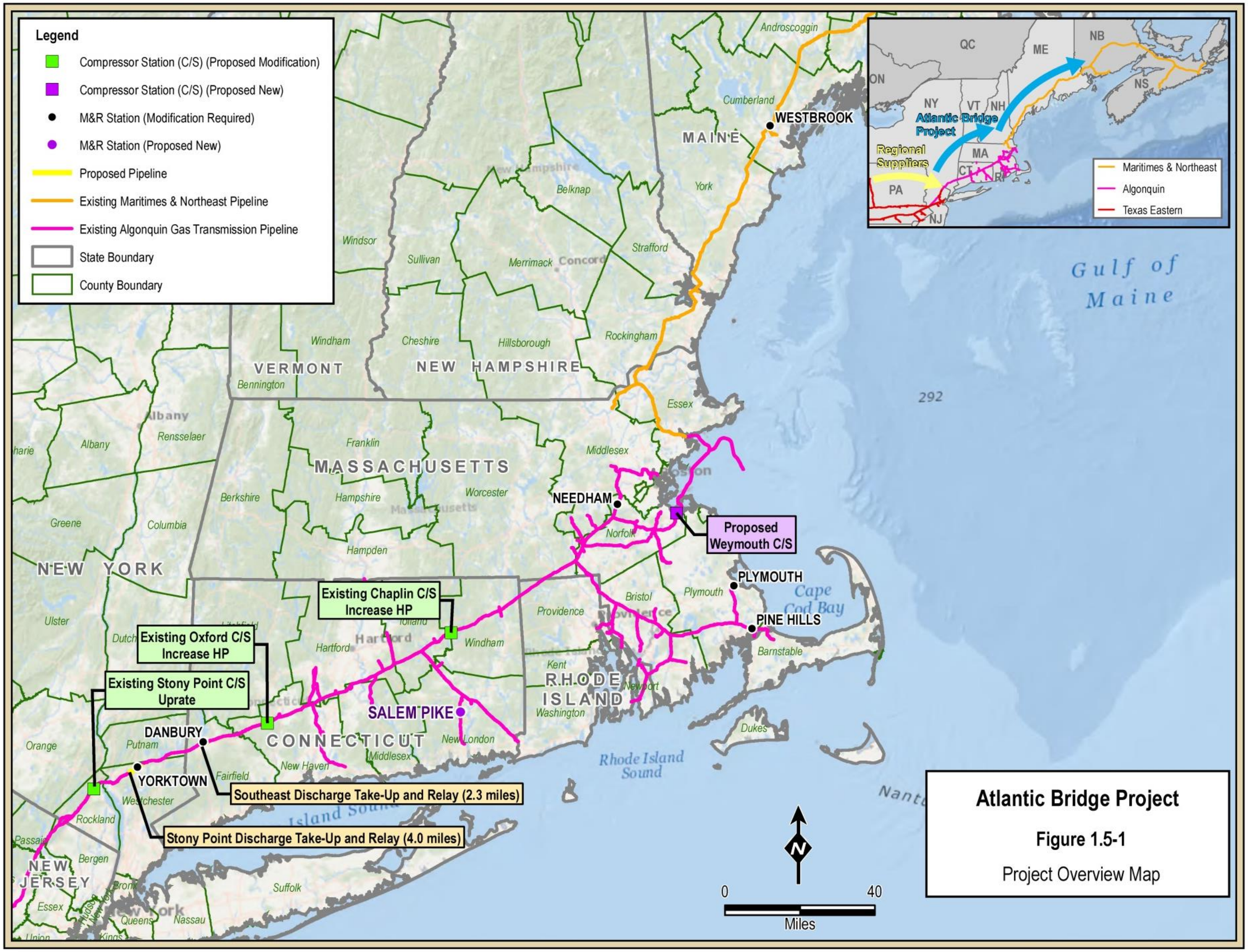
Issues Identified and Comments Received for the Atlantic Bridge Project

Issue/Specific Comment	EA Section Addressing Comment
General	
Potential for export of gas transported by the Project and the connection to any new or existing LNG facilities	1.2
Discussion of regional/local need for capacity increase provided by the Project	1.2
Project segmentation	1.3
Shale gas	1.3
Geology	
Potential impacts associated with construction on steep slopes and in areas of shallow bedrock	2.1.1
Hurricane inundation zone	2.1.1
Soils	
Soil erosion and sedimentation	2.1.2
Water Resources	
Proximity to and potential impacts on Willow Pond	2.2.2
Impacts on New York City drinking water supply and associated facilities (e.g., Catskill Aqueduct, New Croton Reservoir, Amawalk Reservoir)	2.2.2
Wetlands	
Impacts on wetlands, including dredging, filling, clearing, and cover type conversion and proposed mitigation	2.2.3
Vegetation	
Impacts on the removal of trees, including restoration/mitigation plans	2.3.1
Noxious weeds and invasive species management	2.3.1
Revegetation success and monitoring	2.3.1
Wildlife and Aquatic Resources	
Proximity to and potential impacts on Willow Pond wildlife	2.3.2
Potential wildlife impacts at the proposed Weymouth Compressor Station	2.3.2
Special Status Species	
Evaluation of potential impacts on threatened or endangered species and their habitats including rare plants and proposed avoidance and/or mitigation measures	2.3.3
Land Use	
Site-specific details for construction in areas with structures within 50 feet of the proposed construction easement	2.4.3
Impacts on residential, recreational, and special interest areas (e.g., Granite Knolls Park and Woodlands Legacy Field Park) during construction and operation	2.4.4
Visual impacts of aboveground facilities	2.4.7
Weymouth Compressor Station land use and zoning, over industrialization of proposed site	2.5.7

TABLE 1.4-1 (cont'd)

Issues Identified and Comments Received for the Atlantic Bridge Project

Issue/Specific Comment	EA Section Addressing Comment
Socioeconomics	
Local employment opportunities and increased tax revenues	2.5.1
Construction traffic impacts and access management details for areas including Maple Brook Court, Fairview Court, Katrina Drive, Tulip Drive, Maple Ridge Road and Berkshire Drive, Padanaram Road, Oak Lane Road, and East Hayestown/East Pembroke Road	2.5.4
Impacts on property values in the vicinity of the Project	2.5.5
Impacts on, and alternative public outreach methods for, Environmental Justice Communities	2.5.7
Cultural Resources	
Impacts on culturally and historically significant properties	2.6.2
Protocols for unanticipated discovery of historic properties and/or human remains during construction	2.6.3
Air Quality	
Construction air quality impacts and impacts during operation of the new and modified compressor stations	2.7.3 and 2.7.4
Greenhouse gas emissions and climate change	2.7.1
Assessment of health issues associated with radon and air quality	2.7.1, 2.7.4 and 2.7.5
Noise	
Construction noise impacts and proposed mitigation measures	2.8.2
Operational noise impacts at compressor station sites and potential over water noise impacts associated with the Weymouth Compressor Station	2.8.3
Reliability and Safety	
Safety standards and reliability associated with facilities near densely populated areas and public services (e.g., schools and hospitals)	2.9.1
Emergency response plans, evacuation plans, and coordination with community public safety services	2.9.1
Analysis of cumulative safety risk associated with proximity to existing industrial infrastructure in Weymouth	2.9.3
Cumulative Impacts	
Concern about additional impacts on ecosystems/communities already affected by existing power plants and heavy industrial activity	2.10
Request for analysis of cumulative climate impacts associated with shale gas development	2.10
Cumulative impacts associated with the approved AIM Project and the proposed ANE Project	2.10
Alternatives	
Consideration of energy conservation and renewable energy alternatives	3.1
Consideration of alternative pipeline routes and compressor station locations to avoid populated areas and sensitive resources	3.4



Atlantic Bridge Project

Figure 1.5-1

Project Overview Map

The Southeast Discharge Take-Up and Relay includes the replacement of about 2.3 miles of the existing 26-inch-diameter mainline pipeline in the City of Danbury in Fairfield County, Connecticut with new 42-inch-diameter mainline pipeline. The installation of the new 42-inch-diameter pipeline would begin at Algonquin's existing MLV 19 (MP 0.0) and end at MP 2.3 past Rockwell Road. The new pipeline would be installed in the same location (typically the same ditch) as the existing pipeline that is removed. The current MAOP of the existing 26-inch-diameter mainline is 674 psig and the proposed MAOP of the 42-inch-diameter mainline pipeline is 850 psig.

1.5.2 Aboveground Facilities

Primary aboveground facilities are described in table 1.5.2-1 and shown on the maps in appendix A. In addition to the aboveground facilities listed in table 1.5.2-1, the Project would also modify facilities at existing MLVs, and modify existing and add new pig[4] launchers and receivers. Given that all work for these MLV and pig launcher and receiver modifications and additions would occur within the permanent pipeline right-of-way and no additional workspace would be needed, these facilities are not included in table 1.5.2-1 and are considered under the impacts associated with the pipelines.

TABLE 1.5.2-1

Proposed New and Modified Aboveground Facilities for the Atlantic Bridge Project

Facility Type/Facility	County, State	Milepost [a]	Scope of Work
New Compressor Station			
Weymouth Compressor Station	Norfolk, MA	N/A	Construct a new compressor station with a gas-fired Taurus 60 (7,700 hp) compressor unit and cooling facilities; install one new natural gas-fired turbine compression fuel heater, four new natural-gas fired catalytic space heaters, and one emergency generator with a power output of 585 hp.
Existing Compressor Station Modifications			
Stony Point Compressor Station	Rockland, NY	N/A	Uprate an existing Mars 100 compressor unit to use an additional 3.300 hp of constructed but uncertified horsepower capacity; no ground-disturbing activities required.
Chaplin Compressor Station	Windham, CT	N/A	Add a Centaur 50 (6,300 hp) gas-fired compressor unit plus cooling to an existing station; replace two existing 42-parts per million (ppm) nitrogen oxides (NO_X) Taurus 60 gas-fired compressor units (6,950 hp each) with two new 9-ppm NO_X Taurus 60 gas-fired compressor units (7,700 hp each); install one new natural gas-turbine compressor fuel heater.
Oxford Compressor Station	New Haven, CT	N/A	Add a Taurus 60 (7,700 hp) gas-fired compressor units plus cooling facilities to an existing station; Install one new natural gas-fired turbine compressor fuel heater and seven new natural-gas fired catalytic space heaters.
New M&R Station			
Salem Pike M&R Station	New London, CT	N/A	Construct new M&R station to replace an existing station.
Existing M&R and Regulating Station Modifications			
Yorktown M&R Station	Westchester, NY	2.6	Install overpressure protection facilities for existing M&R station.
Danbury M&R Station	Fairfield, CT	1.0	Install overpressure protection facilities for existing M&R station.
Needham Regulator Station	Norfolk, MA	N/A	Modify an existing regulator station.
Pine Hills M&R Station	Plymouth, MA	N/A	Rebuild an existing M&R station.
Plymouth M&R Station	Plymouth, MA	N/A	Rebuild an existing M&R station.
Westbrook M&R Station	Cumberland, ME	N/A	Modify an existing M&R station.

Note: N/A = Not applicable

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

1.5.3 Route and Workspace Modifications

During our review of the initially proposed routes and workspaces and in response to scoping comments, we identified a number of locations where we believed impacts could be avoided or minimized by realigning the pipeline centerline or reconfiguring or reducing the size or location of workspaces. We asked Algonquin to re-evaluate these areas prior to filing the application. Based on our request and their own ongoing Project development, Algonquin made a number of minor changes to either the alignment or workspace, which are included as part of the proposed route evaluated throughout section 2.0. These included:

- Along the Stony Point Discharge Take Up and Relay:
  - eliminating workspace along Maple Brook Court between MPs 1.4 and 1.6 to minimize tree clearing, preserve visual screening, and minimize impacts on residences;
  - reconfiguring and narrowing the construction right-of-way between Maple Brook Court and Quinlan Street (e.g., MPs 1.8 and 2.2) to maximize the use of its existing right-of-way and increase the distance of the workspace from certain homes;
  - narrowing the workspace on the west side of Quinlan Street to avoid impacting a driveway near MP 2.2;
  - reconfiguring and reducing the workspace to minimize impacts on a residence on the west side of Katrina Drive;
  - reducing the workspace between Katrina Drive and Ichabod Court (MPs 2.9 to 3.0), east of Curry Street (MPs 3.1 to 3.5), and between MPs 3.5 and 3.9 to minimize impacts on residences and reduce tree clearing;
  - abandoning a short segment of the existing pipeline in place and realigning the new pipeline to the south to minimize impacts on Willow Pond; and
  - reducing workspace at the eastern end of the pipeline to minimize wetland impacts.
- Along the Southeast Discharge Take Up and Relay:
  - reducing the workspaces within Padanaram Road just east of MP 0.5;
  - reducing the workspace around a residence just west of MP 0.9;
  - reducing the workspace around a residence just east of MP 1.0; and
  - modifying the workspace between MPs 1.2 and 1.3 to increase the distance of work areas from condominiums and an assisted living building.

We have reviewed these minor modifications and determined that they would minimize environmental impacts, and as such we support Algonquin's incorporation of these modifications into the proposed route.

1.6 NON-JURISDICTIONAL FACILITIES

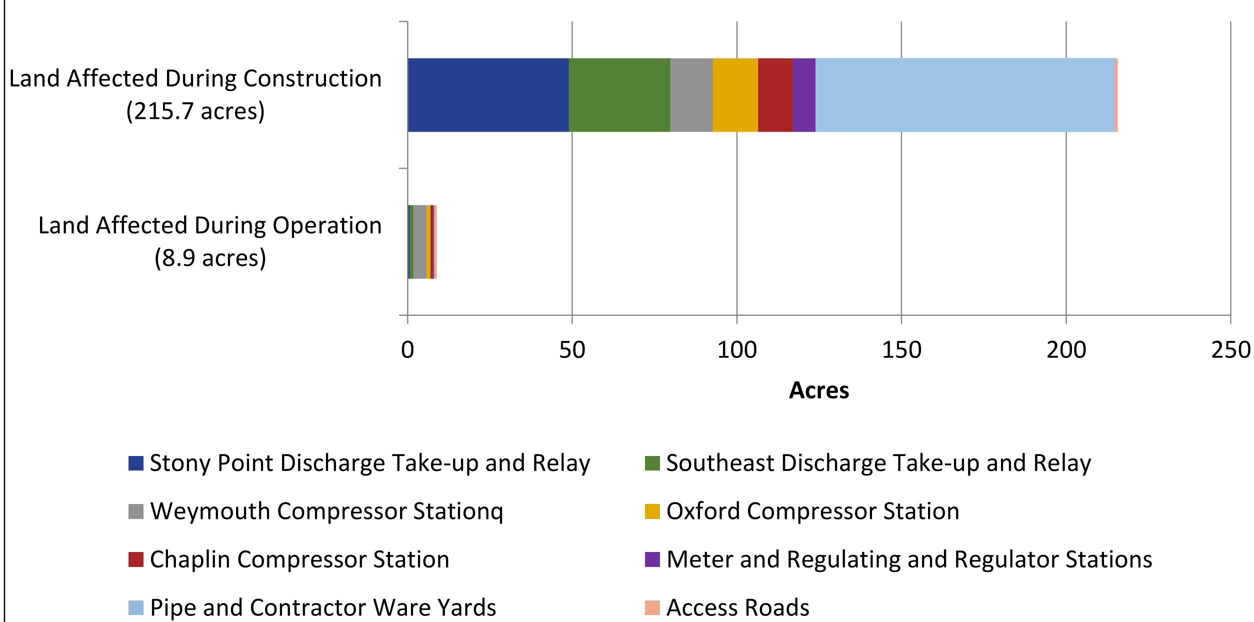
Under section 7 of the NGA and as part of its decision regarding whether or not to approve the facilities under its jurisdiction, the Commission is required to consider all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the FERC's jurisdiction. These "non-jurisdictional" facilities may be integral to the need for the proposed Project (e.g., a new or expanded power plant at the end of a pipeline that is not under the FERC's jurisdiction) or they may be merely associated as a minor, non-integral component of the jurisdictional facilities that would be constructed and operated as part of the project. We have determined that there are no non-jurisdictional facilities associated with the Project.

1.7 LAND REQUIREMENTS

Construction of the Project would affect a total of about 215.7 acres of land, including: 79.9 acres for pipeline facilities; 37.2 acres for compressor stations; 6.9 acres for M&R stations (1.3 acres for the Salem Pike M&R Station, 0.9 acres for the Yorktown M&R Station, 0.9 acre for the Danbury M&R Station, 0.3 acre for the Needham M&R Station, 1.0 acre for the Pine Hills M&R Station, 1.1 acres for the Plymouth M&R Station, and 1.4 acres for the Westbrook M&R Station); 0.9 acre for access roads; and 90.8 acres for contractor/pipe yards.

Figure 1.7-1 shows the land requirements for construction and operation of each Project facility type. Section 2.4 includes additional analysis of the existing land uses associated with the proposed workspaces. Following construction, about 206.8 acres (96 percent) of the affected land would be allowed to revert to previous conditions. The remaining 8.9 acres (4 percent) of land would be retained during operations (6.4 acres for the aboveground facilities, 1.8 acres for the maintained pipeline rights-of-way, and 0.7 acre for permanent access roads (PAR).

FIGURE 1.7-1
Land Affected During Construction and Operation of the Atlantic Bridge Project (acres)



1.7.1 Pipeline Facilities

Construction of the proposed mainline replacement portions of the Project (Stony Point Discharge Take-up and Relay and Southeast Discharge Take-up and Relay) would generally require a 100-foot-wide construction right-of-way to allow the safe passage of equipment and materials associated with construction of the 42-inch-diameter pipeline. This 100-foot right-of-way width does not include special crossing areas, such as wetlands and waterbodies, residential areas, and in-street construction or the Taconic Parkway HDD where other construction right-of-way widths would be employed. Nearly the entire 6.3 miles of the Project would be within or adjacent to existing rights-of-way, consisting of Algonquin's pipeline right-of-way and public roadways.

In addition to the construction right-of-way configurations described above, Algonquin has identified several locations where a wider construction workspace would be required due to: utility and existing pipeline cross-overs; wetland and waterbody crossings; road crossings; side slope construction; topsoil segregation requirements; extra trench depth; shallow bedrock and potential disposal of excess blast rock; and parking areas. In total, Algonquin would require 19.1 acres of additional temporary workspace (ATWS) of various dimensions.

1.7.2 Aboveground Facilities

Construction of the aboveground facilities would affect about 44.1 acres of temporary workspace, about 6.4 acres of which would be permanently maintained for operations (see figure 1.7-1). About 8.6 acres of the temporary workspace required for construction of the compressor stations would be within Algonquin's existing fenced compressor station sites. About 15.7 acres of temporary workspace within the property boundary and outside of the current existing fence lines would be required for the modifications at the Oxford and Chaplin Compressor Stations. About 12.9 acres of new property would be required for the construction of the proposed Weymouth Compressor Station. Temporary workspace areas at the existing compressor station sites include the existing developed station yards and access roads as well as some open land and wooded areas immediately surrounding the developed station site within Algonquin's property. At the Oxford and Chaplin Compressor Stations, these wooded temporary workspace areas would be cleared for use during construction and allowed to naturally revegetate following post-construction restoration. Following construction of the Oxford Compressor Station, about 1.2 acres would be added to the developed station footprint. At the Chaplin Compressor Station, the current developed station would be expanded by about 0.9 acre. These additional areas at the Oxford and Chaplin Compressor Stations would be permanently maintained and fenced for operation of the compressor stations. At the proposed Weymouth Compressor Station, of the 12.9 acres that would be used during construction, about 4.0 acres would be permanently fenced for operation of the facility. The proposed Weymouth Compressor Station site consists of open and industrial land and no tree clearing would be required.

About 6.9 acres of temporary workspace would be required for construction at the existing M&R stations (5.3 acres), existing regulator station (0.3 acres), and new M&R stations (1.3 acres) (see figure 1.7-1). At the existing M&R and regulator stations, the Applicants would use the developed station yards and in some cases adjacent pipeline rights-of-way and open land for temporary workspace. About 0.3 acre of new land would be permanently affected as part of the operation of the new Salem Pike M&R station.

None of the other proposed aboveground facilities would require additional land for construction or operation. The acreage for these facilities is included in the acreage associated with the pipeline facilities, compressor stations, or M&R stations.

1.7.3 Pipe and Contractor Ware Yards

Seven pipe and contractor ware yards in Connecticut and New York would be used on a temporary basis during construction of the Project. These yards would be used by the contractor and/or Algonquin to stage personnel, equipment, new pipe, and other materials necessary for construction of the facilities, and could include contractor trailers, construction equipment, fuel/lubricant storage, and vehicle parking. Table 1.7.3-1 presents the land requirements for the currently identified pipe and contractor ware yards for the Project. The locations of these pipe yard sites are shown on the maps provided in appendix B. Upon completion of construction, the yards would be restored to preconstruction conditions to the extent practicable and allowed to revert to previous land uses.

TABLE 1.7.3-1

Pipe and Contractor Ware Yards for the Atlantic Bridge Project

Yard Name	State	Location	Size (acres)	Existing Land Use
LMC Contractor Yard	New York	9731 Foster Wheeler Road, Dansville, NY	32.5	Industrial storage yard / AIM contractor yard
Global Foundries Construction Yard	New York	2529 Rte. 52, Hopewell Junction, NY	16.8	Industrial parking lot / AIM contractor yard
Hudson East Contractor Yard	New York	2071 Albany Post Road, Montrose, NY	6.9	Industrial storage yard / AIM contractor yard
Westchester County Contractor Yard	New York	Rte. 35/202, Yorktown Heights, NY	2.1	Industrial storage yard
Mill Plain Road Contractor Yard	Connecticut	95 Mill Plain Road, Danbury, CT	1.5	Industrial storage yard / AIM contractor yard
Algonquin Cheshire Pipe Yard	Connecticut	250 East Johnson Ave, Cheshire, CT	21.0	AIM pipe yard
Cromwell Contractor Yard	Connecticut	County Line Road, Cromwell, CT	10.0	Inactive agricultural field / AIM contractor yard
Project Total			**90.8**	

1.7.4 Access Roads

To the extent feasible, existing public and private roads would be used as the primary means of accessing pipeline rights-of-way and aboveground facilities. In addition to the existing access available from public roads, Algonquin has identified one temporary access road (TAR) and four permanent access roads (PARs) that would be used for the Project. The TAR is a dirt access road which would be used during construction of the Project and would temporarily impact about 0.2 acres of land for road upgrades and improvements. Three of the four PARs are existing, gravel roads that would require minor upgrades and/or widening (by between 10 and 20 feet) to be used during pipeline construction and operation. These upgrades would result in about 0.7 acre of new land disturbance. The fourth PAR (PAR 3.4) would be a new road that Algonquin would need to construct from the end of Campfire Road to the Stony Point Take-up and Relay pipeline right-of-way. This new PAR would permanently disturb 0.03 acre of land. Table 1.7.4-1 identifies the locations of new and existing access roads associated with the Project.

TABLE 1.7.4-1

Proposed Access Roads for the Atlantic Bridge Project

Access Road I.D.	Municipality, State	Approx. Milepost	Use (Perm. or Temp.)	Existing Road Description	Approx. Road Length (feet)	Acreage of Disturbance for Upgraded Road (acres)
PIPELINE FACILITIES						
Stony Point Discharge Take-up and Relay						
TAR 1.9	Yorktown, NY	1.9	Temporary	Dirt access road	430	0.2
PAR 3.4	Yorktown, NY	3.4	Permanent	N/A – New road extending off existing paved road	65	<0.1
PAR 4.0	Somers, NY	4.0	Permanent	Gravel access road	765	0.4
PAR 4.0A	Somers, NY	4.0	Permanent	Gravel access road	345	0.2
Southeast Discharge Take-up and Relay						
PAR 2.2	Danbury, CT	2.2	Permanent	Gravel access road	600	0.1
Project Total					**2,205**	**0.9**

1.8 CONSTRUCTION SCHEDULE AND WORKFORCE

Construction of the Project pipeline facilities, new compressor station, new M&R station, and modifications to the Applicants' existing compressor and M&R stations would occur over a 1-year period. If approved, construction would begin with tree clearing, which the Applicants propose to start in the first quarter of 2017. The facilities would be completed and placed into service in November 2017. Table 1.8-1 provides the Applicants' preliminary construction schedule. While construction of the Project would last about 1 year, pipeline construction would be spread over the length of the Project and would not be continuous in any one area for the entire year. Due to the assembly line method of construction, activities in any one area would typically last from several weeks to several months. Work at the aboveground facility sites would be less intermittent and typically would occur over a longer period of time.

1.9 CONSTRUCTION PROCEDURES

The Project would be designed, constructed, operated, and maintained to conform to, or exceed, the minimum federal safety standard requirements of the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA) in 49 CFR 192.[5] These regulations are intended to ensure adequate protection for the public. Among other design standards, Part 192 specifies pipeline material and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

[5] Pipe design regulations for steel pipe are contained in subpart C, Part 192. Section 192.105 contains a design formula for the pipeline's design pressure. Sections 192.107 through 192.115 contain the components of the design formula, including yield strength, wall thickness, design factor, longitudinal joint factor, and temperature derating factor, which are adjusted according to the project design conditions, such as pipe manufacturing specifications, steel specifications, class location, and operating conditions. Pipeline operating regulations are contained in subpart L, Part 192.

TABLE 1.8-1

Preliminary Construction Schedule for the Atlantic Bridge Project

Project Facility	Start	Finish	Approximate Length (miles)	Estimated Peak Number of Construction Personnel
Pipeline Facilities				
Stony Point Discharge Take-Up and Relay [a]	March 2017	October 2017	4.0	130
Taconic Parkway HDD [b]	December 2016	May 2017	0.6	82
Southeast Discharge Take-Up and Relay [a]	March 2017	October 2017	2.3	134
Aboveground Facilities [c]				
Oxford Compressor Station	March 2017	October 2017	N/A	110
Chaplin Compressor Station	March 2017	October 2017	N/A	110
Weymouth Compressor Station	March 2017	October 2017	N/A	110
Salem Pike M&R Station	March 2017	October 2017	N/A	11
Yorktown M&R Station	March 2017	October 2017	N/A	6
Danbury M&R Station	March 2017	October 2017	N/A	11
Needham Regulator Station	March 2017	October 2017	N/A	8
Pine Hills M&R Station	March 2017	October 2017	N/A	20
Plymouth M&R Station	March 2017	October 2017	N/A	12
Westbrook M&R Station	March 2017	October 2017	N/A	8

a Pipeline construction would start in March 2017, however, winter clearing would start in November 2016 to address clearing restrictions for Indiana bats and northern long-eared bats

b The length shown for the HDD is also included in the total length shown for the Stony Point Discharge Take-up and Relay

c No physical construction is required at the Stony Point Compressor Station, not included in schedule

To reduce construction impacts, the Applicants would implement the Project-specific Erosion and Sediment Control Plan (E&SCP).[6] The E&SCP is based on the mitigation measures contained in FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and FERC's Wetland and Waterbody Construction and Mitigation Procedures (Procedures),[7] as well as guidelines from the U.S. Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service (FWS). We reviewed the E&SCP and have determined that the Applicants' adherence to the requirements in the E&SCP would reduce the impacts of the Project. As indicated in sections 2.2.2 and 2.2.3, Algonquin has proposed the use of several ATWSs that would require alternative measures from the FERC Procedures. The E&SCP is further discussed in sections 2.1.2 and 2.2.2.

To avoid or minimize the potential for harmful spills and leaks during construction, the Applicants developed a Spill Prevention, Control and Countermeasure Plan/Preparedness, Prevention, and Contingency Plan for the Atlantic Bridge Project (SPCC Plan).[8] The SPCC Plan describes spill and leak

6 The Applicants' E&SCP was included as appendix 1B to Resource Report 1 in its October 22, 2015 application (Accession No. 20151022-5282). The E&SCP can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

7 The FERC Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/plan.pdf. The FERC Procedures can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/procedures.pdf.

8 The Applicants' SPCC Plan was provided as part of the October 22, 2015 application (Accession No. 20151022-5282). The SPCC Plan can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

preparedness and prevention practices, procedures for emergency preparedness and incident response, and training requirements. Additional discussion of the SPCC Plan is presented in section 2.2.2.

1.9.1 Pipeline Facilities

Same Ditch Replacement (Take-up and Relay) Construction Sequence

The majority of the proposed pipeline segments would be constructed using the take-up and relay construction method. Take-up and relay pipeline construction consists of specific activities that make up a linear construction sequence (see figure 1.9.1-1).

Surveying and Staking

Algonquin would notify affected landowners before initiating preconstruction surveys. A crew would then survey and stake the outside limits of the construction work areas, centerline location of the pipeline, road crossings, and any ATWS, such as lay down areas or stream crossings. The "One Call" system of each state would be contacted and underground utilities (e.g., cables, conduits, and pipelines) would be located and flagged.

Clearing Operations

Algonquin's utilization of its existing pipeline right-of-way and other industrial and commercial sites would minimize the amount of clearing required for the Project. The primary clearing work for the Project would occur in the temporary construction workspace beyond Algonquin's existing maintained right-of-way. The limits of clearing would be identified and flagged in the field before beginning any clearing operations. Initial clearing operations would include the removal of vegetation either by mechanical or hand cutting methods. In wetlands, trees and brush would either be cut with rubber-tired and/or tracked equipment, or hand-cut. Unless grading is required for safety reasons, wetland vegetation would be cut at ground level, leaving existing root systems intact, and the aboveground vegetation would be removed from the wetlands for chipping or disposal. In uplands, tree stumps and rootstock would be left in the temporary workspace, wherever possible, to encourage natural revegetation. Any stumps that are dug up would be removed from the right-of-way and transported to state-approved disposal locations. Brush and tree limbs would be chipped and removed from the right-of-way for approved disposal.

Right-of-Way and Temporary Construction Workspace Grading

Algonquin would rough grade the entire width of the construction right-of-way, including the temporary construction workspace, as necessary, to allow for safe passage of equipment and to prepare a work surface for pipeline installation activities. Typically, bulldozers would grade the right-of-way; however, backhoes used in conjunction with bulldozers would remove boulders and tree stumps, where required. Algonquin would maintain a travel lane or implement traffic control to allow for the passage of daily traffic.

The proposed replacement pipeline facilities cross numerous residential properties. At these locations, Algonquin would strip and stockpile topsoil separately from the subsoil during grading. There may be some areas where the construction right-of-way is limited and topsoil would need to be stockpiled off site. Topsoil would be replaced with appropriate imported material as required. Algonquin would minimize mixing of topsoil with subsoil by using topsoil segregation construction methods in active agricultural lands and wetlands (except when standing water or saturated soils are present).

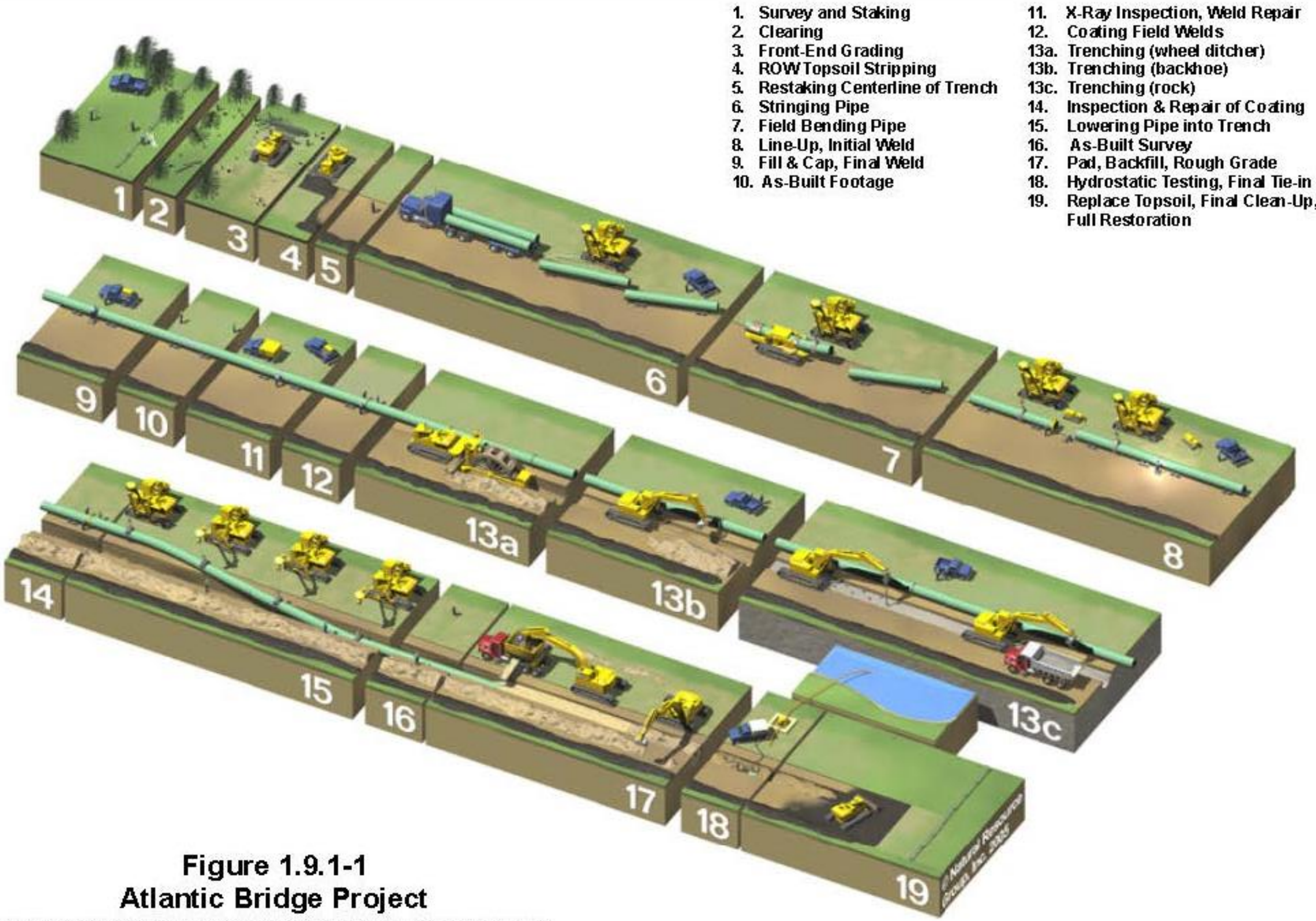


Figure 1.9.1-1
Atlantic Bridge Project
Typical Pipeline Construction Sequence

Trench Excavation and Rock Removal

Algonquin would excavate a trench with a backhoe to allow for the burial of the pipe. Algonquin would place the excavated material next to the trench, in approved ATWS, or would truck the material off site to avoid unnecessary movement of machinery across the terrain. Dewatering of the pipeline trench may be required in areas with a high water table or after heavy rains. Algonquin would discharge trench water in accordance with the Project's E&SCP and all applicable permits to prevent heavily silt-laden water from flowing into nearby waterbodies.

Given the presence of surface rock in portions of the Project area, it is anticipated that rock removal would be required during construction of the Project. Algonquin would remove rock encountered during trenching using one of the techniques listed below. The technique selected would depend on the relative hardness, fracture susceptibility, and expected volume of the material. Techniques include:

- conventional excavation with a backhoe;
- ripping with a bulldozer followed by backhoe excavation;
- hammering with a pointed backhoe attachment followed by backhoe excavation; or
- a combination of drilling holes to weaken the rock and hammering or ripping to fragment the rock.

If it is determined that the bedrock cannot be removed by conventional techniques, blasting would be conducted to loosen the rock and allow for its excavation. Any blasting that is required would be conducted in accordance with the Applicants' Rock Removal Plan (see appendix C), as well as applicable state blasting codes and any local blasting requirements. Rock removal and blasting are further discussed in section 2.1.1.

Remove Existing Pipeline and Re-Excavate Trench

Algonquin would transport the removed pipe away from the construction work area and dispose of it properly. After the existing pipe is removed, Algonquin would re-excavate the trench (wider and deeper as appropriate) to accommodate the new, larger diameter pipeline, and then install the replacement pipe. In two locations along the Stony Point Discharge Take-up and Relay (Taconic Parkway HDD and Willow Pond) the existing 26-inch-diameter pipeline would be abandoned in place by capping and filling it with appropriate material and the new pipeline would be installed in a separate trench or location.

Pipe Stringing, Bending, and Welding

Once the trench is excavated, Algonquin would string the pipe along the trench. Stringing involves hauling the pipe by tractor-trailer from the pipe storage yard to the right-of-way; off-loading the pipe from the trucks; and placing it next to the trench using side-boom tractors. Once the sections of pipe have been placed on the right-of-way, Algonquin would bend the pipe as necessary to fit the horizontal and vertical contours of the excavated trench.

After bending, the individual joints of pipe would be lined up end-to-end and welded together by professional welders that have been qualified according to applicable industry standards and Algonquin's requirements. An independent certified Non Destruction Test technician would inspect each weld to ensure its structural integrity is consistent with 49 CFR 192 of PHMSA's regulations. Any welds that do not meet PHMSA's and Algonquin's specifications would be repaired or replaced and re-inspected.

Algonquin would coat the pipeline to prevent corrosion. The individual pipe joints would be coated (usually with a heat-applied epoxy) at a coating mill prior to being delivered to the Project area. After welding, the weld area would be field coated by a coating crew. The coating would then be inspected to ensure there are no locations on the pipeline with a defect in the coating.

Lowering-in, Tie-Ins, and Backfilling

After a pipe string is coated and inspected, Algonquin would clear the trench of loose rock and debris and a lowering-in crew would place the pipeline in the trench, usually with side-boom tractors. Once the sections of pipe are lowered-in, a tie-in crew would make any final welds to connect the new pipeline with existing infrastructure.

Algonquin would redeposit all suitable material excavated during trenching back to the trench. If some of the excavated material is unsuitable for backfilling, additional select fill may be imported. Before the completion of backfilling, Algonquin would install a 24-inch-wide bright yellow warning tape 12 inches below the surface. This tape would have a warning notice indicating the presence of a high-pressure natural gas pipeline below and would provide Algonquin's toll free number for contact. Backfilling would be completed following the installation of the warning tape. The top of the trench may be slightly crowned in some areas to compensate for future settling. Algonquin would restore any topsoil that was segregated by spreading it across the graded construction right-of-way. Algonquin would also inspect the soil for compaction, and till or scarify the soil as necessary.

Cleaning and Hydrostatic Testing

When the pipeline tie-ins are completed, Algonquin would clean the internal surfaces of the pipeline with pipeline "pigs." Algonquin would install a manifold on one end of the long pipeline section and propel a pig with compressed air through the pipeline into a pig catcher at the other end of the pipeline section to remove any dirt, water, or debris that may have inadvertently collected within the pipeline during installation.

After cleaning, Algonquin would pressure test the pipeline facilities in accordance with PHMSA requirements to ensure that it is capable of operating safely at the intended design pressure. Algonquin would conduct hydrostatic testing in accordance with applicable permits, and no chemicals would be added to the test water. See section 2.2.2 for a discussion on water source(s) and quantities that would be required to hydrostatically test each of the Project facilities. At the completion of the hydrostatic test, Algonquin would discharge water from the test section using pigs propelled by compressed air. All hydrostatic test water would be discharged within suitable vegetated upland areas in accordance with state and federal permits and the Applicants' E&SCP.

Cleanup and Restoration

Algonquin would complete final cleanup (including final grading) and installation of permanent erosion control measures within 20 days after the trench is backfilled, weather and soil conditions permitting. In conjunction with backfilling operations, Algonquin would remove any woody material and construction debris from the right-of-way. Permanent slope breakers or diversion berms would be constructed and maintained in accordance with the Applicants' E&SCP. Algonquin would restore or repair fences, sidewalks, driveways, stone walls, and other structures as necessary.

Algonquin would complete revegetation in accordance with state and municipal requirements (where applicable) and written recommendations on seeding mixes, rates, and dates obtained from the local soil conservation authority or other duly authorized agency and in accordance with the Applicants'

E&SCP. Algonquin would seed the right-of-way within 6 working days following final grading, weather and soil conditions permitting. Alternative seed mixes specifically requested by the landowner or required by agencies may be used. Any soil disturbance that occurs outside the permanent seeding season or any bare soil that has not been stabilized by vegetation would be mulched, and then reseeded during the appropriate seeding season in accordance with the Applicants' E&SCP.

Special Construction Procedures

Abandonment In Place Construction Method

For the sections of pipe that would be abandoned in place at the Taconic Parkway crossing and Willow Pond area, Algonquin would first inspect the pipe for free flowing liquids. Any free flowing liquids that are found would be removed and disposed of in accordance with federal and state requirements. Algonquin would then take wipe samples at each end of the pipeline segment to check for residual polychlorinated biphenyls. After that, they would cap each end of the pipeline segment using a steel plate with a threaded fitting and fill the pipe with cement grout. Each end would then be permanently closed using threaded plugs. Algonquin would continue to maintain the existing right-of-way in areas where the pipeline is being abandoned in place.

Road Crossing Construction Methods

Algonquin would conduct construction across public and private roadways (with the exception of the Taconic Parkway) using either a conventional open-cut, bored crossing, cased crossing, or hammer technique, depending on-site conditions and permit requirements. All crossings would be conducted in accordance with local, state, and federal requirements. Algonquin would schedule the work within roadways and specific crossings to minimize impacts on commuter traffic. Traffic management and signs would be set up as needed and safety measures would be deployed in compliance with applicable permits for work in the public roadway. Algonquin would coordinate with landowners regarding the crossing of private roadways to minimize access impacts. See section 2.5.4 for additional information on traffic management and access management.

The open-cut road crossing technique would require traffic to be rerouted around the open trench during the installation of the pipe. Algonquin would install the pipeline crossing one lane at a time, leaving at least one lane open to traffic as the pipe is installed. Alternatively, Algonquin would detour traffic around the work area through the use of adjacent roadways. If the road is paved, Algonquin would cut, remove, and properly dispose of the pavement located over the proposed trench. Then the trench would be excavated, the pipe installed, and the trench backfilled. Open trenches would either be backfilled or covered with steel plates during non-working hours. Algonquin would keep steel plates on site at each crossing so that a temporary crossing could be made across the trench as required (e.g., emergency vehicles). After the trench is backfilled, Algonquin would install and maintain a temporary patch over the excavated area. Final paving of the affected roadways would be completed later in accordance with applicable state and municipal requirements.

On roads with higher traffic densities where service must be maintained, Algonquin may install the pipeline by boring a hole under the road. Boring minimizes the potential for trench settlement and would allow the road to remain in service while the installation process takes place. Once the bore is completed, the pipeline section would be welded onto the boring pipe and pulled into place as the boring pipe is removed. Any voids between the pipeline and the surrounding subsoil would be filled with grout (a sand-cement mix) to prevent settlement of the road surface.

Algonquin would use the cased crossing method when required by permit or when there is a likelihood of encountering rock during boring. The cased crossing method is similar to the bored crossing method, but it requires a section of steel casing pipe (larger than the 42-inch-diameter pipeline) to be bored into place. Following the installation of the casing pipe, Algonquin would pull the 42-inch-diameter pipeline through the casing. Algonquin would then insulate the pipeline from the casing pipe to prevent corrosion and seal the casing with rubber or polyethylene seals to prevent water from entering the casing.

The hammer technique would involve driving a casing pipe that is slightly larger in diameter than the proposed pipeline under the roadway with an air-operated reciprocating hammer. Once in place, Algonquin would auger out and remove any material inside the casing, and then install the pipe through the casing. The casing pipe would then be removed and grout would be injected around the pipeline.

In-street Construction Methods

In addition to road crossings, portions of the Stony Point Discharge Take-up and Relay and the Southeast Discharge Take-up and Relay would be constructed within or along existing roadways. Algonquin has developed Traffic Management and Access Management plans for the New York, Connecticut, and Massachusetts portions of the Project, which provide additional detail on in-street construction methods.[9] These plans are discussed in more detail in section 2.5.4**.** Algonquin would obtain road opening permits from Yorktown and the City of Danbury before conducting work in these roadways.

Prior to conducting in-street construction, Algonquin would install traffic control devices and detour traffic around the construction area. The workspace along any street would be limited to the areas designated in applicable road opening permits, and this work area would move along the street as construction advances. Algonquin would cut, remove, and properly dispose of the pavement over the proposed trench. Algonquin would then excavate the trench ahead of pipe installation to confirm the location of the existing utilities that would have to be crossed and to allow the pipeline contractor to make vertical or horizontal adjustments in the alignment of the pipeline to avoid these utilities. After the pipeline is installed, Algonquin would backfill the trench with suitable material. No trench would be left unprotected overnight. Any trench that Algonquin has not backfilled by the end of the day would be plated to ensure public safety.

The material and methods that are used to backfill the pipeline would comply with the requirements of the permitting agency. Any excess spoils from the trench would be transported to a designated staging area(s) or workspace along the route where it would be temporarily stockpiled on an impervious surface and kept covered while soil management options are assessed. Algonquin would sample and evaluate the stockpiled soil to determine the proper receiving facility for the material. Algonquin would then properly document and transport the materials to the appropriate receiving facility in accordance with federal and state regulations.

After the in-street trench is backfilled, Algonquin would install and maintain a temporary patch in the excavated area. Final paving of existing roadways would be completed later in accordance with applicable state and municipal requirements. With appropriate approvals, the final curb to curb paving of the roadways may be deferred until the year following pipeline construction to allow for potential

[9] The Applicants' original Access Management and Traffic Management Plans were included as appendices 5A and 5B to Resource Report 5 in its October 22, 2015 application (Accession No. 20151022-5282). In response to our request for additional detail, the Applicants filed revised Access Management and Traffic Management Plans for selected areas. These revised plans were included in Appendix A of the Applicants' February 25, 2016 Supplemental Information filing. These plans can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field for the original plans and enter 20160225-5221 in the "Numbers: Accession Number" field for the revised plans.

settlement of the ditch line in the road surface. Roadway markings and striping would be added as necessary. As required by PHMSA, Algonquin would place pipeline markers adjacent to local roadways and install decals on paved areas to identify the presence of the pipeline below the surface of the pavement.

Residential and Commercial Areas Construction Methods

Construction in commercial/industrial areas and high-density residential areas would be accomplished by conventional construction methods, or by implementing specialized construction methods such as the drag-section or stove-pipe methods. Algonquin would use these specialized methods to reduce the amount of workspace and duration of construction activity in the immediate vicinity of commercial and high-density residential areas.

The drag-section method would involve welding together several sections of pipe into a prefabricated segment. Simultaneously or shortly after, Algonquin would dig a trench similar in length to the prefabricated segment. Algonquin would then install the prefabricated pipe segment or drag section and covered it with backfill prior to excavation of the next trench segment. The stove-pipe method would involve trenching, installation, and backfilling of the trench one pipe section (either 40 or 80 feet) at a time. Both specialized construction methods would minimize the length of time the trench is left open.

Residential properties and other structures within 50 feet of construction work areas are discussed in section 2.4.3 Algonquin would undertake efforts in residential areas to minimize neighborhood and traffic disruption and to control noise and dust to the extent practicable. A discussion of these efforts and mitigation measures is also presented in section 2.4.3.

Waterbody Construction Methods

Algonquin would cross waterbodies using open-cut, dam-and-pump, or flume crossings methods depending on-site conditions. All waterbody crossings would be completed in accordance with the methods and timing restrictions described in their E&SCP and state and federal permit requirements. The proposed waterbody crossing methods for each waterbody that would be affected by the project are provided in table 2.2.2-1 and are described in more detail in the Applicants' E&SCP.

ATWS would be located at least 50 feet from the edge of the waterbody except in the 16 instances where this is not feasible (e.g., in areas with saturated soils, HDD crossing, road crossings). In these instances, Algonquin has requested variances to the FERC Procedures which would allow for a setback of less than 50 feet. Table 2.2.2-3 identifies these locations and the rational for the proposed variance. We have reviewed these locations and Algonquin's justifications and find them acceptable. A discussion of these locations and Algonquin's justifications for reduced setbacks in these areas in included in section 2.2.2.

Algonquin would use the open-cut crossing method when there is no perceptible flow at the time of construction. This method would involve excavation of the pipeline trench across the waterbody, installation of the pipeline, and backfilling of the trench with no effort to isolate the stream from construction activities. Use of the open-cut crossing method on any waterbodies would be confirmed during the federal and state permitting processes. Algonquin would excavate and backfill the trench using backhoes or other excavation equipment working from the banks of the waterbody. Trench spoil would be stored at least 10 feet from the banks (topographic conditions permitting). A section of pipe long enough to span the entire crossing would be fabricated on one bank and either pulled across the bottom to the opposite bank, floated across the stream if there is standing water, or carried into place and submerged into the trench. Algonquin would then backfill the trench, restore the bed, and stabilize the banks of the watercourse. Sediment barriers, such as silt fencing, staked straw bales, or trench plugs would be installed to prevent spoil and sediment-laden water from entering the waterbody from adjacent upland areas.

Algonquin would use either the flume or dam and pump crossing method when flow is present at the time of construction. A discussion of these dry crossing methods and potential associated impacts is presented in section 2.2.2.

Wetland Construction Methods

Wetland crossings would be accomplished in accordance with the Applicants' E&SCP, which is consistent with the FERC Procedures. See section 2.2.3 for additional discussion.

Construction equipment operating in wetland areas would be limited to that needed to clear the right-of-way, dig the trench, install the pipeline, backfill the trench, and restore the right-of-way. Prior to initiating work in wetlands, Algonquin would delineate and mark the wetland boundaries. Algonquin would install temporary erosion control devices as necessary after initial disturbance of wetlands or adjacent upland areas to prevent the flow of sediment into wetlands and beyond the proposed work areas. These devices would be maintained until revegetation of wetlands is complete. Algonquin would install trench plugs at the wetland boundaries as needed to maintain hydrology. Algonquin would strip the top 12 inches of wetland soil from the area directly over the trench line (except in areas of standing water or in saturated conditions) and stockpile it separately from the subsoil. Then, Algonquin would complete the trench, install the pipeline, and backfill the trench with subsoil, followed by the topsoil. A complete description of construction methods can be found in the Applicants' E&SCP. The E&SCP also includes measures to mitigate unavoidable construction-related impacts on wetlands. These construction methods and mitigation measures are part of the proposed action and included in the environmental analysis in section 2.2.3. A description of the proposed alternative measures requiring FERC approval (i.e., right-of-way width is greater than 75 feet in wetlands or ATWS less than 50 feet from wetland) is also included in section 2.2.3.

Horizontal Directional Drill

The HDD method allows for trenchless construction across an area by drilling a borehole below the depth of a conventional lay, and then pulling a prefabricated section of pipe through the borehole. This method is sometimes used to avoid direct impacts on sensitive environmental features or areas that otherwise present difficulties for standard pipeline construction. Algonquin would use the HDD method to construct its pipeline across the Taconic Parkway and one intermittent waterbody. A description of the HDD process is included in section 2.2.2.

1.9.2 Aboveground Facilities

The Project aboveground facilities would be constructed in compliance with the same federal regulations and guidelines as the pipeline facilities, and in accordance with the specific requirements of applicable federal and state approvals. Construction activities associated with these facilities would include; clearing, grading, installing concrete foundations, erecting metal buildings, and installing pipeline, metering facilities, and appurtenances. Initial work at the new compressor station and M&R stations would focus on preparing the sites for equipment staging, fabrication, and construction. Following foundation work, station equipment and structure would be brought to the site and installed, using any necessary trailers or cranes for delivery and installation. Equipment testing and start-up activities would occur on a concurrent basis. The construction and restoration methods and procedures in the Applicants' E&SCP would also be followed, as applicable, for aboveground facilities.

1.10 ENVIRONMENTAL TRAINING AND INSPECTION FOR CONSTRUCTION

The Applicants would provide the construction contractors with copies of applicable environmental permits, including mitigation measures identified in applicable permits, as well as copies of "approved for construction" environmental construction alignment sheets and construction drawings and specifications.

Consistent with the FERC guidelines, the Applicants would conduct environmental training for its construction personnel, including environmental inspectors (EI), contractors, and their employees, regarding proper field implementation of its E&SCP, SPCC Plan, and other project-specific plans and mitigation measures. The training would be given before the start of construction and throughout the construction process, as needed. The EIs and all other construction personnel would play an important role in maintaining compliance with all permit conditions to protect the environment during construction.

As outlined in the Applicants' E&SCP, full time EIs would be designated by the Applicants during active construction or restoration. The EIs would have peer status with all other activity inspectors and would report directly to the Resident Engineer/Chief Inspector who has overall authority on the construction spread. The EIs would have the authority to stop activities that violate the environmental conditions of the FERC certificate (if applicable), other federal and state permits, or landowner requirements, and to order corrective action. Additional information on training and EI roles and responsibilities are provided in the Applicants' E&SCP.

1.11 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

The Applicants would operate and maintain the newly constructed pipeline and aboveground facilities, and modified facilities in accordance with PHMSA regulations provided in 49 CFR 192, the FERC guidance at 18 CFR 380.15, and the maintenance provisions in the Applicants' E&SCP. Algonquin would add an estimated three full-time permanent workers for operation of the proposed and modified facilities.

1.11.1 Pipeline Facilities

The pipeline would be patrolled on a routine basis and personnel well qualified to perform both emergency and routine maintenance on interstate pipeline facilities would handle emergencies and maintenance related to:

- erosion and wash-outs along the right-of-way;
- settling, undermining, or degradation of repaired ditch line in streets or parking lots;
- performance of water control devices such as diversions;
- condition of banks at stream and river crossings;
- third-party activity along the pipeline right-of-way; and
- any other conditions that could threaten the integrity of the pipeline.

The applicable local operations supervisors would be notified of any conditions that need attention. Significant conditions would be reported to the pipeline owners. Corrective measures would be performed as needed.

The pipeline cathodic protection system would also be monitored and inspected periodically to ensure adequate corrosion protection. The pipeline would be designed to allow the use of internal inspection technology. Algonquin would take appropriate responses to conditions observed during internal inspections as necessary.

The pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads and other key points. Markers would indicate the presence of the pipeline and provide a telephone number where a company representative can be reached in the event of an emergency or prior to any excavation in the area of the pipeline by a third party. As part of its effort to prevent any third-party damage on the pipeline, Algonquin currently participates in the One Call system in all states where they have operational facilities.

During operation, the pipeline would be internally inspected and cleaned using "pigs" inserted and retrieved from the pipeline at aboveground pig launcher/receiver facilities. As a cleaning device, pigs can also be used to remove debris that accumulates in the pipeline. We received comments concerning the potential buildup of decay products within the pipeline and the risk of releasing these products to the environment during pipeline maintenance and pigging activities. These comments are addressed in section 2.7.

1.11.2 Aboveground Facilities

The Applicants would continue to operate and maintain the modified compressor stations, M&R stations, and regulator station and would construct and operate the new compressor station and M&R station in accordance with PHMSA requirements and standard procedures designed to ensure the integrity and safe operation of the facilities. Standard operations at compressor stations include such activities as the calibration, maintenance, and inspection of equipment, as well as the monitoring of pressure, temperature, and vibration data, and traditional landscape maintenance such as mowing and the application of fertilizer. Standard operations at aboveground facilities also include the periodic checking of safety and emergency equipment and cathodic protection systems, calibration of equipment and instrumentation, inspection of critical components, and scheduled and preventative maintenance of equipment. Safety equipment, such as pressure-relief devices, would be tested for proper operation. Corrective actions would be taken for any identified problem.

1.12 PERMITS, APPROVALS, AND CONSULTATIONS

The Applicants have committed to obtaining all the necessary environmental permits and would construct, operate, and maintain the proposed facilities in compliance with the required permits and other applicable federal and state regulations and guidelines. Table 1.12-1 identifies the major federal, state, and local environmental permits, approvals, and regulatory clearances that the Applicants would obtain.

TABLE 1.12-1

Major Permits, Approvals, and Consultations for the Atlantic Bridge Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status
Federal			
FERC	Certificate	Issuance of a Certificate under sections 7(b) and (c) of the NGA	Application filed October 22, 2015
USACE • New England District • New York District	Section 404, Clean Water Act Permit	Issuance of a section 404 permit for discharges of dredged or fill material into waters of the United States, including jurisdictional wetlands	Permit applications filed in November 2015
EPA • Region 1 (New England) • Region 2 (New York)		Review Clean Water Act section 404 wetland dredge-and-fill applications to the USACE with 404(c) veto power for wetland permits issued by the USACE	Consultation through the USACE permitting process
FWS • New England Field Office • New York Field Office	Section 7 Endangered Species Act Consultation, Biological Opinion	Finding of impacts on federally listed or proposed species. Provide Biological Opinion if the Project is likely to adversely affect federally listed or proposed species or their habitats	Ongoing consultation. Anticipated completion September/October 2016
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources	Ongoing consultation. Anticipated completion September/October 2016
	Migratory Bird Treaty Act	Provide comments to prevent taking or loss of habitat for migratory birds	Ongoing consultation. Anticipated completion September/October 2016
Advisory Council on Historic Preservation – Federally and Non-Federally Recognized Indian Tribes	Section 106 Consultation, National Historic Preservation Act (NHPA)	Comment on the Project and its effects on historic properties	Ongoing
State of New York [b]			
New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Permits	Section 401, Clean Water Act	Issuance of Water Quality Certification (WQC)	Application filed November 2015
		Consultation with Freshwater Wetlands, and Protection of Waters	Consultations concurrent with WQC review
NYSDEC, Division of Water Permits	State Pollution Discharge Elimination System Program	Issuance of State Pollution Discharge Elimination System Permit for Hydrostatic Test Water Discharge and Trench Dewatering	Pending
		Issuance of State Pollution Discharge Elimination System Construction Stormwater General Permit; Stormwater Pollution Prevention Plan	Pending
NYSDEC, Division of Fish, Wildlife and Marine Resources, Natural Heritage Program	New York State Threatened and Endangered (T&E) Species Program	Consultation on state-listed T&E species	Ongoing – Review concurrent with above and FWS surveys

TABLE 1.12-1 (cont'd)

Major Permits, Approvals, and Consultations for the Atlantic Bridge Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status
NYSDEC, Division of Fish, Wildlife and Marine Resources Bureau of Wildlife and Fisheries	New York State T&E Species Program	Consultation on state-listed T&E species	Ongoing – Review concurrent with above and FWS surveys
New York State Office of Parks, Recreation and Historic Preservation, Historic Preservation Field Services Bureau	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Local			
New York City Department of Environmental Protection, Bureau of Environmental Planning and Assessment	Consultation on Stormwater Pollution Prevention Plan	Stormwater Pollution Prevention Plan for Croton Watershed	Pending
Municipal Agencies	Consultation on local requirements	Consultation on municipal requirements related to pipeline construction	Ongoing
Connecticut			
Connecticut Department of Energy and Environmental Protection (CTDEEP), Bureau of Water Protection and Land Reuse	Section 401, Clean Water Act	Review and issuance of WQC	Application filed November 2015
CTDEEP, Bureau of Materials Management and Compliance Assurance – Water Permitting and Enforcement Division	Hydrostatic test water discharge (section 22a-430b of the Connecticut General Statutes)	Issuance of General Permit for Discharge of Hydrostatic Test Water	Pending
	Stormwater discharge (section 22a-430b of the Connecticut General Statutes)	Issuance of General Permit for Discharges of Stormwater and Dewatering Wastewater from Construction Activities	Pending
CTDEEP, Bureau of Natural Resources, Wildlife Division, Natural Diversity Database	Connecticut T&E Species Program	Consultation on state-listed T&E species	Ongoing
CTDEEP, Bureau of Natural Resources, Inland Fisheries Division	Connecticut T&E Species Program	Consultation on inland fisheries	Ongoing
CTDEEP, Bureau of Air Management	Clean Air Act	Issuance of air permits for compressor station modifications	Applications filed October 2015
CTDEEP, Connecticut Siting Council	Facility Siting	Review and certification of energy facilities through the FERC process	Began consultations in June 2015 – Ongoing
Connecticut Indian Affairs Council	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Local			
Municipalities	Inland Wetlands and Watercourses – Wetland Permit (sections 22a-36 through 22a-45a of the Connecticut General Statutes)	Consultation on waterways and wetlands	Ongoing

TABLE 1.12-1 (cont'd)

Major Permits, Approvals, and Consultations for the Atlantic Bridge Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status
Massachusetts			
Massachusetts Executive Office of Energy and Environmental Affairs, Massachusetts Environmental Protection Act (MEPA) Office	MEPA Certificate	Issuance of certificate for compliance with MEPA. Consultation only, no environmental notification form required	Ongoing
Massachusetts Executive Office of Energy and Environmental Affairs, Office of Coastal Zone Management	Coastal Zone Consistency Program	Review Project for consistency with coastal zone plans and issue determination	Application filed October 2015
Massachusetts Department of Environmental Protection	Chapter 91 Waterways License	Review license application and provide comments	Application filed December 2015
	State Comprehensive Air Plan Approval	Review Air Plan Application and provide comments	Application filed October 2015
Massachusetts Energy Facility Siting Board	Facility Siting	Review and comment on FERC-regulated energy projects	Ongoing
Massachusetts Division of Wildlife and Fisheries; Natural Heritage and Endangered Species Program	Massachusetts T&E Species Program	Consultation on state-listed T&E species	Complete
Massachusetts Historical Commission	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Massachusetts Commission on Indian Affairs	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Local			
Local Municipal Conservation Commissions	Massachusetts Wetlands Protection Act	Review and issue Order of Conditions for wetlands	Applications filed February 2016
Municipal Historical Commissions	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Massachusetts Board of Underwater Archaeological Resources	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing
Maine			
Maine Department of Inland Fisheries and Wildlife	Maine T&E Species Program	Consultation on state-listed T&E species	Complete
Maine Natural Areas Program	Natural Areas Program	Consultation on state-listed species, critical habitat, and significant natural communities	Complete
Maine Historic Preservation Commission	Section 106, NHPA	Review and comment on the Project and its effects on historic properties	Ongoing

[a] Consultations with Native American tribes are discussed in section 4.10.2.

[b] The Project is not subject to New York's State Environmental Quality Review Act because it is subject to the federal NGA and, therefore, is reviewed under the NEPA.

2.0 ENVIRONMENTAL ANALYSIS

2.1 GEOLOGY, SOILS, AND PALEONTOLOGY

2.1.1 Geology

Physiography and Geologic Setting

The Project would be located in the New England Upland and Seaboard Lowland Sections of the New England Physiographic Province. Pipeline and aboveground facilities in New York and Connecticut would be in the New England Upland section, which is characterized by rolling hills with streams in rounded and well-graded valleys. Relief ranges from 100 to 1,000 feet in the more mountainous regions, such as the Ramapo Mountains in New York, and the Bolton and Mohegan ranges in Connecticut (U.S. Geological Survey [USGS], 1999). The proposed aboveground facilities in Massachusetts and Maine would be in the Seaboard Lowland section of the New England province. The section is lower in elevation and typically less hilly than the New England Upland section and has many small rivers and streams flowing along land surfaces that slope towards the ocean. The area was inundated by the ocean and large proglacial lakes during the last glacial retreat. Local relief is typically less than 200 feet in most places within this section (USGS, 1999). Elevations in the Project area range from 100 to 850 feet above mean sea level in the New England Upland Section and from 20 to 300 feet above mean sea level in the Seaboard Lowlands Section. Surficial geologic materials in the area of the proposed Project consist primarily of glacial till with intermittent bedrock outcrops and sand and gravel deposits. Bedrock geology in the Project area is dominated by igneous and metamorphic rocks (USGS; 2015a).

Algonquin conducted an HDD feasibility study for the Taconic Parkway crossing. Three geotechnical borings, ranging in depth from 120 to 201 feet, were completed on the east side of the Taconic Parkway HDD crossing between April and May of 2015. These borings generally consisted of dense to very dense silty sand with trace gravel. Cobbles and boulders (between 4 and 20 inches in diameter) were encountered in all three borings at various depths. Metamorphic bedrock (gneiss) was encountered in two of the borings at 9 and 149 feet below ground surface. No bedrock was encountered in the third boring, which was terminated at 120 feet below ground surface. Two additional bores, each 100 feet deep, were conducted on the west side of the highway between July and August of 2015. Soils consisted of sands, gravels, and boulders, with granite bedrock encountered at 21 feet in one bore and gneiss bedrock encountered at 19 feet in the second. The materials observed are considered to be favorable for HDD installation techniques (Hatch Mott MacDonald, 2015 and GZA GeoEnvironmental, Inc., 2015).

The overall effect of the Project on topography and geology would be minor. The primary impacts would be limited to construction activities and would include temporary disturbance to slopes within the right-of-way resulting from grading and trenching. The Applicants would minimize impacts by returning contours to preconstruction conditions to the maximum extent practicable. At the aboveground facilities, grading and filling may be required to create a safe and stable land surface to support the facility.

Mineral Resources

Based on a review of USGS topographic maps, recent aerial photography, and available USGS and state databases, no active mining or oil and gas operations are within 0.25 mile of the Project facilities (USGS, 2015b, 2015c; New York State Department of Environmental Conservation [NYSDEC], 2015a; Altamura, 1987; Maine Department of Environmental Protection, 2015).

Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically include seismicity (e.g., earthquakes, surface faults, and soil liquefaction), landslides, flooding, and karst terrain. Conditions necessary for the development of other geologic hazards, including avalanches and volcanism, are not present in the Project area. In general, the potential for geologic hazards to significantly affect construction or operation of the Project facilities is low.

Seismic Hazards

The east coast of the United States is a passive tectonic plate boundary on the "trailing edge" of the North American continental plate, which is relatively seismically quiet. The shaking during an earthquake can be expressed in terms of the acceleration due to gravity. For reference, peak ground acceleration (PGA) of 4 percent of gravity or less would result in light to no perceived shaking and no potential damage, and PGAs between 4 and 9 percent would result in moderate perceived shaking and very light damage. PGA of 10 percent of gravity is generally considered the minimum threshold for damage to older structures or structures not made to resist earthquakes (USGS, 2006a). Based on USGS seismic hazard mapping, the seismic risk in the area of the Project facilities in New York, Connecticut, Massachusetts, and Maine is low. PGAs in the Project area, with a 2 percent probability of exceedance in 50 years (2,500-year return time), are between 6 and 14 percent of gravity and PGAs with a 10 percent probability of exceedance in 50 years (475-year return time) are 3 percent of gravity or less (USGS, 2014).

The USGS maintains a database containing information on surface and subsurface faults and folds in the United States that are believed to be sources of earthquakes of greater than 6.0 magnitude during the past 1.6 million years (Quaternary Period). The proposed Project facilities would not cross any surface or subsurface Quaternary-aged faults identified in the database (USGS, 2006b).

O'Rourke and Palmer (1996) performed a review of the seismic performance of gas transmission lines in southern California and concluded that modern electric arc-welded gas pipelines perform well in seismically active areas of the United States. The study included 11 earthquakes with a magnitude of 5.8 or greater. Based on the low seismic risk and occurrence assigned to the Project area, we find the risk of damage to pipeline facilities by earthquakes to be low. The risk of damage to aboveground facilities, which would be built to comply with required building codes and DOT standards, would also be low.

Soil liquefaction is a phenomenon often associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Areas susceptible to liquefaction may include soils that are generally sandy or silty and are generally located along rivers, streams, lakes, and shorelines or in areas with shallow groundwater. Soil conditions necessary for liquefaction to occur would likely be present in the Project area; however, due to the low potential for a seismic event that would cause strong and prolonged ground shaking, the potential for soil liquefaction to occur is low.

Landslides

Landslides involve the down-slope movement of earth materials under force of gravity due to natural or man-made causes. The proposed Project facilities would be in an area considered to have a low incidence of landslides (Radbruch-Hall et al., 1982). Many of the slopes in the Project area consist of glacial till or bedrock, which have a low vulnerability to landslides and slumping.

During construction, the Applicants would implement the measures outlined in their E&SCP to minimize potential risks from landslides and soil erosion. These techniques include the use of erosion control devices (e.g., silt fences, slope breakers) and other best management practices to stabilize soils. The Applicants' E&SCP includes field procedures associated with the use of slope breakers, temporary and permanent trench plugs, matting, riprap, and other erosion control measures. Based on the low landslide incidence potential in the Project area and the mitigation and design features discussed above, we find the potential for landslides to affect the Project to be low.

Flash Flooding, Storm Surge, and Sea Level Rise

The greatest potential for flash flooding to occur in the Project area would be along waterbodies or the coast line during or after a large storm event with significant precipitation over a short period of time. Flood hazard areas identified on the Federal Emergency Management Agency Flood Insurance Rate Map are identified as a Special Flood Hazard Area. Special Flood Hazard Areas are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. According to the National Flood Hazard Layer data, portions of the Weymouth Compressor Station construction workspace would be within the 100-year flood zone; however, the permanent station facility footprint would not be within any flood zone (Federal Emergency Management Agency, 2015). Temporary impacts may occur on floodplains should a flood occur at the same time as construction of the Weymouth Compressor Station, however, the Project would have minimal impacts on flood storage capacity.

We received comments regarding the potential impacts that climate change could have on the Project, particularly as a result of sea level rise and storm surge. Algonquin would design the Weymouth Compressor Station to mitigate the effects of sea level rise and storm surge over a 50-year period. The facility would be designed based on the most conservative calculations from the USACE and the National Oceanic and Atmospheric Administration (NOAA). Algonquin would grade elevation at the Weymouth Compressor Station about 5 feet from the elevation of existing grade. The area beneath the proposed compressor station buildings and the courtyard area would be raised to an elevation of about 19 feet above sea level. The finished floor elevations of the structures would be about 19.5 feet above sea level with the grade gradually sloping away from the structures. Based on models produced by the USACE the future 100 year base flood elevation of about 17.7 feet can be expected in areas near the compressor station site (USACE, 2015). Electrical and other equipment sensitive to water exposure would be kept above this elevation. The proposed design would minimize the risk of sea level rise and storm surges on the Weymouth Compressor Station.

Measures would be implemented to handle waterbody flow increases during pipeline installation activities such as having additional pumps on stand-by for dam-and-pump crossings or appropriately sizing flumes to handle storm flows for flume crossings. Equipment crossings would be designed to handle higher flow volumes that could be anticipated from storm events and flooding situations. After construction is completed, each crossing would be periodically inspected for signs of erosion and remediated, as necessary. For these reasons, the risk of impacts on Project facilities from flash flooding in non-coastal areas is low.

Ground Subsidence

Ground subsidence is the local downward movement of surface material with little or no horizontal movement. Ground subsidence can affect pipelines and aboveground facilities by causing a loss of support that may bend or even rupture a pipeline or weaken the foundations of the aboveground facilities. Common causes of ground subsidence include the presence of karst terrain, underground mining, and significant groundwater or fluid withdrawal, associated with oil-producing regions.

None of the formations along the proposed pipeline routes contain carbonate rocks that form karst terrain features; therefore, subsidence due to karst would not be a concern to the Project (USGS, 2015a; Weary and Doctor, 2014). As discussed above, there are no current or former underground mining activities or oil and gas facilities in the vicinity of the Project; therefore, we find that the Project would not be subject to hazards associated with underground mines or oil-producing activities (USGS, 2015d, 2015e, 2015f, and 2015g).

Blasting

Based on an analysis of the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service's (NRCS) Soil Survey Geographic Database, about 6 percent (4.4 acres) of the proposed pipeline routes would cross areas with bedrock at depths of less than 60 inches (Soil Survey Staff, 2015a). Although much of the proposed replacement pipeline is expected to be installed in the same trench as the existing pipeline to be removed, the depth of the trench for the new pipeline would be deeper due to the new pipeline's larger diameter. The bedrock that may be encountered is lithic (i.e., hard), and blasting or other special construction techniques may be required during installation of the pipeline.

The Applicants have prepared a Rock Removal Plan (appendix C) to be used at each site where solid rock is encountered as either part of the pipeline trench excavation or grading to prepare a level linear work area. The Rock Removal Plan indicates that an experienced contractor would analyze the rock type, and consider all other contributing factors, including location, surrounding environment, nearby facilities, residences, wells and springs, and/or resources before selecting a suitable rock removal technique. The proposed rock removal technique would be approved by the Applicants prior to its implementation. All blasting operations would be performed according to strict guidelines designed to control energy release and protect personnel and property in the vicinity of the blast zone. These guidelines would be consistent with all federal, state, and local regulations that apply to controlled-blasting and blast vibration limits in the vicinity of structures and underground utilities. We have reviewed the Applicants' Rock Removal Plan and find it acceptable.

Paleontological Resources

The majority of the bedrock units crossed by the proposed Project are either metamorphic or igneous in origin and do not contain fossils. However, recent Ice Age fossils may be found in low lying glacial materials and organic bogs during shallow excavation (Columbia University, 2015). If fossils are encountered during construction, the Applicants would temporarily cease excavation in the area and notify the state geological survey or natural history museum, as well as FERC, to ensure that all of the fossils discovered are properly documented.

2.1.2 Soils

Soil information for the Project area was obtained from the NRCS's Soil Survey Geographic database (Soil Survey Staff, 2015a). The Soil Survey Geographic database is a digital version of the original county soil surveys developed by the NRCS for use with geographic information systems (GIS). It provides a detailed level of soils information for natural resource planning and management. Additional information about soils was obtained from Official Soil Series Descriptions (Soil Survey Staff, 2015b).

Soils in the vicinity of the proposed Project are primarily developed in glacial till and other glacial deposits. However, in developed residential areas like some of those crossed by the proposed pipeline segments, soils have typically been disturbed in some manner. In addition to the effects associated with the installation of the existing natural gas pipelines and aboveground facilities, these disturbances can include grading to create a level landscape for development, filling in areas that are wet or possess other undesirable soil characteristics, or filling areas to dispose of materials such as dredge spoil.

Pipeline Facilities

Soils along the proposed pipeline segments were evaluated to identify prime farmland and major soil characteristics that could affect construction or increase the potential for construction-related soil impacts. The soil characteristics evaluated were erosion potential, compaction-prone soils, shallow bedrock, rocky soils, and soils with poor revegetation potential. Table 2.1.2-1 provides a summary of characteristics associated with the soils that would be crossed that could affect construction or increase the potential for soil impacts.

TABLE 2.1.2-1

Summary of Soil Characteristics in the Project Area (acres)

Facility	Total acres [a]	Prime Farmland [b]	Highly Erodible Water [c]	Highly Erodible Wind [d]	Compaction Prone [e]	Shallow Bedrock [f]	Rocky Soils [g]	Revegetation Concerns [h]
Pipeline Facilities								
Stony Point Discharge	49.0	31.3	22.4	0.0	9.6	3.1	10.3	24.8
Southeast Discharge	30.9	6.5	22.8	1.7	0.0	1.3	17.2	22.5
Subtotal	**79.9**	**37.8**	**45.2**	**1.7**	**9.6**	**4.4**	**27.5**	**47.3**
Aboveground Facilities								
Weymouth CS	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oxford CS	13.7	12.6	4.2	0.0	0.0	0.4	4.9	4.2
Chaplin CS	10.6	0.0	9.3	0.0	0.0	0.0	6.3	10.6
Salem Pike M&R Station	1.3	0.2	0.0	0.0	0.0	0.0	1.1	0.0
Yorktown M&R Station	0.9	0.6	0.3	0.0	0.0	0.0	0.6	0.3
Danbury M&R Station	0.9	0.0	0.9	0.0	0.0	0.0	0.0	0.9
Needham Regulator Station	0.3	0.3	<0.1	<0.1	0.0	0.0	0.0	<0.1
Pine Hills M&R Station	1.0	0.0	1.0	0.9	0.0	0.0	0.0	1.0
Plymouth M&R Station	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Westbrook M&R Station	1.4	0.0	1.4	0.0	0.0	1.4	1.4	1.4
Subtotal	**44.1**	**13.7**	**17.1**	**0.9**	**0.0**	**1.8**	**14.3**	**18.4**
Project Total	**124.0**	**51.5**	**62.3**	**2.6**	**9.6**	**6.2**	**41.8**	**65.7**

Sources: Soil Survey Staff, 2015a and 2015b

[a] Values within rows do not add up to the totals listed for each facility due to the fact that soils may occur in more than one characteristic class or may not occur in any class listed in the table.

[b] As designated by the NRCS. Includes soils that are considered prime if a limiting factor is mitigated (e.g., artificial drainage), farmland of statewide importance, and unique farmland.

[c] Includes land in capability subclasses IVe through VIIIe and soils with an average slope greater than 8 percent.

[d] Includes soils in wind erodibility groups 1 and 2.

[e] Includes soils in somewhat poor, poor, and very poor drainage classes with surface textures of sandy clay loam or finer.

[f] All shallow bedrock associated with the Project is considered lithic (hard).

[g] Soils with one or more horizons that have a cobbley, stony, bouldery, channery, flaggy, very gravelly, or extremely gravelly modifier to the textural class and/or contain greater than 5 percent by weight rocks larger than 3 inches.

[h] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively drained, and soils with an average slope greater than 8 percent.

Prime Farmland

The USDA defines prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops" (Soil Survey Division Staff, 1993). This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops. Areas that are not currently used for agriculture can be designated as prime farmland if they are available for these uses in the future. Urbanized land and open water are excluded from prime farmland. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as the cranberry bogs of the northeast. Additionally, land that does not meet the criteria for prime or unique farmland can be designated as farmland of statewide importance. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate state agencies. About 47 percent of the soils that would be affected by pipeline construction are considered prime farmland, unique farmland, or farmland of statewide importance. The Project would not impact any active agricultural land.

Erosion

Erosion is a continuing natural process that can be accelerated by human disturbance. Factors such as soil texture, structure, slope, vegetative cover, rainfall intensity, and wind intensity can influence the degree of erosion. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind-induced erosion often occurs on dry soil where vegetative cover is sparse and strong winds are prevalent. About 57 percent of the soils that would be affected by pipeline construction are considered highly water erodible and 2 percent of the soils are considered highly wind erodible.

To minimize or avoid potential impacts due to soil erosion and sedimentation, the Applicants would utilize the erosion and sedimentation controls outlined in the Project E&SCP. The E&SCP incorporates the requirements identified in the FERC's Plan and Procedures. Temporary erosion controls, including slope breakers and sediment barriers (e.g., hay bales and silt fences), would be installed following initial ground disturbance to control runoff and prevent sediment transport off the construction right-of-way. Temporary erosion controls would be maintained until the Project area is successfully revegetated. Permanent erosion controls would be installed, as necessary, to ensure the successful restoration of the Project area. Significant soil erosion is not expected during or after Project construction.

Compaction Potential

Construction equipment traveling over wet soils could compact soils, disrupting the soil structure, reducing pore space, increasing runoff potential, and cause rutting. The degree of compaction depends on the moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist during construction are the most susceptible to compaction. About 12 percent of the soils that would be affected by the Project pipeline facilities are considered highly prone to compaction.

The Applicants would minimize compaction and rutting impacts during construction by using measures outlined in their E&SCP, including the use of low-ground-weight equipment and/or by temporary installation of timber equipment mats. The topsoil and subsoil would be tested for compaction in residential areas disturbed by construction. In areas where topsoil segregation occurs, plowing or other deep tillage equipment to alleviate subsoil compaction would be conducted before replacement of the topsoil. Given these measures, Project activities would not result in significant adverse long-term soil structural damage or compaction.

Rocky and Shallow-to-Bedrock Soils

About 6 percent of the Project pipeline facilities would cross areas with bedrock at depths of less than 60 inches, and 34 percent of Project pipeline facilities would cross areas with rocky soil profiles. Construction through soils with shallow bedrock and rocky soils could result in the incorporation of rock fragments into surface soils. Introducing rocks into the surface soil horizon could reduce soil moisture-holding capacity, resulting in a reduction of soil productivity. Additionally, lawn mowing equipment could be damaged by contact with large rocks.

The introduction of subsoil rocks into topsoil would be minimized by segregating topsoil from trench spoil in residential areas and replacing topsoil during cleanup and restoration. Algonquin would remove excess rock from at least the top 12 inches of soils in residential areas, as well as other areas at the landowner's request. Following restoration, the size, density, and distribution of rock on the construction right-of-way would be similar to adjacent non-right-of-way areas. Rock that is not returned to the trench would be considered construction debris and removed from the work areas, unless approved by the landowner for another construction use (e.g., mulch). Through adherence to these measures, no significant increase in rock content of topsoil in residential areas would occur.

Revegetation Potential

Successful restoration and revegetation are important for maintaining soil productivity and protecting the underlying soil from potential damage, such as erosion. Soils that have a coarse surface texture and are moderately well to excessively drained may prove to be difficult to revegetate. Steep slopes (greater than 8 percent) may also make the establishment of vegetation more difficult. The clearing and grading of soils with poor revegetation potential could result in a lack of adequate revegetation following construction, which could lead to increased erosion, a reduction in wildlife habitat, and adverse visual impacts. About 59 percent of the soils that would be affected by the pipeline facilities are considered to have revegetation concerns, mainly due to the presence of steep slopes in the Project area.

The Applicants would apply soil amendments, as necessary, to create a favorable environment for the re-establishment of vegetation. The Applicants would conduct post-construction monitoring, at least 2 years in uplands and 3 years in wetlands, to ensure successful revegetation.

Aboveground Facilities

About 13.7 acres of the soils mapped at aboveground facility sites are classified as prime farmland, farmland of statewide importance, or unique farmland.[10] Operation of the modified Oxford Compressor Station would permanently impact about 1.2 acres of these soils. The remaining 12.5 acres would be located in temporary workspaces that would be restored following construction. None of the 44.1 acres of soils that would be impacted by the proposed aboveground facilities are actively being used for agricultural purposes.

[10] One half (0.5) acre of this mapped prime farmland and unique farmland is in disturbed areas at existing facilities that would more accurately be described as urban land.

Implementation of the measures outlined in the Project E&SCP would minimize soil impacts and ensure effective revegetation of disturbed areas. Given the impact minimization and mitigation measures described above, we conclude that soils at the aboveground facilities would not be significantly affected by construction and operation of the Project.

Contractor/Pipe Yards and Access Roads

Algonquin has identified seven pipe and contractor ware yards that would be used during construction. These yards would temporarily affect about 90.8 acres of land. With the exception of the Westchester County Contractor Yard, all of the proposed pipe and contractor yards are currently being used to construct the AIM Project during 2016. The Westchester County Contractor Yard is an existing industrial storage yard and its use would not cause significant soil impacts.

Algonquin has identified one TAR and four PARs that would be required to access the proposed project facilities. These roads would require about 0.9 acres of new land disturbance, of which 0.2 acres are temporary impacts. None of the proposed access roads would have a significant impact on soils.

Contaminated Soils

The Applicants conducted a field study and database search to identify potential sources of soil contamination. According to information from available federal, state, and local agencies, 37 sources of potential contamination are within 0.25 mile of the Project facilities; however, all of these sites are over 100 feet from the Project.

A Phase I Environmental Site Assessment was conducted at the proposed Weymouth Compressor Station. The Phase I Environmental Site Assessment consisted of a visual observation of the site, a review of historical information and environmental databases, and interviews with current site representatives. The results of the Phase I Environmental Site Assessment revealed two Recognized Environmental Conditions (REC) and one Historical REC. The two RECs include historic site use (coal, petroleum, and salt storage facility) and historic filling of the site (using coal ash for a fill material), which indicate the presence of hazardous substances and/or petroleum products at the property. Soil and groundwater samples collected in 1992 indicate the property is underlain by varying amounts of anthropogenic materials (such as brick and wood debris, coal fragments, and coal ash) and contaminants such as arsenic (up to 228 milligrams per kilogram). The Historical REC includes impacts from adjoining and adjacent properties and indicates a past release of hazardous substances or petroleum products at the property that has been addressed to the satisfaction of the appropriate regulatory authority.

If contaminated soil or groundwater (e.g., stained soil, oil, drums, debris, etc.) is encountered during construction, all on-site personnel would stop work, evacuate the area, and implement the Applicants' *Unexpected Contamination Encounter Procedure*.[11] This plan includes measures to be taken by the Chief Inspector and construction personnel to isolate the contaminated area, notify the appropriate agencies, gather information, and monitor hazardous conditions, if possible. We have reviewed the *Unexpected Contamination Procedure* and found it acceptable. The Applicants would prevent accidental release of hazardous materials during construction by implementing their SPCC Plan.

[11] The Applicants' Unexpected Contamination Encounter Procedure was included as Attachment RR7 – Response 2 in their February 10, 2016 Responses to the January 21, 2016 FERC Environmental Data Request (Accession No. 20160210-5200). The plan can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20160210-5200in the "Numbers: Accession Number" field

2.2 WATER RESOURCES AND WETLANDS

2.2.1 Groundwater

Existing Groundwater Resources

Groundwater resources in the Project area are composed of unconsolidated glacial deposits of sand and gravel underlain by consolidated bedrock aquifer systems. The two main consolidated bedrock aquifer types are carbonate rock and crystalline rock (Olcott, 1995).

Surficial aquifers are scattered throughout New York and New England. The surficial aquifer system consists of glacial deposits of sand and gravel that formed during several advances and retreats of continental glaciers. These deposits make up the regional surficial aquifer system, which is the most productive and widely used aquifer in the region (Olcott, 1995).

Portions of the Southeast Discharge Take-up and Relay would be underlain by carbonate-rock aquifers. Carbonate rock aquifers are composed primarily of limestone, dolomite, and marble, and are characterized by the dissolution of pre-existing voids such as pores, joints, and fractures by slightly acidic groundwater (Miller, 1999). Water from these aquifers is generally very hard and slightly alkaline. Wells in carbonate-rock aquifers generally yield 10 to 30 gallons per minute (gpm); however, yields can be larger or smaller depending on the degree of fracturing and the number, size, and interconnection of dissolution features in the rock. Yields of as much as 1,000 gpm have been reported in some wells in carbonate-rock aquifers with numerous dissolution openings (Olcott, 1995).

The remaining Project facilities would be underlain by crystalline-rock aquifers. Crystalline-rock aquifers are formed of igneous and metamorphic rocks. Water transmission through this type of substrate is very low and the volume of water storage capacity is generally small. As a result, groundwater movement through these rock types is dependent on the presence of secondary openings such as fractures or joints in the rocks (Olcott, 1995; Melvin et al., 1988). Water that is stored in overlying glacial deposits or waterbodies is commonly hydraulically connected with the bedrock fracture system and can provide large quantities of water. The common range of well yields is 1 to 25 gpm; however, some wells may exceed 100 to 500 gpm. Groundwater quality in the crystalline-rock aquifer system is generally suitable for most uses because the rock is composed of nearly insoluble minerals and water movement within the upper part of the system is generally rapid and along short flow paths (Olcott, 1995).

Sole Source Aquifers

The EPA defines a sole or principal source aquifer (SSA) area as one that supplies greater than 50 percent of the drinking water for an area, where contamination of the aquifer could create a significant hazard to public health, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer. According to the EPA's SSA maps, the majority of the Project facilities are not located within a designated SSA. However, the existing Pine Hills M&R Station and the Plymouth M&R Station are located within the Plymouth-Carver SSA. The Plymouth-Carver SSA encompasses 199 square miles within southeastern Massachusetts and is the principal source of drinking water for nearly all of the residents living within the service area. It consists of unconsolidated, stratified glacial deposits and is saturated with water fed by direct infiltration of precipitation. In addition, the Plymouth-Carver SSA is highly susceptible to contamination due to its highly permeable and transmissive properties (EPA, 2015a).

State-designated Aquifers

In addition to the EPA-designated SSA program, individual states may enact regulations protecting significant aquifer recharge areas, critical areas where excessive use of groundwater poses a threat to the long-term integrity of a water-supply source, or preservation areas to protect natural resources including public water supply sources.

The New York State Department of Health (NYSDOH) designates highly productive aquifers that are being utilized as water sources by municipal water supply systems as Primary Water Supply Aquifers. There are no Primary Water Supply Aquifers underlying the Project facilities in New York (NYSDEC, 2015b).

Connecticut Water Quality Standards provide a groundwater quality classification system that differentiates groundwater by designated use and discharge restrictions that are applied across the entire state. These groundwater classes are GAA, GA, GB, and GC. The Connecticut Department of Energy and Environmental Protection (CTDEEP) defines Class GAA as groundwater suitable for public drinking water without treatment. No discharge is permitted into Class GAA groundwater unless specific permit requirements are met (e.g. treated domestic sewage or certain agricultural wastes). Class GA is defined as groundwater near a private well or groundwater suitable for private or public water supply. Class GB groundwater is typically found in areas of urbanization or industrial activity, is presumed not to be suitable for human consumption without treatment, and is designated for industrial processing or cooling water. Class GC is not suitable for public or private drinking water and designated uses are assimilation of discharge for certain waste facilities that are subject to specific permitting requirements (CTDEEP, 2015a). The proposed Project facilities in Connecticut are primarily within groundwater quality class GA; however, the Project would also cross Class GB groundwater for less than 0.1 mile.

The Massachusetts Department of Environmental Protection (MassDEP) defines a Potentially Productive Aquifer as any aquifer delineated by the USGS to have either medium or high yield. The existing Plymouth M&R Station is in a designated Potentially Productive Aquifer within the South Coastal River Basin (MassDEP, 2007).

The Maine Geological Survey identifies significant sand and gravel aquifers throughout the state. These aquifers are composed of surficial glacial deposits and have the potential to yield more than 10 gpm. There are no significant sand and gravel aquifers underlying the Project facilities in Maine (Maine Geological Survey, 2015).

Wellhead and Aquifer Protection Areas

Under the Safe Drinking Water Act, each state is required to develop and implement a Wellhead Protection Program in order to identify the land and recharge areas contributing to public supply wells, and prevent the contamination of drinking water supplies. The Safe Drinking Water Act was updated in 1996 with an amendment requiring the development of a broader-based Source Water Assessment Program (SWAP), which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach.

The Wellhead Protection Program in New York is administered by the NYSDOH as part of the SWAP. The SWAP provides information on the potential threat of contamination to both groundwater and surface water sources that supply New York's public drinking water systems. Algonquin contacted the NYSDOH to obtain information regarding the presence of SWAPs in the Project area in New York. The NYSDOH indicated that there are 11 SWAP areas within 150 feet of the Stony Point Discharge

Take-up and Relay (NYSDOH, 2015a, 2015b). These SWAP areas occur along the eastern portion of the pipeline route between about MPs 3.2 to 4.0.

The CTDEEP refers to Wellhead Protection Areas as Aquifer Protection Areas. The Aquifer Protection Area Program protects major public water supply wells in sand and gravel aquifers to ensure a plentiful supply of public drinking water for present and future generations. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and approved by the CTDEEP. No Aquifer Protection Areas would be crossed by Project facilities in Connecticut (CTDEEP, 2012).

In Massachusetts, the MassDEP requires public water utilities to protect Zone II recharge areas with municipal bylaws, ordinances, and/or health regulations. Zone II recharge areas are defined as Wellhead Protection Areas that have been designated through hydrogeologic modeling and approved by the MassDEP Drinking Water Program. No Zone II areas would be crossed by Project facilities in Massachusetts (MassDEP, 2015a).

The Maine Drinking Water Program, administered by the Maine Department of Health and Human Services, establishes Wellhead Protection Areas for public water supply systems. Wellhead Protection Areas range from 300 feet around small wells serving homes or private businesses to a maximum of 2,500 feet around larger public supply wells, depending on population served or pumping rate. No Wellhead Protection Areas would be crossed by Project facilities in Maine (Maine Department of Environmental Protection, 2013).

Water Supply Wells and Springs

The Applicants consulted with state agencies and landowners, reviewed available databases, and conducted field surveys to identify public and private water supply wells and springs within 150 feet of the Project facilities. There are no public water supply wells or springs located within 150 feet of any of the proposed facilities, however, there are seven private domestic wells within 150 feet of the Southeast Discharge Take-up and Relay in Connecticut (see table 2.2.1-1). One of these wells, near MP 0.9, is within the proposed workspace for the Project. Soil data indicates that bedrock can occur within 60 inches of the surface for the three water wells near MP 0.9 and, therefore, blasting may be required near these wells.

TABLE 2.2.1-1

Water Supply Wells Within 150 feet of the Project Area [a]

Facility/City, State	Milepost	Type	Distance from Pipeline (feet)	Distance from Workspace (feet)	Direction from Workspace to Well
Southeast Discharge Take-up and Relay					
Danbury, CT	0.2	Private Domestic	165	131	Northeast
Danbury, CT	0.8	Private Domestic	135	70	Northeast
Danbury, CT	0.9	Private Domestic	80	4	Northeast
Danbury, CT	0.9	Private Domestic	105	38	North
Danbury, CT	0.9	Private Domestic	21	0	Not applicable
Danbury, CT	1.0	Private Domestic	120	62	Southwest
Danbury, CT	1.9	Private Domestic	120	64	West

[a] Based on field surveys and landowner communication.

Contaminated Groundwater

As discussed in section 2.1.2, the Applicants conducted a database search and identified 37 sources of potential contamination within 0.25 mile of the Project. All of these sites are more than 100 feet from the closest proposed facilities. See section 2.1.2 for more information on contaminated sites in the Project area.

General Impacts and Mitigation

Pipeline construction activities would not result in significant impacts on groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. However, trench excavation could intersect the water table in low-lying areas where groundwater is near the surface (e.g., wetlands). Groundwater resources could also be temporarily affected due to changes in overland water flow and recharge caused by clearing and grading of the Project right-of-way. In addition, near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water in these isolated areas. During construction, local water table elevations could be affected by trenching and backfilling, which could temporarily affect wells near the construction area.

The direct and indirect impacts described above would be temporary and insignificant. Impacts would be avoided or minimized by the use of construction techniques contained in the Project E&SCP (e.g., temporary and permanent trench plugs). In instances where trench dewatering would be required, all trench water would be discharged into well-vegetated upland areas to allow the water to infiltrate back into the ground, thereby minimizing any long-term impacts on the water table. Upon completion of construction, Algonquin would restore the ground surface as closely as practicable to original contours and revegetate the right-of-way to ensure restoration of preconstruction overland flow and recharge patterns. Algonquin would also conduct compaction testing in residential areas and mitigate severely compacted soils through the use of deep tillage operations to increase the water infiltration and groundwater recharge (see section 2.1.2).

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect groundwater resources. However, the impacts of such contamination are typically minor because of the low frequency and volumes of spills and leaks. Measures outlined in the Applicants SPCC Plan would be implemented to reduce potential impacts from spills of the hazardous materials used during construction. These measures include regularly inspecting equipment to ensure it is in good working order, properly training employees regarding the handling of fuels and other hazardous materials, and promptly reporting any spills to the appropriate agencies. All fuel storage and equipment refueling would take place at least 100 feet from any wetland, waterbody, or municipal watershed area.

During scoping we received comments from the EPA recommending that all fuel storage and equipment refueling activities be located more than 500 feet from water supply wells. The FERC Procedures were developed based on a compilation of FERC staff project experience and years of feedback from local, state, and federal regulating agencies relating to pipeline construction and impact minimization. The EPA provided no scientific support or justification for this greater distance, therefore we are not recommending that the distance of these activities from water wells be increased to 500 feet.

As discussed above, there is one private water well within the proposed workspace of the Project. Algonquin would cordon off a 5-foot minimum buffer around the well using orange construction fencing. If blasting is required within 150 feet of this well, or any other water supply wells, Algonquin would contact the landowner and offer pre- and post-blasting well yield and water quality testing. During blasting, Algonquin would monitor ground vibrations at all wells within 150 feet of the blast site. If a water well is damaged as a result of the proposed construction activities, Algonquin would provide a temporary source of water and/or compensate the landowner for damages until the well is restored to its former capacity and quality, or a replacement source is provided. These measures would minimize potential impacts on water supply wells.

To ensure that impacts on water supply wells are properly mitigated, **we recommend that:**

- **<u>Within 30 days of placing the facilities in service</u>, Algonquin should file a report with the Secretary of the Commission (Secretary) identifying all water supply wells/systems damaged by construction and how they were repaired. The report should also include a discussion of any other complaints concerning well yield or water quality and how each problem was resolved.**

Based on the Applicants' proposed construction techniques and the implementation of minimization and mitigation measures, we conclude that construction and operation of the Project would not significantly affect groundwater resources in the Project area.

2.2.2 Surface Water

Existing Surface Water Resources

Surface water resources were initially identified using USGS topographic maps, and subsequently surveyed during wetland field delineations conducted in 2014 and 2015. Surveys have been completed in all areas where access has been granted. In areas where access has not yet been granted, waterbody information was determined using existing USGS mapping, aerial imagery, and other GIS-based information.

A total of 27 waterbodies are located within the Project construction workspaces. These include nine perennial streams, nine intermittent streams, and nine ephemeral streams. Of these 27 waterbodies, 26 waterbodies are classified by FERC as minor crossings (less than 10 feet wide) and 1 is considered an intermediate crossing (between 10 and 100 feet wide). No major waterbodies greater than 100 feet wide would be crossed by the Project.

Sixteen of the 27 waterbodies within the proposed workspace would be directly crossed by the pipeline. These would include 11 waterbodies in New York, and 5 waterbodies in Connecticut. No waterbodies would be crossed by the pipeline facilities in either Massachusetts or Maine. The remaining 11 waterbodies would not crossed by the pipeline and no in-stream work would occur within these waterbodies. As such direct impacts on these waterbodies would either be avoided or limited to the installation of equipment crossing bridges. Temporary equipment bridges would be installed in accordance to the Applicants' E&SC Plan. The construction, modification, and operation of the proposed aboveground facilities (e.g. M&R stations, compressor stations, and access roads) would not directly affect any waterbodies. The milepost location, feature ID, waterbody name, state water quality classification, fisheries classification, FERC classification, flow regime, approximate crossing width, and proposed method of crossing for all 27 surface waters within the proposed workspaces are provided in table 2.2.2-1. No National Wild and Scenic Rivers would be crossed by the Project. In addition, the Project would not cross rivers designated under the National Rivers Inventory (National Park Service, 2004, 2009; National Wild and Scenic Rivers System, 2014).

TABLE 2.2.2-1

Waterbodies Crossed by the Atlantic Bridge Project

Facility, State, County, Waterbody ID	Waterbody Name	Milepost	Crossing Width (feet)[a]	Flow Type[b]	FERC Class.[c]	Fishery Type[d]	State Water Quality Classification[e]	Proposed Crossing Method[f]
STONY POINT DISCHARGE TAKE-UP AND RELAY – WESTCHESTER COUNTY, NEW YORK								
B15-SPL-36-S	Unnamed Trib. to Hunter Brook	0.1	6	I	M	CW	D	N/A
B15-SPL-36-SA	Unnamed Trib. to Hunter Brook	0.1	6	I	M	CW	D	N/A
B15-SPL-36-SB	Unnamed Trib. to Hunter Brook	0.2	5	P	M	CW(T)	C(TS)	N/A
B15-SPL-36-SD	Unnamed Trib. to Hunter Brook	0.2	5	I	M	CW	D	N/A
B15-SPL-36-SC	Unnamed Trib. to Hunter Brook	0.2	9	P	M	CW(T)	C(TS)	Dry Crossing
B15-SPL-36-SE	Unnamed Trib. to Hunter Brook	0.3	4	P	M	CW(T)	C(TS)	Dry Crossing
B15-SPL-36-SF	Unnamed Trib. to Hunter Brook	0.3	2	I	M	CW	D	N/A
A15-SPL-3-S1	Unnamed Trib. to Hunter Brook	0.7	3	I	M	CW	D	HDD
A14-SPL-2-S2A	Unnamed Trib. to Hunter Brook	1.2	3	I	M	CW	D	Dry Crossing
A14-SPL-2-S2B	Unnamed Trib. to Hunter Brook	1.2	4	I	M	CW	D	Dry Crossing
A14-SPL-2-S2	Hunter Brook	1.3	10	P	M	CW	C	Dry Crossing
A14-SPL-4-S1	Unnamed Trib. to Hunter Brook	1.5	2	E	M	CW	D	N/A
A14-SPL-5-S1	Unnamed Trib. to Hunter Brook	1.5	8	P	M	CW	C	Dry Crossing
A14-SPL-5-S6	Unnamed Trib. to Hunter Brook	1.5	1	E	M	CW	D	N/A
A14-SPL-5-S4	Unnamed Trib. to Hunter Brook	1.6	2	I	M	CW	D	N/A
A14-SPL-5-S5	Unnamed Trib. to Hunter Brook	1.6	1	E	M	CW	D	N/A
A14-SPL-7-S1	Unnamed Trib. to Hunter Brook	1.7	1	E	M	CW	D	Dry Crossing
A14-SPL-8-S1	Unnamed Trib. to Shrub Oak Brook	2.1	3	I	M	WW	D	N/A
A14-SPL-24-S2	Unnamed Trib. to Shrub Oak Brook	2.2	2	E	M	WW	D	N/A
A14-SPL-24-S1	Unnamed Trib. to Shrub Oak Brook	2.2	9	P	M	WW	C	Dry Crossing
A14-SPL-9-S1	Unnamed Trib. to Shrub Oak Brook	2.4	6	P	M	WW	C	Dry Crossing
A14-SPL-13-S1	Hallocks Mill Brook	3.3	6	P	M	WW	C	Dry Crossing
SOUTHEAST DISCHARGE TAKE-UP AND RELAY – FAIRFIELD COUNTY, CONNECTICUT								
C14-SL-1-S1	Padanaram Brook	0.5	15	P	I	WW	A	Dry Crossing
C14-SL-2-S1	Unnamed Trib. to Padanaram Brook	0.6	8	E	M	WW	A	Dry Crossing[g]
C14-SL-4-SA	Unnamed Trib. to Still River	2.0	3	E	M	WW	A	Dry Crossing
C14-SL-4-S1	Unnamed Trib. to Still River	2.1	2	E	M	WW	A	Dry Crossing
C14-SL-4-SB	Unnamed Trib. to Still River	2.1	2	E	M	WW	A	Dry Crossing

[a] Crossing width is measured from water's edge

[b] I = Intermittent; P = Perennial; and E = Ephemeral

[c] I = Intermediate; M=Minor

[d] CW = Coldwater; CW(T) = Coldwater (Trout); WW = Warmwater

[e] C = best usage for fishing, suitable for fish, shellfish, and wildlife propagation and survival; D = best usage for fishing, do not support fish propagation, T or TS = Following any classification means that designated water are trout (T) or suitable for trout spawning (TS); A = waters are appropriate for fish, aquatic life and wildlife habitat, potential drinking water supply, recreation, navigation, industrial or agricultural water supply.

[f] N/A= Not Applicable, indicates the waterbody is within the proposed workspace but no in-stream construction work would occur. Waterbodies not crossed by the pipeline would be avoided or temporary equipment bridges would be setup. Temporary equipment bridges would be installed in accordance to the Applicants' E&SC Plan.

[g] At the proposed crossing location the waterbody is located in a culvert under a parking lot.

Sensitive Waterbodies

Section 303(d) of the Clean Water Act requires that each state review, establish, and revise water quality standards for the surface waters within the state. States develop monitoring and mitigation programs to ensure that water standards are attained as designated. Waters that fail to meet their designated beneficial use(s) are considered impaired and are listed under a state's 303(d) list of impaired waters. The Project crosses one 303(d)-listed impaired waters in Fairfield County, Connecticut. This waterbody, Padanaram Brook (MP 0.5 of the Southeast Discharge Take-up and Relay), is impaired due to the presence of *Escherichia coli*. According to results of Reporting Year 2014, the probable source for impairment is urban-related runoff and stormwater. However, the cause of this impairment is listed as unknown (EPA, 2014).

Algonquin would cross Padanaram Brook, and majority of all other waterbodies, using the dry crossing technique if flowing water is present at the time of construction. With implementation of this crossing method, and adherence to the mitigation measures set forth in the Project E&SCP, impacts on sensitive waterbodies would be adequately minimized.

Public Watershed Areas

The Project would cross 15 sub-basin level watersheds as defined by the USGS. In New York, the Project would cross nine watersheds: the Peekskill Hollow Creek, Muscoot River, Bailey Brook-Croton River, Long Meadow Pond Brook-Naugatuck River, Mount Hope River, Pawcatuck Mainstem, Still River-headwaters to Limekiln Brook, Candlewood Lake, and the Limekiln Brook-Still River Watersheds. The Yorktown M&R station and 3.2 miles of the 4.0-mile Stony Point Discharge Take-up and Relay pipeline segment would be in the Croton Watershed. The Croton Watershed is one of the main water supply systems that provides drinking water to New York City and surrounding areas. The closest Croton Watershed Reservoir, the Amawalk Reservoir, is about 1.6 miles from the proposed Project facilities.

We received scoping comments regarding concerns and potential impacts of the Project on the Croton W. Algonquin would sequence construction activities to minimize the amount and duration of an open right-of-way within the watershed. Algonquin would also use a separate construction crew to work in the 3.2-mile-long stretch within the watershed and have committed to an environmental inspection and compliance monitoring program to monitor and ensure Algonquin's compliance with environmental permits and requirements. In addition, Algonquin is working with the New York City Department of Environmental Protection (NYCDEP) to develop a Stormwater Pollution Prevention Plan (SWPPP) that addresses NYCDEP's requirements for constructing within a New York City watershed.

The Project would not be located in any Connecticut watershed protection areas and would not be in the vicinity of protected surface waters in Massachusetts or Maine.

The Applicants consulted with the NYSDOH, Connecticut Department of Health, and Maine Department of Health and Human Services and reviewed information provided by the Massachusetts Office of Geographic Information to determine the locations of public water supply intakes near the Project area. This review determined that there are no surface water supply intakes within 3 miles downstream of any of the surface waters that would be affected by the Project.

Water for Hydrostatic Testing and Horizontal Directional Drilling

Pursuant to DOT regulations (49 CFR 192), the Applicants would verify the integrity of the pipeline facilities by conducting hydrostatic testing prior to placing them into service. This testing would involve filling the pipeline with water, pressurizing it, and then checking for pressure losses due to pipeline leakage. Algonquin would also use water in the drilling fluid for the HDD of the Taconic Parkway and for dust control. Table 2.2.2-2 summarizes the quantity and sources of water that would be required for hydrostatic testing and HDD drilling fluid.

TABLE 2.2.2-2

Water Use Sources and Discharge Locations for the Atlantic Bridge Project

Facility Name	Municipal Water Source	Approximate Volume (gallons)	Discharge Location
Pipeline Segments			
Stony Point Discharge Take-up and Relay	Towns of Yorktown and Somers	400,000	Off-site [b]
Taconic Parkway HDD [a]	Town of Yorktown	240,000	Off-site [b]
Southeast Discharge Take-up and Relay	City of Danbury	806,000	On-site [c]
	Total Pipeline Facilities	**1,446,000**	
Aboveground Facilities [d]			
Yorktown M&R Station	Town of Yorktown	12,000	Off-site [b]
Oxford Compressor Station	Town of Oxford	20,000	On-site
Chaplin Compressor Station	Town of Chaplin	20,000	On-site
Salem Pike M&R Station	City of Norwich	10,000	On-site
Danbury M&R Station	City of Danbury	5,000	On-site
Weymouth Compressor Station	Town of Weymouth	20,000	On-site
Plymouth M&R Station	Town of Plymouth	8,000	On-site
Pine Hills M&R Station	Town of Plymouth	1,200	On-site
Needham Regulatory Station	Town of Needham	3,000	On-site
Westbrook M&R Station	City of Westbrook	6,000	On-site
	Total Aboveground Facilities	**105,200**	
Project Total		**1,551,200**	

[a] The HDD section would be hydrostatically tested immediately after installation and may be tested a second time with the mainline.
[b] Hydrostatic test water would be hauled off site to an approved discharge location.
[c] Discharge location is anticipated to be at MP 2.3.
[d] M&R station facilities and/or certain equipment at these facilities may be tested pneumatically.

As indicated in table 2.2.2-2, all 1,551,200 gallons of the water that is needed for hydrostatic testing and the Taconic Parkway HDD would be obtained from multiple municipal sources. Algonquin also estimates that a total of 2,260,000 additional gallons of water would be required for dust control along the two pipeline segments and at the Weymouth Compressor Station. Water for dust control would also be obtained from multiple sources. The Applicants would transport water to the work area via trucks or obtain water from existing fire hydrants. To reduce water usage, hydrostatic testing would occur in sections and water would be recycled between tests. The Applicants have developed a hydrostatic testing procedure, included in the E&SCP, which describes how hydrostatic testing would be conducted and how the water would be discharged. Following the completion of hydrostatic testing, the test water would be discharged into dewatering structures in upland areas within the construction work area in accordance with the Project E&SCP. The discharge rates would be regulated to range between 1,000 and 1,200 gpm. The Applicants would also employ energy dissipation devices during discharge activities and it is anticipated that most of the water would infiltrate into the soil and recharge the local groundwater system. The Applicants' use of dewatering and energy dissipation devices would minimize erosion and the suspension of sediments, and prevent flooding, streambed scour, or excessive stream flow should any of the discharge water reach surface waters. The Applicants are not proposing to use any chemicals for testing or for drying the pipeline following testing. Sampling of discharge water would be conducted in accordance with the Project E&SCP to document water quality at the time of discharge in accordance with applicable permits. In the Croton Watershed, Algonquin proposes to transport discharge water to an approved off-site location outside of the watershed. By implementing the hydrostatic testing procedures summarized above and provided in detail in the E&SCP, and obtaining and complying with the required permits, we conclude that the impacts associated with hydrostatic test water withdrawal and discharge would be minor and temporary.

General Impacts and Mitigation

Project construction activities that potentially can affect water resources include clearing and grading, pipeline installation across waterbodies, HDD crossings, hydrostatic testing, and potential spills or leaks of hazardous materials. Pipeline construction can affect surface waters in several ways, including modifying the existing aquatic habitat, increasing runoff and the rate of in-stream sediment loading, and increasing turbidity levels. The clearing and grading of the waterbody banks, in-stream trenching and backfilling, and trench dewatering associated with non-HDD crossings would disturb the riparian vegetation and soils, exposing the site(s) to erosion. It could also introduce sediment directly or indirectly into the water column. The heavy equipment that is used during construction could also compact upland and riparian soils, which could reduce infiltration and cause greater potential for runoff. Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters could create a potential for contamination and degrade downstream water quality and aquatic habitat. Surface water impacts can also result from inadvertent releases of drilling fluids in the water column during HDD operations.

The greatest potential impact of pipeline construction would be an increase in sediment loading to surface waters resulting from a change in erosion/deposition patterns. The level of impact of the Project on surface waters would depend on the duration of construction activities, precipitation events, sediment loads, stream area/velocity, channel integrity, and bed materials. To mitigate these impacts, Algonquin is proposing to use the dry-crossing and HDD methods to cross waterbodies.

Algonquin proposes to use a non-HDD dry crossing method to install the pipeline at 15 of the 16 waterbody crossing locations if there is flowing water at the time of construction. Algonquin's proposed dry crossing methods would involve either the installation of a flume pipe(s) and/or dam-and-pump operation. Both methods would involve the installation of temporary dams prior to trenching to isolate and divert the stream flow over or around the construction area and allow trenching of the stream crossing under drier conditions. Spoil removed during trenching would be stored away from the water's edge and protected by sediment containment structures. Pipe strings would be fabricated on one bank and either pulled across the stream bottom to the opposite bank or carried into place and lowered into the trench. After the pipe is installed, the trench would be backfilled and the bed and banks of the stream would be restored and stabilized before the flume(s) or dam-and-pump and associated temporary dams are removed.

Except where reasonable alternative access is available, temporary construction equipment crossings or bridges would be installed across all waterbodies to gain access along the right-of-way for construction operations. These bridges would consist of one of either:

- clean rock fill and culverts;
- equipment pads, wooden mats, and/or culverts; or
- flexi-float or portable bridge.

The equipment crossings would be installed after clearing to minimize streambed disturbance and downstream siltation. Only clearing equipment and equipment necessary for the installation of equipment bridges would cross waterbodies prior to bridge installation. Where culverts are used, devices would also be placed at the outlet to prevent scouring of the stream bottom. After such equipment crossings are established, construction equipment would not be permitted to drive through the waterbody for access. The equipment crossings would be removed once access in the area is no longer needed.

Vegetation would not be cleared, except over the pipeline trench, in the area within 10 feet of the waterbody. The work area would be limited in size to the minimum area necessary to safely construct the waterbody crossing and accommodate any stockpile of excavated material from the trench and the prefabricated pipeline crossing section.

Construction-related impacts would be limited to short periods of increased turbidity before installation of the pipeline, during the installation of the dams, and when flow across the restored work area is reestablished. Algonquin would follow the measures outlined in the Project E&SCP to control sedimentation and to minimize the potential for increased turbidity. In addition, Algonquin would return streambeds and banks to their preconstruction conditions in accordance with applicable permit conditions and recommendations from the NYSDEC and CTDEEP.

According to soil data provided by the USDA and obtained from field surveys, there are no streams with shallow bedrock that may require blasting during construction (see section 2.1.2). In the unlikely event that shallow bedrock is encountered, Algonquin would attempt to mechanically excavate the rock. However, if conditions are encountered that warrant the use of controlled blasting, Algonquin would implement the Project Rock Removal Plan, which includes measures that would mitigate the effects of in-water blasting. In its scoping comments, the NYSDEC indicated it would require site-specific dewatering plans for areas of blasting near NYSDEC-regulated wetlands or waterbodies.

Algonquin would cross the Taconic Parkway using the HDD crossing method. This crossing would include one intermittent minor waterbody (Unnamed Tributary to Hunter Brook) at MP 0.7 along the Stony Point Discharge Take-up and Relay pipeline segment. Using the HDD crossing method would avoid potential impacts on the waterbody unless an inadvertent release of drilling fluid occurred directly or indirectly into the waterbody. Drilling fluid consists of nontoxic materials, but an inadvertent return in the water could affect fisheries or other aquatic organisms by increasing turbidity in a waterbody, temporarily coating the waterbody bed with a layer of clay, and/or affecting fish gills. The probability of an inadvertent release is influenced by the subsurface materials but is generally greatest when the drill bit is working near the surface (i.e., near the entry and exit points). As described in section 2.1.1, geotechnical borings conducted at the HDD location indicate that the subsurface materials appear to be favorable for the HDD installation technique and there appears to be adequate soil and rock strength to resist the required drilling fluid pressures necessary for the HDD installation. These conditions and the fact that the HDD entry and exit holes are far from the creek and the HDD path would be about 80 feet below the surface where it crosses the creek would minimize the risk of an inadvertent return into the stream. Algonquin would also implement the measures identified in its Best Drilling Practices Plan &

Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns[12] (BDP Plan) to minimize the risk and impact of a release of drilling fluid should one occur. These measures include:

- visually inspecting the ground surface near the position of the cutting head, if practical;
- monitoring of annular fluid pressures and circulation;
- if necessary, implementing measures to contain release;
- if an inadvertent release cannot be contained or controlled, immediately suspending drilling operations until appropriate measures of containment are in place; and
- notifying the NYSDEC, NYCDEP, and USACE if a release occurs.

We reviewed the Applicants' BDP Plan and found it acceptable.

Algonquin has stated that in the event that there are construction issues with the HDD crossing method, they would abandon the drill hole, seal with grout, and attempt the HDD crossing using an alignment that would be slightly offset from the initial crossing location. In the event that a second HDD crossing were to prove unsuccessful Algonquin would use a conventional bore method or hand tunneling method. If the HDD in its proposed location proves unsuccessful, Algonquin would be required to identify a new location for the crossing or new methodology, and request approval for the new location or methodology with all applicable agencies. Therefore, **we recommend that:**

- **In the event of an unsuccessful HDD at the Taconic Parkway, Algonquin should file with the Secretary a plan for the crossing of the waterbody. This should be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. Algonquin should file this plan concurrent with the submission of its application to applicable agencies for a permit to construct using this alternative path. The Director of the Office of Energy Projects (OEP) must review and approve this plan in writing before construction of the alternative crossing.**

We received comments from the NYSDEC requesting that all waterbodies in New York be crossed using the HDD method. All of the waterbodies that would be crossed by the Project in New York are considered minor (less than 10 feet wide). The HDD method would likely require additional workspace and impacts outside of Algonquin's existing rights-of-way. Algonquin's proposal to utilize a dry crossing method at these streams would adhere to FERC's Procedures and Applicants' E&SCP, and would adequately minimize aquatic impacts. Algonquin, however, must also obtain a 401 Water Quality Certificate for the Project and are analyzing the proposed crossing methods with respect to state requirements. Additional mitigation measures, if required by the NYSDEC, could be included in Algonquin's 401 Water Certificate application.

[12] The Applicants' Best Drilling Practices Plan & Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns was included as part of Appendix 2D to Resource Report 2 in its October 22, 2015 application (Accession No. 20151022-5285). The plan can be found on FERC's website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

We received comments during the scoping period concerning the potential impact of the Project on Willow Pond. Algonquin has since changed the alignment of the pipeline route through this area. The revised alignment would avoid in-water work and direct impacts on Willow Pond.

Long-term impacts associated with pipeline operations and maintenance would be relatively minor and limited to periodic clearing of the vegetation within the permanent right-of-way at waterbody crossings. Algonquin would leave a 10-foot-wide strip of vegetation along waterbody banks to minimize erosion. In addition, Algonquin would revegetate disturbed riparian areas in Connecticut with native grasses and shrubs following guidance from the CTDEEP. Algonquin would minimize impacts by implementing measures outlined in the Project E&SCP. These measures include:

- completing in-stream work between June 1 and November 30 for coldwater fisheries in New York and all waterbody crossing in Connecticut, unless expressly permitted or required by appropriate agencies;
- constructing crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit;
- locating extra workspaces that are in undisturbed lands at least 50 feet back from the waterbody edge unless a reduced setback is requested with sufficient justification on a site-specific basis;
- requiring temporary erosion and sediment control measures to be installed across the construction right-of-way as necessary to prevent the flow of spoil or heavily silt-laden water into any waterbody;
- maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- designing and maintaining equipment bridges to prevent soil from entering the waterbody; and
- restricting spoil placement at least 10 feet from the water’s edge in the construction work area or in other approved additional extra workspaces away from the water's edge.

To minimize impacts from potential spills, the Applicants would implement their SPCC Plan. This plan outlines procedures to prevent spillage of hazardous materials and measures to control, contain, and clean up spills. These procedures include:

- storing hazardous materials, chemicals, lubricating oils, and fuels in upland areas at least 100 feet from waterbody/wetland boundaries;
- prohibiting overnight parking and restricting the refueling of equipment within 100 feet of waterbody/wetland boundaries;
- allowing the refueling of equipment within 100 feet of waterbodies and wetlands only if approved by the EI and no other practical alternative exists, and only then when additional precautions such as continual monitoring of fuel transfer, secondary containment structures, and utilization of spill kit readiness are employed; and

- performing concrete coating activities at least 100 feet from waterbody and wetland boundaries, unless the location is an existing industrial site designated for such use.

We have reviewed the Applicants' SPCC Plan and have found it acceptable.

In addition to the measures described above, Algonquin is also preparing SWPPPs for New York, Connecticut, and Massachusetts to mitigate the effects of stormwater runoff resulting from the Project.

In New York, Algonquin's SWPPP is being prepared in accordance with the State Pollution Discharge Elimination System: Individual Permit Requirements. When completed, the SWPPP will be submitted to the NYSDEC and NYCDEP. The SWPPP will include measures that would be implemented during and after construction. These measures include the use of temporary erosion control devices, runoff piping, swales, and check dams. Algonquin is currently designing stormwater mitigation measures for the aboveground facilities associated with Valve Site 15-b and 16-b. For the proposed facilities within the Croton River Watershed, the New York SWPPP will address stormwater mitigation in adherence to New York City Watershed Regulations. Algonquin would also utilize the Green Infrastructure methodology in New York. This methodology is designed to return the hydrologic conditions to preconstruction conditions and would include:

- reducing land clearing and grading;
- segregating topsoil during trenching;
- revegetating wetland areas by planting trees;
- directing sheet flow to riparian buffers and filter strips; and
- the utilization of soil restoration techniques.

Algonquin's Stormwater Pollution Control Plan for Connecticut is being prepared in accordance with the CTDEEP General Permit for Discharge of Storm Water and Dewatering Wastewaters from Construction Activities. The content of the Stormwater Pollution Control Plan will include specific erosion control devices and procedures. It will also outline specific procedures to be followed for site restoration and clean-up. The proposed facilities at the Chaplin Compressor Station in Connecticut would result in 11,000 square feet of new impervious surfaces. To comply with the 2004 Connecticut Stormwater Quality Manual, Algonquin's permanent stormwater controls at the Chaplin Compressor Station would include the installation of a grassed swale to reduce peak flow, runoff volume, and reduce suspended solids. Stormwater would be controlled at the Oxford Compressor Station with the existing catch basin. The existing catch basin diverts water underground to a retention pond. Water level in the pond is regulated by an outlet control device that discharges into a wooded area. The Applicants have proposed to create a new grassed swale at the Oxford Compressor Station to mitigate for the increased runoff that would result from the proposed new facilities at this station.

In Massachusetts, Algonquin completed a Stormwater Management Report for the proposed Weymouth Compressor Station. This report outlines a number of specific stormwater mitigation measures that would be installed at the station including deep sump hooded catch basins, sediment forbays, outfalls, and roof drain leaders. Discharge areas would also be lined with stone to dissipate flow velocity.

Extra Workspaces Within 50 feet of Waterbodies

FERC's Procedures stipulates that all ATWS shall be located at least 50 feet from waterbodies except where an alternative measure has been requested by Algonquin and approved by FERC. Algonquin has identified certain areas where they believe site-specific conditions do not allow for a 50-foot setback of ATWS from waterbodies. Table 2.2.2-3 identifies the locations and the reasons why

Algonquin believes the ATWS is justified. Based on our review, we concur that all of Algonquin's requests are justified.

TABLE 2.2.2-3

Requested Modifications for Additional Temporary Workspace Near Waterbodies for the Atlantic Bridge Project

State/Facility/Waterbody ID	ATWS Milepost	ATWS Size (acres)	Distance from Resource Area (feet)	ATWS Justification [a]
New York – Stony Point Discharge Take-up and Relay				
B15-SPL-36-S	0.1	3.1	0	A
B15-SPL-36-SA	0.1	3.1	0	A
B15-SPL-36-SB	0.2	0.1	0	A
Unnamed Pond	0.2	<0.1	30	A
B15-SPL-36-SC	0.3	0.5	0	A
B15-SPL-36-SE	0.3	0.5	0	A
B15-SPL-36-SF	0.3	0.5	0	A
A14-SPL-2-S2	1.3	0.1	20	B
A14-SPL-7-S1	1.7	0.1	0	C
A14-SPL-24-S1	2.2	0.2	0	D
A14-SPL-24-S2	2.2	0.2	0	D
A15-SPL-12-S1	3.1	0.5	40	E
Unnamed Pond	3.1	0.5	8	E
Connecticut – Southeast Discharge Take-up and Relay				
C14-SL-1-S1	0.5	0.3	0	F
C14-SL-2-S1	0.6	1.4	0	G
C14-SL-4-S2	2.3	0.7	15	H

[a] A = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, and pullback of the Taconic Parkway HDD crossing.
B = Extra workspace required for a road crossing and work in wetlands.
C = Extra workspace required for a stream crossing and for use of heavy equipment required for replacing and installing large-diameter pipe.
D = Extra workspace required for spoil storage due to saturated subsoils, and use of heavy equipment required for replacing and installing large-diameter pipe.
E = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, a road crossing, and pond avoidance.
F = Extra workspace required for a stream crossing and road crossing.
G = Extra workspace required to cross busy commercial properties.
H = Extra workspace required for use of heavy equipment required for replacing and installing large-diameter pipe and to construct launcher, receiver facilities and regulators.

Based on Algonquin's proposed construction techniques and the implementation of minimization and mitigation measures, including the E&SCP and SPCC Plan, we conclude that construction and operation of the Project would not significantly affect surface water resources in the Project area.

2.2.3 Wetlands

Existing Wetland Resources

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands sustain substantial biodiversity and serve a variety of functions that include: providing wildlife habitat, recreational opportunities, flood control, and naturally improving water quality.

The Applicants have field delineated wetlands on all the tracts where survey access has been granted. Wetlands on inaccessible tracts were identified using USGS maps, aerial imagery, and federal and state GIS-based resource data. The boundaries of these wetlands would be confirmed when access is obtained. The wetland field delineations were performed in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (USACE, 2012) and the routine determination guidelines provided in the USACE *Wetland Delineation Manual* (Environmental Laboratory, 1987). Wetland types were assigned based on the National Wetlands Inventory classifications as described in Cowardin et al. (1979).

The Project would affect 20 wetland areas consisting of the following three cover types: palustrine forested, palustrine scrub shrub, and palustrine emergent. Fifteen of these wetlands would be crossed by the pipeline, 3 other wetlands would be within the pipeline workspace but would not be crossed by the pipeline, 1 wetland would be affected at the Salem Pike M&R station, and 1 wetland would be temporarily affected by the minor road improvements required for PAR 4. The milepost location, feature ID, wetland type, proposed crossing method, approximate crossing length, and impacts on wetlands associated with construction and operation in the Project area are provided in appendix D.

<u>Palustrine Forested Wetlands</u>

Palustrine forested wetlands are characterized by woody vegetation that is at least 20 feet tall and normally include an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. Woody vegetation associated with the forested wetlands in the Project area includes: red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), black birch (*Betula lenta),* green ash *(Fraxinus pennsylvanica),* slippery elm (*Ulmus rubra)* and American elm (*Ulmus americana)*, highbush blueberry (*Vaccinium corymbosum*), sweet pepperbush (*Clethra alnifolia*), northern spicebush (*Lindera benzoin*), northern arrowwood (*Viburnum recognitum*), southern arrowwood (*Viburnum dentatum*), and silky dogwood (*Cornus amomum*). Typical herbaceous plants characteristic of palustrine forested wetlands in the Project area include: cinnamon fern (*Osmunda cinnamomea*), marsh fern (*Thelypteris palustris*), sensitive fern (*Onoclea sensibilis*), skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*), and various sedges (*Carex spp.*).

<u>Palustrine Emergent Wetlands and Scrub-Shrub Wetlands</u>

Palustrine emergent wetlands are described by Cowardin et al., as wetlands with dominance of rooted, herbaceous hydrophytes, not including mosses and lichens (1979). Dominant vegetation in the emergent wetlands in the Project area includes: tussock sedge (*Carex stricta*), woolgrass (*Scirpus cyperinus*), green bulrush (*Scirpus atrovirens*), great bulrush (*Schoenoplectus tabernaemontani*), soft rush (*Juncus effusus*), Joe-Pye weed (*Eupatorium maculatum*), burreeds (*Sparganium spp*), shallow sedge (*Carex lurida*), fox sedge (*Carex vulpinoidea*), and hop sedge (*Carex lupulina*). Invasive species are also abundant in many of the palustrine emergent wetlands that would be crossed by the Project. These species include: reed canarygrass (*Phalaris arundinacea)*, common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), Japanese stilt grass (*Microstegium vimineum*), and multiflora rose (*Rosa multiflora*).

The palustrine scrub-shrub (PSS) wetland cover type includes areas that are dominated by saplings and shrubs that typically form a low and compact structure less than 20 feet tall (Cowardin et. al., 1979). The Project would affect less than 0.1 acre (~0.01 acre) of wetlands with a scrub-shrub component.

Wetland Crossing Methods, General Impacts, and Mitigation

Crossing Methods

The procedures used to install the pipeline across wetlands would depend on the level of soil stability and saturation encountered during construction. In unsaturated wetlands, construction procedures would be similar to Algonquin's construction procedures in uplands. Topsoil would be segregated, but only from the trench area. Spoil would be temporarily stored in the wetland near the trench while construction takes place and the pipe would be assembled directly in the wetland.

Algonquin would not strip topsoil in wetlands that are saturated. Where the soils are unable to support the weight of equipment, Algonquin would use wooden swamp mats to provide support. These specialized mats would also minimize disturbance to wetland hydrology and maintain soil structure. Pipe fabrication would occur outside the wetland in an approved upland ATWS.

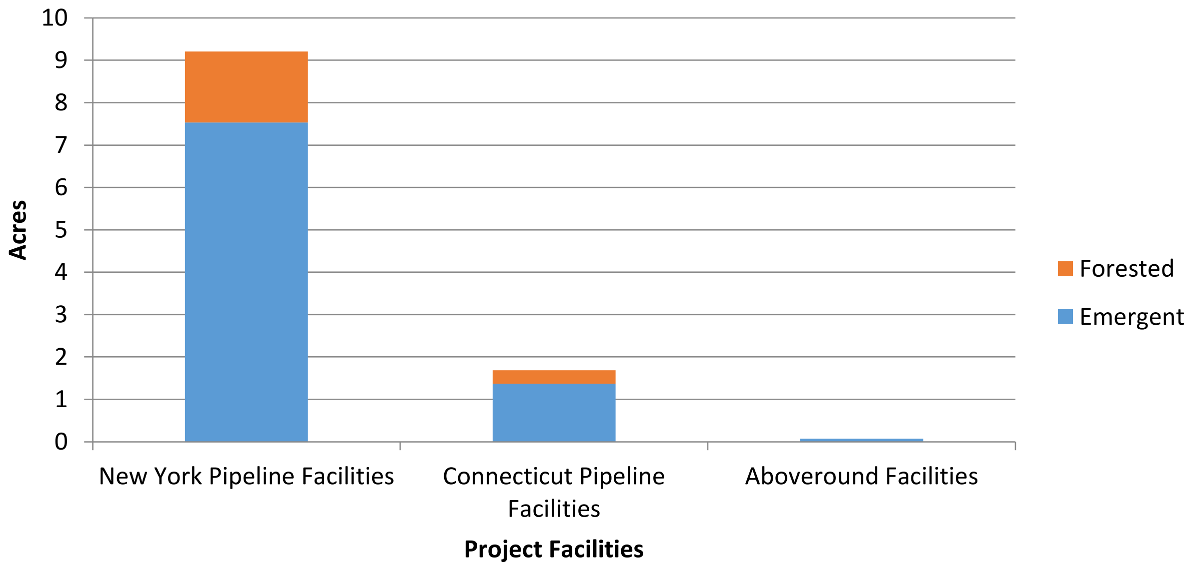
Under certain inundated or saturated conditions where wetland soils and hydrology cannot support conventional pipe laying equipment, Algonquin may use the push-pull method. This method may also be used in areas that have significant quantities of water that would allow for the pipe to be floated over the open trench. Where the push-pull method is used, construction and excavation equipment would work from temporary work surfaces. A prefabricated pipeline segment would be pulled or floated into position and then sunk into the trench. A wide-track bulldozer, or similar equipment, supported with wooden mats, would then backfill the trench.

General Impacts and Mitigation

Figure 2.2.3-1 summarizes the potential impacts of the Project on wetlands by state and facility. In all, construction of the Project would affect 2.0 acres of forested wetlands and about 9.0 acres of emergent wetlands, which would include a minimal amount (0.01 acre) of PSS/PEM wetland. Operation of the Project would not result in the filling of any wetlands and would convert less than 0.1 acre of forested wetland to non-forested wetland as a result of post-construction vegetation maintenance practices, the majority of which would be along the Stony Point Discharge Take-up and Relay pipeline segment. The remaining forested wetlands are located within temporary workspaces that would be allowed to revegetate after construction.

The effects of construction in wetlands would be greatest during and immediately following construction. The primary impact of construction would be the temporary removal or alteration of wetland vegetation. In emergent wetlands, the impact of construction would be relatively short term because herbaceous vegetation would regenerate quickly. In forested wetlands, the impact from construction would be temporary but long term and may take 20 years or longer for the wetland forests on the temporary rights-of-way to regenerate. Other impacts that could result from construction include temporary changes to wetland hydrology and water quality. Construction could increase the potential for erosion and sedimentation impacts and result in the mixing of topsoil with subsoil. This could alter biological activities and chemical conditions within the wetland soils, and could affect the reestablishment and natural recruitment of native wetland vegetation. The temporary stockpiling of soil and movement of equipment in wetlands could also compact and furrow wetland soils, which could alter the natural hydrologic patterns, inhibit seed germination, or increase seedling mortality.

Figure 2.2.3-1
Summary of Wetlands Affected by Construction of the Atlantic Bridge Project Pipeline Facilities



Trenching could also penetrate or remove impervious soil layers under the wetland and, consequently, drain perched water tables. This in turn might result in drier soil conditions that affect the reestablishment of wetland vegetation. Construction clearing activities and disturbance of wetland vegetation could also temporarily affect a wetland's capacity to buffer flood flows and/or control erosion. Construction activities also have the potential to temporarily diminish the recreational and aesthetic value of wetlands.

During operation of the Project, Algonquin would maintain up to a 10-foot-wide corridor centered on the pipeline in an herbaceous state. As mentioned above, less than 0.1 acre of forested wetlands would be affected by the operation of the Project. Algonquin would selectively cut woody vegetation that is greater than 15 feet in height that is located within a 30-foot-wide corridor centered over the pipeline. This maintenance would periodically disturb wetland vegetation but would not significantly affect wetland ecological functions such as sediment/toxicant retention, nutrient removal/transformation, flood attenuation, groundwater recharge/discharge, and wildlife habitat.

The NYSDEC requested HDD crossings of wetlands, where possible. Algonquin has proposed one HDD crossing at the Taconic Parkway which would minimize impacts on two wetlands as shown in appendix D. Although the HDD method is not proposed in other areas, Algonquin has proposed a number of mitigation measures, outlined in the Project E&SCP and Wetland Mitigation Plan,[13] which in our view would adequately minimize impacts on wetlands.

Specifically Algonquin would:

- neck down the width of the right-of-way to 75 feet in wetlands where practicable unless FERC has approved a wider right-of-way width on a site-specific basis;
- complete wetland crossings within 24 to 48 hours;
- segregate up to 12 inches of topsoil from the trench line in unsaturated wetlands;
- temporarily install mats or timber riprap where necessary, to create a stable surface for equipment, or using other methods such as low-ground-weight equipment to minimize soil mixing and disturbance;
- install trench plugs at the edges of wetlands to prevent subsurface drainage along the pipeline; and
- install erosion controls as needed to control sedimentation until disturbed soils are adequately stabilized and adjacent upland areas are restored.

The E&SCP and the Applicants Conceptual Mitigation Plan[14] also includes measures on how Algonquin would restore wetlands. These measures would include:

- reestablishing wetland topsoil, subsoil, site contours, and surface hydrologic patterns to preconstruction state;
- not using lime or fertilizer within wetlands;
- revegetating the right-of-way by seeding the wetland area with annual ryegrass at a rate of 40 pounds per acre of Pure Live Seed or other seed mix specified by appropriate agencies within six working days of final grading;
- planting 1.5 times the preconstruction number of cleared trees to enhance restoration of forested wetlands in New York with locally sourced, native species approved by state and federal permits;
- participating in the In-Lieu Fee program in Connecticut;

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13 The Applicants' Wetland Mitigation Plan was included Attachment RR2 – Response 9 in their February 10, 2016 Response to the January 21, 2016 FERC Environmental Data Request (Accession No. 20160210-5200). The E&SCP can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20160210-5200 in the "Numbers: Accession Number" field.

14 The Applicants' Conceptual Mitigation Plan was included as appendix 2H to Resource Report 2 in its October 22, 2015 application (Accession No. 20151022-5282). This plan can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

- developing and conducting post-construction monitoring measures to determine the success of revegetation rates;
- developing in Invasive Plant Species Control Plan (IPSCP) to monitor, document, and control invasive species post-construction; and
- minimizing the presence of invasive species in wetlands following construction through the implementation of the Applicants' IPSCP as discussed in more detail in section 2.3.1.

Compensatory Mitigation

As discussed above, the Project would not permanently fill any wetlands and would result in minimal (less than 0.1 acre) conversion of forested to non-forested wetlands. However, the temporary clearing of forested wetlands would be a long-term impact that could require 20 or more years for the forest to return to a preconstruction state. Algonquin proposes to provide compensatory mitigation to offset this impact.

In New York, Algonquin would enhance the restoration of temporarily and permanently impacted forested wetlands by re-planting affected areas. The number of planted trees would be determined through comparison of preconstruction and post construction site conditions. Prior to tree clearing, Algonquin would identify the species and number of all living, native trees greater than 6 inches in diameter at breast height within the wetland areas encompassed by the construction workspace. Information on aerial coverage and invasive species would also be documented. After construction, Algonquin would restore the wetland by planting native, locally sourced trees that are 36 inches tall at the time of planting. The number of trees planted would be 1.5 times the number of living native trees that were cleared in the workspace. Algonquin would also install deer and rodent guards to prevent damage to the restored trees. Post-constructed monitoring would be conducted for three years following pipeline construction, in compliance with FERC requirements, to determine the success of the restoration measures. Algonquin would also comply with any additional monitoring requirements identified through the federal and state wetland permitting processes.

In Connecticut, Algonquin would participate in the Audubon Connecticut In Lieu Fee Program to off-set Project impacts to aquatic resources. The amount of in-lieu fees paid to the program would be determined by the USACE. The fees that are paid would support projects sponsored by the Connecticut Audubon Society and National Audubon Society in Connecticut.

We received comments from the EPA during scoping regarding temporary impacts and secondary impacts in relation to the development of compensatory mitigation. Compensatory mitigation is addressed through the USACE and state level wetland permitting process and would be discussed in more detail in these permits, as appropriate.

Extra Workspaces Within 50 feet of Wetlands

The Applicants' E&SCP is consistent with the FERC Procedures. The E&SCP stipulates that the construction right-of-way width in wetlands be limited to 75 feet and that all ATWS should be located at least 50 feet from wetlands except where an alternative measure has been requested by Algonquin and approved by FERC. Algonquin identified several areas where it believes a 75-foot right-of-way is insufficient to accommodate wetland construction and a wider right-of-way is necessary. Table 2.2.3-1 lists the locations where Algonquin has requested a wider construction right-of-way and the site-specific rationale for the request. Based on our review of the requests for a wider construction right-of-way, we have determined that Algonquin has provided sufficient justification for the use of additional workspaces in those wetland areas.

TABLE 2.2.3-1

Requested Modifications for Locations Where the Construction Right-of-way Is Greater Than 75 Feet Wide in a Wetland for the Atlantic Bridge Project

State, Facility, Wetland ID	Milepost or Milepost Range	Crossing Width (>75-foot Right-of-Way)	Justification [a]
New York – Stony Point Discharge and Relay			
B15-SPL-36W	0.1	85 to 145	A
B15-SPL-36W	0.1 to 0.3	37 to 100	A
A14-SPL-2W	1.0-1.1	25 to 50	B
A14-SPL-2W	1.1 to1.2	0 to 25	B
A14-SPL-2W	1.3	25 to 30	C
A14-SPL-2W	1.3 to 1.4	10 to 87	B
A14-SPL-7W	1.7	30	D
A14-SPL-13W	3.3 to 3.4	10 to 65	B
A14-SPL-14W	3.9 to 4.0	10 to 85	B
Connecticut – Southeast Discharge Take-up and Relay			
C15-SL-4-W	2.0 to 2.1	10	B
B14-SL-5-W	2.3 to 2.4	75 to 145	E
C14-SL-4-W	2.4	140 to 145	B

[a] A = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, and pullback of the Taconic Parkway HDD crossing.
B = Extra workspace required for spoil storage due to saturated subsoils, and use of heavy equipment required for replacing and installing large-diameter pipe.
C = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, and a road crossing.
D = Extra workspace required for use of heavy equipment required for replacing and installing large-diameter pipe.
E = Extra workspace required for use of heavy equipment required for replacing and installing large-diameter pipe and to construct launcher and receiver facilities.

Algonquin also identified locations where it believes site-specific conditions do not allow for a 50-foot setback of ATWS from wetlands. Table 2.2.3-2 lists the locations where Algonquin requested less than a 50-foot setback from a wetland and the site-specific rationale for the requested modification from our Procedures. Based on our review, we have also determined that the requested modifications are justified.

As discussed above, the Project would primarily result in temporary impacts on wetlands, and would have minimal permanent impact on wetlands. The implementation of the mitigation measures outlined in the E&SCP and Conceptual Mitigation Plan would minimize wetland impacts and help ensure the successful restoration of wetland areas. We conclude that temporary and permanent wetland impacts of the Project would be offset by Algonquin's implementation of mitigations measures and, therefore, would not represent a significant impact on wetland resources.

TABLE 2.2.3-2

Requested Modifications for Additional Temporary Workspace Near Wetlands for the Atlantic Bridge Project

State, Facility, Wetland ID	ATWS Milepost	ATWS Size (acres)	Distance From Resource	ATWS Justification [a]
New York – Stony Point Discharge and Relay				
B13-SPLR-W30	0.0	1.1	0	A
B15-SPL-36W	0.1	3.1	0	B
B15-SPL-36W	0.1	3.1	0	B
B15-SPL-36W	0.3	0.5	0	B
A14-SPL-2W	1.3	0.1	0	C
A14-SPL-7W	1.7	0.1	0	D
A14-SPL-8W	1.9	0.7	43	E
A14-SPL-9W	2.4	0.1	37	F
A15-SPL-12W	2.9	0.3	0	G
A15-SPL-12W	3.1	0.5	35	H
A14-SPL-13W	3.3	0.1	20	F
A14-SPL-14W	3.8	0.1	0	F
A14-SPL-14W	3.9	0.2	0	F
A15-SPL-15W	4.0	0.8	0	F
Connecticut – Southeast Discharge Take-up and Relay				
C14-SL-2-W	0.6	1.4	0	I
B14-SL-5-W	2.3	0.7	0	J
C14-SL-4-W	2.3	0.7	0	F

[a] A = Extra workspace required for the removal and relocation of the launcher/receiver pressure regulating facility

B = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, and pullback of the Taconic Parkway HDD crossing.

C = Extra workspace required for a road crossing and work in wetlands.

D = Extra workspace required for use of heavy equipment required for replacing and installing large-diameter pipe.

E = Extra workspace required for road crossing.

F = Extra workspace required for spoil storage due to saturated subsoils, and use of heavy equipment required for replacing and installing large-diameter pipe.

G = Extra workspace required for road crossing and pond avoidance.

H = Extra workspace required for spoil storage due to saturated subsoils, use of heavy equipment required for replacing and installing large-diameter pipe, a road crossing, and avoidance of a pond.

I = Extra workspace required to cross busy commercial properties.

J = Extra workspace required for use of heavy equipment required for replacing and installing large-diameter pipe and to construct launcher and receiver facilities.

2.3 VEGETATION, WILDLIFE, AND FISHERIES

2.3.1 Vegetation

Existing Vegetation Resources

Plant community types within the Project area were determined based on a review of aerial photography, existing land use classifications, and field surveys. Descriptions of existing typical vegetative cover types in the Project area are based on field observations and the natural community classification systems described in *Draft Ecological Communities of New York State* and *The Vegetation of Connecticut: A Preliminary Classification* (Edinger et al., 2002; Metzler and Barrett, 2006).

The Project pipeline segments and associated workspace areas traverse forested and open upland communities, as well as forested and emergent wetlands. Wetland vegetation communities that would be affected by the Project are discussed in section 2.2.3. The upland vegetative cover types within the Project area are consistent with typical plant communities found in New York, Connecticut, Massachusetts, and Maine. The Project area is comprised of vegetation communities similar to those described in table 2.3.1-1.

TABLE 2.3.1-1

Upland Vegetation Cover Types Associated with the Atlantic Bridge Project

Vegetation Community	General Description	Common Species
Upland Forest	Mixed deciduous and oak-hickory forest	Trees: Northern red oak, black oak, chestnut oak, shagbark hickory, American beech, red maple, sugar maple, white ash, paper birch, yellow birch, black birch, tulip tree, sweetgum, and eastern white pine. Shrubs: witch-hazel, raspberry, shadbush, choke cherry, blackberry, American hornbeam, Japanese barberry[a], Greenbrier, sassafras, and lowbush blueberry. Herbs: Virginia creeper, New York fern, White wood aster, wild geranium, and goldenrod.
Open Upland	This vegetation community consists of all non-forested, non-wetland habitats including Algonquin maintained rights-of-way, other utility rights-of-way, open fields, vacant land, herbaceous and scrub-shrub uplands, golf courses, and municipal land.	Shrubs: Silky dogwood, raspberry, multiflora rose[a], hawthorn, serviceberry, choke-cherry, sumac, northern arrowwood, Oriental bittersweet[a]. Herbs: Queen Anne's lace, goldenrod, Kentucky bluegrass, Canada bluegrass, fescue, Timothy grass, quackgrass, smooth brome, orchard grass, common chickweed, common milkweed common evening primrose, oldfield cinquefoil, aster spp., wild strawberry, ragweed, hawkweed spp., dandelion, common reed[a], and Japanese knotweed[a].

a Non-native species.

Within the Project area, upland forest is primarily limited to minimal workspace areas along the Stony Point Discharge Take-up and Relay and Southeast Discharge Take-up and Relay pipeline segments and a few aboveground facility locations. Open upland areas are primarily associated with existing, maintained utility rights-of-way, along which much of the Project pipeline segments are located, and the aboveground facility sites. However, the majority of aboveground facility work associated with the Project would occur within existing developed areas.

Algonquin has identified one TAR and four PARs for use on the Project. The TAR is a dirt access road which would be used during construction of the Project and would temporarily impact about 0.2 acres of open land for road upgrades and improvements. Three of the four PARs are existing, gravel roads that would require minor upgrades and/or widening (by between 10 and 20 feet) to be used during pipeline construction and operation. These upgrades would result in about 0.7 acre of new land disturbance. The fourth PAR (PAR 3.4) would be a new road that Algonquin would need to construct from the end of Campfire Road to the Stony Point Take-up and Relay pipeline right-of-way. This new PAR would permanently disturb 0.03 acre of land. Algonquin has identified seven pipe and contractor ware yards to be used temporarily during construction of the Project. Six of these yards were used during construction of the AIM Project and the seventh is an existing industrial yard. There would be no vegetation impacts associated with these pipe and contractor ware yards.

Figures 2.3.1-1 and 2.3.1-2 summarize the approximate acreage of upland vegetation communities that would be affected by the Project during construction and operation. For the purposes of the upland vegetation impact analysis presented in figures 2.3.1-1 and 2.3.1-2, the vegetated portions of "residential" land used in uplands is included as open upland and forested upland vegetation. Additionally impacts at aboveground facilities do not include the temporary vegetation impacts associated with the construction of the Yorktown and Danbury M&R Stations and the Stony Point and Southeast new Launcher/Receiver facilities which are already included in the vegetation impact acreages for the pipeline segments.

Vegetative Communities of Special Concern or Value

Vegetative communities of special concern include sensitive or protected vegetation types, natural areas, and unique plant communities. The Applicants have consulted with federal and state resource agencies to determine if any federally or state-listed threatened and endangered (T&E) plant species (including federal and state species of special concern) or their designated communities occur within the Project area. T&E and special concern plant species are described in section 2.3.3.

Within the Project area, the existing Pine Hills M&R Station in the Town of Plymouth, Massachusetts is located in a pitch pine/scrub oak community as mapped by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The pitch pine/scrub oak community is an imperiled community in Massachusetts with a state rank of S2 (typically 6 to 20 occurrences, few remaining acres, or very vulnerable to extirpation in Massachusetts for other reasons). Overall, this community type is not floristically diverse, typically consisting of an open canopy of pitch pine (*Pinus rigida*) and a dense understory of scrub oak (*Quercus ilicifolia*) or dwarf chinquapin oak (*Q. prinoides*).

Modifications at the Pine Hills M&R Station would not require any expansion of the station footprint. The existing property containing the Pine Hills M&R Station is about 9.8 acres in size. Of this, only 0.3 acre of open upland vegetation, consisting of grasses and forbs, would be temporarily affected during construction, and no new land would be permanently affected for operations and maintenance of the station. Based on the aforementioned factors, impacts on the pitch pine/scrub oak community at this facility site are not anticipated.

General Impacts and Mitigation

In total, construction of the proposed pipeline facilities and aboveground facilities would disturb about 96.9 acres of vegetation including about 74.5 acres of open upland and 11.4 acres of forested upland. The remaining 11.0 acres would be wetland impacts, which are discussed in section 2.2.3. Permanent vegetation impacts associated with the pipelines, aboveground facilities, and access roads would include about 2.1 acres of forested upland vegetation, 6.4 acres of open upland vegetation, and less than 0.1 acre of forested wetland totaling 8.6 acres.

Figure 2.3.1-1
Upland Vegetation Affected by Construction of the Atlantic Bridge Project

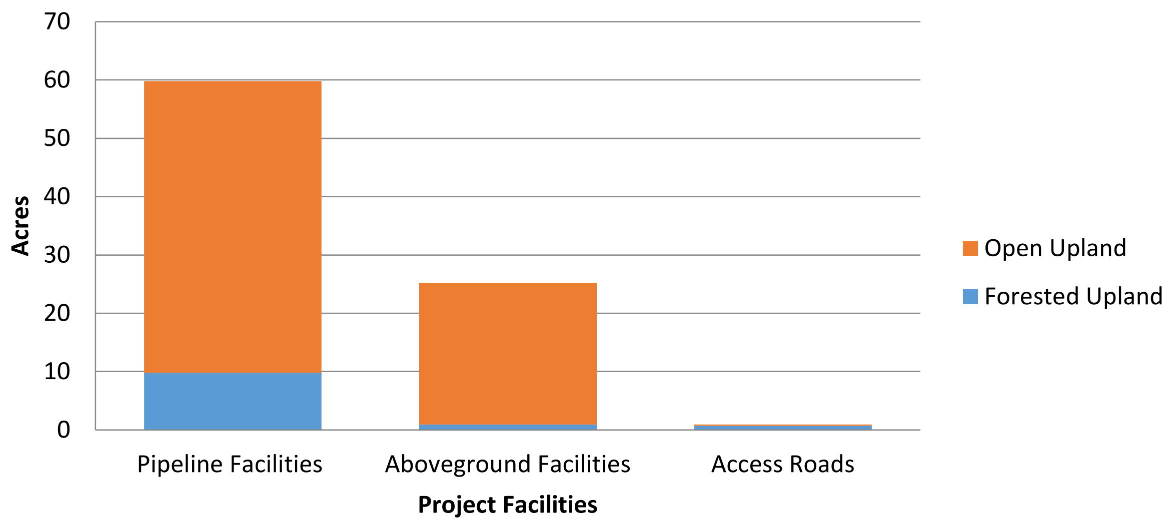
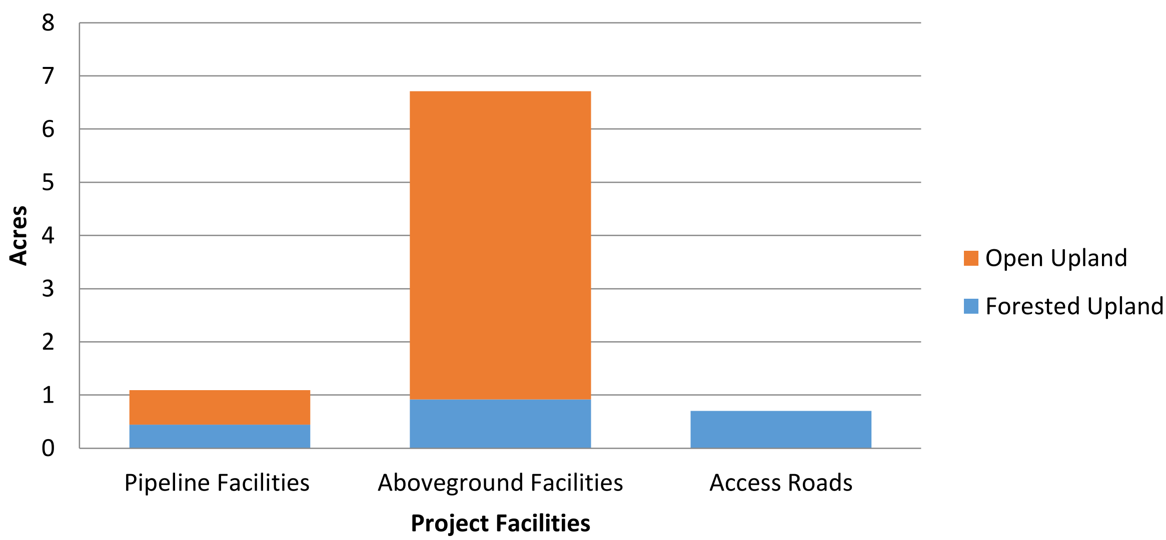


Figure 2.3.1-2
Upland Vegetation Affected by Operation and Maintenance of the Atlantic Bridge Project



Upland Forest

Project-related impacts on upland forest habitat include fragmentation, edge effects, and increased opportunity for invasive species establishment. Loss of woody vegetation would require a significant amount of time to revert to its preconstruction condition. In most areas, the proposed Project construction right-of-way would overlap with a portion of Algonquin’s existing 75-foot-wide permanent pipeline right-of-way, minimizing impacts on upland forest. However, pipeline construction would generally require a 100-foot-wide construction workspace to allow for the safe passage of equipment and materials necessary to install larger diameter pipe. The expansion of Algonquin’s existing right-of-way could result in incremental fragmentation of upland forest habitat and decrease the quality of habitat for forest wildlife species.

The limits of clearing would be identified and flagged in the field prior to the start of clearing operations. The cleared width within the right-of-way and temporary construction workspaces would be kept to a minimum. In areas requiring clearing within the right-of-way for construction, all trees would be cut into lengths, chipped on the right-of-way, or removed to an approved site. In temporary workspaces, tree stumps and rootstock would be left in place wherever possible to facilitate natural revegetation. As described in the Project E&SCP, erosion control measures would be installed following initial soil disturbance activities.

Given that the Project has been routed to use existing utility rights-of-way, minimal forested vegetation would be affected. After construction, the forest would be allowed to recover within the construction right-of-way and temporary workspace; however, the impact in these areas would be long term. The Project would permanently convert about 0.5 acre of forested upland and less than 0.1 acre of forested wetland to herbaceous cover along the pipeline segments, about 0.9 acre of upland forest would be permanently removed by the construction or modification of aboveground facilities, and 0.7 acre of upland forested would be affected due to road widening needed for permanent Project access roads. Impacts on upland forest due to road widening would be limited to tree trimming; it is not anticipated that any trees would be removed during this process.

Open Upland

Open upland consists of grasslands, successional old fields, shrublands, residential areas, low vegetation surrounding industrial/commercial area, and maintained utility rights-of-way. About 6.4 acres of open upland would be permanently removed or included in areas associated with Project maintenance, with the majority (5.8 acres) lost due to new construction or modification of aboveground facilities. The remaining impact on 0.6 acre of open upland would be short term. The construction of the pipeline would affect a total of 118.9 acres of industrial commercial land, the majority of which is not vegetated, however small portions do contain open land vegetation types.

Following construction, the entire right-of-way would be restored. The temporary workspaces used during construction (other than areas already existing as gravel or pavement) would be seeded and allowed to revegetate with no further maintenance or disturbance associated with pipeline operations. Areas of new permanent right-of-way would be maintained as an herbaceous plant community with periodic mowing. The Applicants would monitor all disturbed areas to determine the post-construction revegetative success for two growing seasons. If it is determined that the proposed monitoring timeframe is not adequate to assess the success of restoration, the Applicants would be required (by FERC) to extend post-construction monitoring. In order to address the spread of invasive plants within the Project facilities, specific field surveys to document invasive plant species occurrences in the Project area would occur prior to construction. This information would be used in conjunction with the IPSCP, which details a targeted approach for invasive plant species management for the Project.

We received comments in regards to invasive plants and the need for preconstruction field surveys and use of certain seed mixes. The Applicants prepared an IPSCP which would be implemented to minimize the introduction of new invasive plants or contain existing invasive populations. The Applicants would prioritize invasive species management within wetlands and within existing populations where feasible methods could be implemented and have the greatest impact. The IPSCP outlines specific mitigation measures and would be implemented before, during and after construction. These measures would include but are not limited to:

- preconstruction field surveys (2016) to determine density and distribution of priority invasive plants;
- implementation of topsoil segregation and replacement back to original wetland;
- seed upland areas with weed-free seed mix of upland plant species within six days of final regrading; and
- seed wetland areas with Project approved New England wetland plant species mix within six days of final regrading.

The IPSCP also includes measures on how the Applicants would minimize and monitor impacts after construction. These measures would include:

- monitoring wetland areas for five growing seasons following construction to be initiated during the first growing season after construction;
- implementation of an Integrated Management Plan that includes manual, mechanical and if necessary, chemical treatments that are applied by state licensed applicators and adhere state regulations; and
- compiling an annual Invasive Species Monitoring Report that includes summaries of previous year's treatment, agency correspondence, current findings, management recommendations, and a treatment schedule for following year.

We have reviewed the Applicants' IPSCP plan and have found it acceptable.

Because the impacts on open upland habitat would be short term and these areas would be restored quickly following the methods discussed above and outlined in the E&SCP, we conclude construction and operation of the Project would not result in a significant impact on open upland vegetation in the Project area.

Agricultural Land

There are no agricultural lands within the Project area. Impacts on agricultural land would not occur from construction or operation of the Project.

Residential Areas

Impacts on vegetative cover in residential areas would include the removal of trees, ornamental shrubs, and maintained lawn areas within the construction right-of-way. Residential impacts from the aboveground facilities would affect minimal vegetative cover (less than 1.0 acre total). The construction of the pipeline would affect a total of 29.7 acres of residential land; although not all of the residential land is vegetated (i.e., residential roads and driveways are included). The majority of the impacts on residential land (78 percent) would occur within the existing Algonquin maintained permanent right-of-way, and minimal permanent easements (less than 0.1 acre) would be acquired in residential areas. Thus residential land vegetation impacts would be short term. Algonquin would assess the specific tree removal impacts in accordance with individual landowner easement agreements and would restore the landscape in the temporary construction right-of-way immediately after construction in accordance with the measures in the E&SCP and any specific requirements identified by landowners.

While permanent impacts on vegetation are anticipated, the Project would not permanently impact unique, sensitive or protected communities or species. Based on the Applicants' proposed construction techniques, the implementation of minimization and mitigation measures, and post-construction monitoring, we conclude that construction and operation of the Project would not significantly impact vegetation.

2.3.2 Wildlife

Existing Wildlife Resources

As discussed in section 2.3.1, the Project would cross vegetated upland and wetland habitats. Existing plant communities within these habitats, as well as aspects of the physical environment (climate, microclimate, hydrology, geology, etc.), influence the wildlife species that are present. Each of the vegetative community cover types provide habitat for a variety of wildlife species. Table 2.3.2-1 lists common wildlife species that could be found within each of the defined habitat types in the Project area.

Significant or Sensitive Wildlife Habitat

Significant or sensitive wildlife habitats include features such as vernal pools, wildlife management and refuge areas, or other known wildlife resources not specific to the T&E species discussed in section 2.3.3. The Applicants consulted with federal and state resource agencies regarding the presence of significant or sensitive wildlife habitats in the Project area. No vernal pools were identified in the Project study area during field surveys conducted in 2014 and 2015. In New York, the Stony Point Discharge Take-up and Relay pipeline segment would cross Granite Knolls Park and Woodlands Legacy Field Park in Westchester County, which are protected open space (see section 2.4.4). The Project facilities would not affect any wildlife management areas, wildlife refuges, or other protected open spaces providing substantial wildlife habitat in Connecticut, Massachusetts, or Maine.

<u>Granite Knolls Park (West and East Sections), Yorktown, Westchester County, New York</u>

Granite Knolls Park is comprised of two separate properties on either side of Stony Street; 73 acres to the west of Stony Street and 103 acres to the east. The park is primarily forested with dominant trees species including red maple, northern red oak, white oak, black birch, and ash (Kozlowski, 2013). The wetlands, streams, rocky outcrops, and forests on the property provide valuable habitat for a wide array of wildlife, and the park also serves as a wildlife corridor to access other protected open space located to the southwest. Typical wildlife species would include white-tailed deer, raccoons, eastern coyote and a variety of small mammals. In addition, many species of birds, amphibians and reptiles are known to inhabit the park (Kozlowski, 2013). The Project would cross Granite Knolls Park West within the existing pipeline right-of-way from MPs 0.0 to 0.1 along the Stony Point Discharge Take-up and Relay pipeline segment. No portions of Granite Knolls Park East would be used for construction or operation of the Project.

TABLE 2.3.2-1

Common Wildlife Species in the Atlantic Bridge Project Area

Vegetation Community	General Description	Habitat Resources Provided	Common Wildlife Species [a]
Upland Forest	Primarily mixed deciduous and oak-hickory forest.	Provide year-round food resources, cover, and nesting and breeding habitat for a variety of wildlife species including the availability of nest cavities found in standing snags and felled logs.	Amphibians and reptiles: Northern dusky salamander, eastern red-backed salamander, eastern American toad, gray treefrog, spring peeper, wood frog, northern brownsnake, northern red-bellied snake, northern ring necked snake, northern black racer, eastern milksnake. Birds: ruffed grouse, wild turkey, American woodcock, common raven, cuckoos, owls, woodpeckers, flycatchers, warblers, vireos. Mammals: Woodchuck, American red squirrel, woodland vole, red fox, striped skunk.
Open Upland	Areas include successional scrub-shrub habitats, open fields, pasture, and disturbed and/or maintained areas such as existing utility rights-of-way or other open space areas.	Offer habitat for ground-nesting birds, shrubby habitats for small mammal species, and edge habitats adjacent to open spaces and low-growing areas for foraging.	Amphibians and reptiles: Spotted salamander, red-spotted newt, eastern garter snake. Birds: turkey vulture, red-tailed hawk, mourning dove, blue jay, house wren, American robin, field sparrow, American goldfinch. Mammals: Virginia opossum, eastern cottontail, meadow vole, coyote, gray fox, white-tailed deer.
Forested Wetland	Contain a diverse assemblage of plant species, largely dominated by red maple.	Forested wetlands contain a diverse assemblage of plant species and provide important food, shelter, breeding sites, and habitat for migratory and overwintering wildlife.	Amphibians and reptiles: Northern dusky salamander, four-toed salamander, spring peeper, green frog, northern watersnake, northern red-bellied snake. Birds: Green heron, wood duck, broad-winged hawk, ruby-throated hummingbird, red-bellied woodpecker, eastern phoebe, eastern kingbird, brown thrasher. Mammals: masked shrew, eastern chipmunk, white-footed mouse, long-tailed weasel.
Open Wetland	Consists of freshwater emergent wetland areas, including wet meadows and emergent marshes characterized by a variety of grasses, sedges, and rushes.	Many freshwater emergent wetlands in the Project area are dominated by invasive species, especially common reed and, therefore, often provide relatively low quality wildlife habitat.	Amphibians and reptiles: Spotted salamander, pickerel frog, American bullfrog, snapping turtle, red-eared slider, eastern garter snake. Birds: Black-crowned night heron, mute swan, mallard, clapper rail, common gallinule, spotted sandpiper, Wilson's snipe, belted kingfisher, Acadian flycatcher, marsh wren, red-winged blackbird. Mammals: Northern-short-tailed shrew, eastern cottontail, meadow vole, muskrat, mink, white-tailed deer.
Urban	Environments include industrial, commercial, and residential areas.	Typically characterized by a fairly low diversity of wildlife species that are tolerant of human development and activity.	Amphibians and reptiles: American bullfrog, green frog, eastern painted turtle, eastern garter snake. Birds: Canada goose, American black duck, mallard, killdeer, gulls, rock pigeon, mourning dove, chimney swift, barn swallow, American crow, northern mockingbird, European starling, common grackle, house finch, house sparrow. Mammals: Eastern cottontail, eastern chipmunk, eastern gray squirrel, house mouse, Norway rat, muskrat, coyote, raccoon, white-tailed deer.

[a] Many common wildlife species are habitat generalists and may occur in more than one vegetation community/habitat type.

Construction of the Project would temporarily impact about 1.4 acres of open land and about 0.1 acre of forested land within the park. Following construction, disturbed areas would be restored, reseeded, and allowed to revegetate naturally, except on Algonquin's existing permanent right-of-way, which would be maintained as before. Although long-term impacts associated with tree clearing would occur, overall impacts on the area would be minimized by installing the pipeline within Algonquin's existing permanent easement. Therefore, we conclude that impacts on the Granite Knolls Park would be sufficiently minimized.

Woodlands Legacy Field Park, Yorktown, Westchester County, New York

Woodlands Legacy Field Park is about 157 acres in size which, based on aerial imagery, is primarily comprised of hardwood species that likely consist of American beech, northern red oak, white oak, and red maple. The park contains a segment of Hunter Brook, which is a designated trout stream. Given the landscape in the surrounding area, it can be inferred that an array of small mammals, birds, reptiles, and amphibians occur in Woodlands Legacy Field Park. The Project would cross the park on existing right-of-way from MPs 0.7 to 1.3 along the Stony Point Discharge Take-up and Relay segment.

Algonquin is proposing to avoid impacts on a portion of the Woodlands Legacy Field Park by implementing the HDD crossing method from MPs 0.4 to 0.9. Along a portion of the HDD alignment, the Project would be outside of Algonquin's existing permanent right-of-way. In these areas Algonquin would obtain a new 10-foot-wide permanent right-of-way that would total about 0.1 acre of land. Installation of the pipeline between MPs 0.9 and 1.3 would be accomplishing using conventional, non-HDD methods. Once construction is complete, these areas would be restored and seeded in accordance with the Project E&SCP and the SWPPP for the New York pipeline, and then allowed to revegetate naturally. Therefore, we conclude that impacts on the Woodlands Legacy Field Park would be sufficiently minimized.

General Impacts and Mitigation

Permanent and temporary impacts on vegetated habitats due to the construction of the Project are discussed in section 2.3.1. Within areas where the right-of-way would be expanded or new aboveground facilities would be installed, the Project would result in temporary and permanent impacts on wildlife and habitat during construction and operation. Construction of the Project facilities would affect about 11.4 acres of upland forest, about 74.5 acres of open upland habitat, 2.0 acres of forested wetland, and 9.0 acres of open wetland. The majority of the pipeline routes would be within or adjacent to existing utility rights-of-way or roadways, which have been routinely maintained to control vegetative growth. These maintained rights-of-way could provide early successional habitats for several important game species including white-tailed deer and wild turkey, and may function as travel corridors for some generalist species and provide edge habitat along large forested areas.

During construction, noise and increased activity in construction areas could result in temporary wildlife impacts such as displacement, abandoning reproductive efforts, and disrupting daily routines. Direct mortality to smaller mammals, reptiles, and amphibians that are less mobile could also occur during clearing and grading operations associated with construction. Vegetation clearing outside of the pipeline workspace would also be required at aboveground facilities. The majority of construction activities at all aboveground facilities would temporarily affect open upland vegetation, most of which is currently maintained and does not provide wildlife habitat. Algonquin has identified seven proposed pipe and contractor ware yards for potential use during the construction of the Project. All seven yards are existing construction or industrial sites with no vegetative communities or other natural resources present. We conclude that the temporary use of these yards would not result in a significant impact on wildlife or wildlife habitat.

Permanent impacts on wildlife would include conversion of forested habitats to scrub-shrub and emergent habitats, displacing some species of wildlife that prefer forested habitat. In upland areas, vegetation maintenance on the pipeline right-of-way would involve clearing the entire permanent right-of-way of woody vegetation. In wetlands, an up to 10-foot-wide corridor centered on the pipeline may be maintained annually in an herbaceous condition to facilitate periodic pipeline corrosion/leak surveys. In addition, trees in wetlands that are within 15 feet on either side of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the right-of-way. Some minor permanent impact on vegetation would occur at aboveground facilities resulting in wildlife displacement; however, similar suitable habitat for any displaced species is immediately adjacent to areas that would be affected.

Algonquin has attempted to minimize impacts on wildlife habitats by locating pipelines along and within developed, previously disturbed corridors of existing utility rights-of-way and roads. The forested areas that are present along the Project pipeline segments already exist as edge habitat not interior forested habitat, thus even in the cases where some of the existing forested edge may be pushed back to allow for safe construction workspace, the general habitat types would remain. Trees would be allowed to regenerate outside of the permanently maintained right-of-way following construction. Aboveground facilities have also been designed to limit vegetation clearing and minimize impacts on wildlife.

We received comments during the scoping period with concerns of potential impacts on wildlife in Willow Pond. Algonquin has since changed the alignment of the pipeline route through this area to avoid all in-water work at Willow Pond; therefore, no direct impacts on the wildlife within the pond would occur.

We also received multiple scoping comments expressing concern about potential impacts on fish and wildlife in the Fore River Basin as a result of construction and operation of the Weymouth Compressor Station. In particular, concerns regarding construction noise from activities, such as onshore pile driving, could impact local wildlife species. Algonquin would use drills and augers rather than pile driving, which would minimize construction noise. However, construction would result in short-term, temporary increases to noise. Algonquin would enclose the compressor unit in an acoustically-insulated building, thereby, reducing operating noise levels. The Weymouth Compressor Station site is in highly industrialized area and operational lighting would not be expected to affect local lighting conditions.

While there could be some temporary, short-term impacts on wildlife species during construction of Project facilities, these habitats would exist similarly to present condition after construction. The Applicants would adhere to all requirements outlined in the E&SCP. Therefore, we conclude that construction and operation of the Project would not be expected to adversely affect the distribution or regional abundance of wildlife species given the similar habitat types available in the immediate Project area.

2.3.3 Protected Species

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act, 16 United States Code (USC) 703-711. Executive Order 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS. Executive Order 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts.

On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary Memorandum of Understanding does not waive legal requirements under the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Endangered Species Act of 1973 (ESA), NGA, Federal Power Act, or any other statutes and does not authorize the take of migratory birds.

Table 2.3.3-1 identifies 43 bird species of special concern that may occur in the Project area and includes FWS Birds of Conservation Concern, Partners in Flight additional stewardship and watchlist species, FWS gamebirds of management concern, and state-listed species.

TABLE 2.3.3-1

Potential Bird Species of Special Concern in the Atlantic Bridge Project Area

Species	Scientific Name	PIF [a]	BCC [b]	BMC [c]	NY [d]	CT [e]	MA [f]	ME [g]
Acadian flycatcher	*Empidonax virescens*	AS	n/a	X	n/a	n/a	n/a	n/a
American bittern	*Botaurus lentiginosus*	n/a	X	X	X	n/a	E	n/a
American black duck	*Anas rubripes*	n/a	n/a	FS	n/a	n/a	n/a	n/a
American woodcock	*Scolopax minor*	n/a	n/a	X	n/a	n/a	n/a	n/a
Bald eagle	*Haliaeetus leucocephalus*	n/a	X	n/a	T	T	T	X
Black–throated green warbler	*Setophaga virens*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Blue–winged warbler	*Vermivora cyanoptera*	WL	X	X	n/a	n/a	n/a	X
Bobolink	*Dolichonyx oryzivorus*	n/a	n/a	n/a	n/a	X	n/a	n/a
Broad–winged hawk	*Buteo platypterus*	n/a	n/a	n/a	n/a	X	n/a	n/a
Brown thrasher	*Toxostoma rufum*	AS	n/a	n/a	n/a	X	n/a	X
Canada goose	*Branta canadensis*	n/a	n/a	X	n/a	n/a	n/a	n/a
Canada warbler	*Cardellina canadensis*	WL	X	X	n/a	n/a	n/a	X
Carolina wren	*Thryothorus ludovicianus*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Chestnut–sided warbler	*Setophaga pensylvanica*	AS	n/a	n/a	n/a	n/a	n/a	X
Common gallinule	*Gallinula galeata*	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cooper’s hawk	*Accipiter cooperii*	n/a	n/a	n/a	X	n/a	n/a	n/a
Eastern kingbird	*Tyrannus tyrannus*	n/a	n/a	n/a	n/a	n/a	n/a	X
Eastern meadowlark	*Sturnella magna*	n/a	n/a	n/a	n/a	X	n/a	n/a
Eastern screech–owl	*Megascops asio*	n/a	n/a	n/a	n/a	n/a	n/a	X
Eastern towhee	*Pipilo erythrophthalmus*	AS	n/a	n/a	n/a	n/a	n/a	X
Eastern whip–poor–will	*Antrostomus vociferus*	n/a	X	n/a	n/a	n/a	X	X
Eastern wood–pewee	*Contopus virens*	n/a	n/a	n/a	n/a	n/a	n/a	X
Golden–winged warbler	*Vermivora chrysoptera*	WL	n/a	FS	X	n/a	n/a	n/a
Indigo bunting	*Passerina cyanea*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Mallard	*Anas platyrhynchos*	n/a	n/a	X	n/a	n/a	n/a	n/a
Mourning dove	*Zenaida macroura*	n/a	n/a	X	n/a	n/a	n/a	n/a
Northern goshawk	*Accipiter gentilis*	n/a	n/a	n/a	X	n/a	n/a	n/a
Olive–sided flycatcher	*Contopus cooperi*	WL	X	X	n/a	n/a	n/a	X
Pine warbler	*Setophaga pinus*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Piping plover	*Charadrius melodus*	n/a	n/a	X	E	T	T	E
Prairie warbler	*Setophaga discolor*	WL	X	X	n/a	n/a	n/a	X
Red–bellied woodpecker	*Melanerpes carolinus*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Red knot	*Calidris canutus*	n/a	X	FS	n/a	n/a	n/a	X
Roseate tern	*Sterna dougallii*	n/a	n/a	X	E	E	E	E
Rusty blackbird	*Euphagus carolinus*	WL	X	FS	n/a	n/a	n/a	X
Swamp sparrow	*Melospiza georgiana*	AS	n/a	n/a	n/a	n/a	n/a	n/a
Virginia rail	*Rallus limicola*	n/a	n/a	X	n/a	n/a	n/a	n/a
White–eyed vireo	*Vireo griseus*	AS	n/a	n/a	n/a	n/a	n/a	n/a

TABLE 2.3.3-1 (cont'd)

Potential Bird Species of Special Concern in the Atlantic Bridge Project Area

Species	Scientific Name	PIF [a]	BCC [b]	BMC [c]	NY [d]	CT [e]	MA [f]	ME [g]
Willow flycatcher	*Empidonax traillii*	WL	n/a	X	n/a	n/a	n/a	n/a
Wood duck	*Aix sponsa*	n/a	n/a	X	n/a	n/a	n/a	n/a
Wood thrush	*Hylocichla mustelina*	WL	X	FS	n/a	n/a	n/a	X
Yellow–bellied sapsucker	*Sphyrapicus varius*	AS	X	n/a	n/a	n/a	n/a	n/a
Yellow–breasted chat	*Icteria virens*	n/a	n/a	n/a	X	n/a	n/a	n/a
Yellow–throated vireo	*Vireo flavifrons*	AS	n/a	n/a	n/a	n/a	n/a	n/a

[a] PIF = Partners in Flight; AS = Additional Stewardship Species; WL = Watch List Species (Rich et al., 2004).
[b] BCC = Birds of Conservation Concern (FWS, 2008).
[c] BMC = Birds of Management Concern; FS = Focal Species (FWS, 2011).
[d] NYSDEC, 2015c.
[e] CTDEEP, 2010.
[f] Massachusetts Division of Fisheries and Wildlife, 2015.
[g] Maine Department of Inland Fisheries and Wildlife, 2011.
Notes: E = Endangered; T = Threatened; n/a = not applicable to this specific list; X = included on list

Impacts on migratory birds would be similar to impacts on other wildlife. Potential impacts would or could include: the temporary and short-term loss of breeding and foraging habitat associated with vegetation clearing, and longer term impacts associated with tree clearing. These effects could reduce forage and cover making birds more susceptible to stress and predation. If construction occurs during the breeding seasons, mating and nesting of birds, and the rearing of young on or near the right-of-way could be disrupted. Mortality of individual birds, particularly young birds, is also possible. The Project has been designed to minimize potential effects on migratory birds and additional measures to limit migratory bird impacts would be implemented during Project construction and operation. These measures include:

- routing Project facilities to avoid sensitive resources where possible;
- maximizing the use of existing pipeline and utility rights-of-way;
- limiting the construction and operation right-of-way widths to the minimum necessary;
- conducting mitigation for impacts on sensitive resources (e.g., wetlands) through agency permit conditions;
- adherence to the measures outlined in the Project E&SCP during construction of the Project facilities; and
- limiting routine right-of-way maintenance clearing and prohibiting maintenance clearing during the migratory bird nesting season (April 15 to August 1, as identified in the E&SCP).

Tree clearing is proposed to occur from January to March of 2017 in New York and April to May of 2017 in Connecticut. General pipeline construction is scheduled to begin in March of 2017 and be completed by October of 2017, project wide. Tree clearing would occur during the April 15 to August 1 nesting season for migratory birds in Connecticut. Construction of the Connecticut facilities would temporarily affect about 4.1 acres of forest and permanently affect about 1.2 acres of forest. Given that the Connecticut facilities are generally located in highly developed areas, it is unlikely that these sites provide valuable habitat for nesting migratory birds; therefore, impacts would be insignificant. The Applicants have not received confirmation from the FWS that the proposed measures are acceptable to minimize or avoid impacts on migratory birds. Therefore, **we recommend that:**

- **Prior to construction, Algonquin should file with the Secretary any updated consultations with the FWS regarding migratory birds including any additional avoidance or mitigation measures developed.**

Bald and Golden Eagle Protection Act

Although the bald eagle was removed from the federal list of T&E species by the FWS in 2007, bald and golden eagles (*Aquila chrysaetos*) are still protected under the Bald and Golden Eagle Protection Act (16 USC 668-668d), which prohibits the taking of eagles, their eggs, or their nests. Golden eagles are not included in the 43 bird species of special concern that may occur in the Project area and would not be affected by the Project. Based on information obtained for the AIM Project, bald eagles occur in portions of Rockland and Westchester Counties, New York, with the area around the Hudson River being of most concern. Because the Project is not located in known areas of concern for the bald eagle and there would be no impact on suitable bald eagle nesting or winter habitat, no impacts on the bald eagle would be expected. However, if a bald eagle winter roost or nest is identified within the Project area, the Applicants would comply with the National Bald Eagle Management Guidelines.

Federally Threatened and Endangered Species

The ESA (P.L. 93-205 of 1973, codified as amended at Title 16 USC sections 1531-1544) protects federally listed T&E fish, wildlife, plants, and invertebrates. The ESA states that T&E plant and animal species are of aesthetic, ecological, educational, historic, and scientific value to the United States, and protection of these species and their habitats is required. A federally listed endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A federally listed threatened species is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. The FWS, responsible for terrestrial and freshwater species, and NOAA's National Marine Fisheries Service (NMFS), responsible for marine species, jointly administer the law.

Protection is also afforded to "critical habitat" under the ESA. Critical habitat is defined by the FWS as "the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of T&E species and that may need special management or protection" (FWS, 2015a). The Applicants, acting as our non-federal designee, consulted with the FWS New York and New England Field Offices and the NMFS to determine if any federally listed species (including federal candidate and/or federal species of special concern), or their designated critical habitats occur within the Project area. No federally-listed species were identified in consultation with NMFS. FWS indicated that three species have federally designated critical habitat; however, there is no designated critical habitat within the Project area and no impacts on designated critical habitat would occur. Table 2.3.3-2 identifies the federally listed species that may occur in the Project area. These species are discussed in detail below.

The Applicants conducted field surveys for three of the federally listed species on table 2.3.3-2 to determine their presence or absence, and the possible extent of populations within the Project area. The Applicants coordinated directly with the applicable agencies regarding the scope and methodologies to be employed during species-specific surveys, which were performed by experienced wildlife specialists on all accessible properties. To comply with section 7 of the ESA, we are requesting that the FWS consider this EA as our Biological Assessment for the Project.

TABLE 2.3.3-2

Federally Listed Species Potentially Occurring Within the Atlantic Bridge Project Area

Species	Federal Status [a]	Designated Critical Habitat [b]	State Status [c]	Comments	Effect Determination
BIRDS					
Piping plover (*Charadrius melodus*)	T [d]	Yes	NY – E CT – T MA – T ME – E	Coastal areas.	No effect
Red knot (*Calidris canutus*)	T	No	MA – T ME – E	Coastal areas.	No effect
Roseate tern (*Sterna dougallii dougallii*)	E [d]	No	NY – E CT – E MA – E	Coastal areas.	No effect
MAMMALS					
Indiana bat (*Myotis sodalis*)	E	Yes	NY – E CT – E MA – E	Indiana bat has the potential to occur throughout the Project area (FWS, 2013). Lives in caves and abandoned mine shafts. Roosts in trees. Active hibernacula about 20 miles from the Stony Point Discharge Take-up and Relay pipeline segment.	May affect, not likely to adversely affect
Northern long-eared bat (*Myotis septentrionalis*)	T	No	MA – E	Forest dwellers that prefer a deciduous forest habitat.	May affect, not likely to adversely affect
REPTILES					
Bog turtle (*Glyptemys muhlenbergii*)	T	No	NY – E CT – E MA – E	Inhabits wet meadows or open calcareous bogs dominated by sedges or sphagnum moss.	May affect, not likely to adversely affect
Northern red-bellied cooter (*Pseudemys rubriventris*)	E	Yes	MA – E	Ponds with abundant aquatic vegetation.	No effect

[a] E: Endangered; T: Threatened
[b] Although critical habitat has been designated for three species, none occurs within or would be affected by the Project.
[c] If status is not listed for a particular state, species is not state-listed.
[d] These species have both endangered and threatened status depending on location. The status listed here is the status in all states within the Project area.

Piping Plover, Red Knot, and Roseate Tern

The piping plover, red knot, and roseate tern are federally and state-listed threatened or endangered coastal birds that are known to occur in Plymouth County, Massachusetts; red knot and roseate tern also occur in Norfolk County, Massachusetts. Piping plovers inhabit open, sandy beaches. Red knots are found in intertidal, marine habitats, especially near coastal inlets, estuaries, and bays. Roseate terns breed on rocky, offshore islands, barrier beaches, and saltmarsh islands. The Weymouth Compressor Station would be in a coastal area; however, the station would be constructed in an open, scrubby upland area. Additionally, the shoreline surrounding the location of the proposed compressor station does not appear to provide suitable habitat for piping plover, red knot, or roseate tern; therefore, no impacts on these species would occur as a result of the Project. On this basis, we conclude that the Project would have *no effect* on the piping plover, red knot, or roseate tern.

Indiana Bat and Northern Long-Eared Bat

Indiana bat has been federally listed as an endangered species since 1973. It is also a state-listed endangered species in New York, Connecticut, and Massachusetts. The species' range includes parts of New England, New York, and the Southeastern and Midwestern United States. The northern long-eared bat was federally listed as threatened in 2015, and is also a state-listed endangered species in Massachusetts. The northern long-eared bat range includes portions of the eastern United States and Canada, west to British Columbia, Wyoming, and Montana.

The Indiana and northern long-eared bats share similar life histories and habitat. During the winter months, from late October to April, these bat species live in hibernacula, in caves and cave-like structures including abandoned mine shafts or railroad tunnels. The bats emerge in the spring and travel to summer roost sites and/or maternity colonies in wooded or semi-wooded habitats and typically occupy their summer habitat from early April through mid-September each year. Spring staging and fall swarming habitats near hibernacula entranceways are occupied from mid-March to mid-May and mid-August to mid-November, respectively.

The Applicants contacted the FWS New England Field Office and New York Field Office, and they identified Indiana and northern long-eared bats within the vicinity of the Stony Point Discharge Take-up and Relay pipeline segment (FWS, 2015b). Licensed bat surveyors conducted acoustic surveys, under a FWS-approved study plan, between July 21 and 25, 2015 to determine the presence/likely absence of Indiana bat and northern long-eared bat within the Project area. Surveys were conducted in accordance with the *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (FWS, 2015c) and the *Northern Long-eared Bat Interim Conference and Planning Guidance* (FWS, 2014). Surveys were focused in areas where forest clearing impacts would occur as part of the proposed Project and included six sites along the Stony Point Discharge Take-up and Relay segment, one site along the Southeast Discharge Take-up and Relay segment, one site at the Oxford Compressor Station, and one site at the Salem Pike M&R Station.

Analysis of the survey data resulted in detections of eight bat species, including northern long-eared bat and Indiana bat along the New York portion of the Project. Based on the survey results, Algonquin concluded that suitable summer roosting habitat would be impacted by the Project in New York. To minimize the potential for impacts, Algonquin would conduct tree clearing work in New York between October 1 and March 31 to avoid the summer maternity season. With the implementation of a tree clearing window outside of the maternity season, we conclude that the Project may *affect, but is not likely to adversely affect* the Indiana bat or northern long-eared bat. Algonquin has submitted the survey results to the FWS for their information and review. However, given that the survey results are still under review by the FWS, **we recommend that:**

- **Algonquin should not begin construction activities in New York until:**
  - **a. the staff receives comments from the FWS regarding the Indiana bat and northern long-eared bat;**
  - **b. the staff completes formal ESA consultation with the FWS, if required; and**
  - **c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin.**

Bog Turtle

The bog turtle is a federally listed threatened species that is also listed as endangered in New York, Connecticut, and Massachusetts. The species' range is restricted to scattered populations in the eastern United States from western Massachusetts and New York south to North Carolina. Bog turtles are semi-aquatic, preferring wet meadows or open calcareous bogs. They hibernate through the winter in muskrat lodges or burrows, emerging by around mid-April (NYSDEC, 2015d).

Based on initial information from the FWS, bog turtles could be present in suitable wetlands along the Stony Point Discharge Take-up and Relay segment in New York (FWS, 2015d) and the Southeast Discharge Take-up and Relay segment in Connecticut (FWS, 2015d). Phase 1 Bog Turtle Habitat Surveys were conducted in wetlands by licensed surveyors in April 2015 on all accessible properties along the two pipeline segments. Based on Phase 1 survey results, Phase 2 Bog Turtle Visual Surveys were performed in May and June of 2015 at four locations determined to contain potentially suitable habitat for the species. Bog turtles were not found during the Phase 2 surveys; therefore, Phase 3 surveys were not required for the Project. Algonquin submitted the survey results to the FWS, NYSDEC, and CTDEEP for their information and review. Although no bog turtles were detected, potentially suitable habitat was found in the Project area. Therefore, we believe that the Project *may affect, but is not likely to adversely affect* the bog turtle. However, given that the survey results are still under review by the FWS, NYSDEC, and CTDEEP, **we recommend that**:

- **Algonquin should not begin construction activities in New York or Connecticut until:**

  a. the staff receives comments from the FWS, NYSDEC, and CTDEEP regarding the bog turtle;

  b. the staff completes formal ESA consultation with the FWS, if required; and

  c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin.

Northern Red-bellied Cooter

Northern red-bellied cooter is a federally listed endangered species, as well as an endangered species in Massachusetts. In Massachusetts, the northern red-bellied cooter occurs in an isolated population in Plymouth County (Massachusetts Division of Fisheries and Wildlife, 2008). The large basking turtle primarily inhabits freshwater ponds of various sizes with abundant aquatic vegetation. The active season is generally from mid-March through October, during which time the species is almost exclusively found in water. Northern red-bellied cooters normally nest in sandy soils within 100 yards of a pond (FWS, 2006).

Modifications to two aboveground facilities would occur in Plymouth County, Massachusetts (Plymouth M&R Station and Pine Hills M&R Station) as part of the Project. However, there is no suitable foraging or nesting habitat for northern red-bellied cooters at either site. The nearest potentially suitable habitat would be a small pond about 0.3 mile east of the Pine Hills M&R Station. Based on this information, no impacts on northern red-bellied cooters or their suitable habitat would occur. Therefore, we conclude that the Project would have *no effect* on the northern red-bellied cooter.

State Threatened and Endangered Species

In general, impacts on state-listed species would typically be similar to those described for vegetation and wildlife in sections 2.3.1 and 2.3.2.

In addition to federal law, New York, Connecticut, Massachusetts, and Maine have passed laws to protect state T&E species. The state-specific regulations are as follows:

- New York ESA (New York Environmental Conservation Law Section 11-0535 and 6 New York Code of Rules and Regulations (NYCRR) Part 182);
- Connecticut ESA (Connecticut General Statutes Chapter 495);
- Massachusetts ESA (Massachusetts General Law Section 131A); and
- Maine ESA (Title 12 Maine Revised Statutes Annotated Sections 12801-12810).

The overall goal of state endangered species programs is to conserve, protect, restore, and enhance any T&E species and their essential habitat. The Applicants consulted with the New York Natural Heritage Program, CTDEEP, Massachusetts Division of Fisheries and Wildlife, Maine Natural Areas Program, and Maine Department of Inland Fisheries and Wildlife to determine if any state-listed T&E species (including state species of special concern) occur within the Project area. All of the federally listed species identified above are also state-listed in one or more states as identified in table 2.3.3-2. Table 2.3.3-3 identifies the two state-listed species lacking federal status that may occur in the Project area. These species are discussed in detail below.

TABLE 2.3.3-3

State-Listed Species Potentially Occurring Within the Atlantic Bridge Project Area

Species	State Status	Comments
REPTILES		
Eastern Box Turtle (*Terrapene carolina carolina*)	CT – Special Concern MA – Special Concern	Primary habitats are deciduous woodlands and overgrown old fields where turtles have ample cover and sunlight and are wetland-dependent.
PLANTS		
Hairy-fruited Sedge (*Carex trichocarpa*)	CT – Special Concern	Calcareous meadows and swales frequently associated with rivers.

<u>Eastern Box Turtle</u>

Eastern box turtle, a small terrestrial species, is listed as a special concern species in the State of Connecticut. The species occurs throughout Connecticut within a variety of habitats including deciduous and mixed forests, fields and early successional habitat, wet meadows, vernal pools, and shallow wetlands. Absent only from the highest elevations, they typically occur in well-drained forest bottomlands and open deciduous forests (CTDEEP, 2014). During the summer, activity is restricted to mornings and evenings and they often cease being active in mid-November to overwinter in loose soil underneath leaf litter.

The CTDEEP identified known extant populations of eastern box turtle in the area of the Oxford Compressor Station (CTDEEP, 2015b). Although work at the Oxford Compressor Station would not affect the species' preferred habitat, additional measures to protect the eastern box turtle would be implemented. Specifically, work in eastern box turtle habitat would occur during the winter dormancy period from November through April, to the extent practical. If this timetable cannot be met and work must be conducted when these turtles are active, the following conservation measures would be implemented:

- the entire work area would be surrounded by a silt fence prior to construction to serve as a turtle exclusion barrier;
- the area inside the fence would be searched by a qualified biologist to locate any turtles present;
- turtles would be relocated to an area immediately outside of the fenced area and positioned in the same direction that it was traveling;
- construction and operation rights-of-way would be limited to the minimum width necessary;
- contractors would be apprised of the possible presence and provided with a description of the species;
- vehicles or heavy machinery would not be parked in designated turtle habitat; and
- all silt fencing would be removed after work is completed.

The proposed modifications at the Oxford Compressor Station could potentially displace eastern box turtles if they are discovered and relocated. However, the species would be relocated to similar habitat to avoid potential mortality and this impact would be short term. Therefore, significant adverse effects on the eastern box turtle would be avoided.

<u>Hairy-fruited Sedge</u>

Hairy-fruited sedge is a special concern species in the State of Connecticut. Preferred habitats of this species include the margins of floodplain forests and swamps, wet meadows, margins of marshes and ponds, and marshy swales. Flowers are present on the plant from May through mid-June, and the fruits of this species mature from early June through early July.

The CTDEEP identified a record of this species in the Southeast Discharge Take-up and Relay pipeline right-of-way in Danbury, Connecticut (CTDEEP, 2015b). A botanical survey for this species was conducted in June of 2015. One population of hairy-fruited sedge was documented in the vicinity of the Southeast Discharge Take-up and Relay segment at MP 2.2. This species was found just south of the Project workspace in a delineated wetland area. The hairy-fruited sedge was not documented within the construction workspace, and no impacts on this species are anticipated as a result of Project. Algonquin submitted the survey results to the CTDEEP for their information and review. However, given that the survey results are still under review by the CTDEEP, **we recommend that:**

- **<u>Prior to construction in Connecticut</u>, Algonquin should file with the Secretary any additional correspondence from the CTDEEP regarding the survey results for the hairy-fruited sedge and whether any additional avoidance measures in potentially suitable habitat would be implemented.**

2.3.4 Fisheries Resources

Existing Fisheries Resources

As discussed in section 2.2.2, the Project would cross 16 waterbodies, 11 in New York and 5 in Connecticut. All of these waterbodies, including the nine intermittent and ephemeral streams, are classified as freshwater fisheries. Eight (all of which are in New York) are classified as coldwater fisheries; the remaining eight are considered warmwater fisheries.

Fisheries of Special Concern

Waterbodies with fisheries of special concern include those that:

- have fisheries with important recreational value;
- support coldwater fisheries;
- are included in special state fishery management regulations; or
- provide habitat for federally or state-listed T&E species.

Waterbodies that have significant economic value because of fish stocking programs, commercial fisheries, essential fish habitat (EFH), or tribal harvest are also considered fisheries of special concern.

In New York, any waters with a designation of trout waters or suitable for trout spawning are considered to be fisheries of special concern. The Stony Point Discharge Take-up and Relay pipeline segment of the Project would cross Hunter Brook and seven tributaries to Hunter Brook in Westchester County. Two tributaries to Hunter Brook that would be crossed by the Project at MPs 0.2, and 0.3 are designated as trout spawning (NYSDEC, 2015e).

No fisheries of special concern occur within the Project area in Connecticut, Massachusetts, or Maine.

Essential Fish Habitat

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802[10]). Under the Magnuson-Stevens Fishery Conservation and Management Act, federal action agencies which fund, permit, or carry out activities that may adversely affect EFH are required to consult with NMFS regarding potential adverse impacts of their actions on EFH. The Applicants consulted with NMFS and determined that the Project area would not cross or affect any waters designated as EFH.

General Impacts and Mitigation

The Project pipeline segments would cross a total of 16 surface waterbodies. These would include one intermediate waterbody crossing (i.e., between 10 and 100 feet wide) and 15 minor waterbody crossings less than 10 feet wide. Construction methods at waterbody crossings are described in section 1.9.1. Construction impacts on fisheries resources may include:

- direct contact of construction equipment with food resources (e.g., relatively immobile prey such as rock-fixed macroinvertebrates);

- temporarily increased sedimentation or turbidity immediately downstream of construction activities;

- alteration or removal of aquatic habitat cover;

- introduction of pollutants through possibly contaminated bottom sediments or spills of fuels or lubricants;
- impingement or entrainment of fish and other biota associated with the use of water pumps at dam-and-pump crossings;
- downstream scour associated with use of pumps or flume discharge; and
- restriction of fish movement through stream systems where waterways are temporarily dammed.

The removal of streamside vegetation at the crossings may also reduce shading of the waterbody, diminish escape cover, and could, in small areas where flow is minimal or constrained, result in locally elevated water temperatures.

The water used for hydrostatic testing and the HDD drilling fluid would be obtained from municipal sources and would not affect fisheries resources. Construction activities would be performed in a manner that would minimize the potential for erosion and sedimentation within the stream channel. Specifically, dry crossing procedures would be implemented to confine in-stream impacts on the construction work area, thereby helping to eliminate impacts on downstream reaches. Algonquin would strive to complete in-stream pipeline removal and installation activities, excluding blasting activities, within a 24-hour period for minor crossings and 48 hours for the intermediate crossing per each operation. Algonquin would adhere to the June 1 to September 30 in-stream construction timing window included in the Project E&SCP unless an alternate timing window is required by federal or state permitting agencies. All procedures at waterbody crossings in Connecticut and New York would also comply with and implement recommendations/requirements contained in the CTDEEP and NYSDEC permits.

The potential impingement or entrainment of fish and other biota at intake pumps would be mitigated by fitting the withdrawal hoses with intake screens sized to eliminate the entrainment of fingerling and small fish during water withdrawal. The discharge ends of flumes and dam-and-pump operations would be directed and controlled to prevent scour, sedimentation, and flooding. Any dewatering that is required would comply with appropriate regulatory permit conditions and would be filtered as necessary to prevent the introduction of heavily silt-laden water and foreign or toxic substances into the aquatic system. The short-term and localized interruption of fish passage is not anticipated to affect the migration of fish within the stream systems.

Algonquin plans to use the HDD method to cross one minor waterbody. This method would avoid direct impacts on the stream and its fisheries. However, fisheries resources could still be affected if there is an inadvertent return of drilling fluid in or near the stream. If drilling fluid enters the water column, it could interfere with oxygen exchange by gills causing fish, if present, to move away from the area of increased turbidity. The potential for an inadvertent release would be minimized by the HDD design, which includes situating the staging areas for the HDD far back from the banks of the waterbody and designing the drill path so that it is more than 90 feet below the surface where it crosses under the stream. In addition, Algonquin would implement the measures identified in the Project BDP Plan. In the event of an inadvertent return to the waterbody, these measures would minimize the impact on fisheries to short-term effects and individual fish in the immediate vicinity of the drilling fluid.

According to soil data provided by the USDA and obtained from field surveys, there are no streams with shallow bedrock that may require blasting during construction (USDA, 2014). In the unlikely event that shallow bedrock is encountered, Algonquin would attempt to mechanically excavate the rock. However, if conditions are encountered that warrant the use of controlled blasting, Algonquin would implement the Project Rock Removal Plan (appendix C), which includes measures that would mitigate the effects of blasting on fish species.

Tree removal at waterbody crossings may reduce shading, which could result in locally elevated water temperatures and a reduction in dissolved oxygen that can negatively influence habitat quality. Clearing of trees and other vegetation would be restricted to only what is necessary to safely construct and operate the pipelines, although use of existing right-of-way would minimize these impacts.

Streambeds and banks would be expected to quickly revert to preconstruction conditions. Once construction is complete, streambeds and banks would be quickly restored to preconstruction conditions to the fullest extent possible. Restoration, bank stabilization, and revegetation efforts, which are defined in the Project E&SCP, would minimize the potential for erosion from the surrounding landscape. Adherence to the E&SCP would also maximize the re-growth of riparian vegetation, thereby minimizing potential long-term impacts associated with lack of shade and cover.

The accidental release of pollutants directly into waterbodies may be debilitating to fisheries, causing adverse effects such as irritation or damage to fish gills and the skin, or impaired swimming and feeding behavior. The Applicants have prepared an SPCC Plan to reduce this risk. The SPCC Plan, which the Applicants' contractor(s) would be required to follow, includes hazardous material storage and refueling restrictions to minimize the chance of a spill reaching the water and control, containment, and disposal measures to limit the impact of any spill that may occur.

No long-term impacts are anticipated after construction due to restoration of stream bottoms and regrowth of stream bank vegetation. In the event that vegetation maintenance during operation would be required along specific streambanks, impacts on fisheries would be minor. By implementing the above measures, we conclude that Project-related impacts on fisheries due to construction and operation would be minimized.

2.4 LAND USE, RECREATION, AND VISUAL RESOURCES

2.4.1 Land Use

Construction of the Project would impact a total of about 215.7 acres of land. About 37 percent of this acreage would be utilized for the pipeline facilities, including the construction right-of-way and ATWS. The remaining acreage impacted during construction would be associated with aboveground facilities (20 percent), pipe and contractor ware yards (42 percent), and access roads (1 percent). Figures 2.4.1-1 and 2.4.1-2 summarize the acreage of each land use type that would be affected by construction and operation of the Project. The primary land use types impacted during construction would be industrial/commercial land (118.9 acres), open land (53.1 acres), residential land (30.3 acres), and forested/woodland (13.4 acres). Open water would account for less than 0.1 acre of land that would be impacted during construction of the Project.

The areas impacted by construction would include Algonquin's existing pipeline rights-of-way and aboveground facility sites, and lands outside of these areas. Following construction, areas associated with the existing pipeline rights-of-way and aboveground facility sites would continue to be maintained as before. In addition to these areas, about 8.9 acres of new land would be permanently encumbered by operation of the Project. About 20 percent of this newly encumbered acreage would be for new pipeline right-of-way, 72 percent would be for aboveground facilities, and 8 percent would be for new PARs. The majority of the new permanently encumbered area would be in open land (68 percent). The reminder would be on forest land (26 percent), industrial/commercial land (5 percent), and residential land (less than 1 percent). A portion of the new permanently encumbered land is forest land along the Taconic Parkway HDD on the Stony Point Discharge Take-up and Relay. No tree clearing or subsequent right-of-way maintenance would be required in this area, so the actual acreage of forest land that would be impacted by operation of the Project would be less than indicated on figure 2.4.1-2.

Figure 2.4.1-1
Land Use Types and Acres Impacted by Construction of the Atlantic Bridge Project

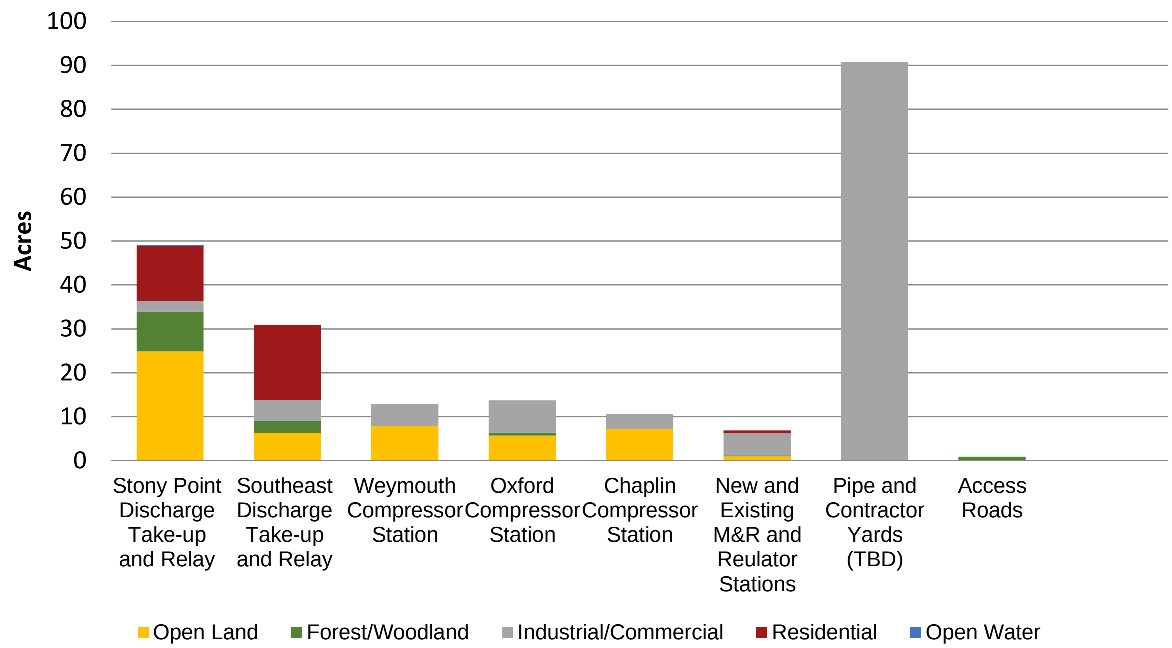
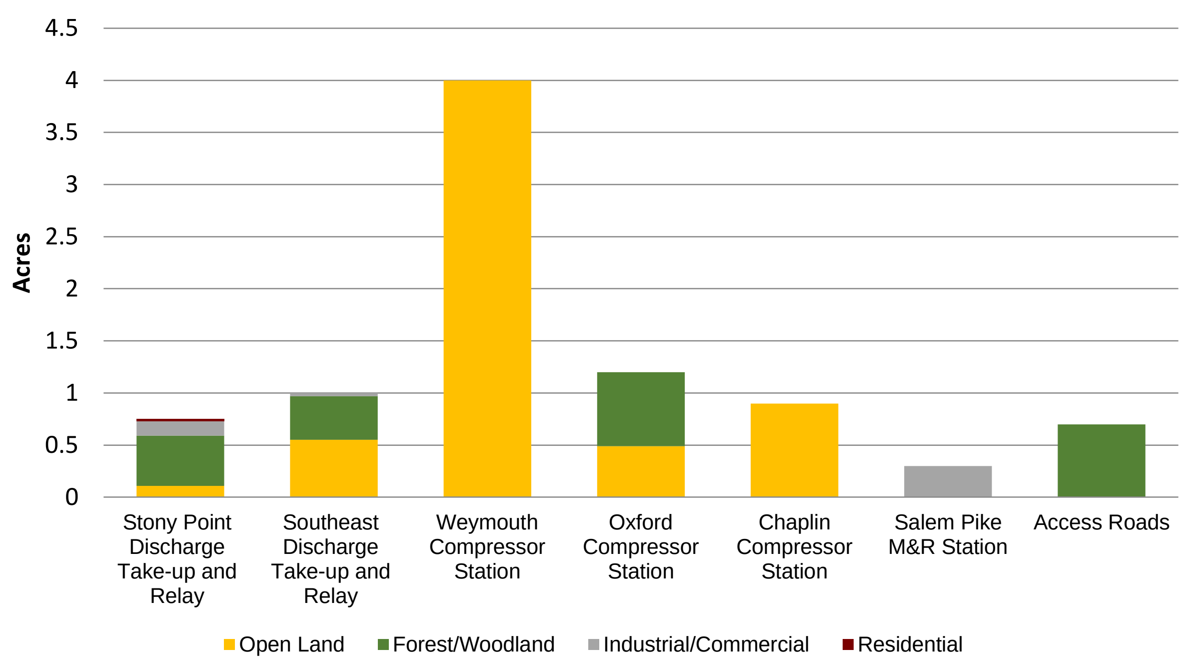


Figure 2.4.1-2
Land Use Types and Acres Impacted by Operation of the Atlantic Bridge Project



As discussed in sections 2.2.3 and 2.3.1, the pipeline and aboveground facilities would result in the clearing of 13.4 acres of forest land. The impact of this clearing would be long term or permanent depending on where the forest land is located. Forests and woodlands cleared outside of the permanent rights-of-way and maintained aboveground facility sites would be allowed to regenerate to preconstruction conditions, but impacts on forest resources within these areas would last for several years. Forest and woodlands that are cleared within the new maintained permanent right-of-way and aboveground facility sites (about 1.4 acres) would be permanently converted to a non-forested condition. About 0.7 acre of forested land that would be affected by the Project is associated with the modifications needed for PARs. However, based on information provided by Algonquin, the effect of these PARs would be limited to tree trimming and it is not anticipated that any existing trees would be removed.

Open land includes Algonquin's existing pipeline right-of-way, other utility rights-of-way, open fields, vacant land, herbaceous and scrub-shrub uplands, non-forested lands, emergent wetland, scrub-shrub wetland, golf courses, and municipal land. Construction of the Project would impact 53.1 acres of open land. Impacts on most of the affected open land would be temporary and short term, and would be minimized by the Applicants' implementation of the E&SCP and their restoration of open land areas to preconstruction conditions. Exceptions would be at the three compressor stations, where a total of about 5.4 acres of open land would be converted to industrial land for operation of the facilities. Because the permanent pipeline right-of-way would be maintained as open land, there would be no permanent change in land use where the right-of-way crosses existing open land areas. Following construction, these areas would continue to function as open land. However, some activities, such as the building of new commercial or residential structures, would be prohibited on the new permanent right-of-way.

Industrial/commercial land includes manufacturing or industrial plants, paved areas, landfills, mines, quarries, electric power or natural gas utility facilities, developed areas, roads, and commercial or retail facilities. Impacts on industrial and commercial properties would be restored to preconstruction conditions or as specified in specific landowner agreements. All road surfaces would be quickly reestablished so that normal access to area businesses can resume. Most often, access would be reestablished by the contractor's filling in the trench and patching the surface with a rough coat of pavement to restore access. So that construction equipment would not tear up the road surface when traveling across it during construction, a separate contractor would return later to complete final paving, at which time the road surface would be permanently restored to its preconstruction condition. Algonquin would coordinate the crossing of private driveways with business owners so as to maintain vehicle access and minimize impacts. Steel plates and/or wood mats would be kept on site at all times so that a temporary platform could be made across the trench should the need arise. Of the 118.9 acres of industrial and commercial land used during construction, about 0.5 acre would be permanently impacted by the Project, which would include 0.2 acre along the pipeline facilities and 0.3 acre for the Salem Pike M&R Station.

Residential land includes existing developed residential areas and planned residential developments. This may include large developments, low, medium, and high density residential neighborhoods; urban/suburban residential; multi-family residences; residentially zoned areas that have been developed; or short segments of the route at road crossings with homes near the route alignment. Pipeline and aboveground facility construction would impact about 30.3 acres of residential land. Minimal new permanent easements (less than 0.1 acre) would be acquired in residential areas. A detailed description of impacts on residences is discussed in section 2.4.3. Construction methods proposed for residential areas are described in section 1.9.1.

The open water classification includes waterbody crossings that are visible on aerial photography. Project construction would temporary impact less than 0.1 acre of land designated as open water. The Project would not cross any waterbodies greater than 100 feet in width. A detailed description of impacts on waterbodies is provided in section 2.2.2. Waterbody construction methods are described in section 1.9.1.

Pipeline Facilities

The proposed replacements would comprise 6.3 miles of 42-inch-diameter pipeline. Combined these replacement pipelines would impact a total of 79.9 acres of land during construction comprised of about 31.2 acres of open land, 29.7 acres of residential land, 11.8 acres of forest/woodland, 7.2 acres of industrial/commercial, and less than 0.1 acre of open water. Land use-related impacts associated with these pipelines would include the disturbance of existing uses within the right-of-way and adjacent workspaces during construction and retention of small amount of new permanent right-of-way for operation of the pipeline.

The proposed construction right-of-way width for the Stony Point Discharge Take-up and Relay varies. In the area between Stony Street and the Taconic Parkway HDD, the construction right-of-way width would be over 100 feet to accommodate the required HDD workspace in this area. Further to the east after the crossing of Route 132, the width of the construction right-of-way would generally vary between to 75 to 85 feet to minimize impacts in residential neighborhoods and the Croton Watershed. The construction right-of-way width proposed for the Southeast Discharge Take-up and Relay pipeline segment is 100 feet. As discussed in section 2.2.4, Algonquin is requesting a modification of the FERC Plan (IV.A.2) to allow for use a construction right-of-way that is wider than 75 feet in some locations.

Algonquin is proposing to reduce impacts on existing land uses along these segments by:

- overlapping the construction workspace with Algonquin's existing 75-foot wide permanent pipeline right-of-way;
- siting the construction workspace along existing public roads or parking lots where practicable; and
- reducing the construction workspace in wetland, waterbody, and residential areas.

In addition to the construction right-of-way, ATWS would be required in site-specific locations for the safe and efficient construction of the pipeline facilities. Site-specific locations can include areas needed for road crossings, parking areas, wetland and waterbody crossings, and topsoil segregation. The location, size (dimensions and acreage), existing land use, and explanation/justification of ATWS areas required for the Project are listed in table 2.4.1-1. A total of 19.1 acres of ATWS would be used temporarily during construction of the Project. Following construction these areas would be restored, seeded as appropriate, and allowed to return to preconstruction use.

Aboveground Facilities

Construction at the aboveground facilities would include modifications to three existing compressor stations, five existing M&R stations, and one existing regulator station, as well as the construction of one new compressor station and one new M&R station. The aboveground facilities would disturb a total of about 44.1 acres of land. Of this total, about 6.4 acres would be permanently retained for operation of the aboveground facilities. Figures 2.4.1-1 and 2.4.1-2 above summarize the land requirements and land use types for the aboveground facilities associated with the Project. The primary land uses that would be affected by the construction of these facilities are open land (49 percent) and industrial/commercial land (47 percent). Forest/woodland and residential would make up the remaining 4 percent.

TABLE 2.4.1-1

Location of Additional Temporary Workspace Along the Atlantic Bridge Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Explanation/Justification
STONY POINT DISCHARGE TAKE-UP AND RELAY				
Westchester County, NY				
0.0	110 x 460	1.1	O, I, F	Valve site 15-B; road crossing
0.0	95 x 1580	3.1	F	HDD pullback, run-off swale
0.2	4 x 70	<0.1	F	Workspace for HDD
0.3	45 x 425	0.5	F	HDD exit (Taconic Parkway)
0.9	150 x 215	0.8	O	Temporary Parking Area
0.9	50 x 375	0.3	F	HDD entry (Taconic Parkway)
1.0	30 x 425	0.3	F	HDD entry (Taconic Parkway)
1.3	55 x 65	0.1	O, I, R	Road crossing
1.5	35 x 175	0.1	F, R	Road crossing, avoid residential structures
1.7	15 x 285	0.1	R	Avoid residential structures
1.9	85 x 220	0.5	O	Work on powerline right-of-way
1.9	5 x 840	0.2	F	Work on powerline right-of-way
2.0	10 x 200	0.1	F	Wetland crossing
2.1	40 x 55	0.1	F	Stream crossing, road crossing, avoid residential structures, wetland crossing
2.2	30 x 530	0.2	I, R, F	Stream crossing
2.4	10 x 100	0.1	F	Staging area for wetland crossing
2.5	80 x 260	0.4	I	Yorktown M&R Station, Runon/Runoff swales
2.5	7 x 680	0.1	I	Yorktown M&R Station, Runon/Runoff swales
2.7	25 x 75	0.1	R	Road crossing
2.9	30 x 965	0.3	I, R	Road crossing
3.1	80 x 30	0.1	I, O	Road crossing
3.1	80 x 360	0.5	O, I, R	Staging area, road crossing
3.3	15 x 100	0.1	R	Wetland crossing
3.3	35 x 100	0.1	F	Wetland crossing
3.4	5 x 5	<0.1	I	Access Road Upgrades
3.5	15 x 165	0.1	O	Existing pipeline crossing
3.8	10 x 520	0.1	F	Wetland Crossing
3.9	10 x 195	0.1	F	Wetland crossing
4.0	145 x 630	1.4	F, I	Workspace at existing Somers M&R Station
4.0	70 x 480	0.8	F, O	Workspace at existing Somers M&R Station
SOUTHEAST DISCHARGE TAKE-UP AND RELAY				
Fairfield County, CT				
0.0	15 x 210	0.1	I, R	Valve Site 19-1
0.0	25 x 205	0.1	I, R	Valve Site 19-1
0.0	110 x 100	0.3	R	Valve Site 19-1
0.0	100 x 120	0.3	R	Valve Site 19-1
0.1	7 x 65	<0.1	R	Valve Site 19-1
0.5	50 x 360	0.3	R, I	Road crossing
0.6	25 x 60	0.1	I	Road crossing
0.6	165 x 1,180	1.4	I, R	Avoid industrial area, staging area
0.6	20 x 18	<0.1	I	Road crossing

TABLE 2.4.1-1 (cont'd)

Location of Additional Temporary Workspace Along the Atlantic Bridge Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Explanation/Justification
0.8	240 x 290	1.6	O, R, F	Avoid industrial area, staging area
0.8	30 x 1,105	0.7	R, I	Road crossing and residential area
1.0	50 x 60	0.1	I, R	Danbury M&R Station
1.0	30 x 45	0.1	R	Road crossing
1.1	45 x 50	0.1	R	Avoid structures
1.1	35 x 190	0.1	R	Avoid structures
1.2	40 x 170	0.1	R	Avoid structures
1.2	35 x 195	0.1	R, I	Road crossing and residential area
1.3	30 x 240	0.1	R, I	Road crossing and residential area
1.3	30 x 475	0.3	R	Avoid structures
1.4	10 x 155	<0.1	F	Avoid residential area
1.9	55 x 70	0.1	R, I	Great Plain road crossing
2.1	25 x 295	0.2	I, F	Wetland crossing
2.2	25 x 360	0.2	I, F	Road crossing
2.3	115 x 460	0.7	O, F, I	Wetland crossing
2.4	25 x 390	0.2	F	Workspace at the launcher/receiver site

[a] For irregularly shaped workspaces, multiplication of approximate dimensions would not yield the correct workspace area. Refer to acres column for the correct area.

[b] F = Forest/woodland; I = Industrial/commercial; O = Open land; R = Residential

Compressor Stations

Algonquin proposes to construct one new compressor station and modify three existing compressor stations. The Weymouth Compressor Station would be located in Norfolk County, Massachusetts and would temporarily impact a total of 12.9 acres of land during construction, consisting of 61 percent open land and 39 percent industrial land. Of the 12.9 acres, 4.0 acres of land would be converted from open land to industrial land and permanently impacted by the operation of the compressor station.

No land would be disturbed for the uprate at the existing Stony Point Compressor Station. The modifications at the two other existing compressor stations would impact a total of about 24.3 acres of land during construction, comprising 12.9 acres of open land, 10.7 acres of industrial/commercial land, and 0.7 acres of forest land. About 2.1 acres of this land, all within the existing station properties owned by Algonquin, would be converted from its current use to industrial land and thus permanently affected by operation of the new compressor station modifications.

Project modifications at the Chaplin Compressor Station in Windham County, Connecticut would impact a total of about 10.6 acres of land, consisting of 68 percent open land and 32 percent industrial/commercial land. Of the 10.6 acres, about 0.9 acre of new land would be converted from open land to industrial land and thus permanently affected by operation of the modified facility (100 percent open land). Outside the permanently affected area, construction impacts would be temporary and short term.

Modifications at the Oxford Compressor Station in New Haven County, Connecticut would impact a total of about 13.7 acres of land, consisting of 53 percent industrial/commercial land, 42 percent open land, and 5 percent forest/woodland. Of the 13.7 acres, about 1.2 acres of new land (comprising about 0.7 acre of forest/woodland and 0.5 acre open land) would be converted from its existing use to industrial use and thus permanently affected by operations of the modified facility. Outside the permanently affected area, construction impacts would be temporary and short term, except on forested land where impacts would be long term.

Metering and Regulating Stations

The Applicants propose to modify six existing M&R and regulator stations in New York, Connecticut, Massachusetts, and Maine. Modifications at the six existing stations are minor in nature and would take place within the existing fenced facilities. None of these modifications would permanently impact new land during operation.

Algonquin proposes to construct one new M&R station to replace an existing station. Construction of the new Salem Pike M&R station would temporarily impact a total of about 1.3 acres of land including 0.8 acre of industrial/commercial land, 0.3 acre of open land and 0.2 acre of forest land. About 0.3 acre (23 percent) of this land (all of which is currently industrial land), would be permanently retained to operate the new M&R station.

Contractor/Pipe Yards

The Applicants' proposes to use seven pipe and contractor ware yards during construction of the Project facilities. These yards would impact about 90.8 acres of land, all of which is existing industrial land.

Access Roads

To the extent feasible, existing public and private roads would be used as the primary means of accessing pipeline rights-of-way and aboveground facilities. In addition to the existing access available from public roads, Algonquin has identified one TAR and four PARs that would be used for the Project. Table 1.7.4-1 identifies the locations of new and existing access roads associated with the Project. The access roads would account for a total of 0.9 acres of construction related impacts, of which 0.7 acres would be permanent.

2.4.2 Land Ownership and Easement Requirements

Pipeline operators must obtain easements from existing landowners to construct and operate proposed facilities, or acquire the land on which the facilities would be located. Easements can be temporary, granting the operator the use of the land during Project construction (e.g., ATWSs, TARs, contractor ware yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed.

Algonquin's existing permanent easements give them the right to maintain the existing rights-of-way as necessary for pipeline operation. Where the proposed pipeline construction activities occur within Algonquin's existing rights-of-way, they would not need to acquire new easements or property to operate the proposed facilities. However, Algonquin would need to acquire new easements or acquire land to construct and operate the pipeline where the proposed activities deviate from the existing right-of-way. These easements would convey both temporary (for construction) and permanent rights-of-way to Algonquin.

In addition to the right to use specific property for construction, operation, maintenance, pipeline repair and replacement, and related activities as referenced above, an easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction. This includes losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way after construction. Compensation would be based on a market study conducted by a licensed real estate appraiser.

If an easement cannot be negotiated with a landowner and the Project is approved by the Commission, Algonquin may use the right of eminent domain to acquire the property necessary to construct the Project. This right would extend to all Project-related workspace covered by the Commission's approval, including the temporary and permanent rights-of-way, aboveground facility sites, pipe and contractor ware yards, access roads, and ATWSs. Algonquin would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to state or federal law.

Algonquin plans to retain the existing easements and continue to maintain these rights-of-way following the installation of the pipeline facilities except as otherwise provided in the existing easements or modified as part of the negotiations with the landowner.

2.4.3 Existing Residences and Planned Developments

Existing Residences and Buildings

Appendix E lists by facility and milepost the residences and other structures within 50 feet of proposed construction work areas. Based on our evaluation, FERC has identified:

- 34 residences, 51 residential structures, and 2 non-residential structures within 50 feet of construction workspaces in New York; and
- 93 residences, 23 residential structures, and 7 non-residential structures within 50 feet of construction workspaces in Connecticut.

The residents living at and using these structures would be impacted by construction and could be impacted by operation of the Project. In general, as the distance between a residence and the construction work area increases, the impact on a residence decreases. In residential areas, there would be short-term impacts associated with temporary disturbances during construction and long-term impacts associated with the encumbrance of a permanent right-of-way, which would restrict the construction of new permanent structures within the right-of-way. Temporary impacts during construction of the pipeline facilities in residential areas could include: inconvenience caused by noise and dust generated by construction traffic; disruption to access of homes by trenching of roads or driveways; increased localized traffic associated with the transportation of workers, equipment, and materials to and from the work site; disturbance of lawns, landscaping, and visual character caused by the removal of turf, shrubs, trees, and/or other landscaping between residences and adjacent rights-of-way; and potential damage on existing septic systems or wells.

Special construction and restoration methods would be used at site-specific locations to minimize residential neighborhood disruptions and to reduce impacts during construction. In particular, crossing of any private driveways would be managed to ensure that access to residential homes and businesses is maintained during construction. During negotiations with landowners, pipeline crossing locations can be established for residents to drive across the right-of-way to access other parts of their property if desired. Disruption to residential utilities would be minimized by using the local "One Call" system to locate and protect utilities. In the event of a disruption of service, immediate steps would be taken to restore service including making temporary repairs where appropriate and calling the service provider to make permanent repairs where necessary.

Algonquin would implement the following general measures to minimize construction-related impacts on residential areas:

- safety fence would be installed at the edge of the construction right-of-way for a distance of 100 feet on either side of residences that are within 50 feet of the construction right-of-way;
- attempts would be made to preserve mature trees, vegetative screens, and landscaping within the construction work area;
- the trench would be backfilled promptly after the pipe is laid or temporary steel plates or timber mats would be placed over the trench; and
- final cleanup (including final grading) and installation of permanent erosion control measures would be completed within 10 days after the trench is backfilled.

For the residences within 50 feet of the construction workspace, Algonquin has developed Residential Construction Plans that identify the measures that would be used to minimize disruption and to maintain access to the residences (see appendix F). These plans include a dimensioned drawing depicting the location of the residence relative to the pipeline construction workspace boundaries, the proposed right-of-way, and other nearby residences, structures, roads, and miscellaneous features (e.g., other utilities, playgrounds, etc.). Notes are also provided in the plans to describe the specific measures that would be implemented at each residential property (e.g., landowner notification prior to construction, installation of safety fencing), including the potential construction techniques to be used, workspace restrictions that apply, anticipated construction schedule, and safety measures to be implemented.

As shown in appendices E and F, there are seven residences in New York and nine residences in Connecticut would be within 10 feet of the proposed construction work area. One residence located at about MP 3.3 of the Stony Point Take-up and Relay would be about nine feet from a proposed work area. With this one exception, all residences within 10 feet of the proposed construction area in New York and Connecticut are also located within the 10 feet of Algonquin's existing permanent easement. Therefore, these residences may already experience maintenance activities within 10 feet, and further reduction in construction workspaces is not warranted.

We have reviewed the Residential Construction Plans and find them acceptable for all residences within 50 feet of the construction workspace, including adequately minimizing potential impacts on residences within 10 feet of the construction workspace. **However, we encourage the owners of each of these residences to provide us with comments on the plans specific for their property.** In addition, because of the increased potential for construction of the Project to disrupt these residences, and to ensure that Algonquin has provided these specific property owners adequate opportunity for input regarding construction activity so close to their residence, **we recommend that:**

- **<u>Prior to construction</u>, Algonquin should file with the Secretary for the review and written approval of the Director of OEP, a revised set of Residential Construction Plans that incorporate and address the comments Algonquin received from affected landowners.**

Following construction, all residential areas would be restored to preconstruction conditions or as specified in written landowner agreements. Landowners would continue to have use of the right-of-way provided it does not interfere with the easement rights granted to Algonquin for construction and operation of the pipeline facilities. For example, no structures would be allowed on the permanent right-of-way, including houses, decks, playgrounds, tool sheds, garages, poles, guy wires, catch basins, swimming pools, trailers, leach fields, septic tanks, or other structures that cannot be easily removed.

Between MPs 0.5 and 0.7 along the Southeast Take-up and Relay, the pipeline would cross a steep slope Padanaram Brook (located at the base of the slope), Padanaram Road (Route 37), and commercial parking lots on the east and west of Pandaram Road. The steep slope area would be accessed from the Elmer's Diner parking lot to the east and from Berkshire Drive to the west. Algonquin proposes to construct through this area during the nighttime to minimize the impact of the Project on Elmer's Diner and the businesses east of Padanaram Road. Because of the steep slope, Algonquin would remove the existing 26-inch-diameter pipeline in 40-foot segments and install the new 42-inch-diameter pipeline in 80-foot segments. Padanaram Brook would be crossed using the dam and pump method, which would be a 24 hour per day operation until the crossing is completed.

Elmer's Diner is open 24 hours a day. A portion of the parking lot that is currently used by Elmer's Diner's customers would be used a workspace for the pipeline and to bore Padanaram Road. Algonquin estimates this area would be disturbed for an estimated 7 to 14 continuous days. Algonquin would make an accommodation for alternate parking and patron access during this 7 to 14 day period. There is an additional parking area immediately north of the existing 26-inch-diameter pipeline that could be used by Elmer's Diner's patron. Algonquin would maintain access between this lot and the diner by installing an earthen plug and/or a bridging device across the pipeline trench that is suitable for pedestrian travel. Algonquin continues to discuss the proposed construction activities with landowners at this location to minimize potential impacts on parking and business operations.

The Applicants developed and provided an Environmental Complaint Resolution Procedure Plan[15] as part of its application. This plan identifies procedures that the Applicants would take to address landowner calls that are received during construction. The Applicants would provide a description of these procedures to landowners via letter prior to construction. The letter would include a toll free telephone number to contact with questions or concerns and a commitment that a response to a question or concern would be provided no later than 48 hours after receiving the initial call. In the event that the Applicants' response is not satisfactory, the letter would include instructions how to contact the FERC's Dispute Resolution Service Helpline. We have reviewed the plan and find it acceptable.

We conclude that implementation of the Applicants' construction methods for working in proximity to residences and other structures and site-specific Residential Construction Plans, with our added recommendations, would adequately minimize disruption to residential and commercial areas to the extent practicable and facilitate restoration of these areas as soon as possible upon completion of construction. Further, the Applicants' Environmental Complaint Resolution Procedure Plan would promote resolution of landowner issues.

Planned Residential and Commercial Developments

The Applicants have maintained contact with landowners and local officials concerning residential subdivisions or planned new residential developments occurring within 0.25 mile of the Project. Three planned developments within 0.25 mile of the Project were identified (see table 2.4.3-1). However, construction plans and schedules for these proposed projects are not available at this time. Two of the three planned developments would be between 600 and 1,000 feet from the proposed facilities and

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15 The Applicants' Environmental Complaint Resolution Procedure Plan was included as part of Appendix 8C to Resource Report 8 in its October 22, 2015 application (Accession No. 20151022-5285). The plan can be found on FERC's website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

thus would not be directly impacted. The third, along the Stony Point Discharge Take-up and Relay segment, would be crossed by the proposed workspace but not by the pipeline. We do not anticipate any significant direct impacts on this development. Algonquin would construct the pipeline within their existing right-of-way at this location, which already precludes the placement of structures over the permanently maintained right-of-way. However, if one or more of these developments is completed and occupied before the pipeline is constructed, residents within these developments could experience temporary impacts similar to those described for other nearby residences including noise and dust during construction. Algonquin would continue to coordinate with the developers and permitting authorities to identify any potential conflicts associated with the construction and operation of the Project.

TABLE 2.4.3-1

Planned Residential and Commercial Areas Within 0.25 Mile of the Atlantic Bridge Project

County, State, Pipeline Segment Municipality	Begin Milepost	End Milepost	Distance Crossed (feet)	Distance and Direction from the Nearest Point Along the Construction Work Area	Planned Project/Area, Description, Timing
Westchester County, NY					
Stony Point Discharge Take-up and Relay	3.8 [a]	4.1 [a]	1,425 [a]	Distance from construction work area unknown at this time. Subdivision Plan is not on file. Construction workspace for the Atlantic Bridge Project impacts the property at the southern end. However, the pipe is not on the property.	Proposed Residential subdivision on Tract No.: W-142A. 01 Kenneth Kearney (construction schedule is not available at this time)
Norfolk County, MA					
Weymouth (Weymouth Compressor Station)	N/A	N/A	N/A	1,000 feet east of compressor station site.	Proposed Commercial Development (construction schedule is not available at this time)
Plymouth (Plymouth M&R Station)	N/A	N/A	N/A	660 feet southeast of the M&R station.	Planned Retirement Community (construction schedule is not available at this time)

[a] Approximate location of the planned area in relation to the pipeline.

Note: Connecticut and Maine have no planned residential and/or commercial areas within 0.25 mile of the Project identified.

2.4.4 Recreation and Special Interest Areas

USGS topographic maps; aerial photographs; correspondence with federal, state, and local agencies; field reconnaissance; and internet searches were used to identify parks, recreation areas, scenic areas, and other designated or special interest areas at the federal, state, and local level in the vicinity of the proposed Project facilities. The areas that would be crossed by the Project or that would be within 0.25 mile of the construction right-of-way are listed in table 2.4.4-1.

One of the primary concerns when crossing recreation and special interest areas is the impact of construction on the recreational activities, public access, and resources the area aims to protect. Construction would alter visual aesthetics by removing existing vegetation and disturbing soils. Construction would also generate dust and noise, which could be a nuisance to recreational users, and may interfere with or diminish the quality of the recreational experience by affecting wildlife movements or disturbing trails.

TABLE 2.4.4-1

Public Land and Designated Recreation or Scenic Areas Within 0.25 Mile of the Atlantic Bridge Project

State, Facility, County	Approximate Distance and Direction from Nearest Point Along Construction Work Area	Crossing Length (Feet)	Name of Area/Ownership
New York			
Stony Point Discharge Take-up and Relay			
Westchester County	1,150 feet southwest of MP 0.0	--	Sylvan Preserve Park/Town of Yorktown
	0 feet from MP 0.0	240	Granite Knolls (West)/Town of Yorktown
	0 feet from MP 0.6	0 (HDD)	Yorktown Trailway/ New York State Department of Transportation
	0 feet from MP 0.7	2,963	Woodlands Legacy Park/Town of Yorktown
	235 feet northwest of MP 1.2	--	Private Recreation/Private
	1,360 feet south of MP 1.1	--	Town-owned Open Space/ Town of Yorktown
	20 feet southeast of MP 1.1	--	Town-owned Open Space/ Town of Yorktown
	570 feet southeast of MP 1.2	--	New Hope Farms Park/Town of Yorktown
	530 feet south of MP 1.3	--	London Woods Field/Town of Yorktown
	65 feet north of MP 1.3	--	Town-owned Open Space/ Town of Yorktown
	0 feet from MP 1.5	300	Private Recreation/Maple Brook Homeowners Association
	0 feet from MP 1.6	472	Private Recreation/Maple Brook Homeowners Association
	0 feet from MP 1.7	844	Town-owned Open Space/ Town of Yorktown
	0 feet from MP 1.9	192	Town-owned Open Space/ Town of Yorktown
	0 feet from MP 2.1	1,258	Town-owned Open Space/ Town of Yorktown
	545 feet southeast of MP 2.4	--	Town-owned Open Space/ Town of Yorktown
	890 feet north of MP 2.7	--	Town-owned Open Space/ Town of Yorktown
	0 feet from MP 3.0	54	Willow Park/Town of Yorktown
	0 feet from MP 3.1	2,134	Town-owned Open Space/ Town of Yorktown
	1,285 feet north of MP 3.3	--	Town-owned Open Space/ Town of Yorktown
Connecticut			
Southeast Discharge Take-up and Relay			
Fairfield County	1,315 feet west of MP 0.0	--	Ridgewood Country Club/Private
	330 feet south of MP 0.4	--	Open Space/Private
	710 feet north of MP 1.1	--	Hatters Park/City of Danbury
	45 feet west of MP 1.3	--	Open Space/City of Danbury
	1,105 feet of from MP 1.4	--	Wooster Cemetery/Private
	215 feet north of MP 2.1	--	Great Plain Cemetery/Private

TABLE 2.4.4-1 (cont'd)

Public Land and Designated Recreation or Scenic Areas Within 0.25 Mile of the Atlantic Bridge Project

State, Facility, County	Approximate Distance and Direction from Nearest Point Along Construction Work Area	Crossing Length (Feet)	Name of Area/Ownership
Chaplin Compressor Station			
Windham County	1,330 feet east of station boundary	--	Bernard Church Woods/Private
	1,450 feet east of station boundary	--	Russ Cemetery/Town of Chaplin
Oxford Compressor Station			
New Haven County	410 feet north of station boundary	--	Town-owned Open Space/Town of Middlebury
	750 feet west of station boundary	--	Town-owned Open Space/Town of Oxford
Salem Pike M&R Station			
New London County	1,080 feet East of station boundary	--	Maplewood Cemetery/City of Norwich
Massachusetts			
Weymouth Compressor Station			
Norfolk County	0 feet from station boundary	--	Kings Cove/Private
Norfolk County	110 feet southwest of station boundary	--	Lovells Grove CR/Private
Needham Regulator Station			
Norfolk County	190 feet north of station boundary	--	Sudbury Aqueduct/Commonwealth of Massachusetts
	620 feet southeast of station boundary	--	Ridge Hill Reservation/Town of Needham

In general, Project impacts on recreational and special interest areas occurring outside of forest land would be temporary and limited to the period of active construction, which typically lasts several weeks or months in any one area. These impacts would be minimized by implementing the measures in the Applicants E&SCP. Traffic-related impacts would be minimized through implementation of the measures in the Applicants traffic management plans (see section 2.5.5). Noise mitigation measures would be employed during construction including sound muffling devices which are provided as standard equipment by the construction equipment manufacturer (see section 2.8).

Following construction, most open land uses would be allowed to revert to their former uses. Forest land affected by the temporary construction right-of-way and ATWS areas, however, would experience long-term impacts because of the time it would take for woody vegetation to regrow to its preconstruction condition. Moreover, forest land within the new permanent right-of-way would be permanently impacted and prevented from becoming reestablished within the maintained portion of the right-of-way. Algonquin would construct the majority of the Project adjacent to its existing pipelines within its existing permanent right-of-way or largely overlapping its existing permanent right-of-way, or within or adjacent to existing roadways. Therefore, most of the recreational and public interest areas crossed would not be further impacted during operation of the Project.

Implementation of the measures discussed above would minimize or eliminate impacts on most of the public lands, recreation, and other public interest areas identified in table 2.4.4-1. Therefore, the Project would not result in significant impacts on these areas. Areas requiring additional site-specific considerations are discussed in detail below by state.

New York

Granite Knolls Park (West and East Sections), Yorktown, Westchester County

The Granite Knolls Park in the northeastern portion of Yorktown consists of two separate properties on either side of Stony Street. To the west of Stony Street, the Granite Knolls Park West encompasses 73 acres of land just north of the Sylvan Glen Town Preserve. On the east side of Stony Street, the Granite Knolls Park East is situated on 103 acres of land between Stony Street and the Taconic e Parkway. Once the site of small-scale quarry and farming operations, the park is now mostly forested and features a large glacial erratic known to locals as the Giant Boulder. The park, which was purchased by the Town of Yorktown in 2010, contains over six miles of hiking and mountain biking trails that are open to the public and maintained by volunteers of the New York-New Jersey Trail Conference (NY-NJ Trail Conference, 2015). The Stony Point Discharge Take-up and Relay pipeline segment of the Project would begin (MP 0.0) in the Granite Knolls Park West on existing right-of-way. The pipeline segment would continue for less than 0.1 mile through the park and then cross Stony Street.

The pipeline segment would cross the park property along Algonquin's existing permanent right-of-way. Although Algonquin would need to obtain temporary construction workspace for the Project, no new permanent right-of-way would be acquired. Construction of the Project would temporarily impact about 1.4 acres of open land from MPs 0.0 to 0.1 and about 0.1 acre of forested land at MP 0.4. Following construction, disturbed areas would be restored, reseeded, and allowed to revegetate naturally, except on Algonquin's existing permanent right-of-way, which would be maintained as before. No portions of Granite Knolls Park East would be used for construction or operation of the Project, however, the park is in close proximity to the Project and park users could experience temporary increases in noise during construction.

Construction within Granite Knolls Park West would begin in March 2017 and last a maximum of 8 months. The Town of Yorktown would be notified of planned construction activities prior to construction. Although long-term impacts associated with tree clearing would occur, overall impacts on the area would be minimized by installing the pipeline within Algonquin's existing permanent easement. Construction and operation of the Project would not cross any trails within the park and would not interfere with existing uses of the park. Therefore, we conclude that impacts on the Granite Knolls Park would be sufficiently minimized.

Yorktown Trailway, New York State Department of Transportation, Westchester County

The Yorktown Trailway is a 3.4 mile multi-use trail paralleling the Taconic Parkway between Routes 6 and 202. The trail is in the New York Department of Transportation right-of-way and follows a former equestrian trail and sewer line. The trail is maintained by volunteers of the New York-New Jersey Trail Conference. It is accessible from adjacent neighborhoods and connects the Granite Knolls (East) Park and the Woodlands Legacy Field Park. The Stony Point Discharge Take-up and Relay pipeline segment would cross the trail at MP 0.6 along the HDD crossing of the Taconic Parkway. The trail would remain open during construction of the Project, and impacts on the trail would be avoided due to the use of the HDD crossing method, which would allow installation of the pipeline without impacting the ground surface.

As discussed in more detail in section 2.8.3, the proposed HDD would result in prolonged period of increased noise at both the drill entry and exit locations, which could impact people using the trailway during the construction period. To assess the potential magnitude of this noise impact, Algonquin performed ambient noise surveys and the predicted the increased noise of the HDD operation at nearby noise-sensitive areas (NSA). Algonquin determined that without mitigation, the potential noise of the

HDD at NSAs near the trailway could exceed 55 decibels on the A-weighted scale (dBA). To reduce the noise at this location Algonquin has committed to implementing the following noise mitigation measures at the Taconic Parkway HDD entrance point:

- installation of a temporary noise-reducing tent over most of the HDD equipment and the HDD site workspace;
- use of "low-noise" generators for the mud/cleaning system (i.e., generator set designed with a factory-installed acoustical enclosure);
- use of a residential–grade exhaust silencer on all engines; and
- limiting HDD operations to daytime operation, where feasible.

Based on the above information we find that impacts on the Yorktown Trailway would be sufficiently minimized.

Woodlands Legacy Field Park, Town of Yorktown Parkland, Westchester County

The Woodlands Legacy Field Park is owned by the Town of Yorktown. It is located on the east side of the Taconic Parkway and connects two pieces of Strang Boulevard. With over 157 acres of land, the park contains 3.6 miles of trails typically used for hiking, mountain biking, and cross-country skiing. It also contains two baseball fields and a football field. The park is used for organized sports, primarily on weekends and after school on weekdays. On Saturdays sports run from 7:00 a.m. through 10:00 p.m. and on weekdays from 4:00 p.m. through the evening.

The Project would cross the park property between MPs 0.7 and 1.3 along the Stony Point Discharge Take-up and Relay pipeline segment. Within the park property, the Project would be mostly along Algonquin's existing mainline right-of-way. Algonquin is proposing to avoid impacts on a portion of the Woodlands Legacy Field Park by implementing the HDD crossing method from MPs 0.4 to 0.9. Along a portion of the HDD alignment, the Project would be outside of Algonquin's existing permanent right-of-way. In these areas Algonquin would obtain a new 10-foot-wide permanent right-of-way that would total about 0.1 acre of land. Algonquin's use of the HDD method would avoid surface impacts on the park between the HDD entry and exit points, but would result in prolonged period of increased noise at both the HDD entry and exit locations, which could impact people using park during the construction period. HDD construction would start in December 2016 and last between 4 and 6 months. A small section of a hiking trail that is collocated along Algonquin's existing right-of-way would be closed during construction. Following construction, Algonquin would restore the temporary workspaces within the park by seeding and revegetating them in accordance with the E&SCP and the Project SWPPP for the New York pipeline, and its consultations with the Town of Yorktown.

To assess the potential magnitude of this noise impact, Algonquin performed ambient noise surveys and predicted the increased noise of the HDD operation on nearby NSAs. Algonquin determined that without mitigation the potential noise of the HDD at NSAs near the park could exceed 55 dBA. To reduce the noise at this location Algonquin has committed to implementing several noise mitigation measures at the Taconic Parkway HDD entrance point (see the discussion of the Yorktown Trailway above for more details).

Installation of the pipeline between MPs 0.9 and 1.3 would be accomplishing using conventional, non-HDD methods. Construction would start sometime between April and October 2017 and would last 2 months. Construction would require about 6.4 acres of temporary construction workspace along the

Algonquin's existing cleared right-of-way and within maintained open areas along the existing park access road (Strang Boulevard). In addition, an ATWS area associated with the HDD entry location at MP 0.9 would require about 0.2 acre of tree clearing to the south of the existing right-of-way. Once construction is complete, these areas would be restored and seeded in accordance with the Project E&SCP, Project SWPPP for the New York pipeline, and Algonquin's consultations with the Town of Yorktown; after which these areas would be allowed to revegetate naturally.

With the exception of the one trail discussed above, recreational uses of the park would not be interrupted during construction or operation of the Project; however, there would be a temporary increase in the amount of vehicles along Strang Boulevard during construction of the Project. Certain construction related activities would result in the closure of one lane of Strang Boulevard within the park, which would be used intermittently by contractor personal for access to the construction are and for vehicle parking. Congestion would also occur in connection with the truck turn-around area located where the access road meets the public parking areas. Users of the park could also be affected by noise, dust, and visual impacts during construction. Algonquin anticipates conducting construction in this area during the winter of 2016/2017 in order to avoid disrupting the warm season activities of the park (e.g., baseball and football). Traffic would be managed in accordance with a Project Traffic Management Plan. Algonquin has committed to coordinating with the Town of Yorktown regarding the construction activities prior to construction. Based on this information we find that impacts on the Woodlands Legacy Field Park would be sufficiently minimized.

<u>Private Recreation, Maple Brook Homeowners Association, Westchester County</u>

Located within an existing subdivision in the Town of Yorktown, the Maple Brook Homeowners Association owns and maintains certain areas of land as private recreation land. The Project would cross this recreation land between MPs 1.5 and 1.7 along the Stony Point Discharge Take-up and Relay pipeline segment.

No new permanent right-of-way would be needed within the lands owned by the Maple Brook Homeowners Association. The proposed pipeline replacement in this area would be accomplished using a 75-foot-wide construction right-of-way and one temporary construction workspace (30 by 285 feet). The construction right-of-way would be within Algonquin's existing permanent right-of-way. Temporary workspace would be located outside of the existing right-of-way and would impact about 0.1 acre of forested land to the north of the existing right-of-way within the Maple Brook residential development. Following construction, the right-of-way and temporary workspace would be restored, seeded, and allowed to revegetate naturally, except on Algonquin's existing permanent right-of-way, which would continue to be maintained as before. The Maple Brook Homeowners Association would be notified of planned construction activities prior to construction. Given this information, we conclude that impacts on the Maple Brook Homeowners Association private recreation parcel would be sufficiently minimized.

<u>Town-Owned Open Space, Town of Yorktown, Westchester County</u>

The Town of Yorktown owns and manages several properties that are protected as open space. The Project pipeline would cross four town-owned properties along the Stony Point Discharge Take-up and Relay pipeline segment, including Willow Park on Curry Street and Tulip Road. The first two town-owned parcels that would be crossed by the pipeline occur between MPs 1.9 and 2.2. Algonquin proposes to construct the pipeline on these parcels using a 75-foot-wide construction right-of-way and one temporary ATWS. The construction right-of-way would be within Algonquin's existing permanent right-of-way. The one ATWS would be 25 by 200 feet in size and would impact about 0.1 acre of forested land to the north of the existing right-of-way.

The proposed pipeline would cross Willow Park, a town-owned property, from MPs 3.0 to 3.1. The park is used primarily as a playground and is not currently used for organized sports. In this area, the replacement pipeline has been routed along the southern border of Algonquin's existing permanent right-of-way to avoid work in and impacts on the pond. The existing pipeline under the pond would be abandoned in-place and no new permanent right-of-way would need to be acquired. However, 1.0 acre of temporary construction workspace would be used within the park. All of this temporary workspace is currently open land. Areas of the park located outside of the temporary workspace and right-of-way would remain open to the public during construction. The playground would be relocated during construction to move it further away from construction activities. Construction is anticipated to begin in June 2017 and last a maximum of 2 months.

The fourth town-owned parcel that would be crossed by the pipeline is located between MPs 3.1 and 3.5. A total of 2.7 acres of the construction workspace would be required on this parcel. No new permanent right-of-way would need to be acquired and about 0.3 acre of temporary construction workspace beyond the existing right-of-way would be disturbed on the town property. Temporary construction workspace would impact about 0.2 acre of forested land within the parcel along the northern edge of the existing right-of-way.

Following construction, the entire right-of-way would be restored. Temporary workspaces used during construction would be seeded and allowed to revegetate with no further maintenance or disturbance associated with pipeline operations. The Town of Yorktown would be notified of planned construction activities prior to construction. Although long-term impacts associated with tree clearing would occur, overall impacts on the area would be minimized by installing the pipeline within Algonquin's existing permanent easement. Therefore, we conclude that impacts on the Town of Yorktown-owned open space would be sufficiently minimized.

Massachusetts

Town of Needham Conservation Commission, Norfolk County

The existing Needham Regulator Station is located on two parcels of land identified as conservation land owned by the Town of Needham Conservation Commission. These parcels are primarily forested and Town of Wellesley Sudbury Path crosses the northern corner of one of the parcels. The proposed modifications to the Needham Regulator Station would occur within the existing fence line of the facility and would not affect the current land use, however public using the Sudbury Path may experience temporary increases in noise during construction at the Needham Regulator Station. Algonquin has committed to coordinating with the Town to address specific issues related to the proposed facility modifications and operation; therefore, we find that impacts on the Town of Needham Conservation Commission land to be adequately minimized.

Conservation Restrictions of Nearby Parcels, Norfolk County

Construction of the Weymouth Compressor Station would occur on land that is in close proximity to two privately-owned parcels with conservation restrictions. One parcel, Kings Cove parcel, would be acquired as part of the 12.9 acres proposed for the compressor station site, while the second parcel, Lovells Grove parcel, is about 125 feet southwest of the proposed compressor station site boundary and does not abut the property. The fenced station is expected to occupy a 4.0-acre footprint within the 12.9 acres, and no work would occur within the Kings Cove parcel. Additionally, use of the Kings Cove parcel by the public would not be impacted during or after construction of the compressor station, although users of the area could be affected by noise, dust and visual impacts during construction and to a lesser extent by noise and visual impacts during operation. During construction, Algonquin would implement measures in the Project E&SCP to prevent disturbance to the Kings Cove and, Lovells Grove parcels and other off-site areas. Algonquin has committed to coordinating with the Town of Weymouth and the property owners to address specific issues related to construction and operation of the proposed facility. Therefore, we find that impacts on the Kings Cove and Lovells Grove parcels would be sufficiently minimized. See sections 2.4.6 and 2.8.4 for additional discussion of visual and noise impacts associated with the Weymouth Compressor Station.

2.4.5 Coastal Zone Management Act

In 1972, Congress passed the Coastal Zone Management Act (CZMA) to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the nation's coastal zone for this and succeeding generations" and to "encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone" (16 USC 1452, Section 303 (1) and (2)).

Section 307 (c)(3)(A) of the CZMA states that "any applicant for a required federal license or permit to conduct an activity, in or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide a certification that the proposed activity complies with the enforceable policies of the state's approved program and that such activity would be conducted in a manner consistent with the program." In order to participate in the Coastal Zone Management Plan, a state is required to prepare a program management plan for approval by the NOAA, Office of Ocean and Coastal Resource Management. Once the Office of Ocean and Coastal Resource Management has approved a state's plan, including its enforceable program policies, the state program gains "federal consistency" jurisdiction. This means that any federal action (e.g., a project requiring federally issued licenses or permits) that takes place within the state's coastal zone must be found to be consistent with state coastal policies before the action can take place (NOAA, 2012). No designated coastal zone management areas would be crossed by or within 0.25 mile of any Project facility in New York, Connecticut, or Maine. As such, no federal consistency determinations are required for the proposed Project in New York, Connecticut, or Maine.

The Massachusetts Office of Coastal Zone Management (MACZM), within the Massachusetts Executive Office of Energy and Environmental Affairs (MAEEA), is the lead agency for administering the Massachusetts Coastal Zone Management Plan, as approved by NOAA in 1978 and updated through subsequent filings. This plan provides MACZM with the authority to review federal projects affecting the Massachusetts coast to ensure consistency with state policies (MACZM, 2015). The proposed Weymouth Compressor Station would be within the state-designated coastal zone management area.

Algonquin has determined that the Project is consistent with the MACZM's enforceable coastal policies as outlined in the MACZM's Policy Guide (2011) and filed their application for a Coastal Zone Management Consistency Determination with the MACZM on October 21, 2015. The Applicants have not yet received the consistency determination from the state, therefore, **we recommend that:**

- **<u>Prior to construction of the Weymouth Compressor Station</u>, Algonquin should file with the Secretary a copy of the MACZM's determination of consistency with the CZMA**.

Designated Port Area

The proposed Weymouth Compressor Station would be within the Weymouth Fore River Designated Port Area. This Designated Port Area has particular physical and operational features important for water dependent industrial uses such as commercial fishing, shipping, and other vessel related marine commercial activities and/or for manufacturing, processing, and production activities that require marine transportation or need large volumes of water for withdrawal or discharge.

This portion of the Project would be subject to review through the MassDEP Chapter 91 waterways license process. Algonquin has filed their Chapter 91 waterways license with the MassDEP at the end of 2015. Given the Project's occupancy of filled tidelands, it is expected that mitigation would be required. Algonquin would coordinate with the MassDEP on this expected mitigation measures during the Chapter 91 licensing process.

2.4.6 Hazardous Waste

Hazardous Waste Sites and Landfills

The Applicants contracted with Environmental Data Resources, Inc. to prepare a corridor database search for the Project. This search identified 37 sites within 0.25 mile of the Project. All of these sites are over 100 feet from proposed facilities. Sections 2.1.2 and 2.2.1 provide summaries of these sites as they pertain to soils and groundwater.

A Phase 1 Site Investigation[16] was completed for the proposed Weymouth Compressor Station. Samples collected showed that the fill materials exceed some Massachusetts environmental standards including arsenic. These high levels were attributed to the presence of coal ash from historic use of the site as an oil terminal and coal storage facility. Should any contaminated materials be encountered during construction, the Applicants would follow measures outlined in their Unexpected Contamination Encounter Procedures, which are discussed in section 2.1.2.

2.4.7 Visual Resources

Pipeline Facilities

Visual resources along the proposed pipeline routes are a function of geology, climate, and historical processes, and include topographic relief, vegetation, water, wildlife, land use, and human uses and development. All of the areas along the pipeline that would be disturbed by the Project would be within or adjacent to existing rights-of-way, consisting of Algonquin's pipeline right-of-way and public roadways. As a result, the visual resources along the majority of the Project have been previously affected by pipeline or other operations.

Visual impacts associated with the Project construction right-of-way and ATWSs would include the removal of existing vegetation and the exposure of bare soils, as well as earthwork and grading scars associated with heavy equipment tracks, trenching, blasting, and machinery and tool storage. Other visual effects could result from the removal of large individual trees that have intrinsic aesthetic value; the removal or alteration of vegetation that may currently provide a visual barrier; or other changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts would be greatest where the pipeline route parallels or crosses roads and the pipeline right-of-way may visible to passing motorists, from residences where vegetation used for visual screening or for ornamental value is removed, and where the pipeline crosses forested areas. The duration of visual impacts would depend on the type of vegetation that is cleared or altered. The impact of vegetation clearing would be shortest in open areas where the re-establishment of vegetation following construction would be relatively fast (generally less than 5 years). The impact would be greater in forest

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[16] The Applicants' Phase 1 Report was included as appendix 8F to Resource Report 8 in its October 22, 2015 application (Accession No. 20151022-5282). The Phase 1 Report can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

land, which would take many years to regenerate. The greatest potential visual impact would result from the removal of large specimen trees, which would take longer than other vegetation to regenerate and if located on the new permanent right-of-way would be prevented from becoming re-established.

The area crossed by the pipeline facilities is a highly fragmented landscape, comprising mostly a mixture of open land, residential areas, forest/woodland, and industrial/commercial development. Additionally, as discussed above, all of the land that would be disturbed by the pipeline routes would be within or adjacent to the existing rights-of-way. These factors would minimize the visual impact of construction. The visual effect of the pipeline would also be mitigated by the HDD crossing, where impacts on visual resources between the HDD entry and exit holes would be avoided.

After construction, most of the areas that would be disturbed by the pipelines would be restored and returned to preconstruction conditions in compliance with federal, state, and local permits; landowner agreements; and Algonquin's easement requirements. The primary long-term visual effects associated with the pipelines would be the clearing of about 11.8 acres of forested vegetation. The permanent visual impacts of the pipelines would be limited to the 0.4 acres of forested vegetation that would be permanently cleared for the new permanent right-of-way.

Aboveground Facilities

The modified and new aboveground facilities associated with the Project would be the most visible features and would result in long-term impacts on visual resources. The magnitude of these impacts would depend on a variety of factors such as the existing landscape, the remoteness of the location, and the number of viewpoints from which the facility could be seen.

The work at a majority of the aboveground facilities would occur within the property line of existing compressor station or M&R station sites. Only minor, temporary construction disturbance would occur outside the existing fence lines at some facilities. Therefore, after the completion of construction, these aboveground facilities would be consistent with the existing visual landscape.

The proposed Salem Pike M&R Station would be constructed at a new location about 300 feet from the existing Salem Pike M&R Station. Construction of the new M&R station would permanently impact about 0.3 acre of industrial land. The station would be behind a row of existing mature evergreen trees which would be preserved to provide a visual screen to motorists along Old Salem Road. Given the existing developed nature of the proposed M&R station location and the presence of a natural visual screen, we find that the new Salem Pike M&R Station would not significantly alter the visual character of the property.

The proposed Weymouth Compressor Station would be constructed on a 12.9 acre site on a peninsula adjacent to the Fore River. The site is currently a mixture of open land (shrubs and grassy vegetation) and industrial land surrounded by the Fore River to the northwest and northeast and the Fore River Bridge and additional industrial sites to the south. The Massachusetts Water Resource Authority (MWRA) facility is also on this peninsula. We received comments during the public scoping period about the visual impact of the new compressor station. Algonquin has completed a set of visual simulations of the Weymouth Compressor Station, which has been designed to be visually similar to the MWRA building (appendix G). The visual simulations also show that a row of trees would be in place along the eastern and northwestern sides of the site. While the new compressor station would be visible to residents across the Weymouth Fore River and King's Cove, we find the impact would not be significantly out of character with the current visual landscape given the design of the compressor station and the vegetative screen.

Contractor/Pipe Yards

With the possible exception of minor grading activities and surfacing, soils at the pipe and contractor ware yards would not be disturbed. As a result, there would be no permanent impacts on visual resources associated with the use of these yards. The only impacts at yards would be temporary during construction, when trailers, vehicles, pipe, and other construction-related material would be stored at these sites.

Access Roads

To the extent feasible, existing public and private roads along the Project routes would be used as primary means of accessing pipeline rights-of-way and aboveground facilities. In addition to existing access available by the use of public roads, Algonquin has identified five access roads for use on the Project. These additional access roads would permanently impact 0.7 acre of forest land. Impacts on forest due to road widening would be limited to tree trimming; it is not anticipated that any trees would be removed during this process. This tree trimming would result in a minor, but insignificant impact on visual resources.

2.5 SOCIOECONOMICS

Construction and operation of the Project could impact socioeconomic resources. The socioeconomic impact area we analyzed encompasses an estimated maximum distance of 20 miles for workers to travel each way to and from the construction sites associated with the following Project facilities within the following counties:

- Stony Point Discharge Take-up and Relay – Westchester County, New York;
- Southeast Discharge Take-up and Relay – Fairfield County, Connecticut; and
- Weymouth Compressor Station – Norfolk – County, Massachusetts.

The other new or proposed modifications to existing aboveground facilities and appurtenant aboveground facilities would primarily occur within existing facility footprints or rights-of-way and represent minor activities. Construction and operation of these facilities would not have a significant socioeconomic impact and are therefore not discussed further in this section.

The potential socioeconomic effects of the Project include population effects associated with the influx of construction workers and the impact of these workers on public services and temporary housing during construction. Other potential socioeconomic effects include traffic impacts due to in-street construction; increased vehicle traffic necessary to move materials, equipment, and workers to and from the right-of-way; as well as increased property tax revenue, job opportunities, and income associated with local construction employment.

2.5.1 Population, Economy, and Employment

Table 2.5.1-1 provides a summary of demographic and socioeconomic conditions for the affected communities in the Project area. The major occupations throughout the Project area are in education; professional, scientific, management, administrative, and waste management; and finance and insurance.

Portions of the Stony Point and Southeast Discharge Take-up and Relay segments and the entire Weymouth Compressor Station would be within metropolitan areas. Generally each Project county has a higher per capita income and lower unemployment rate than respective state averages (U.S. Bureau of Labor Statistics, 2015a, 2015b).

TABLE 2.5.1-1

Existing Economic Conditions by Geographic Area for the Atlantic Bridge Project

State, County	Population (2010) [a]	Population (2014) [b]	Population Density (Persons/ sq. mile) [a]	Per Capita Income [c]	Unemployment Rate May 2015 [d, e]	Civilian Workforce (percent) [c]	Top Three Industries [c]
New York	19,378,102	19,746,227	402	$32,083	5.1	63.3	E, P, R
Westchester County	949,113	969,296	2,205	$47,237	4.7	65.2	E, F, P
Connecticut	3,574,097	3,596,677	738	$37,468	5.2	67.4	E, M, P
Fairfield County	916,829	945,438	1,467	$48,467	4.8	68.8	E, F, P
Massachusetts	6,547,629	6,745,408	839	$35,518	4.6	67.5	E, P, R
Norfolk County	670,850	687,802	1,694	$43,921	4.0	68.8	E, F, P

Sources:
[a] U.S. Census Bureau. 2010a.
[b] U.S. Census Bureau. 2014.
[c] U.S. Census Bureau. 2013a.
[d] U.S. Bureau of Labor Statistics. 2015a.
[e] U.S. Bureau of Labor Statistics. 2015b.
Note: Industries: E – Educational service; F – Finance and insurance; M – Manufacturing; P – Professional, scientific, and management, and administrative and waste management services; R – Retail trade

Construction of the Project could temporarily increase the population in the general vicinity of the Project. Table 2.5.1-2 lists the size of the estimated construction workforce for the various Project components. Workforce numbers associated with each pipeline segment during this period would average between 23 and 27 workers but would peak at about 212 workers or the Stony Point Discharge Take-up and Relay and about 134 workers for the Southeast Discharge Take-up and Relay. The average workforce at the Weymouth Compressor Station would be 75 workers and the peak would be about 110 workers. The average and peak workforces at the other aboveground facility sites would be lower and the construction period would be shorter. Peak construction workforce is expected to total about 752 workers across all Project components (see table 2.5.1-2).

It is assumed that the locally hired workers would comprise between 5 and 27 percent of the peak workforce depending on facility. These local hires would include surveyors, welders, equipment operators, and general laborers. Construction personnel that may be hired from outside of the Project area would also include supervisory personnel and inspectors in addition to the jobs previously listed. These individuals are anticipated to temporarily relocate to the Project vicinity during construction. Algonquin would hire one full-time operational worker as an engine analyst on a regional basis for the pipeline facilities along with two full-time operational workers including a mechanic and technician at the Weymouth Compressor Station.

The impact of the Project on the local and regional population would be temporary and proportionally small. Given the brief construction period and past project experience, most non-local workers would not be accompanied by their families. Based on the county populations within the Project area, the additional people that might temporarily relocate to the area would not result in a significant change. Additionally, this temporary increase in population would be distributed throughout the proposed facilities and would not have a permanent impact on the population. The operation of the proposed facilities would have a negligible impact on population and employment because Algonquin would add only three full-time permanent workers in the Project area.

TABLE 2.5.1-2

Summary of the Average and Peak Construction Workforce by Facility for the Atlantic Bridge Project

Facility	County, State	Duration of Construction (months)	Average Workforce	Peak Workforce	Peak Construction Workforce Hired Locally
PIPELINE FACILITIES					
Replacement Pipeline					
Stony Point Discharge Take-up and Relay	Westchester, NY	8	23	212	30
Southeast Discharge Take-up and Relay	Fairfield, CT	8	27	134	19
ABOVEGROUND FACILITIES					
New Compressor Station					
Weymouth Compressor Station	Norfolk, MA	8	75	110	30
Existing Compressor Station Modifications					
Chaplin Compressor Station	Windham, CT	6	75	110	30
Oxford Compressor Station	New Haven, CT	6	75	110	30
New M&R Station					
Salem Pike M&R Station	New London, CT	6	1	11	1
Existing M&R Station Modifications					
Yorktown M&R Station	Westchester, NY	5	2	6	1
Danbury M&R Station	Fairfield, CT	6	2	11	1
Needham Regulator Station	Norfolk, MA	6	5	8	1
Pine Hills M&R Station [a]	Plymouth, MA	6	6	20	1
Plymouth M&R Station [a]	Plymouth, MA	6	4	12	1
Westbrook M&R Station	Cumberland, ME	3	2	8	1
TOTALS [b]		**--**	**297**	**752**	**146**

a Existing stations to be rebuilt.

b Totals represent the estimated total maximum number of workers during construction. Actual numbers may be less as certain workers may shift from one project component to another.

2.5.2 Housing

Construction of the Project could temporarily decrease the availability of housing in the Project area and thus have a short-term positive impact on the area's rental industry through increased demand and higher rates of occupancy. Assuming that the local construction workers do not require housing, up to about 606 housing units[17] for non-local workers may be required across the Project area during peak construction activities. Given the vacancy rates (4.7 percent to 7.1 percent) and the high number of vacant housing units in the counties that would be affected by the Project, construction workers should not encounter difficulty in finding temporary housing. The effect of the three new full-time operational workers on the availability of housing in the area would be negligible (U.S. Census Bureau, 2013a; Hotels and Motels, 2015; Yellow Pages, 2015; Connecticut Office of Tourism, 2015; MAEEA, 2015a; and Recreational Vehicle-Clubs and Campgrounds, 2015).

2.5.3 Public Services

A wide range of public services and facilities are also offered in the Project area. Services and facilities include hospitals, full-service law enforcement, career and volunteer fire departments, and

17 As provided in section 2.5.1, the peak construction workforce is expected to total about 752 workers of which about 146 are expected to be local hires.

schools. Based on the number of police (96) and fire stations (300), public schools (678), and hospitals (31), there appears to be adequate public service infrastructure in the Project vicinity to accommodate the temporary needs for the small number of non-local construction workers.

Short-term, temporary impacts on public services could include the need for localized police assistance or certified flaggers to control traffic flow during construction activities. Additional discussion of traffic and public service assistance necessary to support traffic control is provided in section 2.5.5. In the event of an on-the-job accident, the Applicants' contractors could require police, fire, and/or medical services, depending on the type of emergency; however, the anticipated demand for these services would not exceed the existing capabilities of the emergency service infrastructure in the Project area. It is not anticipated for non-local construction personnel to relocate their families to the Project area. Therefore, we find that the education infrastructure in the Project vicinity would not be impacted. There would not be any long-term impacts on public services from construction of the Project.

2.5.4 Transportation and Traffic

The local road and highway system in the vicinity of the Project facilities is readily accessible by interstate highways, U.S. highways, state highways, secondary state highways, county roads, and private roads. Access to the Project area is also served by other means of transportation such as commuter rail systems and buses. As noted earlier, construction activities would be located in or near large metropolitan areas that have sufficient transportation infrastructure. To the extent feasible, the Applicants would use existing public and private roads along the proposed pipeline as the primary means of accessing the pipeline rights-of-way and aboveground facilities. Maps included in appendix A depict the roads that the Applicants would use to access the construction right-of-way; access roads are discussed in more detail in section 1.7.4.

The proposed facilities would not cross any railroads, but the pipeline would be installed across or within 25 existing public roadways. The HDD method would be used to cross two of these roads (the Taconic Parkway and Strang Boulevard). The bore or hammer method would be used to cross three other roads (Yorktown Road along the Stony Point Discharge Take-up and Relay and Padanaram Road and Glen Hill Road along the Southeast Discharge Take-up and Relay). The HDD, bore, and hammer methods would allow installation of the pipeline under the roads without impacting the road surface. The remaining 20 local roads would be open cut, which would entail digging a trench that would impact the road surface. These methods are described in section 1.9.1. The construction activities associated with the open cut crossings would temporarily impact traffic on the affected roadways. Traffic on nearby roads may also be affected by the establishment of detours and other traffic controls to divert traffic away from the work area.

We received numerous comments regarding impacts on traffic during construction of Project facilities. Road crossings for construction of the pipeline facilities would require road crossing and/or opening permits from applicable state and local agencies which would dictate the day-to-day construction activities at road crossings. Work within the affected roadways would be conducted in accordance with the requirements of these permits and the Applicants' project-specific Access Management and Traffic Management Plans.

The detailed plans for pipeline construction in Connecticut and New York contain temporary traffic control devices and detours for the multitude of roadway crossing scenarios that would occur. We have reviewed the Traffic Management Plan for the Connecticut and New York Pipeline Segments, including the revised site-specific and detailed plans for Ichabod Court/Tulip Drive, Maple Ridge Road, Golden Hill Road, Berkshire Drive, and Great Plain Road, and find them acceptable.

Traffic flows in the project areas could also be affected by the commuting of the construction workforce and the movement of construction vehicles and delivery of equipment and materials to the construction work area. The daily commuting of the construction workforce to the Project area could increase traffic congestion locally and create roadside parking hazards. Algonquin estimates that a maximum of 134 people would be working on any one pipeline segment and/or aboveground facility at any one time, resulting in short-term, temporarily increases in traffic. Because Project facility construction work is generally scheduled to take advantage of daylight hours, workers would typically commute to and from the contractor/pipe yards or other locations during off-peak hours (e.g., before 7:00 a.m. and after 6:00 p.m.), which would reduce project-related traffic impacts. Algonquin would also minimize the potential for traffic congestion by encouraging construction workers to share rides or take public transportation to the construction site. Algonquin's contractors may also provide buses to move workers from common parking areas to the construction work areas. The Applicants typically deliver materials and equipment to the job site during the early morning and evening hours to minimize disruptions on traffic on local roads associated with these activities. A discussion of the potential cumulative impacts related to traffic can be found in section 2.10.5.

Construction at the Weymouth Compressor Station would be conducted in accordance with Algonquin's Weymouth Compressor Station Traffic Management Plan. We have reviewed this plan and find it acceptable. This plan details the Construction Vehicle Route Map that would be utilized to minimize any impacts on adjacent residential and commercial areas. Construction material deliveries to the compressor station would follow this designated route.

To maintain safe conditions, the Applicants would require construction contractors to comply with vehicle weight restrictions and limitations and to remove any soil deposited on road surfaces from crossing construction equipment. Mats or other appropriate measures (e.g., sweeping) would be used, when necessary, to reduce mud deposition from equipment crossing roadways. In addition, the Applicants would have adequate local police and or trained flag persons moving traffic through the construction area efficiently. Additional discussion of safety and comments received during the scoping period related to traffic and transportation can be found in section 2.9.1.

During construction, the Applicants would utilize methods that reduce noise levels and vibration by reducing speeds of all equipment traveling on roadways. Heavy equipment speeds would be thoroughly monitored on the roadways when in close proximity to homes and businesses. The Applicants would also bridge and mat areas where certain pavements are present.

2.5.5 Property Values

We received comments regarding the potential effect of the Project on property values. Landowners typically have the following concerns regarding potential impacts on property values: devaluation of property if encumbered by a pipeline easement; being the responsible party for property taxes within a pipeline easement; paying potential landowner insurance premiums for Project-related effects; and negative economic effects resulting from changes in land use. As described in section 2.4.2, Algonquin would acquire easements for both the temporary (construction) and permanent rights-of-way where applicable. The Project pipeline segments primarily involve replacements of existing pipeline in the same location and would not require a new permanent pipeline easement, with the exception of where the Taconic Highway HDD would be located. Additionally, most of the aboveground facilities would be modified at existing facilities within properties owned by the Applicants. The existing property values in these areas account for the presence of the existing pipeline and/or compressor station infrastructure. As such, these pipeline and aboveground facilities would not result in any long-term changes that would negatively impact property values outside of the pipeline rights-of-way or aboveground facility sites.

The Weymouth Compressor Station is a new facility that would be situated on a previously disturbed industrial property that is currently owned by Calpine Fore River Energy Center, LLC. Algonquin would purchase the land required for the facility from the current owner. The compressor station would be located between an existing water treatment facility and electric power plant, and while it would introduce a new visual element on the site, it would not significantly increase the noise at any NSA, alter the visual character of the area, which already includes a number of industrial facilities, significantly increase the safety risk in the surrounding communities, or result in other impacts that would significantly impact adjacent property values.

Several studies have looked at the effect of pipelines on sales and property values. A report by Integra Realty Resources, which was prepared in 2016 for the Interstate Natural Gas Association of America Foundation, Inc., evaluated the impact of natural gas pipelines on real estate in five separate and geographically diverse areas, including two suburban areas; one master-planned residential community; and two rural areas. Each of these areas is either crossed by one or more natural gas pipeline, or in close proximity to three natural gas pipelines. The study concluded that there was no significant impact on property sales along natural gas pipelines or based on the pipeline size or the product carried (Interstate Natural Gas Association of America Foundation, 2016). Additionally, other studies have reached similar conclusions: PGP Valuation Inc. (2008) for Palomar Gas Transmission Inc.; Ecowest (Fruits, 2008) for the Oregon LNG Project; Diskin, Friedman, Peppas, and Peppas (2011); and Hansen et al. (2006).

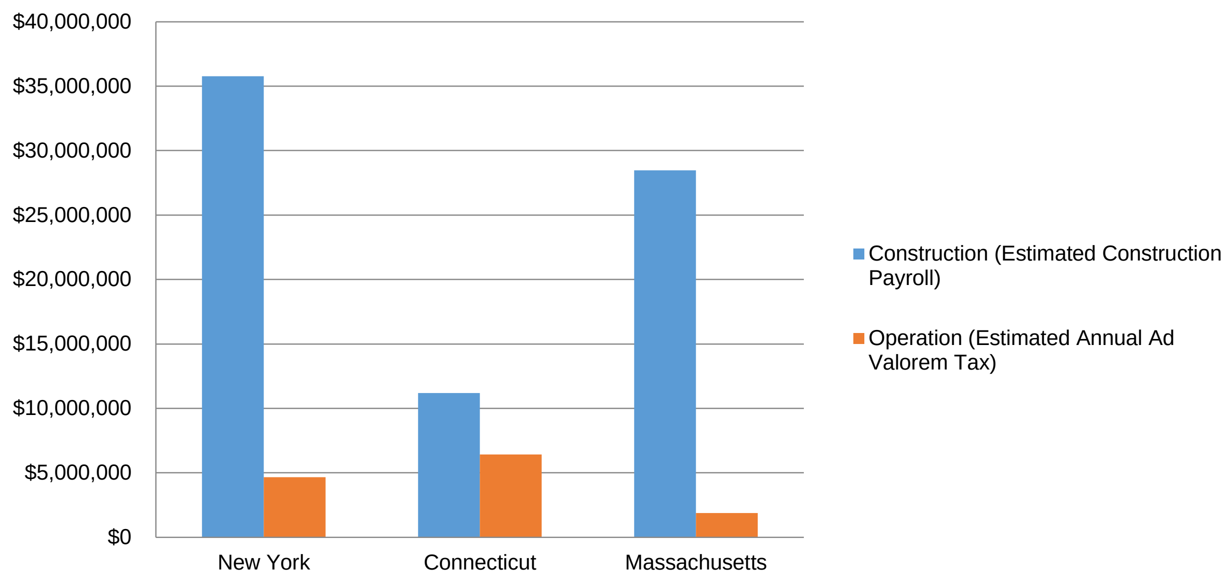
Regarding the potential for insurance premium adjustments associated with pipeline proximity, insurance advisors consulted on other natural gas projects reviewed by FERC indicated that pipeline infrastructure does not affect homeowner insurance rates (FERC, 2008). Additionally, the existing home owner's insurance rates in the majority of the Project area account for the presence of the existing pipeline and/or compressor station infrastructure. As such, we find that homeowners' insurance rates are unlikely to change due to construction and operation of the proposed Project. Similarly, regarding the potential impacts on mortgage rates associated with pipeline proximity, we are not aware of any practice by mortgage companies to re-categorize properties nor are we aware of federally insured mortgages being revoked based on proximity to pipelines.

2.5.6 Economy and Tax Revenues

Construction and operation of the Project would have a beneficial impact on the local economy in terms of increased payroll, local materials purchased, and utilization of local vendors. Payroll taxes would also be collected from the workers employed on the Project. The Applicants anticipate that the total payroll for the Project would be about $75,415,585 during the construction phase (see figure 2.5.6-1).

The Applicants estimate that some additional money would be spent locally on the purchase and/or rental of equipment and the purchase of materials and supplies such as stone, sand, concrete, fencing material, and bulk fuel.

Figure 2.5.6-1
Socioeconomic Impact Resulting from Construction and Operation of the Atlantic Bridge Project



Construction of the Project would also result in increased state and local sales tax revenues associated with the purchase of some construction materials as well as goods and services by the construction workforce. Local communities would benefit from ad valorem taxes, paid annually by the Applicants over the life of the Project (see figure 2.5.6-1).

The new compressor station in Weymouth would be on existing industrial land that would be acquired by Algonquin. Operation of the compressor station would not restrict other development in the surrounding area. The pipeline would be installed underground and any surface impacts, such as damaged pavement, would be repaired. Once installed, the pipeline would not impede normal surface traffic or access to businesses, and most preconstruction property uses would be allowed. The primary long-term impact of pipeline construction is typically the restrictions associated with the various permanent right-of-way widths, which would preclude specific uses, such as the installation of permanent aboveground structures, over the pipeline. However, given the nature of the pipeline facilities being primarily same-ditch replacement, property owners are already subject to these restrictions.

2.5.7 Environmental Justice

Executive Order 12898 on Environmental Justice recognizes the importance of using the NEPA process to identify and address, as appropriate, any disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Consistent with Executive Order 12898, the Council on Environmental Quality (CEQ) called on federal agencies to actively scrutinize the following issues with respect to environmental justice (CEQ, 1997a):

- the racial and economic composition of affected communities;
- health-related issues that may amplify project effects on minority or low-income individuals; and

- public participation strategies, including community or tribal participation in the process.

The EPA's Environmental Justice Policies focus on enhancing opportunities for residents to participate in decision making. The EPA (2011) states that Environmental Justice involves meaningful involvement so that "(1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that would affect their environment and/or health; (2) the public's contributions can influence the regulatory agency's decision; (3) the concerns of all participants involved would be considered in the decision-making process; and (4) the decision-makers seek out and facilitate the involvement of those potentially affected."

In accordance with Executive Order 12898 on Environmental Justice, all public documents, notices, and meetings were made readily available to the public during our review of the Project. The Applicants met with many different stakeholders during the initial development of the route, including local residents and affected landowners. These efforts involved a number of informational meetings and open houses with the affected communities and local authorities. The Applicants also established, and are maintaining, a Project website to share Project information with the public.

The Applicants also used FERC's pre-filing process. One of the major goals of this process is to increase public awareness and encourage public input regarding every aspect of the project before an application is filed. As part of this process, FERC staff participated in the Applicants' open houses and hosted our own scoping meetings to receive input from the public about the Project. These scoping meetings included meetings in the Town of Yorktown, New York; Danbury, Connecticut; the Town of Franklin, Massachusetts; and the Town of Weymouth, Massachusetts. FERC staff also visited all of the proposed pipeline segments and the new compressor station site. Interested parties have had, and will continue to be given, opportunities to participate in the NEPA review process. To date, this included the opportunity to participate in the public scoping meetings within the Project area to identify concerns and issues that should be covered in the EA, and the opportunity to submit hand written and electronic comments about the Project to FERC. For additional information on FERC's pre-filing process see section 1.4. Outreach with Indian tribes is described in section 2.6.1.

In its comments during pre-filing, the EPA recommended some non-traditional communication techniques to improve success in contacting some of the low income and minority communities within the Project area. In response, Algonquin prepared fact sheets in Spanish, Mandarin, and Cantonese, which they posted on the Project website. Algonquin also agreed to prepare notices in all three languages (in addition to English) regarding future public meetings and notices regarding construction information for the identified Environmental Justice Communities.

Demographic and Economic Data

Environmental Justice Areas or Communities are defined by the EPA and the individual states. The EPA defines Environmental Justice Areas or Communities as locations that have a "meaningful greater" percentage of minorities than the general population has, or locations in which minorities comprise more than 50 percent of the affected area's population. The EPA Region 2 Interim Environmental Justice Policy, which applies to permits issued by that region, including those in New York, suggests that the minority threshold should be 51.5 percent in urban areas of the state. The NYSDEC defines Environmental Justice Communities according to the following thresholds: communities where 23.6 percent or more of the individuals within a given census block are living below the federal poverty level as low-income populations; and/or communities where minorities comprise more than 51.1 percent of the population within a given census block. The State of Connecticut considers Environmental Justice Communities to include U.S. census block groups where 30 percent or more of the population consists of low income persons who are not institutionalized and have an income below

200 percent of the federal poverty level; and distressed municipalities (Connecticut Environmental Justice Policy, 2012a, 2012b). In Massachusetts, the MAEEA includes as environmental justice populations those neighborhoods (U.S. Census Bureau census block groups) that meet one or more of the following criteria:

- median annual household income is at or below 65 percent of the statewide median income for Massachusetts;
- 25 percent of the residents are minority;
- 25 percent of the residents are foreign born; or
- 25 percent of the residents are lacking English language proficiency (MAEEA, 2015b).

Table 2.5.7-1 provides demographic statistics for the cities and towns that would be affected by the Project. Table 2.5.7-2 provides an overview of the general economic status of these cities and towns.

TABLE 2.5.7-1

Demographic Statistics for Municipalities Crossed by Project Facilities for the Atlantic Bridge Project

Project Facility/ Town or City	Total Population	White (percent)	African American (percent)	Native American and Alaskan Native (percent)	Asian (percent)	Native Hawaiian and Pacific Islander (percent)	Other Race (percent)	Two or More (percent)	Total Minority (percent) [a]
Stony Point Discharge Take-up and Relay									
Town of Yorktown	36,081	87.9	3.3	0.1	4.7	0.0	2.1	1.8	22.4
Town of Somers	20,434	92.9	1.6	0.1	3.2	0.1	1.0	1.2	12.1
Southeast Discharge Take-up and Relay									
City of Danbury	80,893	68.2	7.2	0.4	6.8	0.0	12.9	4.5	17.8
Weymouth Compressor Station									
City of Quincy	92,271	67.3	4.6	0.2	24.0	.0.	1.7	2.1	11.4
Town of Braintree	35,744	86.7	2.7	0.2	7.6	0.0	1.3	1.6	23.9
Town of Weymouth	53,743	89.7	3.1	0.2	3.2	0.0	2.0	1.8	11.9

Source: Unless otherwise noted: U.S. Census Bureau. 2010b.
[a] U.S. Census Bureau. 2013a.
Note: "minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White.

TABLE 2.5.7-2

Demographic Statistics for Municipalities Crossed by Project Facilities for the Atlantic Bridge Project

Project Facility/ Town or City	Median Household Income (2009 to 2013)	Persons Below Poverty (2009 to 2013) (percent)
Stony Point Discharge Take-up and Relay		
Town of Yorktown	$101,074	2.0
Town of Somers	$112,649	2.8
Southeast Discharge Take-up and Relay		
City of Danbury	$64,969	10.6
Weymouth Compressor Station		
City of Quincy	$61,328	10.5
Town of Braintree [a]	$81,844	5.1
Town of Weymouth [a]	$68,113	7.6

Source: Unless otherwise noted: U.S. Census Bureau. 2013a.
[a] U.S. Census Bureau. 2013b.

New York

Based on a review of the minority and incomes data and EPA's EJScreen, which is an electronic tool that helps identify Environmental Justice Areas, we have determined that none of the census block groups affected by the Project in New York have minority populations greater than 50 percent or have 23.6 percent or more of the individuals within it living below the poverty line (EPA, 2015b).

Connecticut

None of the counties or census blocks that would be crossed by the Project in Connecticut have minority populations greater than the general EPA guideline of 50 percent. Additionally, none of the pipeline facilities would cross any of the 2014 Connecticut Department of Economic and Community Development's List of Distressed Municipalities (Connecticut Department of Economic and Community Development, 2015) or any defined census block groups with 30 percent or more of the population living below 200 percent of the federal poverty level.

Massachusetts

The proposed Weymouth Compressor Station is not directly located in an Environmental Justice census tract. However, based on a review of the EPA EJScreen, we have determined that there are 4 Environmental Justice census tracts composed of 12 block groups within a 0.5-mile radius of the proposed Weymouth Compressor Station site. Table 2.5.7-3 provides more detail concerning these four census tracts with environmental justice concern. As shown in the table 2.5.7-3 below, two of the four block groups have a median annual household income that is at or below 65 percent of the statewide median income for Massachusetts. All four block groups have minority populations that are greater than 25 percent.

TABLE 2.5.7-3

Environmental Justice Populations Within a 0.5-mile Radius of the Weymouth Compressor Station for the Atlantic Bridge Project

State/County/ Town or City	Median Household Income (percent)	Total Minority (percent) [a]
Massachusetts	**$66,866**	**31.4**
Norfolk County	127.0 [b]	24.5
City of Quincy	91.7 [b]	11.4
CT 4178.02 BG 1 (Germantown)	**54.1** [b]	**43.7**
CT 4178.02 BG 2 (Germantown)	**28.8** [b]	**60.3**
CT 4179.01 BG 1 (Quincy Point)	86.7 [b]	**27.3**
CT 4179.01 BG 2 (Quincy Point)	92.9 [b]	**45.4**

Sources: U.S. Census Bureau. 2010b and 2013a

[a] "Minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White.

[b] Percentage of state level median household income.

Notes: CT = Census Tract; BG = Block Group; **Bold** values indicates exceedance of Massachusetts Environmental Justice Area or EEA threshold.

Impact Analysis

The construction and operation of the proposed facilities would affect a mix of racial/ethnic and socioeconomic areas in the Project area as a whole. All 79.9 acres of the proposed pipeline facilities would be located outside of Environmental Justice Communities. Of the aboveground facilities, none are sited within an Environmental Justice Community; however, there are four Environmental Justice census tracts within a 0.5-mile radius of the proposed Weymouth Compressor Station site that could experience construction or operational impacts. In general the impacts on the Environmental Justice Communities near the Weymouth Compressor Station would be similar to those experienced by others elsewhere, although not all of the impacts identified in this EA would affect minority or low-income populations. To minimize the overall impact of the Project, the Applicants collocated the proposed facilities with existing linear and aboveground facility infrastructure to the extent practicable. The proposed Weymouth Compressor Station would be on an open industrial property owned by Calpine Fore River Energy Center, LLC. Algonquin's use of the property would be consistent with the zoning of the site.

Algonquin would implement a series of measures that would minimize any potential impacts on the nearby communities, including the Environmental Justice Communities located near the Weymouth Compressor Station. For instance, Algonquin proposes to employ proven construction-related practices to control fugitive dust such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic. Similarly, noise control measures would be implemented by Algonquin during Project construction and operation. Additionally, Algonquin would ensure that the noise attributable to the Weymouth Compressor Station would be less than 55 dBA day-night sound level (L_{dn}) at nearby NSAs, and the increase in the overall noise due to the new station would be well below the threshold considered perceptible to the human ear. The Weymouth Compressor Station would be designed to blend in with the existing visual landscape as shown in the visual simulation presented in appendix G. Algonquin has also developed traffic management plans for the Weymouth Compressor Station to minimize traffic impacts on the local community during construction.

Based on the estimated emissions from operation of the proposed Project facilities and our review of Algonquin's modeling analysis, we have determined that the Project would comply with the national ambient air quality standards (NAAQS), which are protective of human health, including children, the elderly, and sensitive populations (see section 2.7.1). The Project facilities would also be designed, constructed, operated, and maintained in accordance with or to exceed PHMSA's minimum federal safety standards in 49 CFR 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, apply to all areas along the proposed pipeline routes regardless of the presence or absence of minority or low income populations.

The Atlantic Bridge Project and Weymouth Compressor Station in particular would also bring economic benefits to the region via added tax revenues and construction jobs. Therefore, we conclude that with the implementation of the mitigation measures discussed above, the Project would not result in any disproportionately high or adverse environmental and human health impacts on minority or low-income communities.

2.6 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA) Title 16 USC section 470 (16 USC 470) requires federal agencies to take into account the effects of their undertakings (including the issuance of Certificates) on properties listed in or eligible for listing in the National Register of Historic Places (NRHP) and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The Applicants, as non-federal parties, are assisting FERC in meeting its obligations under section 106 by preparing the necessary information, analyses, and recommendations as authorized by 36 CFR 800.2(a)(3).

The Applicants conducted archival research and walkover surveys of the proposed Project area to identify historic aboveground properties and locations for additional subsurface testing in areas with potential for prehistoric and historic archaeological sites. The Applicants then conducted field surveys for aboveground properties and archaeological sites.

2.6.1 Consultation

On April 27, 2015, FERC sent copies of the NOI for the Project to a wide range of stakeholders, including applicable federal, state, and local agencies and federally recognized Indian tribes (Tribes) that may have an interest in the Project area. The NOI contained a paragraph about section 106 of the NHPA, and stated that we use the notice to initiate consultations with the State Historic Preservation Office (SHPO), and to solicit their views and those of other government agencies, interested Tribes, and the public on the Project's potential effects on historic properties. A supplemental NOI was issued on November 19, 2015. In addition to the FERC's notification process, the Applicants or their consultant, Public Archaeology Laboratory, separately contacted the SHPOs and Tribes that might attach cultural or religious significance to cultural resources in the Project area.

State Historic Preservation Officers

Table H-1 in appendix H summarizes communications with the New York, Connecticut, Massachusetts, and Maine SHPOs. Algonquin contacted the New York, Connecticut, and Massachusetts SHPOs on August 1, 2014 to provide them information regarding the Project and to request comments. Algonquin provided the New York and Connecticut SHPOs with technical proposals for conducting identification surveys in each state on October 24, 2014. The New York SHPO provided comments on the technical proposal on November 20, 2014, while the Connecticut SHPO responded on November 18, 2014.

On April 20 and June 29, 2015, Algonquin notified the New York, Connecticut, and Massachusetts SHPOs of changes to the Project. In addition, a revised technical proposal was provided to the New York and Connecticut SHPOs with the April 20, 2015 correspondence and the draft Unanticipated Discovery Plan with the June 29, 2015 correspondence.

On August 14, 2015, Maritimes provided a Project notification package to the Maine SHPO, consisting of an initial outreach letter, associated mapping, and the Applicants' pre-filing request for review and comment. Subsequently, on October 13, 2015, Maritimes submitted correspondence to the Maine SHPO providing archaeological and historic architectural properties assessments for the Westbrook M&R Station, as well as the Unanticipated Discovery Plan for review and comment. No additional archaeological or architectural survey of the Westbrook M&R Station was recommended by Maritimes as the proposed workspace at the Westbrook M&R Station had been previously surveyed for archaeological and architectural resources as part of the Maritimes Phase IV Project (Docket Nos. PF05-17 and CP06-335-000). Maritimes also recommended that that no historic properties would be affected by proposed Project activities at the existing Westbrook M&R Station. In a comment letter dated November 3, 2015, the Maine SHPO concurred with Maritimes recommendations. We also concur.

On October 13, 2015, Algonquin provided the New York and Connecticut SHPOs with archaeological overview/identification survey and evaluation technical reports and historic architectural properties overview/identification survey technical memoranda and requested comments on the reports. Additionally, on October 13, 2015, Algonquin provided the Massachusetts SHPO with archaeological and historic architectural properties assessments for aboveground facilities that had been subject to previous surveys, as well as a technical memorandum presenting the results of a historic architectural properties overview/identification survey for the proposed Weymouth Compressor Station. Algonquin has not filed the Massachusetts SHPO comments.

In two separate comment letters dated November 30, 2015, the New York SHPO concurred with Algonquin's recommendations. The New York SHPO also concurred that the Project would have no adverse effect on the NRHP listed Taconic Parkway. We also concur. On February 9, 2016, Algonquin submitted an addendum archaeological report to the New York SHPO for review and comment. The February 9, 2016 report provided the survey results for a portion of the Stony Point Discharge Take-up and Relay project area that had not been previously surveyed due to land access restrictions. In a comment letter dated March 2, 2016, the New York SHPO concurred with Algonquin's recommendations made in the addendum archaeological identification survey report. We also concur.

In a comment letter dated December 15, 2015, the Connecticut SHPO concurred with Algonquin's recommendations. Algonquin submitted final copies of the revised cultural resources survey reports to the Connecticut SHPO on February 9, 2016. In addition to addressing the Connecticut SHPOs editorial comments, the revised archaeological identification survey report included the results of survey of a portion of the Southeast Discharge Take-up and Relay project area that had not been previously surveyed due to land access restrictions. Comments from the Connecticut SHPO regarding the revised cultural resources survey report have not been filed.

Tribal Consultations

Table H-2 in appendix H summarizes communications with Tribes. On August 1, 2014, in an attempt to identify any concerns about properties of traditional religious or cultural significance that may be affected by this undertaking, the Applicants sent initial outreach letters to nine Tribes: the Delaware Nation of Oklahoma, Delaware Tribe of Indians, Mashantucket (Western) Pequot Tribal Nation, Mashpee Wampanoag Indian Tribe, Mohegan Tribe of Indians, Narragansett Indian Tribe, Saint Regis Mohawk Tribe, Stockbridge-Munsee Community Band of Mohican Indians, and Wampanoag Tribe of Gay Head (Aquinnah).

The Delaware Tribe of Indians responded with an interest in the general vicinity of the Project and asked to continue receiving information regarding field surveys for the Project. The Mashantucket (Western) Pequot Tribal Nation responded that the Tribe has an interest in the proposed Project and requested survey information when completed, as well as section 106 consultation with FERC for the Project. The Stockbridge-Munsee Community Band of Mohican Indians responded that the tribe was interested in Project facilities associated with the pipeline replacement in New York. The Wampanoag Tribe of Gay Head (Aquinnah) met with Algonquin and communicated that the tribe was interested in the Project. No additional responses have been filed by Algonquin.

Algonquin provided copies of the June 29, 2015 letters to the SHPOs, to all nine Tribes including enclosures (the progress memoranda for New York and Connecticut, and the draft Unanticipated Discovery Plan). On June 5, 2015, the Stockbridge-Munsee Tribe provided comments on the New York archaeological survey progress memorandum, as well as comments and an addition to the draft Unanticipated Discovery Plan; the tribe's recommended addition to the plan has been incorporated.

Maritimes sent initial outreach letters to four additional Tribes (Aroostook Band of Micmacs, Houlton Band of Maliseet Indians, Passamaquoddy Tribe, and Penobscot Indian Nation) on August 14, 2015. On August 20, 2015, FERC wrote consultation letters to the 13 Tribes contacted earlier by the Applicants to request their comments on the proposed Project. None of the Tribes have responded.

Algonquin prepared a draft Ceremonial Stone Landscapes (CSL) survey plan to identify and document CSLs within the Project area of potential effect (APE) and, on September 8, 2015, sent the plan to four Tribes (Narragansett Indian Tribe, Wampanoag Tribe of Gay Head (Aquinnah), Mashantucket (Western) Pequot Tribal Nation, and Mohegan Tribe of Indians) who had previously expressed an interest in CSLs. On September 18, 2015, Algonquin met with a representative of the Narragansett Indian Tribe to discuss the CSL survey plan.

Subsequent meetings to discuss the CSL survey plan were held between Algonquin and the Mashantucket (Western) Pequot Tribal Nation, Mohegan Tribe of Indians, Narragansett Indian Tribe, and Wampanoag Tribe of Gay Head (Aquinnah) on November 13, 2015, December 21, 2015, and January 11, 2016. Additionally, email communications related to the CSL survey plan between the Tribes and Algonquin occurred between late October 2015 and late February 2016.

On October 13, 2015, Algonquin provided copies of letters sent to the New York, Connecticut, and Massachusetts SHPOs including enclosures (archaeological assessments and reports for each state) to the Delaware Nation of Oklahoma, Delaware Tribe of Indians, Mashantucket (Western) Pequot Tribal Nation, Mashpee Wampanoag Indian Tribe, Mohegan Tribe of Indians, Narragansett Indian Tribe, Saint Regis Mohawk Tribe, Stockbridge-Munsee Community Band of Mohican Indians, and Wampanoag Tribe of Gay Head (Aquinnah). The Aroostook Band of Micmacs, the Houlton Band of Maliseet Indians, the Passamaquoddy Tribe, and the Penobscot Indian Nation were provided copies of the October 13, 2015 letter sent to the Maine SHPO and the enclosures (archaeological assessment for the Westbrook M&R Station and the draft Unanticipated Discovery Plan). On October 23, 2015, the Penobscot Nation provided comments on the Project's planned activities at the Westbrook M&R Station. The Tribe stated that they had no objection to the proposed undertaking but requested that they be notified if Native American cultural materials were identified during construction activities.

On October 26, 2015, the Houlton Band of Maliseet Indians provided comments to Maritimes regarding the proposed Project activities at the Westbrook M&R Station. The tribe requested that they be notified is any archaeological resources or human remains are discovered during construction activities.

On February 9, 2016, Algonquin provided copies of the letters sent to the New York and Connecticut SHPOs and enclosures (addendum archaeological survey report for New York and the revised archaeological and architectural survey reports for Connecticut) to the Delaware Nation of Oklahoma, Delaware Tribe of Indians, Mashantucket (Western) Pequot Tribal Nation, Mohegan Tribe of Indians, Narragansett Indian Tribe, Saint Regis Mohawk Tribe, Stockbridge-Munsee Community Band of Mohican Indians, and Wampanoag Tribe of Gay Head (Aquinnah)Tribes. No responses have been filed.

Public Participants

Between August 2014 and February 2016, Algonquin consulted with several governmental organizations, state recognized tribes, and municipal historic preservation commissions in New York, Connecticut, and Massachusetts to provide them an opportunity to comment on the proposed Project. Maritimes did not identify any additional parties in Maine. The parties in New York, Connecticut, and Massachusetts included the following:

- Connecticut Office of the State Archaeologist;
- Plymouth Historical Commission;
- Weymouth Historical Commission;
- Needham Historical Commission;
- Massachusetts Ponkapoag Tribal Council;
- Eastern Pequot Tribal Nation;
- Golden Hill Paugussett Tribe;
- Ramapough Lenape Indian Nation;
- Schaghticoke Tribal Nation;
- Connecticut Indian Affairs Council; and
- Massachusetts Commission on Indian Affairs.

The Massachusetts Ponkapoag Tribal Council and the Ramapough Lenape Indian Nation provided information on their respective areas of interest and indicated that they would like to continue receiving information regarding the Project as it progressed. No comments have been filed.

2.6.2 Results of Cultural Resources Surveys

For the pipeline rights-of-way in New York and Connecticut, Algonquin surveyed a 200-foot-wide corridor for archaeological sites. The direct APE would be the pipeline construction workspace, ATWS, access roads, and permanent right-of-way. This was contained within the surveyed area. For non-pipeline Project facilities such as M&R stations, compressor stations, and access roads, the Applicants surveyed the required construction workspace areas. Surveys for the indirect APE included historic architectural properties and were conducted in a 300-foot-wide area that extended 150 feet on either side of the pipeline centerline and the property limits of associated existing compressor and M&R stations. In total, about 207.9 acres (105.3 acres in New York, 88.3 acres in Connecticut, 12.9 acres in Massachusetts, and 1.4 acres in Maine) were surveyed for cultural resources.

New York

<u>Stony Point Discharge Take-up and Relay</u>

Cultural resource surveys for the Stony Point Discharge Take-up and Relay are 100 percent complete for architectural and archaeological resources. A total of five prehistoric archaeological sites of an undetermined cultural affiliation were identified along the Stony Point Discharge Take-up and Relay survey corridor and associated access roads. None of the identified cultural resources were recommended by Algonquin as potentially eligible for the NRHP and no further testing is recommended. In addition, 31 stone walls were noted within the Stony Point Discharge Take-up and Relay pipeline survey corridor.

Where avoidance is not possible, Algonquin would document the restoration of the walls be undertaken per the Stone Wall Management Plans.

A total of five aboveground historic resources were identified in the indirect APE associated with the Stony Point Discharge Take-up and Relay segment. Four of these are residences dating from the early 19th and 20th centuries that are considered not eligible for the NRHP. The remaining resource, Taconic State Parkway (NY-4; New York SHPO USN 11918.000053), which was constructed between 1923 and 1963, is listed in the NRHP. The parkway would be crossed using the HDD method (see section 2.2.2)

Yorktown M&R Station

Algonquin conducted an archaeological assessment of the existing Yorktown M&R Station as part of the survey work performed along the Stony Point Discharge Take-up and Relay facility. The Yorktown M&R Station proposed workspace is entirely within the 200-foot study area and was found to have been previously disturbed by prior pipeline and M&R station construction. Algonquin assessed the proposed Yorktown M&R Station workspace as having no archaeological sensitivity and no additional testing was recommended. Additionally, no architectural properties that are 50 years old or older were identified within the APE of this facility.

Connecticut

Southeast Discharge Take-up and Relay

Cultural resource surveys for the Southeast Discharge Take-up and Relay are 100 percent complete for architectural and archaeological resources. The archaeological survey of the pipeline segment and associated access road did not identify any archaeological sites. However, a single stone wall was encountered within the Southeast Discharge Take-up and Relay pipeline survey corridor. If avoidance of the stone wall is not possible, Algonquin recommend that documentation and restoration of the wall is undertaken per the Stone Wall Management Plan.

A survey for historic architectural properties identified 21 resources that were 50 years old or older within the indirect APE. In addition, four previously inventoried architectural properties were revisited. These 25 resources range in date from the late 19th through mid-20th centuries. All 25 resources were recommended by Algonquin as not eligible for listing in the NRHP.

Oxford and Chaplin Compressor Stations

Background research and field reconnaissance survey completed by Algonquin established that the proposed workspace at the Oxford Compressor Station and Chaplin Compressor Station had been previously surveyed for archaeological resources as part of the Algonquin Ramapo Expansion Project (Docket No. CP06-76-000) and AIM Project (Docket No. CP14-96-000), respectively. Both areas were found to have low archaeological sensitivity and no additional survey of either compressor station was recommended by Algonquin. Additionally, no architectural properties that are 50 years old or older were identified within the APE of these facilities.

Danbury M&R Station

Algonquin conducted an archaeological assessment of the existing Danbury M&R Station as part of the survey work performed along the Southeast Discharge Take-up and Relay facility. The Danbury M&R Station proposed workspace is entirely within the 200-foot study area and was assessed by Algonquin as exhibiting low archaeological sensitivity; no additional testing was recommended. Additionally, no architectural properties that are 50 years old or older were identified within the APE.

Salem Pike M&R Station

The archaeological survey of the Salem Pike M&R Station identified no archaeological sites. A survey for historic architectural properties did not identify any properties that were 50 years old or older within the proposed Salem Pike M&R Station's APE. However, one stone wall segment was identified and if the stone wall cannot be avoided, Algonquin recommended that the wall be documented and restored following construction per the Stone Wall Management Plan.

Massachusetts

Weymouth Compressor Station

Background research and field reconnaissance survey completed by Algonquin established that proposed Weymouth Compressor Station APE had been previously surveyed for archaeological resources as part of the Algonquin HubLine Project (Docket No. CP01-5-000). The area was assessed as having no/low archaeological sensitivity and no additional survey of the Weymouth Compressor Station was recommended by Algonquin. A survey for historic architectural properties identified 23 resources that were 50 years old or older within the Project's indirect APE. Of these, a total of 22 properties were recommended by Algonquin as not eligible for listing in the NRHP. The remaining property (Procter and Gamble Manufacturing Company) was recommended by Algonquin as potentially eligible for listing in the NRHP. Algonquin's assessment indicates that construction of the proposed compressor station would not alter the setting or any other characteristics of the Procter and Gamble Manufacturing Company's integrity or significance; therefore, the Project would have no adverse effect on the property.

Needham Regular Station, Pine Hills M&R Station, and Plymouth M&R Station

Algonquin assessed the proposed workspace at the Needham Regulator Station, Pine Hills M&R Station, and Plymouth M&R Station as all having no/low archaeological sensitivity. Therefore, no archaeological surveys of the Project facilities were conducted. No architectural properties 50 years old or older were identified within the APE of these facilities

Maine

Westbrook M&R Station

Background research and field reconnaissance survey completed by Maritimes established that proposed workspace at the Westbrook M&R Station had been previously surveyed for archaeological and architectural resources as part of the Maritimes Phase IV Project (Docket Nos. PF05-17 and CP06-335-000) and was assessed as having no/low archaeological sensitivity. No additional archaeological or architectural survey of the Westbrook M&R Station was recommended by Maritimes. In addition, Maritimes recommended that that no historic properties would be affected by activities at the existing Westbrook M&R Station.

2.6.3 Unanticipated Discoveries Plan

The Applicants prepared procedures for unanticipated historic properties or human remains encountered during construction. The *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* provide for the notification of interested parties, including Tribes, in the event of any discovery. The Applicants sent copies of the Unanticipated Discovery Plan to the New York, Connecticut, Massachusetts, and Maine SHPOs; however, to date, only the New York SHPO has agreed with the plan's provisions. The Applicants have not filed comments from the Connecticut, Massachusetts, and Maine SHPOs. However, we have reviewed the plans and find them acceptable.

2.6.4 Compliance with the National Historic Preservation Act

Section 106 of the NHPA has not been completed for the Project. Cultural resources surveys of portions of the Project and consultation with the SHPOs and other parties have not been completed.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Algonquin not begin construction activities in Massachusetts, New York, or Connecticut <u>until</u>:**

  a. Algonquin files with the Secretary the Massachusetts SHPO comments on the archaeological assessment that was submitted to the SHPO for review and comment;

  b. Algonquin files with the Secretary the Connecticut SHPO comments regarding the revised cultural resources survey reports submitted for review on February 9, 2016;

  c. Algonquin files other reports, evaluation studies, plans, or special studies not yet submitted;

  d. the ACHP is provided an opportunity to comment on the undertaking if historic properties would be adversely affected; and

  e. FERC staff reviews and the Director of OEP approves all cultural resources survey reports and plans, and notifies Algonquin in writing that any necessary treatment plans/mitigation measures may be implemented or that construction may proceed.

  All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."

2.7 AIR QUALITY

Air quality would be affected by construction and operation of the Project. Although air emissions would be generated by construction activities involving the proposed pipeline and aboveground facilities, the majority of air emissions associated with the Project would result from operation of the new Weymouth Compressor Station and new compressor units at two of the existing compressor stations (Chaplin and Oxford Compressor Stations). The modifications at the fourth compressor station, the Stony Point Compressor Station in New York, would only include an uprate to the horsepower on a compressor engine. The emissions associated with horsepower modifications to the Stony Point Compressor Station were previously approved and permitted by the NYSDEC, and potential impacts associated with these emissions were included in the EIS that was prepared for the AIM Project.[18] Therefore, the Stony Point Compressor Station is not included in the analysis below.

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[18] The AIM Project EIS was filed on January 23, 2015 (Accession No. 20150123-4001). The EIS can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20150123-4001 in the "Numbers: Accession Number" field.

2.7.1 Existing Air Quality

The Project area encompasses southeastern New York; southwestern, central, and eastern Connecticut; eastern and southeastern Massachusetts; and southeastern Maine. The climate in the New York and southwestern and central Connecticut portions of the Project is characterized as continental. Winters are cold to moderately cold and summers are warm to hot. The climate within the rest of the Project area is described as humid continental with warm, humid summers and cold, snowy winters characterized by frequent changes in the weather, large ranges in temperature, and considerable diversity from place to place. Normal monthly precipitation across the Project area ranges between 3 and 6 inches.

Ambient air quality is protected by federal and state air quality standards. The EPA establishes NAAQS to protect human health and welfare.[19] Primary standards protect human health, including sensitive populations such as children, the elderly, and asthmatics. Secondary standards set limits to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings. NAAQS have been developed for seven "criteria air pollutants", including nitrogen dioxide (NO_2), carbon monoxide (CO), ozone; sulfur dioxide (SO_2), particulate matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}), and lead, and include levels for short-term (acute) and long-term (chronic) exposures. For the Project the NYSDEC, CTDEEP, and MassDEP have adopted the NAAQs, as promulgated by the EPA and have developed ambient air quality standards (AAQS) for additional pollutants other than the traditional pollutants regulated by the EPA.

The EPA now defines air pollution to include greenhouse gases (GHG), finding that the presence of GHGs in the atmosphere may endanger public health and welfare through climate change. As with any fossil fuel-fired project or activity, the Project would contribute GHG emissions. The primary GHGs that would be emitted by the Project are carbon dioxide (CO_2), methane, nitrous oxide. Emissions of GHGs are typically quantified and regulated in units of carbon dioxide equivalents (CO_2e). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is a ratio relative to CO_2 of a particular GHG's ability to absorb solar radiation as well its residence time within the atmosphere. Thus, CO_2 has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.[20] We received comments on the amount and impacts of GHG emission the Project would contribute. In compliance with EPA's definition of air pollution to include GHGs, we have provided estimates of GHG emissions for construction and operation, as discussed throughout this section. Impacts from GHG emissions (i.e., climate change) are discussed in more detail in section 2.7.3.

Air quality control regions (AQCR) are areas established by the EPA and local agencies for air quality planning purposes, in which State Implementation Plans describe how the NAAQS would be achieved and maintained. The AQCRs are intra- and interstate regions, such as large metropolitan areas, where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated based on compliance with the NAAQS, for each pollutant. Attainment areas are in compliance (below) with the NAAQS and nonattainment areas are not in compliance (exceed) with the NAAQS. Areas that have been designated nonattainment, but have since demonstrated compliance with the NAAQS are designated as "maintenance" for that pollutant. Maintenance areas may be subject to more stringent regulatory requirements to ensure continued attainment of the NAAQS pollutant.

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19 The current NAAQS are listed on EPA's website at http://www.epa.gov/air/criteria.html.

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

The entire Project area is designated attainment for SO_2, NO_2, PM_{10}, and lead, but portions of the Project are designated as nonattainment and/or maintenance areas for CO, ozone, and $PM_{2.5}$. Table 2.7.1-1 identifies the Project counties that are designated as nonattainment and/or maintenance (EPA, 2015c).

TABLE 2.7.1-1

Nonattainment and Maintenance Areas Within the Vicinity of the Atlantic Bridge Project

Project Component	Nonattainment/ Maintenance Pollutant	County	Air Quality Control Region	General Conformity Applicability Threshold (tons/year)
Stony Point and Southeast Discharge Take-up and Relay Pipelines Yorktown M&R Station Danbury M&R Station	$PM_{2.5}$ Maintenance	Westchester, NY	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NO_X – 100
	1997 Ozone – Moderate NA	Westchester, NY	NY-NNJ-LI, NY-NJ-CT	NO_X – 100 VOC – 50
	2008 Ozone – Marginal NA	Westchester, NY	NY-NNJ-LI, NY-NJ-CT	NO_X – 100 VOC – 50
	CO – Maintenance	Westchester, NY	NY-NNJ-LI, NY-NJ-CT	CO – 100
Oxford Compressor Station	$PM_{2.5}$ Maintenance	New Haven, CT	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NO_X – 100
	1997 Ozone – Moderate NA	New Haven, CT	NY-NNJ-LI, NY-NJ-CT	NO_X – 100 VOC – 50
	2008 Ozone – Marginal NA	New Haven, CT	NY-NNJ-LI, NY-NJ-CT	NO_X – 100 VOC – 50
	CO – Maintenance	New Haven, CT	New Haven-Meriden-Waterbury, CT	CO – 100
Salem Pike M&R Station Chaplin Compressor Station	1997 Ozone – Moderate NA	New London, CT	Greater Connecticut	NO_X – 100 VOC – 50
	2008 Ozone – Marginal NA	New London, CT	Greater Connecticut	NO_X – 100 VOC – 50
Weymouth Compressor Station Needham Regulator Station	1997 Ozone – Moderate NA	Norfolk, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_X – 100 VOC – 50
	CO – Maintenance	Norfolk, MA	Boston, MA	CO – 100
Plymouth M&R Station Pine Hills M&R Station	1997 Ozone – Moderate NA	Plymouth, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_X – 100 VOC – 50

Notes: NY = New York; NJ = New Jersey; CT = Connecticut; MA = Massachusetts; NA: nonattainment; NY-NNJ-LI = New York-North New Jersey-Long Island; NO_X = nitrogen oxides; VOC = volatile organic compound

Key:

NY-NNJ-LI, NY-NJ-CT, $PM_{2.5}$ Maintenance	NY-NNJ-LI, NY-NJ-CT, 1997 Ozone – Moderate NA	NY-NNJ-LI, NY-NJ-CT, 2008 Ozone – Marginal NA	NY-NNJ-LI, NY-NJ-CT, CO – Maintenance
Poughkeepsie, NY, 1997 Ozone – Moderate NA	Hartford-New Britain-Middletown, CT, CO – Maintenance	New Haven-Meriden-Waterbury, CT, CO – Maintenance	Greater Connecticut, 1997 Ozone – Moderate NA
Greater Connecticut, 2008 Ozone – Marginal NA	Providence (all of RI), RI, 1997 Ozone – Moderate NA	Boston-Lawrence-Worcester (Eastern MA), MA, 1997 Ozone – Moderate NA	Boston, MA, CO – Maintenance

All Project facilities are also within the Northeast Ozone Transport Region. The Ozone Transport Region (42 USC 7511c) includes 11 northeastern states in which ozone transports from one or more states and contributes to a violation of the ozone NAAQS in one or more other states. States in this region are required to submit a State Implementation Plan, stationary sources are subject to more stringent permitting requirements, and various regulatory thresholds are lower for the pollutants that form ozone, even if they meet the ozone NAAQS.

The EPA and state and local agencies have established a network of ambient air quality monitoring stations to measure and track the background concentrations of criteria pollutants across the United States. This data is then used by regulatory agencies to compare the air quality of an area to the NAAQS. Background air quality data in the region surrounding each compressor station were obtained from representative air quality monitoring stations.

2.7.2 Permitting/Regulatory Requirements

Air quality in the United States is regulated by federal statutes in the Clean Air Act and its amendments. The provisions of the Clean Air Act that are applicable to the Project are discussed below.

Prevention of Significant Deterioration and Nonattainment New Source Review

The Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) air permit programs are designed to protect air quality when air pollutant emissions are increased either through the construction of new major stationary sources or major modifications to existing stationary sources. The CTDEEP and MassDEP administer the PSD and NNSR permitting programs in their respective states. The Oxford Compressor Station is an existing minor PSD and NNSR source and the Chaplin Compressor Stations is an existing major PSD and NSSR source. The proposed modifications to the Oxford Compressor Station do not trigger PSD or NNSR review. The proposed modifications to the Chaplin Compressor Station do not trigger NNSR review; however, the Chaplin Compressor Station modifications trigger PSD for GHGs. The PSD review requires a Best Available Control Technology determination. The proposed construction and operation of the new Weymouth Compressor Station does not trigger PSD or NNSR review. The Project also includes a new M&R station and minor modifications to existing M&R stations, which do not trigger PSD or NNSR Review.

One additional factor considered in the PSD permit review process is the potential impacts on protected Class I areas. Class I Areas were designated because the air quality was considered a special feature of the area (e.g., national parks, wilderness areas, national forests). The nearest Class I area to the Project is the Lye Brook Wilderness Area in Vermont. The shortest distance between the Lye Brook Wilderness Area and the closest/only portion of the Project (the Chaplin Compressor Station) subject to PSD permitting is about 71 miles (115 kilometers). Therefore, an assessment of the impact on Class I areas is not required. However, CTDEEP may be responsible for notifying the federal land manager and determining any needed additional analysis, as part of the PSD permitting process.

Title V Permitting

Title V is an operating air permit program run by each state for each facility that is considered a "major source." The existing Chaplin Compressor Station in Connecticut has an existing Title V permit which would need to be modified to incorporate the proposed modifications associated with the Project. The Oxford Compressor Station is an existing synthetic minor source under the Title V permitting program, and the proposed modifications would require a Title V permit. The proposed Weymouth Compressor Station would not require a Title V permit. The new M&R station and minor modifications to existing M&R stations would not require a Title V permit.

New Source Performance Standards

The EPA promulgates New Source Performance Standards (NSPS) to establish emission limits and fuel, monitoring, notification, reporting, and recordkeeping requirements for stationary source types or categories. NSPS Subpart Dc establishes reporting requirements (for notification of initial construction and initial startup) and recordkeeping requirements (for amount of fuel combusted) for steam-generating units. Although Algonquin has not completed the final design of the heaters, Subpart Dc is unlikely to apply to the Project. However, upon final design, if any applicable steam-generating units are installed as part of the Project, they would be subject to Subpart Dc requirements. NSPS Subpart JJJJ sets emission standards for nitrogen oxides (NO_X), CO, and volatile organic compounds. Subpart JJJJ would apply to the new emergency generators at the Oxford and Weymouth Compressor Stations. NSPS Subpart KKKK sets emission standards for NO_X and SO_2 and would apply to the new turbines at each of the Project compressor stations.

National Emission Standards for Hazardous Air Pollutants

The 1990 Clean Air Act Amendments established a list of 189 hazardous air pollutants (HAP), resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions from specific source types located at major or area sources of HAPs by setting emission limits, monitoring, testing, record keeping, and notification requirements. The Oxford and Chaplin Compressor Stations are currently not major sources for HAPs and would remain minor sources of HAPs after the Project. The proposed Weymouth Compressor Station would also not be a major source of HAPs. Subpart ZZZZ applies to the new emergency generators at the Oxford and Weymouth Compressor Stations. Algonquin would comply with Subpart ZZZZ by meeting the requirements of NSPS JJJJ.

General Conformity

The lead federal agency must conduct a conformity analysis if a federal action would result in the generation of emissions that would exceed the conformity threshold levels of the pollutant(s) for which an air basin is designated nonattainment or maintenance. Conforming activities or actions should not, through additional air pollutant emissions:

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

General conformity assessments must be completed when the total direct and indirect emissions of a project would equal or exceed specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area. The operational emissions that would be permitted or otherwise covered by major or minor New Source Review (NSR) permitting programs are not subject to the general conformity applicability analysis. Estimated emissions for the Project subject to review under the general conformity thresholds (construction emissions and operational emissions not subject to major or minor NSR permitting), along with a comparison to the applicable general conformity threshold are presented in table 2.7.2-1.

As shown in table 2.7.2-1, during both construction and operation, emission estimates would not exceed general conformity applicability thresholds. Based upon this evaluation, a general conformity assessment is not required.

TABLE 2.7.2-1

Summary of Emissions Subject to General Conformity Review Associated with the Atlantic Bridge Project for 2017 and Ongoing

Designated Pollutant	Designated Area	Threshold (tpy)	Pollutant or Precursor	2017 Total Non-Exempt Emissions (tons) [a]	Ongoing Operational Emissions (tons)
Ozone	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	50	VOC	5.6	1.4
		100	NO_X	39.9	1.2
	Greater Connecticut	50	VOC	0.7	0.6
		100	NO_X	4.9	0.6
$PM_{2.5}$	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	100	$PM_{2.5}$	9.2	0.1
		100	SO_2	0.1	0.1
		100	NO_X	39.9	1.2
CO	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	100	CO	46.7	1.0
	New Haven-Meriden-Waterbury, CT	100	CO	8.9	<0.1
	Boston, MA	100	CO	9.6	<0.1

[a] Includes construction emissions and any non-exempt operating emissions for the identified time period.

Notes: NY = New York; NJ = New Jersey; LI =Long Island; CT = Connecticut; MA = Massachusetts.

Greenhouse Gas Emissions and the Mandatory Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000 metric tons of GHG (as CO_2e) in 1 year. The Mandatory Reporting Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO_2e, for accounting and disclosure purposes in section 2.7.3. Operational GHG emission estimates for the Project are presented, as CO_2e, in section 2.7.4. Based on the emission estimates presented, actual GHG emissions from operation of all three compressor stations, each of which would be considered separate stationary sources, have the potential to exceed the 25,000-metric tons per year (tpy) reporting threshold for the Mandatory Reporting Rule. Recent additions to the Mandatory Reporting Rule effective for calendar year 2016 require reporting of GHG emissions generated during operation of natural gas pipeline transmission system, which would include blowdown emissions, equipment leaks, and vent emissions at compressor stations, as well as blowdown emissions between compressor stations (40 CFR 98 Subpart W). The applicability of 40 CFR 98 Subpart W would apply to the entire commonly owned Algonquin system. If the actual emissions from any of each compressor stations or from the operation of the Algonquin natural gas pipeline system are equal to or greater than 25,000 metric tpy, Algonquin would be required to comply with all applicable requirements of the rule.

State Air Quality Regulations

This section discusses the potentially applicable state air regulations for the proposed facilities. These regulations include state permitting programs, which are further described by state in the following sections. Some states within the Project area have developed standards for mobile sources or construction activities. New York and Connecticut developed standards to limit emissions from diesel engines through idling restrictions (i.e., 6 NYCRR 217-3 and Regulation of Connecticut State Agencies 22a-174-19), and

New York developed standards on diesel engine retrofitting in 6 NYCRR 248. These standards, as they apply to Project activities, are further described in section 2.7.3.

New York

The NYSDEC implements a minor source permitting program for both construction and operation of emission sources under one permit. Project activities in New York include modifications to the Yorktown M&R Station, which would include new natural gas-fired in-line gas heaters. The modifications would either qualify for a minor facility registration or be exempt from registration and permitting provisions based on final design of the Yorktown M&R Station. Algonquin would apply for any applicable permit, as determined by the final design of this M&R station.

Connecticut

The CTDEEP has established state NSR permitting requirements, to which both the Oxford and Chaplin Compressor Stations would be subject, and also has a permit-by-rule program, to which units at the M&R stations would be subject. Project activities in Connecticut include modification to two existing compressor stations, one existing M&R station, the removal of one existing M&R station, and the installation of one new M&R station. State NSR permits are required for each new natural gas-fired turbine compressor unit at the compressor stations and were submitted by Algonquin in September and October 2015, respectively. Supplemental applications were submitted by Algonquin in February 2016 to address minor changes to the equipment located at each compressor station and update the relevant emissions calculations. The proposed modifications to the new and existing M&R stations include an in-line gas heater at each station. Potential emissions at each unit are not expected require a state NSR permit. However, Algonquin would apply for any applicable permit, as determined by the final design of this M&R station.

Massachusetts

The MassDEP implements air programs requiring a Comprehensive Plan Application and/or Limited Plan Approval for applicable units. Project activities in Massachusetts include one new proposed compressor station, modifications to two existing M&R stations, and modifications to one existing regulator station. A MassDEP Non-Major Comprehensive Plan Application is required for the Weymouth Compressor Station and was submitted by Algonquin in October 2015. A supplemental application was submitted by Algonquin in February 2016 to address minor changes to the equipment located at the station and update the relevant emissions calculations. The proposed modifications to the existing M&R and regulator stations include in-line gas heaters at each station. Potential emissions for the heaters are not expected require a Comprehensive Plan Application or Limited Plan Approval. However, Algonquin would apply for any applicable permit, as determined by the final design of this M&R station.

2.7.3 Construction Emissions

Air emissions would be generated during construction of the new pipeline segments, modifications at two existing compressor stations, construction of one new compressor station, modifications at five existing M&R stations, modifications at one existing regulator station, and construction of one M&R station.

Construction activities for the proposed facilities and pipeline replacement activities would result in temporary increases in emissions of some pollutants due to the use of equipment powered by diesel or gasoline engines. Construction activities would also result in the temporary generation of fugitive dust due to land clearing, ground excavation, and cut and fill operations. Emissions would also be generated by delivery vehicles and construction workers commuting to and from work areas.

Construction-related emission estimates were based on the anticipated types of non-road and on-road equipment and their projected level of use, as well as fugitive dust emission estimates associated with construction activities. Table 2.7.3-1 presents the total estimated construction emissions for 2017, separated by project component.

TABLE 2.7.3-1

Potential Construction Emissions for the Atlantic Bridge Project (tons per year) [a]

Project Component	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	CO_2e	HAP (total)
Pipeline: Stony Point Discharge Take-up & Relay	20.3	26.0	<0.1	38.0	4.9	3.0	8,389	0.2
Pipeline: Southeast Discharge Take-up and Relay	14.9	19.2	<0.1	30.9	3.9	2.0	5,292	0.2
Chaplin CS	3.6	8.8	<0.1	0.3	0.3	0.5	1,056	<0.1
Oxford CS	3.8	8.9	<0.1	0.3	0.3	0.6	1,076	<0.1
Weymouth CS	4.0	9.1	<0.1	0.3	0.3	0.6	1,153	<0.1
M&R and Regulator Stations (total)	1.7	4.8	<0.1	0.9	0.2	0.2	425	<0.1
Project Total	**48.3**	**76.8**	**0.1**	**70.7**	**9.9**	**6.9**	**17,391**	**0.6**

[a] Emission estimates include non-road and on-road construction emissions, fugitive dust emissions, blowdown and purge emissions during the construction period, and indirect emissions from construction worker commuting.

Fugitive dust would result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity. The Applicants have prepared a Dust Control Plan[21] that describes the mitigation measures that would be implemented to control fugitive dust during Project construction, especially in sensitive areas such as road crossings, residences, and nonattainment areas. We have reviewed the Dust Control Plan and find it acceptable.

The construction phase of the proposed Project would result in the generation of diesel combustion emissions associated with the operation of construction equipment and vehicles. Massachusetts, New York, and Connecticut developed standards to limit emissions from diesel engines through idling restrictions. In addition, some of the states that would be affected by the Project have developed standards for other methods of reducing diesel emissions, such as the use of low sulfur diesel and advanced pollution control technologies. The Applicants have committed to using ultra low sulfur diesel fuel and non-road engines either retrofitted with best available technology or certified to meet EPA's Tier IV exhaust emission standards, where feasible, to limit emissions from diesel combustion. Additionally, the Applicants would also limit the idling of engines to a maximum of 5 minutes or less in accordance with specific state or local regulations whenever the construction equipment is not in use. The estimated construction-related emissions presented in table 2.7.3-1 include diesel combustion emissions for the Project; however, diesel combustion emission estimates were based on standard

[21] The Applicants' Dust Control Plan was included as appendix 9C to Resource Report 9 in its October 22, 2015 application (Accession No. 20151022-5282). The Dust Control Plan can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20151022-5282 in the "Numbers: Accession Number" field.

emission rates developed by the EPA and do not include diesel mitigation measure that would be implemented during Project construction. Therefore, the actual diesel combustion emissions generated during Project construction are likely to be lower than the emission estimates presented in table 2.7.3-1.

These construction emissions would occur over the duration of construction activity and would be emitted at different times and locations along the length of the Project. With the mitigation measures proposed by the Applicants, air quality impacts from construction equipment would be temporary and should not result in a significant impact on regional air quality.

2.7.4 Operational Emissions

Sources of air emission during the operation of the Project include: one new compressor station, modifications to two existing compressor stations, one new M&R station, and modifications to five existing M&R stations and one existing regulator stations. Tables 2.7.4-1 to 2.7.4-3 provide the potential emissions for the compressor station modifications, which include existing station emissions for the modified compressor stations.

TABLE 2.7.4-1

Potential Operational Emissions for the Oxford Compressor Station Modifications for the Atlantic Bridge Project

	Emissions (tpy)							
Source	NO_X	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Existing Station PTE	49.0	99.0	48.7	4.8	9.5	3.9	7.0	<100,000
Proposed Compressor Unit	9.9	16.7	1.3	1.0	2.0	0.1	0.3	35,594
Proposed Emergency Generator	0.6	1.2	0.5	<0.1	<0.1	0.2	0.3	259
Proposed Gas Heaters [a]	0.3	0.2	0.1	<0.1	<0.1	<0.1	<0.1	379
Proposed Parts Washer	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0
New Fugitive Releases (Piping, Gas Releases, Tanks)	0.0	0.0	7.4	0.0	0.0	0.0	0.2	5,410
Total of Proposed Units	10.8	18.1	9.7	1.0	2.0	0.3	0.8	41,642
Total of Proposed Modifications [b, c]	**10.8**	**18.1**	**6.1**	**1.0**	**2.0**	**0.2**	**<0.1**	**41,642**
Proposed Modified Station PTE [b, d]	59.8	117.1	14.6	5.8	11.5	4.0	6.1	112,047

[a] Proposed gas heaters include on natural gas-fired turbine compressor fuel heater and seven natural gas-fired catalytic space heaters

[b] Minor discrepancies in totals may be present due to rounding

[c] The VOC, Formaldehyde, and HAP emissions included under "Total of Proposed Modifications" are different from respective emissions under "Total of Proposed Units" because the "Total of Proposed Modifications" values also account for emission reductions due to implementation of a Leak Detection and Repair (LDAR) program on the existing piping components in pipeline liquid service.

[d] These emissions represent the existing equipment emissions that would continue to operate after the proposed modifications, in addition to the new equipment associated with the Project. VOC, Formaldehyde, HAPs, and CO_2e fugitive emissions are excluded because natural gas compressor stations are not one of the 28 specifically listed source categories.

TABLE 2.7.4-2

Potential Operational Emissions for the Chaplin Compressor Station Modifications for the Atlantic Bridge Project

	Emissions (tpy)							
Source	NO_X	CO	VOC	SO_2	PM_{10}/ $PM_{2.5}$	Hexane	Total HAPs	CO_2e
Existing Station PTE	94.2	77.8	50.9	2.9	5.6	0.9	6.9	129,535
Proposed Compressor Unit	8.4	18.3	1.1	0.9	1.7	0.0	0.3	30,070
Replacement Compressor Units	19.9	33.5	2.5	2.1	4.0	0.0	0.6	71,601
Proposed Gas Heater	0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1	119
New Fugitive Releases (Piping, Gas Releases, Tanks)	0.0	0.0	7.4	0.0	0.0	<0.1	0.1	5,407
Contemporaneous Emissions Change [a]	–11.7	N/A	N/A	N/A	N/A	N/A	N/A	12,366
Total of Proposed Modifications [b]	**16.8**	**51.9**	**11.1**	**2.9**	**5.7**	**<0.1**	**1.0**	**119,562**
Emission Reductions from Removed Units	–71.3	–59.0	–13.8	–1.8	–3.6	–0.3	–5.4	–80,901
Total Project Emissions Change [b, c]	**–54.5**	**–7.1**	**-2.7**	**1.1**	**2.1**	**–0.3**	**–4.4**	**38,661**
Proposed Modified Station PTE [d]	39.7	70.7	7.9	3.9	7.7	0.1	1.6	138,600

[a] Contemporaneous emissions changes include other facility modifications that occurred within the same contemporaneous period as the proposed Project as defined by PSD regulations, which are considered when comparing the Project to PSD permit thresholds.
[b] Minor discrepancies in totals may be present due to rounding.
[c] Total emissions change includes the removal of two existing compressor units combined with the new emissions associated with the proposed new units.
[d] These emissions represent the existing equipment emissions that would continue to operate after the proposed modifications, in addition to the new equipment associated with the Project. VOC, Hexane, HAPs, and CO_2e fugitive emissions are excluded since natural gas compressor stations are not one of the 28 specifically listed source categories.

TABLE 2.7.4-3

Potential Operational Emissions for the Proposed Weymouth Compressor Station for the Atlantic Bridge Project

	Emissions (tpy)							
Source	NO_X	CO	VOC	SO_2	PM_{10}/ $PM_{2.5}$	Hexane	Total HAPs	CO_2e
Proposed Compressor Unit	10.0	16.8	1.3	1.0	2.0	0.0	0.3	35,800
Proposed Emergency Generator	0.4	0.8	0.3	<0.1	<0.1	<0.1	0.2	172
Proposed Gas Heater [a]	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1	268
Proposed Parts Washer	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0
New Fugitive Releases (Piping, Gas Releases, Tanks)	0.0	0.0	9.0	0.0	0.0	0.1	0.3	5,465
Total of Proposed Modifications [b]	**10.6**	**17.7**	**11.0**	**1.0**	**2.0**	**0.1**	**0.8**	**41,705**

[a] Proposed gas heaters include one natural gas-fired turbine compressor fuel heater and four natural gas-fired catalytic space heaters.
[b] Minor discrepancies in totals may be present due to rounding.

Table 2.7.4-4 presents an estimate of representative potential emissions from new proposed combustion sources at M&R stations.

TABLE 2.7.4-4

Potential Emissions [a] from New Combustion Sources at M&R Stations for the Atlantic Bridge Project (tons per year)

M&R Station	CO	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$
Yorktown	0.5	0.6	<0.1	<0.1	0.1	0.1
Salem Pike	0.5	0.6	<0.1	<0.1	0.1	0.1
Danbury	0.5	0.6	<0.1	<0.1	0.1	0.1
Plymouth	0.8	0.9	0.1	0.1	0.1	0.1
Pine Hills	0.2	0.2	<0.1	<0.1	<0.1	<0.1

[a] These emissions represent the estimated emission estimates based on an expected maximum rated heat input capacity of 2 MMBtu/hr.

Fugitive releases at each compressor station were included in tables 2.7.4-1 to 2.7.4-3. Non-combustion related emissions would also occur from the pipeline and at the proposed M&R stations during normal operation. Table 2.7.4-5 provides an annual estimate of these emission sources.

TABLE 2.7.4-5

Non-Routine and Fugitive Operating Emissions for the Atlantic Bridge Project (tons per year)

Pollutant	Fugitives and Non-Routine (M&R Stations)	Fugitives and Non-Routine (Pipeline)	Total
VOC	1.9	0.1	2.0
CO_2e	4,528	142	4,670

Algonquin provided a summary of practices that would be implemented at the proposed facilities associated with the Project and practices that are currently in place at all Algonquin facilities to minimize fugitive emissions, which would include natural gas releases from meters and regulators, valves and other piping components, and from operation and maintenance activities. Algonquin would implement a preventative maintenance program at all Project facilities to ensure that all leaks are found and repaired quickly and that operations are optimized to limit the frequency and extent of maintenance blowdowns. At a minimum, Algonquin would conduct annual leak detection at all compressor stations, M&R stations, and along the pipeline. Additionally, Algonquin complies with EPA's 40 CFR Part 98, Subpart W and will comply with EPA's proposed 40 CFR Part 60, Subpart OOOOa standards, which both require leak detection and repair programs. Measures to minimize the volume of planned blowdowns include utilizing pump-down techniques to lower gas pressure before maintenance, conducting annual emergency shutdown systems tests with blowdown isolation valves closed, scheduling multiple maintenance activities concurrently, and utilizing "hot taps" when making new connections to the pipeline system. Fugitive methane emissions are a major source of GHG emissions from the proposed Project. Algonquin also has a program in place for minimizing methane emissions at all of their facilities. Measures include replacing wet seals with dry seals at compressors, replacing older infrastructure to reduce blowdowns, replacing existing high-bleed pneumatic controllers with low-bleed controllers, installing leak detection monitoring systems, utilizing portable gas detectors for routine inspections, and participating in the EPA's National Gas Star Program to share best practices for reducing methane emissions.

Due to modifications on existing equipment and/or removal of existing compressors at the Chaplin Compressor Station, the potential emissions of most pollutants at the Chaplin Compressor Station would be reduced from their current potential levels. However, Algonquin completed screening-level air quality modeling for NO_2, $PM_{2.5}$, and CO using the EPA's AERSCREEN model for the Oxford and

Chaplin Compressor Station modifications to satisfy CTDEEP requirements. Air quality modeling was also completed for NO_2, $PM_{2.5}$, PM_{10}, CO, and SO_2 using the EPA's AERMOD model for the entire Oxford, Chaplin, and Weymouth Compressor Stations. Table 2.7.4-6 summarizes the results of the modeling analyses.

TABLE 2.7.4-6

Summary of Predicted Air Quality Impacts for the Atlantic Bridge Project

Facility/Pollutant	Averaging Period	Background ($\mu g/m^3$)	Facility Impact ($\mu g/m^3$) [a]	Facility Impact + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Oxford Compressor Station [b]					
NO_2	1-Hour	92.2	39.3	131.5	188
	Annual	24.5	3.9	28.3	100
$PM_{2.5}$	24-Hour	24.0	2.2	26.2	35
	Annual	8.5	0.8	9.3	12
PM_{10}	24-Hour	37.0	3.5	40.5	150
CO	1-Hour	1,840.0	573.8	2,413.8	40,000
	8-Hour	1,495.0	358.2	1,853.2	10,000
SO_2	1-Hour	47.2	3.5	50.7	196
	3-Hour	78.1	3.7	81.8	1,300
	24-Hour	24.1	1.5	25.6	365
	Annual	3.1	0.1	3.2	80
Chaplin Compressor Station [b]					
NO_2	1-Hour	79.0	32.3	111.3	188
	Annual	16.9	3.2	20.2	100
$PM_{2.5}$	24-Hour	20.0	2.2	22.2	35
	Annual	7.4	0.3	7.7	12
PM_{10}	24-Hour	25.0	3.1	28.1	150
CO	1-Hour	2,185.0	293.7	2,478.7	40,000
	8-Hour	1,495.0	201.1	1,696.1	10,000
SO_2	1-Hour	21.0	3.5	24.5	196
	3-Hour	21.0	2.8	23.8	1,300
	24-Hour	10.7	1.7	12.5	365
	Annual	2.0	0.1	2.1	80
Weymouth Compressor Station [b, c]					
NO_2	1-Hour	91.0	58.2	149.2	188
	Annual	32.8	3.4	36.2	100
$PM_{2.5}$	24-Hour	16.4	4.6	21.0	35
	Annual	7.2	0.7	7.9	12

[a] Facility impacts based on AERMOD modeling analysis. Modeled impacts for Oxford and Chaplin Compressor Stations include existing facility sources and proposed new sources associated with the Project.

[b] Three operating scenarios were modeled. The worst-case scenario for each pollutant is presented.

[c] PM_{10}, SO_2, and CO are below their respective SILs and considered insignificant for NAAQS standards.

The modeling analyses for all modeled pollutants at all three compressor stations showed that each compressor station (existing and proposed new equipment), combined with respective background pollutant levels, would not contribute to a violation of the NAAQS. We reviewed the modeling analyses and agree with these conclusions.

Based on the identified estimated emissions from operation of the proposed Project facilities and review of the modeling analysis, we agree that the Project would result in continued compliance with the NAAQS, which are protective of human health, including children, the elderly and sensitive populations.

We received comments claiming that compressor stations release large quantities of toxic pollutants. Some commenters also cited reports from the Pennsylvania Department of Environmental Protection and Southwest Pennsylvania Environmental Health Project linking compressor station emissions to health impacts.

The majority of the reports/studies that were referenced by commenters are based on natural gas production facilities that transport and process raw gas, which often contain more types of pollutants than transmission quality natural gas. Therefore, we do not find the referenced studies applicable for relating health impacts from operation of the proposed compressor stations. At a transmission compressor station utilizing gas-driven compressors, the overwhelming majority of operational emissions are criteria pollutants, particularly NO_X and CO. The modeling that was performed, and is discussed above, indicates that emissions of these pollutants would be within the levels established by EPA to be protective of human health.

Small quantities of a number of HAPs can form from combustion of natural gas and blowdown events.[22] Combustion of transmission quality natural gas can result in acute (1-hour) and chronic (long-term) exposures. Because blowdowns are an infrequent, episodic occurrence, they may result in acute exposures lasting, from 15 minutes to a few hours. We evaluated the acute and chronic health risks of exposure from HAPS and VOCs from combustion of transmission quality natural gas and blowdown events from transmission compressor stations in the New Market Project EA under docket CP14-497.[23] Our analysis for the New Market Project assessed the human health risk of three compressor stations, two of which included a Solar Taurus 70 compressor unit rated at 10,880 hp. The third compressor station included an existing Solar Taurus 60 compressor unit rated at 7,410 hp, a new Solar Taurus 50 compressor unit rated at 6,393 hp, and two new caterpillar reciprocating engines rated at 2,370 hp each. Our assessment included conservative assumptions (e.g. individuals exposed to maximum concentrations from full-capacity facility operations for 24 hours per day, 350 days per year, at the fence line of the facility) and uncertainty factors to overestimate risks.

The results of this analysis showed that the cancer and non-cancer health risks of short-term and long-term exposures to all constituents of natural gas during combustion, venting, or a full station blowdown event would be below established benchmarks (i.e., are safe) to protect the general population and sensitive subgroups (those with health conditions, children, elderly, etc.). The proposed compression at the Weymouth Compressor Station and the new compressor units proposed at the existing Oxford and Chaplin Compressor Stations are smaller and would emit lower quantities of pollutants than any of the three compressor stations analyzed in the New Market Project health risk assessment. Therefore, we find that the health risks from operation of the Project facilities would not be significant.

2.7.5 Radon

We received comments concerning the risk of radon exposure associated with the burning of natural gas sourced from Pennsylvania Marcellus Shale. We have recently evaluated general background information, studies, and literature on radon in natural gas in several past project EISs.[24] These studies include samples taken at well sites, pre-processing, post processing, and transmission pipelines; and the recent Pennsylvania Department of Environmental Protection's Technologically Enhanced Naturally

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

[23] New Market Project Environmental Assessment (Docket CP14-97) issued October 2015.

[24] New Jersey-New York Expansion Project Final Environmental Impact Statement (Docket CP11-56) issued March 2012, Rockaway Delivery Lateral and Northeast Connector Projects Final Environmental Impact Statement (Dockets CP13-36 and CP13-132) issued February 2014, and the Algonquin Incremental Market Project Final Environmental Impact Statement (Docket CP14-96) issued January 2015.

Occurring Radioactive Materials Study Report issued in January 2015 (Pennsylvania Department of Environmental Protection, 2015). This report is consistent with past studies, which identify indoor radon concentrations ranging from 0.0042 picocuries per liter (pCi/L) to 0.13 pCi/L.

In the United States, the EPA has set the indoor action level for radon at 4 pCi/L. If concentrations of radon are high enough to exceed these activity levels, the EPA recommends remedial actions, such as improved ventilation, be implemented to reduce levels below this threshold. Further, the Indoor Radon Abatement Act established the long-term goal that indoor air radon levels be equal to or better than outdoor air radon levels. The average home in the United States has a radon activity level of 1.3 pCi/L, while outdoor levels average about 0.4 pCi/L. Past studies demonstrate that indoor radon concentrations from Pennsylvania Marcellus Shale sourced gas would remain below the EPA action level and the Indoor Radon Abatement Act long-term goal. Therefore, we find that the risk of exposure to radon in natural gas is not significant.

We also received comments concerning the potential buildup of decay products (progeny) within the pipeline and the risk of releasing these products to the environment either during pipeline maintenance or the removal of existing pipe. First, we note that without a significant presence of the parent radionuclide (i.e. radon), it is unlikely for there to be a significant presence of progeny. However, to further address this potential, Algonquin would clean the pipeline to be removed prior to its being reused for another other purpose. Algonquin also conducts annual inspections and regular cleaning of its operational pipelines. Any liquids or solids removed during these cleanings would be collected and treated as hazardous material that would be disposed of at a licensed facility in accordance with federal, state, and local regulations. These measures would minimize the risk that any radioactive solids would be released to the environment.

2.8 NOISE

Construction and operation of the Project may affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 dBA added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise.

2.8.1 Noise Regulatory Requirements

2.8.1.1 Federal Noise Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate to potential noise impacts from the proposed Project at NSAs. Due to the 10 dBA nighttime penalty added prior to the calculation of the L_{dn}, for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA.

2.8.1.2 State and Local Noise Regulations

New York

There are no applicable statewide noise regulations in New York. Chapter 148 of the Town of Stony Point Town Code generally prohibits excessive noise, including operating an internal combustion powered machine without a proper muffler or other noise-deadening device (Town of Stony Point, 2015). Accordingly, the FERC noise standards establish more stringent noise requirements for the Stony Point Compressor Station and thus impacts are discussed below based on the FERC standards.

Connecticut

Connecticut has established noise regulations that apply to the compressor stations and M&R stations. These noise regulations (Title 22a, part 69, section 22a-69-1/2/3/4) establish standard noise limits emitting from a sound source, as measured at certain Noise Zones (i.e., land use category) when emitted from other Noise Zones. Table 2.8.1-1 summarizes the Noise Zone Standards that establish noise level requirements (CTDEEP, 2015c).

TABLE 2.8.1-1

Summary of Connecticut Noise Zone Standards and Noise Limits

Noise Zone/Class Emitter	Receptor Class C	Receptor Class B	Receptor Class A/Day [a]	Receptor Class A/Night [b]
Class C Emitter	70 dBA	66 dBA	61 dBA	51 dBA
Class B Emitter	62 dBA	62 dBA	55 dBA	45 dBA
Class A Emitter	62 dBA	55 dBA	55 dBA	45 dBA

[a] Daytime is defined by Connecticut noise standards as the hours between 7:00 a.m. and 10:00 p.m.
[b] Nighttime is defined by Connecticut noise standards as the hours between 10:00 p.m. and 7:00 a.m.
Notes:
Class A Noise Zone = generally defined as residential land use.
Class B Noise Zone = generally defined as commercial land use.
Class C Noise Zone = generally defined as industrial land use.

According to the Connecticut noise regulations, where mixed land use exists, the least restrictive of the class categories apply. In the case of the compressor stations and M&R stations, the noise level that corresponds to a Class C Emitter to a Receptor Class A would apply. Therefore, the station noise should not exceed 51 dBA L_{eq} at the adjacent Class A Noise Zone (i.e., property line of the adjacent residences). Because these compressor stations are scheduled to operate on a 24-hour basis, the noise level emitted from these stations should not exceed a sound level of 51 dBA L_{eq} at the adjacent Class A Noise Zone (i.e., property line of adjacent residences) to demonstrate compliance with the state standard. Consequently, the FERC sound requirement for a compressor station (i.e., an L_{dn} of 55 dBA, which corresponds to an L_{eq} of 48.6 dBA at the nearby NSAs) is generally more stringent for residences than the Connecticut state noise requirements (sound level of 51 dBA L_{eq}). However, in the unusual situation of a house set back on a very large parcel of land, the FERC sound level limit could be satisfied at the house and the Connecticut noise limit exceeded at the property line. Upon review of the site and existing NSAs for the Project, this unusual condition does not exist.

Massachusetts

Massachusetts has established noise regulations (310 Code of Massachusetts Regulations 7.10). The MassDEP provided further guidance in a policy document dated February 1, 1990, which provides the following noise standards.

A source of sound will be considered to be violating the MassDEP's noise regulation (310 Code of Massachusetts Regulations 7.10) if the source:

1. increases the broadband sound level by more than 10 decibels (dB) above ambient (i.e., 10 dBA above ambient limit); or

2. produces a "pure tone" condition, when any octave band center frequency sound pressure level (SPL) exceeds the two adjacent center frequency SPLs by 3 dB or more.

These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the lowest background A-weighted sound level that is exceeded 90 percent of the time (i.e., L_{90}) (MassDEP, 2015b). For the purposes of assessing the "pure tone" condition, the octave-band SPLs of 31.5 to 8,000 hertz were used. Based on review of the noise guideline adopted by the MassDEP and site ambient sound surveys, the resulting A-weighted noise guideline for surrounding NSAs of the new compressor station and existing M&R and Regulator stations in Massachusetts is greater than the FERC sound level requirement (i.e., A-weighted sound level of 48.6 dBA). In general, if the FERC sound level requirement is achieved, the state-level noise limit would also be attained.

2.8.2 Construction Noise Impacts and Mitigation

Noise would be generated during construction of the pipeline and aboveground facilities. Pipeline construction would be conducted by a number of separate crews working at different locations along the pipeline route. The rate of progress of each crew would depend on the specific activities they are engaged in but would typically progress between a hundred and several thousand feet per day. An exception to this would be the crews involved in HDD construction, which would be stationary for weeks to months depending on the length of the drill and the hardness of the substrate being drilled. Thus, construction activities in any one area could last from several weeks to several months on an intermittent basis. Construction equipment would be operated on an as-needed basis during this period. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Noise mitigation measures that would be employed during construction include ensuring that the sound muffling devices, which are provided as standard equipment by the construction equipment manufacturer, are kept in good working order. If needed, additional noise abatement techniques and other measures could be implemented during the construction phase to mitigate construction noise disturbances at NSAs. Generally, nighttime noise is not expected to increase during construction because most construction activities would be limited to daytime hours. Two exceptions to this would be certain HDD activities, which are expected to continue into the nighttime hours and construction associated with Elmer's Diner (see section 2.4.3).

Due to nighttime construction associated with the Taconic Parkway HDD the fact that the equipment involved in the HDDs would be stationary for an extended period of time, there is a greater potential for a prolonged noise impact. Algonquin proposes to use the HDD method at one location (Taconic Parkway crossing). Algonquin performed ambient noise surveys and acoustical assessments of the HDD site within 0.5 mile of NSAs to determine background noise levels and the predicted noise levels at NSAs.

The results of the Algonquin's noise assessments, including the distance and direction of the nearest NSAs from the HDD site, and the predicted noise resulting from each HDD operation are summarized in table 2.8.2-1. Additional NSAs are also present farther from the noise-generating sources at the proposed HDD entrance/exit points; however, Project noise levels at further NSAs in each direction would be lower than presented in table 2.8.2-1 due to additional noise attenuation provided by the greater distance from the noise source. The acoustical assessments indicate that the noise at the closest NSA on the HDD entry side would exceed 55 dBA L_{dn} during drilling if no additional mitigation is employed.

TABLE 2.8.2-1

Noise Quality Analysis for the Horizontal Directional Drilling Site Associated with the Atlantic Bridge Project

Planned HDD Site (Entry or Exit Point)	Distance and Direction of the Closest NSA to Site Center	Ambient L_{dn} [a]	Estimated L_{dn} of the HDD Without Mitigation	Estimated Noise Reductions from mitigation (dB)	Estimated L_{dn} of the HDD with Mitigation (dBA)	L_{dn} of HDD + Ambient L_{dn} (dBA)	Potential Change in Ambient Noise (dB)
Taconic Parkway HDD							
HDD entry site	710 feet north	41.3	62.5	14.7	47.8	48.7	7.4
HDD exit site	1,150 feet west-southwest	47.0	46.2	NA	NA	49.6	2.6

[a] Noise levels are based on ambient monitoring completed in the vicinity of the HDD entrance/exit point.

Note: NA = Not applicable

To reduce the noise at this location, Algonquin has committed to implementing the following noise mitigation measures at the Taconic Parkway HDD entrance point:

- employ a temporary noise-reduction tent over most of the HDD equipment and the HDD site workspace;
- employ "low-noise" generators for the mud/cleaning system (i.e., generator set designed with a factory-installed acoustical enclosure);
- employ a residential-grade exhaust silencer on all engines; and
- limit HDD operations to daytime operation, where feasible.

We reviewed the Algonquin' noise assessment and agree that the mitigation measures committed to by Algonquin should result in noise levels in compliance with the FERC's noise criterion of 55 dBA L_{dn} at nearby NSAs. However, given the populated nature of the area surrounding the HDD entrance location, **we recommend that:**

- **Algonquin should file <u>in the weekly construction status reports</u> the following for the Taconic Parkway HDD entrance site:**

  a. the noise measurements from the nearest NSA for each drill entry site, obtained at the start of drilling operations;

b. **the noise mitigation that Algonquin implemented at the start of drilling operations; and**

c. **any additional mitigation measures that Algonquin would implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is over ambient conditions greater than 10 dB.**

Algonquin has not yet provided a nighttime noise analysis for the construction activities located between MPs 0.5 and 0.7 along the Southeast discharge Take-up and Relay pipeline segment. Therefore, **we recommend that:**

- **Prior to construction during nighttime hours (10:00 p.m. to 7:00 a.m.) between MPs 0.5 and 0.7 along the Southeast Discharge Take-up and Relay, Algonquin should file with the Secretary for review and written approval by the Director of OEP, a nighttime construction noise analysis and mitigation plan for all NSAs within one half mile of the construction work areas where nighttime construction is requested. The plan should include:**

  a. **the length of time nighttime construction would occur;**

  b. **clear identification of all NSAs within one half mile of the construction work areas where nighttime construction is requested, and the projected noise levels of construction activities at night at the NSAs;**

  c. **specifications regarding the input parameters that were modeled (particularly the number of each equipment and the consideration of back-up alarms); and**

  d. **details for mitigation measures that Algonquin commits to implementing (e.g. height and material of moveable barriers, use of a spotter over back-up alarms, the availability of lower-pitched back-up alarm equipment).**

2.8.3 Operation Noise Impacts and Mitigation

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

The Applicants provided ambient noise surveys and acoustical analyses for the Project aboveground facilities within 0.5 mile of an NSA, including: modifications of three existing compressor stations; construction of one new compressor station; modifications of five existing M&R stations; modification of one existing regulator station; and construction of one new M&R station. The distances and directions to the nearest NSAs from the existing or proposed compressor station buildings are presented in table 2.8.3-1 and shown on figures 2.8.3-1 through 2.8.3-4.

TABLE 2.8.3-1

Noise Quality Analysis for the New and Existing Compressor Stations to Be Modified for the Atlantic Bridge Project

Location/Facility	Distance and Direction to NSA	Existing L_{dn} including Current Station as applicable(dBA)	L_{dn} Attributable to the New Station or Station Modifications (dBA)	Existing L_{dn} + L_{dn} of Proposed Changes (dBA)	Potential Change in Noise Level Attributable to the Station (dB)
NEW YORK					
Existing Stony Point Compressor Station [a]					
NSA 1	650 feet west-southwest	62.9	59.0	59.2	-3.7
NSA 2	725 feet west-northwest	63.0	57.9	58.1	-4.9
NSA 3	800 feet south	49.9	50.6	50.8	0.9
NSA 4	1,025 feet east	49.6	48.3	48.5	-1.1
CONNECTICUT					
Existing Oxford Compressor Station					
NSA 1	1,700 feet north-northwest	46.6	45.7	49.2	2.6
NSA 2	2,000 feet south	47.4	41.4	48.4	1.0
NSA 3	2,200 feet (east-northeast	52.1	39.8	52.3	0.2
NSA 4	2,200 north-northeast	47.4	41.0	48.3	0.9
Existing Chaplin Compressor Station					
NSA 1	1,200 feet north-northeast	48.9 [b]	45.7	50.6	1.7
NSA 2	1,100 feet northeast	48.2 [b]	47.1	50.7	2.5
NSA 3	1,350 feet east-northeast	47.8 [b]	45.4	49.8	2.0
Massachusetts					
Proposed Weymouth Compressor Station					
NSA 1	610 feet south-southeast	70.4	49.0	70.4	0.0
NSA 2	1,370 feet north	54.9	42.1	55.1	0.2
NSA 3	1,560 feet east	54.0	40.8	54.2	0.2
NSA 4	900 feet south	56.5	45.3	56.8	0.3
NSA 5	1,030 feet southeast	64.3	43.9	64.3	0.0
NSA 6	2,300 feet southeast	50.6	35.7	50.7	0.1
NSA 7	1,970 feet east-northeast	49.1	38.2	49.4	0.3
NSA 8	2,400 feet west	52.6	35.3	52.7	0.1
NSA 9	4,200 feet east-southeast	49.8	29.1	49.8	0.0

[a] Stony Point Compressor Station pre-existing noise levels based on 2006 sound survey before AIM Project modifications. Estimated station sound level accounts for modifications associated with the AIM Project and the uprating of Unit C7.

[b] The existing compressor station sound level is based on a 2009 acoustical survey and the results of an acoustical analysis associated with modifications for the AIM Project.

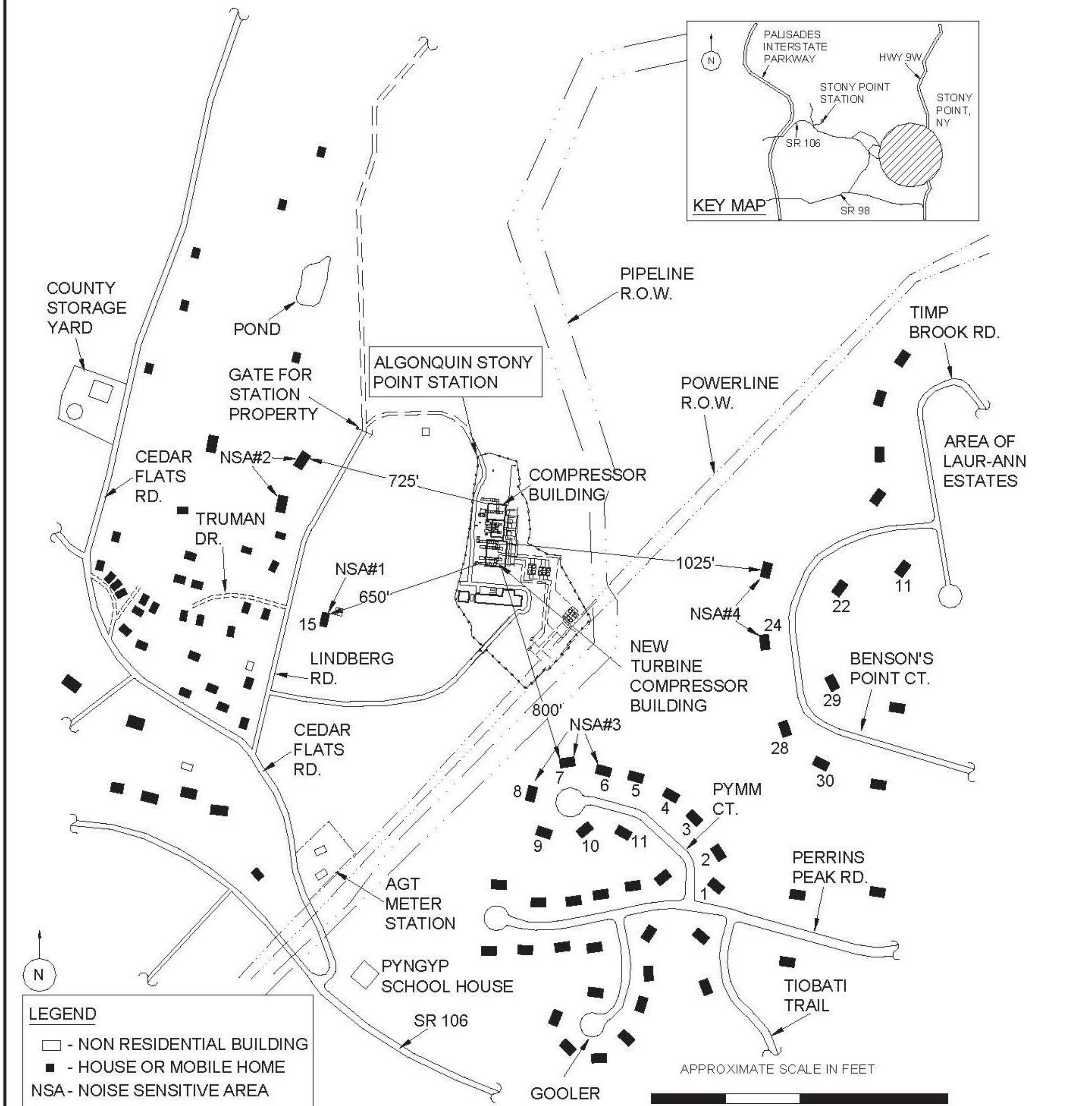


Figure 2.8.3-1
Atlantic Bridge Project
Existing Stony Point Compressor Station
Closest Noise-Sensitive Areas

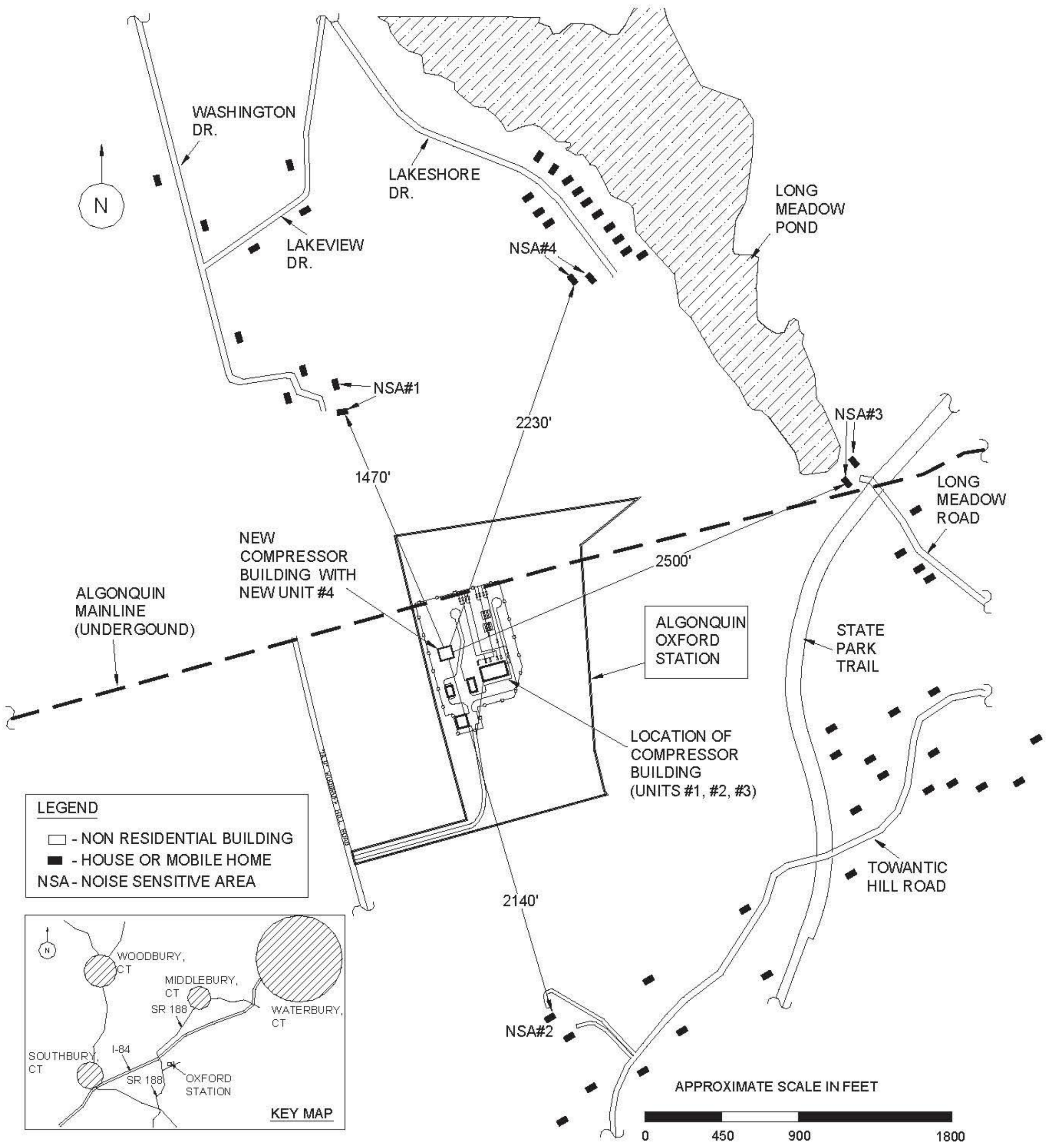


Figure 2.8.3-2
Atlantic Bridge Project
Existing Oxford Compressor Station
Closest Noise-Sensitive Areas

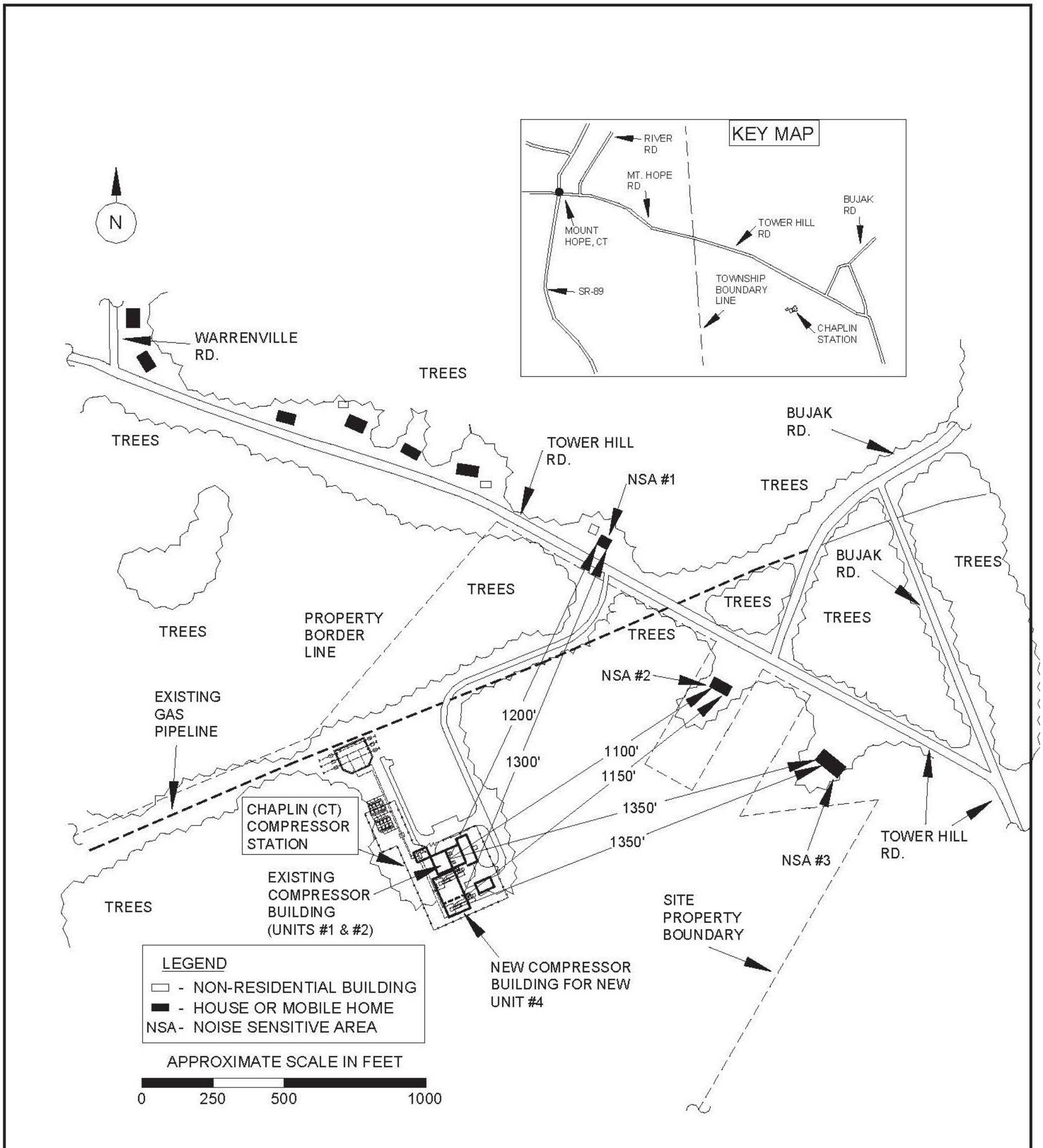


Figure 2.8.3-3
Atlantic Bridge Project
Existing Chaplin Compressor Station
Closest Noise-Sensitive Areas

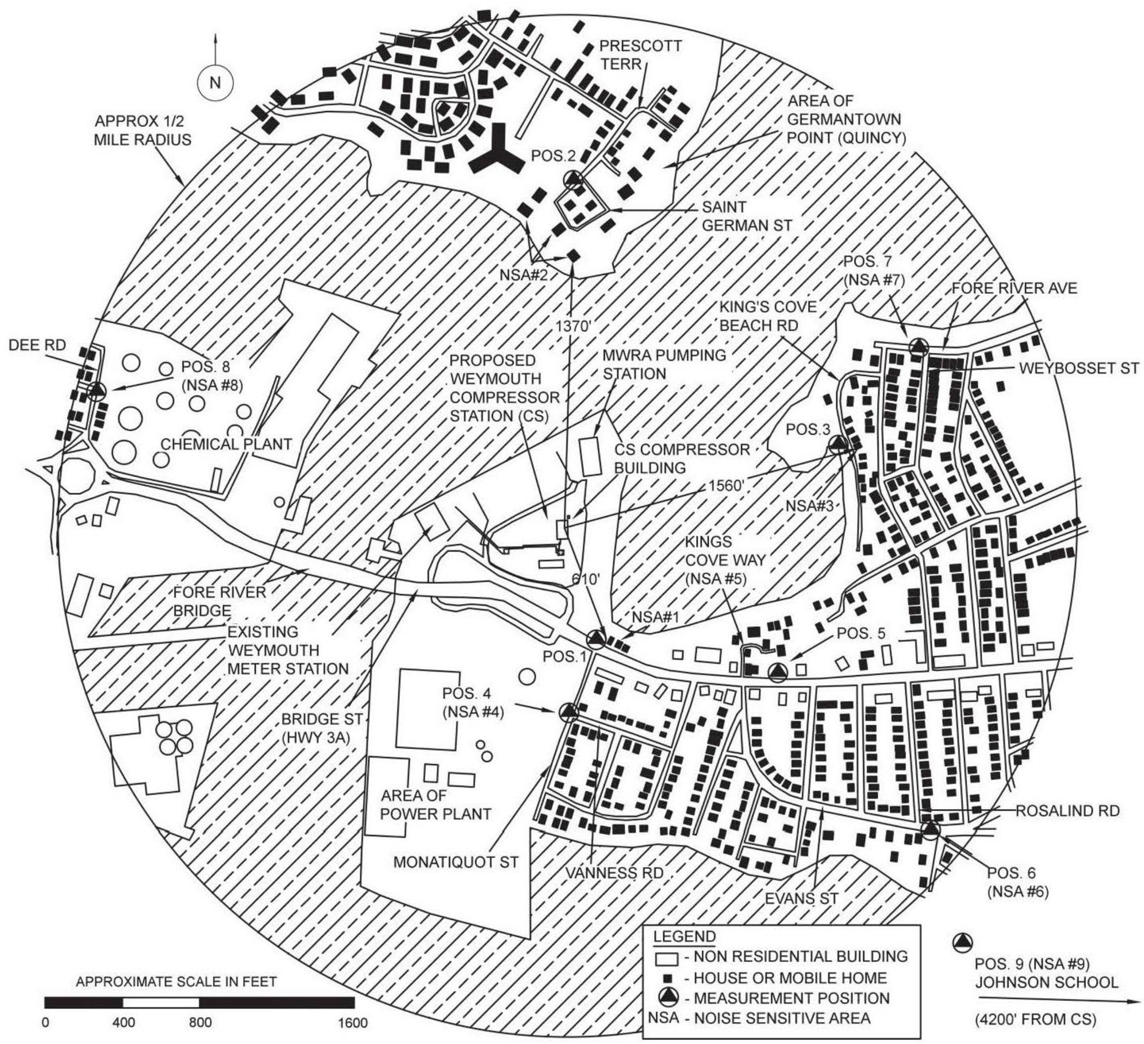


Figure 2.8.3-4
Atlantic Bridge Project
Proposed Weymouth Compressor Station
Closest Noise-Sensitive Areas

Algonquin completed an acoustical analysis to identify the estimated noise impacts at the nearest NSAs from the proposed changes at the three existing compressor stations and proposed new compressor station. The results of these acoustical analyses are presented in table 2.8.3-1 and include various assumed noise control measures. Algonquin assumed the following noise mitigation measures in its compressor station acoustical analyses:

- compressor building – enclosing the new turbine(s) and compressor(s), including the use of appropriate building materials;
- adequate muffler system for each turbine exhaust system;
- acoustical pipe insulation for outdoor aboveground gas piping if necessary;
- adequate silencer for each turbine air intake system;
- low-noise lube oil cooler for each compressor unit;
- low-noise gas cooler for each installation of a new gas cooler;
- silencers of each compressor unit blowdown vent; and
- courtyard barrier or walls between the compressor building and auxiliary building for the proposed Weymouth Compressor Station.

We received comments from the Massachusetts Energy Facilities Siting Board (MEFSB) that expressed concern about potential noise impacts from the new Weymouth Compressor Station. Specifically, the MEFSB expressed concern regarding the potential for increased noise impacts from the new Weymouth Compressor Station at a number of nearby residential receptors. Additionally, we received comments about the potential for noise to travel across the Weymouth Fore River and Kings Cove and affect nearby NSAs. Algonquin conducted a sound survey that analyzed noise impacts at the eight MEFSB-recommended NSAs, including those across the large bodies of water. The results of this survey are shown in table 2.8.3-1. The nearest receptor across Weymouth Fore River is listed on the table as NSA 2. NSA 3 and NSA 7 on the table are the nearest receptors across Kings Cove. The analysis includes the estimated noise impact from the Weymouth Compressor Station attenuating over the water along with the total cumulative sound level. The sound contributions for these NSAs were analyzed separately to assess the impact of noise traveling over water. The noise modeling methodology incorporates hemispherical sound propagation, which is more applicable over acoustically-hard surfaces such as water. Additionally, the acoustical analysis for these NSAs did not include the attenuation due to ground effect that was included for the NSAs with mostly land between the receptor and the Weymouth Compressor Station.

The MEFSB also expressed concern that the background ambient levels determined in the sound survey were biased by the Fore River Bridge Replacement Project. The sound survey included daytime and nighttime ambient sound measurements at each NSA identified by the MEFSB. There were no construction activities at the Fore River Bridge related to the Fore River Bridge Replacement Project during the nighttime sound tests. In addition, the Fore River Bridge construction activities were not a significant noise contributor during the daytime ambient sound levels as traffic was the dominant noise contributor during the daytime sound tests.

Based on these results, the noise generated by the new compressor station would meet both FERC sound level requirements and MassDEP noise requirements at the nearest NSAs, including the MassDEP noise guideline for pure tone noise condition. The total increase in noise at NSAs, including the NSAs across the Weymouth Fore River and Kings Cove, during operation of the compressor station would be 0.3 dB or less, which is well below the level of change considered detectable to the human ear.

The noise analysis for the three existing compressor stations that would be modified indicate that existing noise levels at NSAs are below 55 dBA L_{dn}, except at the Stony Point Compressor Station where existing noise levels at the two closest NSAs are 62.9 and 63.0 dBA L_{dn}, respectively. None of the proposed modifications at these stations would generate noise in excess of 55 dBA L_{dn}, which is the FERC sound level requirement. The change in noise at the NSAs resulting from the proposed modifications is also predicted to be less than 3 dB. Additionally, the combined noise of the existing stations and proposed modifications would not exceed 55 dBA L_{dn} at any NSAs except at the two NSAs near the Stony Point Compressor Station where existing noise levels already exceed 55 dBA L_{dn}. The sound levels of the modified Oxford Compressor Station and Chaplin Compressor Station would also satisfy the Connecticut noise requirements because the FERC requirements are considered more stringent than the state requirements.

Although Algonquin evaluated the implementation of various mitigation measures at each compressor station within the acoustical analyses that were completed for the Project, they are still evaluating noise control measures needed at the existing compressor stations. We reviewed the compressor station noise analyses and agree that, if properly implemented, the noise control measures presented would ensure that noise attributable to the new and modified existing compressor stations would be either less than 55 dBA L_{dn} at nearby NSAs, or where the noise currently attributable to the compressor station is greater than 55 dBA L_{dn}, the noise attributable to the station modifications would cause no perceptible change to station noise levels. However, to ensure that the noise levels currently under development are properly implemented, **we recommend that:**

- **Algonquin should file a noise survey with the Secretary <u>no later than 60</u> days after placing the new Weymouth Compressor Station in service. If a full load condition noise survey of the entire station is not possible, Algonquin should file an interim survey at the maximum possible horsepower load and file the full load survey <u>within 6 months</u>. If the noise attributable to the operation of the new compressor station at full or interim power load conditions exceeds an L_{dn} of 55 dBA, Algonquin should file a report on what changes are needed and should install the additional noise controls to meet the level <u>within 1 year</u> of the in-service date. Algonquin should confirm compliance with the above requirement by filing a second noise survey with the Secretary <u>no later than 60 days</u> after it installs the additional noise controls; and**

- **Algonquin should file noise surveys with the Secretary <u>no later than 60</u> days after placing the authorized units at the Stony Point, Oxford, and Chaplin Compressor Stations in service. If a full load condition noise survey of the entire station is not possible, Algonquin should file an interim survey at the maximum possible horsepower load and file the full load surveys <u>within 6 months</u>. If the noise attributable to the operation of the modified compressor station at full or interim power load conditions exceeds existing noise levels at any nearby NSAs that are currently at or above an L_{dn} of 55 dBA, or exceeds 55 dBA L_{dn} at any nearby NSAs that are currently below 55 dBA L_{dn}, Algonquin should file a report on what changes are needed and should install the additional noise controls to meet the level <u>within 1 year</u> of the in-service date. Algonquin should confirm compliance with the above requirement by filing a second noise survey with the Secretary <u>no later than 60 days</u> after it installs the additional noise controls.**

In addition to the operational noise discussed above, there would also be blowdown events during which the pipeline would generate noise for short periods of time (e.g., 1 to 5 minutes). Algonquin has indicated that these potential blowdown events would be associated with each of the new compressor units, which would each be outfitted with a blowdown silencer to ensure that the noise attributable to these blowdown events would be 60 dBA at a distance of 300 feet. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that there would be a significant contributor to operational noise from the Project.

The Applicants also completed acoustical analyses on the modified M&R and regulator stations that would result in additional noise and the proposed new M&R station to determine what, if any, noise control measures would be needed to ensure compliance with federal and local noise ordinances. Table 2.8.3-2 lists the estimated noise resulting from the operation of the new or modified M&R and regulator stations. The results indicate that the subsequent noise would be either less than 55 dBA L_{dn} at nearby NSAs, or where the existing noise is greater than 55 dBA L_{dn}, the noise attributable to the new station or station modifications would cause no perceptible change to station noise levels. As such, the proposed new Salem Pike M&R Station and modifications at existing M&R stations would be in compliance with FERC's 55 dBA L_{dn} noise standards and applicable state noise requirements at the nearest NSAs. The distances and directions to the nearest NSAs from the existing and proposed M&R stations are listed in table 2.8.3-2 below.

TABLE 2.8.3-2

Noise Quality Analysis for the Applicable M&R and Regulator Stations for the Atlantic Bridge Project

Location/Facility	Distance and Direction to NSA	Current Ambient L_{dn} (dBA)	L_{dn} Attributable to the New Station/ Modifications (dBA)	Station L_{dn} + Ambient L_{dn} after Proposed Changes (dBA)	Potential Change in Ambient Noise Level (dB)
NEW YORK					
Existing Yorktown M&R Station					
NSA 1	70 feet south	48.7	47.0	51.6	2.3
CONNECTICUT					
Existing Danbury M&R Station					
NSA 1	40 feet southeast	66.0	50.2	66.1	0.1
Proposed Salem Pike M&R Station					
NSA 1	70 feet east	47.6	45.6	49.7	2.1
MASSACHUSETTS					
Existing Pine Hills M&R Station					
NSA 1	940 feet west	59.1	36.1	59.1	0.0
Existing Plymouth M&R Station					
NSA 1	875 feet southeast	58.0	34.7	58.0	0.0
Existing Needham Regulator Station					
NSA 1	175 feet east	54.4	50.0	55.7	1.3

[a] Current ambient levels based on noise surveys as described in section 2.8.1.

The Applicants have stated that they are currently evaluating noise control measures to be implemented at the proposed modified and new M&R and regulator stations. The acoustical analyses completed for these facilities included detailed recommendations for noise control measures, which, if properly implemented, would ensure that noise attributable to the facilities was less than 55 dBA L_{dn}. The Applicants assumed the following noise mitigation measures in its M&R and regulator station acoustical analyses:

- flow control valves associated with new regulator runs would be designed to achieve 85 dBA for full range of operating conditions;

- aboveground gas piping would be covered with acoustical insulation if flow control valves cannot achieve 85 dBA; and

- regulator runs/valves would be located at meter stations inside acoustically insulated buildings where necessary.

It is our experience that M&R stations can vary widely in terms of actual noise impacts after being placed in service relative to predicted noise impacts from these stations. In addition, the number of residences in proximity to the proposed or existing stations further justifies the need for post-construction noise surveys for several of the proposed modified and new M&R and regulator stations to verify that noise would be within acceptable limits at nearby NSAs. To verify compliance with the FERC's noise standards, **we recommend that**:

- **Algonquin should file noise surveys with the Secretary <u>no later than 60 days</u> after placing the modified Yorktown and Danbury M&R Stations, the modified Needham Regulator Station, and the proposed new Salem Pike M&R Station in service. If the noise attributable to the operation of any M&R station or regulator station at full load exceeds an L_{dn} of 55 dBA at any nearby NSA, Algonquin should file a report on what changes are needed and should install the additional noise controls to meet the level <u>within 1 year</u> of the in-service date. Algonquin should confirm compliance with the above requirement by filing a second noise survey with the Secretary <u>no later than 60 days</u> after it installs the additional noise controls.**

Based on the analyses conducted and mitigation measures proposed, we believe that the Project would not result in significant noise impacts on residents, and the surrounding communities.

2.9 RELIABILITY AND SAFETY

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

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. The natural gas in Algonquin's system contains a chemical odorant that produces the familiar "natural gas smell."

Methane has an auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5 and 15 percent in the air. Unconfined mixtures of methane in the air are not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration of methane within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air.

2.9.1 Safety Standards

PHMSA is mandated to provide pipeline safety under Title 49 USC Chapter 601. The Office of Pipeline Safety administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve the required safety standard. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. PHMSA provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. A state may also act as PHMSA's agent to inspect interstate facilities within its boundaries; however, PHMSA is responsible for enforcement actions. For the Project, Connecticut and New York are interstate agents that have been delegated authority to inspect interstate natural gas pipeline facilities. The Office of Pipeline Safety federal inspectors perform inspections on interstate natural gas pipeline facilities in Maine and Massachusetts.

PHMSA pipeline standards are published in 49 CFR Parts 190–199. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues. Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between PHMSA and FERC, PHMSA has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by PHMSA in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert PHMSA. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

FERC also participates as a member of PHMSA's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable. The pipeline and aboveground facilities associated with the Project would be designed, constructed, operated, and maintained in accordance with or to exceed PHMSA's Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. PHMSA specifies material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion.

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

- Class 1 – location with 10 or fewer buildings intended for human occupancy;
- Class 2 – location with more than 10 but less than 46 buildings intended for human occupancy;
- Class 3 – location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
- Class 4 – location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For instance, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock.

Class locations also specify the maximum distance to sectionalized block valves (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; MAOP; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. A summary of class locations based on current population density along the proposed pipeline segments is provided in table 2.9.1-1.

TABLE 2.9.1-1

Area Classifications Along the Atlantic Bridge Project

Facility	County, State	Begin Milepost [a]	End Milepost [a]	Length (feet)	Class Location
New Pipeline					
Stony Point Discharge Take-up and Relay	Westchester, NY	0.0	0.2	1,198	2
		0.2	0.7	2,530	1
		0.7	3.5	14,881	3
		3.5	4.0	2,675	1
Southeast Discharge Take-up and Relay	Fairfield, CT	0.0	2.3	12,293	3

[a] Minor discrepancies in totals are due to rounding.

During operation of the pipeline, if a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline, Algonquin would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required, to comply with PHMSA's code of regulations for the new class location.

In compliance with Part 192, the Applicants would be required to implement several safety measures during construction and operation of Project facilities. The piping, fittings, and other components containing natural gas under pressure must be designed with a significant margin of safety factor above normal operating parameters. To ensure that the maximum pressure is never exceeded, the system must be equipped with safety relief valves set to release gas that would maintain pressures below the MAOP. The relief valves must be tested periodically for proper operation and set point, and repaired or replaced as required. Also, gas vented to the atmosphere must be directed away from any potential sources of ignition.

PHMSA's pipeline safety regulations require natural gas transmission operators to develop and follow a written integrity management program that contains all of the elements described in 192.911 and addresses the risks on each covered transmission pipeline segment. The rule establishes an integrity management program, which applies to all high consequence areas (HCA).

PHMSA published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for PHMSA to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

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

- current Class 3 and 4 locations;
- any area in Class 1 or 2 locations where the potential impact radius[25] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle[26]; or
- any area in Class 1 or 2 locations where the potential impact circle includes an identified site.

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

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

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

Following construction of the Stony Point and Southeast Discharge Take-up and Relay pipeline segments, the new potential impact radius along these pipelines would be 845 feet. Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. PHMSA's regulations specify the requirements for the integrity management plan at section 192.911. The HCAs have been determined

[25] The potential impact radius means the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property. The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline (in pounds per square inch) multiplied by the square of the pipeline diameter in inches.

[26] The potential impact circle is a circle of radius equal to the potential impact radius.

based on the relationship of the pipeline centerline to other nearby structures and identified sites. Table 2.9.1-2 lists the HCAs by milepost that would be crossed by the pipeline facilities.

TABLE 2.9.1-2

Location of High Consequence Areas Along the Pipeline Facilities for the Atlantic Bridge Project [a]

Facility	County, State	Begin Milepost [b]	End Milepost [b]	HCA Length (feet)
New Pipeline				
Stony Point Discharge Take-up and Relay	Westchester, NY	0.4	3.6	16,912
Southeast Discharge Take-up and Relay	Fairfield, CT	0.0	2.3	12,675
New Compressor Station				
Weymouth Compressor Station	Norfolk, MA	N/A	N/A	N/A

[a] HCA designations are based on existing Algonquin pipeline facilities and the most recent annual review of HCAs as defined in Algonquin's integrity management program.

[b] Minor discrepancies in totals are due to rounding.

The pipeline integrity management rule for HCAs requires inspection of the pipeline every 7 years. Algonquin has implemented comprehensive integrity management programs that meet, and in many cases exceed, these regulations. While the pipeline integrity management regulations apply only to HCAs, Algonquin would continue to implement the same rigorous practices across their entire pipeline systems. Key elements of Algonquin's integrity management programs include data gathering, risk assessment, integrity assessments, response and remediation, and preventative and mitigative measures as described below.

A two-foot wide brightly colored warning tape would be placed one-foot below natural grade along the length of the pipeline. A variety of pipeline location markers (e.g., adhesive decals, marker posts, and signage) would be used to clearly identify the location of the pipeline.

The pipeline would be patrolled on a routine basis, and personnel well qualified to perform both emergency and routine maintenance on interstate pipeline facilities would handle emergencies and maintenance. Patrolling is performed regularly to monitor activity near Algonquin's pipeline facilities. Furthermore, Algonquin maintains state-by-state partnerships with the local One-Call Centers and their "Call Before You Dig" programs as well as the national "Call 811" Program. Algonquin's staff is dispatched to a site where a one-call is made to mark the location of the pipeline. These personnel stay on site when any excavation occurs over, under, or adjacent to Algonquin's facilities.

PHMSA prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities to minimize the hazards in a natural gas pipeline emergency. Key elements of the Applicants' Emergency Plan (under Part 192.615) include:

- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards, including evacuating individuals and rerouting traffic as necessary to avoid any area that is deemed to be unsafe.

The Applicants are committed to providing pertinent information about its facilities and working with nearby emergency responders. The DOT also requires interstate pipeline operators to develop a public liaison program for each municipality it traverses. An emergency response plan specific to each compressor station is developed and local first responder organizations are trained in how to coordinate a response with Algonquin in the unlikely event of an emergency at a compressor station. The Emergency Response Plans for each of these stations include:

- details on how to identify and classify emergencies;
- notification and emergency response procedures for events including detection of gas, fire, explosion, natural disaster, or a bomb threat and emergency shutdown steps;
- phone numbers for Spectra emergency response personnel, first responders (fire departments and law enforcement), and emergency response contractors;
- operating maps; and
- directions to each of the facilities.

The Emergency Response Plans are reviewed annually. All applicable personnel receive annual training on the Emergency Response Plans, and the area offices conduct emergency response exercises on an annual basis. Additionally, the Applicants conduct periodic training sessions to review operating and emergency procedures with their operations staff.

The Applicants' Gas Control Center monitors system pressures, flows, and customer deliveries on its entire system. The center is staffed 24 hours a day, 7 days a week, and 365 days a year from Houston, Texas. The Project facilities would also be equipped with remote control shutoff valves. In the event of an emergency, the Gas Control Center would send a command signal to the remote control valves to initiate the closure of the valves. The remote control valves are capable of closing quickly to isolate a section of pipeline from the rest of the system.

The Applicants' operating personnel would patrol the right-of-way along the new and existing pipeline facilities on a weekly basis. The Applicants would also conduct annual leak detection surveys of its pipeline facilities to identify any potential leaks. These surveys are instrumental in early detection of leaks and can reduce the likelihood for pipeline failure.

PHMSA requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to the appropriate public officials. The Applicants would maintain liaisons with public authorities and local utilities in all locations along the pipeline system. A current list of the individuals and organizations to be contacted would be maintained by the Transmission Area Managers at the South Plainfield (New Jersey), Cromwell (Connecticut), and Westwood (Massachusetts) Area Offices. The Applicants would provide the appropriate training to local emergency service personnel before the pipeline is placed in service.

2.9.2 Pipeline Incident Data

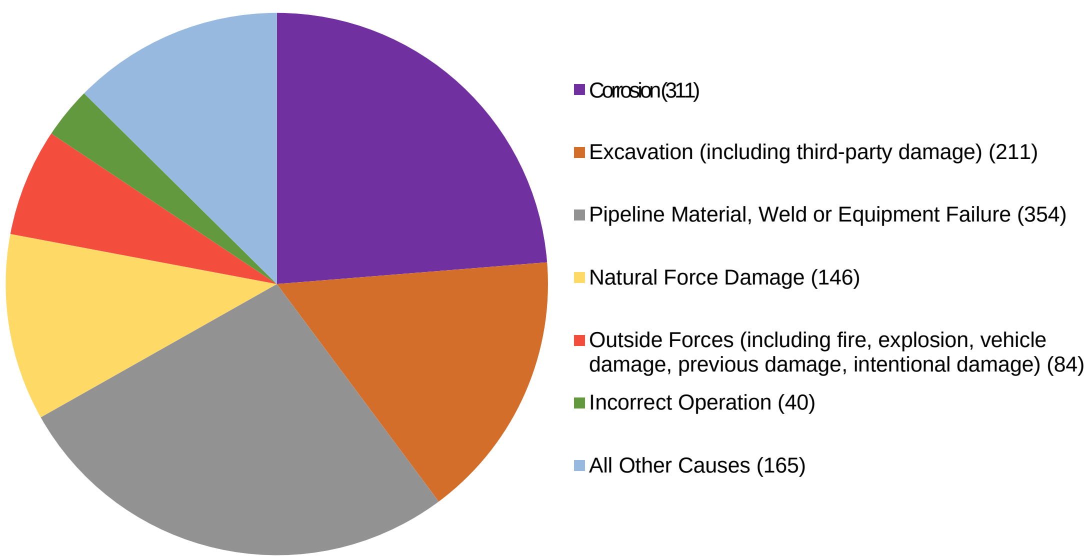
PHMSA requires all operators of natural gas transmission pipelines to notify PHMSA of any significant incident and to submit a report within 20 days. Significant incidents are defined as any leaks that:

- cause a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 in 1984 dollars.[27]

During the 20-year period from 1995 through 2015, a total of 1,307 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Figure 2.9.2-1 provides a nationwide distribution of the causal factors as well as the number of each incident by cause. The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure comprise 49.5 percent of all significant incidents. The pipelines included in the data set in figure 2.9.2-1 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline (PHMSA, 2015).

Figure 2.9.2-1
Nautral Gas Transmission Pipeline FacilitySignificant Incidents by Cause (1996 to 2015)



Between 1996 and 2015 there have been a total of 12 significant gas transmission incidents in New York, 1 in Massachusetts, and none in Connecticut (PHMSA, 2015).

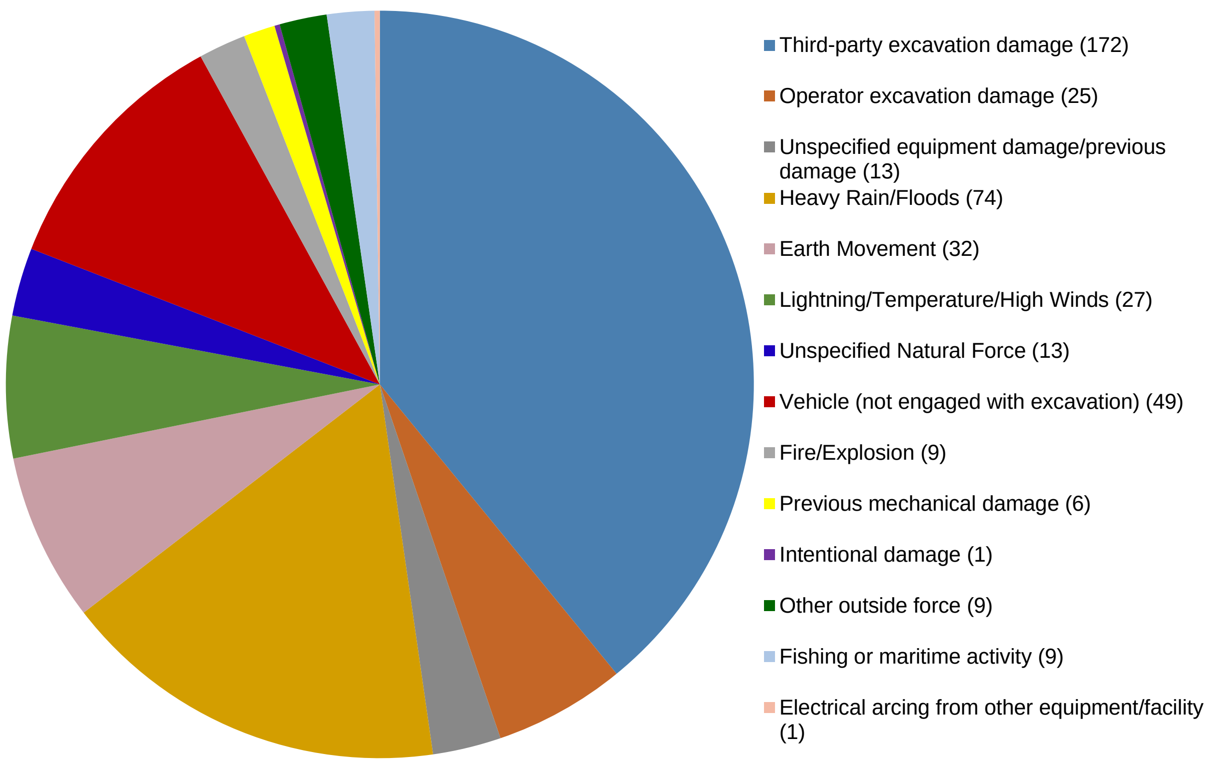
The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, since corrosion and pipeline stress/strain is a time-dependent process. The use of both an external protective coating and a cathodic

[27] $50,000 in 1984 dollars is about $114,000 as of October 2015 (Consumer Price Index Bureau of Labor Statistics, 2015).

protection system,[28] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

As shown in figure 2.9.2-1, outside force, excavation, and natural forces are the cause in 33.5 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Figure 2.9.2-2 provides a breakdown of outside force incidents by cause (PHMSA, 2015).

Figure 2.9.2-2
Outside Forces Incidents by Cause (1996 to 2015)



Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller-diameter pipelines; which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movement.

Since 1982, operators, including the Applicants, have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies

[28] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline that includes the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

(e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

We received scoping comments regarding Spectra's safety record. Spectra's reportable incident and leak rates are significantly lower than industry averages, as shown in table 2.9.2-1. In addition, pipeline operator compliance and incident history is publically available on the PHMSA website at www.phmsa.dot.gov/pipeline.

TABLE 2.9.2-1

Average 5-Year Leak and Incident Rates for Spectra and All U.S. Natural Gas Transmission Lines

Category	Spectra Energy Pipelines (per 1,000 miles/year)	All U.S. Gas Transmission Lines (per 1,000 miles/year)
Onshore Incidents	0.16	0.30
Leaks	0.54	1.97

2.9.3 Impact on Public Safety

Algonquin would implement various public safety measures during construction in residential and commercial areas. These measures are discussed in more detail in section 2.4.3. Algonquin would consult with an engineer that specializes in developing alternating current mitigation systems for pipeline utility companies to address potential effects on the pipeline facilities of a lightning strike at a nearby electric transmission tower. An alternating current mitigation system would be designed and installed to mitigate the steady state induced alternating current on the pipeline and deal with any fault current, should one occur. Typically lightning arrestors along with decoupling devices would be employed on the pipeline to protect against any electrical surges.

We received comments from landowners concerning the safety of the new Weymouth Compressor Station and how the proposed Weymouth Compressor Station would be affected if there were to be an emergency or an incident at a neighboring industrial facility. The new Weymouth Compressor Station and modifications at existing compressor stations would be designed, constructed, and operated to meet or exceed applicable specifications included in DOT's regulations at 49 CFR Parts 192.163 through 192.173 and 192.731 through 192.731.

Many commenters expressed concern about the potential for an incident at the Weymouth Compressor Station to impact the Fore River Bridge or other nearby industrial infrastructure. To address this, we first note that there is existing natural gas pipeline infrastructure closer to the Fore River Bridge than the proposed Weymouth Compressor Station. The potential impact radius of that existing natural gas infrastructure located adjacent to the proposed Weymouth Compressor Station is 786 feet. We further considered information about the new compressor station. Based on the current facility design the location where gas would be vented in an emergency situation would be about 450 feet from the east end of the Fore River Bridge. The heat flux level that would be emitted if ignition were to occur during gas venting would be 37.5 kilowatts per square meter at a distance of 282 feet. Given that the bridge is 450 feet from the point of venting and the heat flux level would be much lower (less than 15 kilowatts per square meter), the structural integrity of the bridge would not be affected. The Calpine Fore River Energy Center is about 700 feet from the proposed compressor station, and the heat flux level at the power plant would be even lower than at the bridge. Therefore we do not expect the power plant would be impacted by ignition during a gas venting event.

In response to public concern and at FERC's request, Algonquin also assessed other accidental natural gas release scenarios at the proposed Weymouth Compressor Station to determine if the ignition of an accidental release at any other location could impact the integrity of the new Fore River Bridge (as the bridge is the closest infrastructure near the compressor station). Algonquin's assessment covered the compressor station components and the full range of operation parameters at the compressor station; and plausible compressor station incidents of gas release, based on historical incident reports to PHMSA[29] by gas pipeline operators. Algonquin's analysis also assessed the impact of an incident on both the suction and discharge sides of the proposed Weymouth Compressor Station site.

Algonquin evaluated the likelihood of these specific incidents occurring at the Weymouth and the safety consequence of each incident scenario. Plausible incidents resulting in the release of natural gas from the compressor station site were classified by release location, volume of product release, resulting consequence, and the specific risks to the bridge structure as a result of either thermal radiation or overpressure. To evaluate thermal radiation, Algonquin relied upon PHAST 7.112, a hazard analysis software tool that is commonly used for this type of analysis. Algonquin also assessed flammable concentrations using the EPA's SCREEN3 model. Algonquin's assessment of thermal radiation from these scenarios indicated that there would be no damage to the structural integrity of the new Fore River Bridge. To evaluate the potential for damage from overpressure, Algonquin relied upon the following thresholds, which are recognized in technical publications: 1) a 5 psi overpressure, and 2) a 1 psi overpressure. The gas would be primarily composed of methane and should be vented to a location that is free of congestion or confinement, which should result in negligible overpressures much less than 1 psi and the structural integrity of the bridge would not be affected. Based on this and the scenarios considered, we conclude that if a major event were to occur at the proposed Weymouth Compressor Station, it is unlikely that it would pose a threat to the structural integrity of the new Fore River Bridge or the other nearby infrastructure.

We also received comments regarding the impact on public evacuation routes if there were an incident at the Weymouth Compressor Station. If the Project were approved, prior to placing it into service, the Applicants would create an Emergency Response Plan specific to the Weymouth Compressor Station. Local public safety officials and first responders would be trained in how to respond to an event at the station. The Emergency Response Plan would be reviewed annually, all associated personnel would receive yearly training, and annual emergency response exercises would be conducted. The Applicants would communicate Emergency Response Plan information to the public that live and/or work near the proposed compressor station. If an evacuation were warranted, the evacuation zone would depend on the nature, extent, and location of the incident. If access to the Fore River Bridge were impeded during an evacuation, there are other roads available for public use heading south to maneuver around the Fore River.

The service incidents data summarized in figure 2.9.2-1 include natural gas transmission system failures of all magnitudes, with widely varying consequences. Table 2.9.3-1 presents the average annual injuries and fatalities that have occurred on natural gas transmission lines for the 5-year period between 2010 and 2014. The majority of fatalities from pipelines are due to local distribution pipelines not regulated by FERC. These are natural gas pipelines that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes that are more susceptible to damage. Additionally, local distribution systems generally do not have large rights-of-way or the pipeline markers common to the FERC-regulated natural gas transmission pipelines. Therefore, incident statistics inclusive of distribution pipelines are inappropriate to use when considering natural gas transmission projects.

[29] PHMSA incident reports are available online at: http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelineincidenttrends.

TABLE 2.9.3-1

Annual Average Fatalities – Natural Gas Transmission Pipelines [a]

	Injuries		Fatalities	
Year	Employees	Public	Employees	Public
2011	1	0	0	0
2012	3	4	0	0
2013	0	2	0	0
2014	1	0	1	0
2015	12	2	6	0

[a] From PHMSA (PHMSA, 2015)

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 2.9.3-2 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Drawing conclusions from direct comparisons between accident categories is difficult, however, because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornados, or floods.

TABLE 2.9.3-2

Annual Average Fatalities –Nationwide Accidental Deaths [a]

Type of Accident	Annual Number of Deaths
Motor vehicle	35,369
Poisoning	38,851
Falls	30,208
Drowning	3,391
Fire, smoke inhalation, burns	2,760
Floods [b]	81
Tornado [b]	72
Lightning [b]	49
Natural gas distribution lines [c]	13
Natural gas transmission pipelines [c]	2

[a] All data, unless otherwise noted, represents annual accidental deaths recorded in 2013 (U.S. Department of Health and Human Services, 2016)
[b] NOAA, 2016
[c] PHMSA, 2015

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1996 to 2015, there were an average of 65 significant incidents, 9 injuries, and 2 fatalities per year. The number of significant incidents over the more than 303,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. Further, the majority of the Project involves the replacement of existing, aged pipeline with new pipeline in the same location and would not increase the risk to the nearby public. For the small portion of the Project involving a new compressor station, we conclude, based on the above numbers, that the operation of the new compressor station would represent a slight increase in risk to the nearby public.

2.9.4 Terrorism

We received comments regarding concerns that the Project facilities could be used in a terrorist attack. Safety and security concerns have changed the way pipeline operators, as well as regulators, must consider terrorism, both in approving new projects and in operating existing facilities. The Department of Homeland Security is tasked with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies is working to improve pipeline security practices, strengthen communications within the industry, and extend public outreach in an ongoing effort to secure pipeline infrastructure.

The Commission, like other federal agencies, is faced with a dilemma in how much information can be offered to the public, while still providing a significant level of protection to energy facilities. Consequently energy facility design plans and layout location information has been removed from our website to ensure that sensitive information is not readily available.

The Applicants stated that through their parent company, Spectra, they would continue to participate in various activities in close collaboration with the U.S. Department of Homeland Security's Transportation Safety Administration (TSA) and key industry groups concerning security as part of the Project. This would include:

- complying with the TSA's Pipeline Security Division's Security Guidelines;
- participating in monthly intelligence meetings with both the U.S. Department of Homeland Security's Intelligence Program and the TSA's Pipeline Security Division's monthly update conference calls;
- attending classified briefings with the U.S. Department of Homeland Security for the industry, annually, and as needed;
- chairing the Interstate Natural Gas Association of America Security Committee and participating in the American Gas Association Security Committee, as well as the Oil and Natural Gas Sector Coordinating Council's Pipeline Working Group;
- participating in the production of a new video, sponsored by TSA, aimed at training law enforcement officers to respond to security events at pipeline facilities;
- participating annually in TSA's International Pipeline Security Forum;
- reporting suspicious incidents to the Transportation Security Operations Center; and
- conducting major crisis management drills, at least annually, within the company.

Safety and security are important considerations in any action undertaken by FERC. The likelihood of future acts of terrorism or sabotage occurring at or along the Project facilities, or at any of the myriad natural gas pipeline or energy facilities throughout the United States, is unpredictable given the disparate motives and abilities of terrorist groups. Although being sensitive to the history of incidents in the Project area, the continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts.

2.10 CUMULATIVE IMPACTS

The eastern United States has been affected by human activity for over 15,000 years beginning with indigenous peoples who lived in large settlements and associated satellite villages. Today about 31.4 million people reside in New York, Connecticut, Massachusetts, and Maine. This includes about 2.5 million people that live in the three counties where the new take up and relay pipeline and new compressor station would be constructed.

In accordance with NEPA, we identified other actions located in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by CEQ, a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects within the regions of influence as part of the affected environment (environmental baseline) which was described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered. Actions located outside the regions of influence are generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

The purpose of this analysis is to identify and describe cumulative impacts that would potentially result from implementation of the Project. This cumulative impacts analysis uses an approach consistent with the methodology set forth in relevant guidance (CEQ, 1997b, 2005; EPA, 1999). Under these guidelines, inclusion of actions within the analysis is based on identifying commonalities of impacts from other actions to potential impacts that would result from the Project. The cumulative impacts analysis for the Project was conducted using the following guidelines:

- To be included in the analysis, an action must affect a resource category potentially affected by the Project. For the most part, the area of potential cumulative impact is limited to the area directly affected by the Project and, depending on the resources, in the adjacent areas. The effects of more distant actions are, in most cases, not assessed because the impacts of most actions are localized and would not contribute significantly to impacts in the Project area. The potential cumulative impact area for certain resources, such as air quality and waterbodies, encompasses a larger geographic area; therefore, we considered these on a broader, more regional basis.

- The distance into the past and future (i.e., the temporal range) which other actions could potentially cumulatively affect the project area depends on the duration and permanency of the impacts. Most of the impacts associated with the Project would be temporary or short term and limited to the construction phase, which the Applicants plan to be complete by November 2017 assuming they receive the necessary authorizations. The potential for cumulative impacts associated with the Project would be greatest during this period, and largely confined to this period for certain resources.

- Where a potential for cumulative impacts was determined to exist, the impacts were quantified to the extent practicable; however, in some cases the potential impacts can only be described qualitatively. This is particularly the case for projects that are in the planning stages; are contingent on economic conditions, availability of financing, and/or the issuance of permits; or for which there is a lack of comprehensive information available.

The criteria listed below define the Project's region of influence, which is used in this cumulative impacts analysis to describe the general area for which the Project could contribute to cumulative impacts. The region of influence varies depending on the resource being discussed.

Impacts on geology and soils, land use, residential areas, recreational areas, visual resources (affected by pipeline construction and construction of aboveground facilities at the Applicants' existing aboveground facility sites), cultural resources, and traffic by the Project would be highly localized and well within 0.25 mile. Therefore, we evaluated other projects (e.g. residential development, commercial development, and transportation projects) within 0.25 mile of the construction work areas for the Project to address the possible direct and indirect effects of other contributing activities for cumulative impacts on these resources.

We used the same 0.25 mile area to assess cumulative impacts on visual resources affected by construction of the pipelines and aboveground facilities at the Applicants' existing aboveground facility sites. For the Weymouth Compressor Station, however, we expanded the radius of the area to be assessed for cumulative impacts on visual resources to 0.5 mile because the station would be a new facility and would be visible from various points including from Germantown Point in Quincy and the south and east sides of Kings Cove in Weymouth.

The Project pipeline segments are each less than 5 miles long and primarily utilize existing rights-of-way. Waterbody and wetland crossings, as well as impacts on groundwater, vegetation, and wildlife by the Project would be localized and minimized. The impacts on these resources would also be temporary, with the exception of the effects related to the clearing and conversion (permanent or otherwise) of forestland to non-forest cover types, and the establishment of new or expanded rights-of-way, which would be long term. Therefore, we evaluated other projects within the same sub-watersheds (HUC 12) as the Project to address the possible cumulative effects on wetlands, surface waters, groundwater, vegetation, and wildlife.

The Project compressor stations would result in long-term impacts on air quality. Therefore, other projects with the potential to result in long-term impacts on air quality (e.g., natural gas compressor stations or industrial facilities) were considered in our cumulative impact assessment of air quality impacts. For existing compressor stations CTDEEP 2014 design values for the closest monitors to the Oxford and Chaplin Compressor Stations were used as the ambient background conditions in the air quality analysis. For the Weymouth Compressor Station, MassDEP provided regional source data for large emission sources near the compressor station that were identified as potentially significantly impacting air quality near the proposed compressor station.

Long-term noise impacts from the Project compressor stations would be localized to within one mile of each station. Therefore, we evaluated other projects that would result in long-term impacts on noise affecting the same NSAs as the Project compressor stations.

The anticipated cumulative impacts of the Project and these other actions are discussed below, as are pertinent mitigation measures. Table 2.10-1 lists present or reasonably foreseeable future projects or activities that may cumulatively or additively impact resources that would be affected by the construction and operation of the Project.

Other Known Projects

In addition to those projects identified in table 2.10-1, there are other FERC-jurisdictional natural gas projects currently proposed or under consideration in the states affected by the proposed Project. These include Algonquin's Salem Lateral Project in Massachusetts; Tennessee's Connecticut Expansion Project in New York, Massachusetts, and Connecticut; Tennessee's Northeast Energy Direct (NED) Project in New York and Massachusetts; National Fuel Gas Supply Corporation's Northern Access 2015 Project in New York; National Fuel Gas Supply Corporation and Empire Pipeline, Inc.'s Northern Access 2016 and Tuscarora Lateral Projects in New York; Dominion Gas Transmission's New Market Project in New York, and Millennium's Eastern System Upgrade Project. However, none of these other projects would occur within the same region of influence as the Project, and are therefore not discussed further.

TABLE 2.10-1

Existing/Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the Atlantic Bridge Project

Facility/Project	Description	Status	Approximate Location Relative to Atlantic Bridge Project [a]	Resources Potentially Cumulatively Affected [b]
PIPELINE FACILITIES				
Stony Point Discharge Take-up and Relay				
AIM Project	In New York the AIM Project will replace 3.3 miles of natural gas pipeline from Haverstraw to Stony Point, construct 12.3 miles of mainline pipe in Stony Point, Cortlandt, Peekskill, and Yorktown, and replace 0.1 mile of pipeline in the Town of Southeast. The AIM Project also includes the modifications of two existing compressor stations and three existing metering and regulating stations.	Under Construction, anticipated in-service November 2016.	0 mile from MP 0.0 on the Stony Point Discharge Take-Up and Relay	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
ANE Project	In New York the ANE Project would replace 12.7 miles of natural gas pipeline from Comers to Southeast. About 4.7 miles would be in Somers, 1.4 miles in Carmel, and 6.5 miles in Southeast.	Pre-filing process approved by FERC November 17, 2015. Project construction is expected to begin in 2018.	0.1 mile from MP 4.0 of the Stony Point Discharge Take-up and Relay	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
Costco Wholesale Store and Fueling Facility	Construction of a 151,092 square foot store with a 12 dispenser fueling facility supported by 610 on-site parking spaces in Yorktown New York.	Under construction - anticipated completed construction November 2016.	1.1 miles from MP 0.0 of the Stony Point Discharge Take-up and Relay	GW, WT, VG, WD
Route 6 Intersection Improvement Project (no. 839202)	Realignment of Route 6, Route 118, Union Valley road, and Miller Road intersection and construction of additional turn lanes in Somers and Carmel New York.	Anticipated completed construction in July 2016.	1.4 miles from MP 4.0 of the Stony Point Take-up and Relay	GW, WT, VG, WD
Bear Mountain Parkway/Route 6 Interchange (No. 800402)	Reconstruction of the Bear Mountain State Parkway and US Route 6 interchange in Westchester, New York.	Proposed construction in 2020-2021.	2.7 miles from MP 0.0 of the Stony Point Discharge Take-up and Relay	GW, WT, VG, WD
Southeast Discharge Take-up and Relay				
AIM Project	In Connecticut the AIM Project will replace about 4.4 miles of existing 26-inch-diameter pipeline with new 42-inch-diameter pipeline, portions of which will be located in Danbury. The project also includes modifications to an existing compressor station and M&R station.	Under Construction, anticipated in-service November 2016.	0.0 miles from MP 0.0 of the Southeast discharge Take-up and Relay	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
ANE Project	The ANE Project would replace 17.6 miles of pipeline from Danbury to Southbury Connecticut in Fairfield and New Haven counties.	Pre-filing process approved by FERC November 17, 2015. Project construction is expected to begin in 2018.	0.0 mile from MP 2.1 to 2.3 of the Southeast Discharge Take-up and Relay	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
Kennedy Flats	Construction of a 375-unit apartment complex off Main Street in Danbury Connecticut, near the intersection of Kennedy Avenue and Rose Street).	Currently under construction with an anticipated completion date of spring 2016.	0.5 mile from MP 0.0 of Southeast Discharge Take-up and Relay	GW, WT, VG, WD

TABLE 2.10-1 (cont'd)

Existing/Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the Atlantic Bridge Project

Facility/Project	Description	Status	Approximate Location Relative to Atlantic Bridge Project [a]	Resources Potentially Cumulatively Affected[b]
NEW AND EXISTING ABOVEGROUND FACILITY MODIFICATIONS				
Oxford Compressor Station				
AIM Project	As part of the AIM Project, the existing Oxford Compressor Station will be modified to facilitate the transportation of additional gas volumes resulting from the AIM Project.	Project completion is expected for November of 2016.	0 mile from the Oxford Compressor Station	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
Competitive Power Ventures (CPV) Towantic Energy Center	CPV proposes to construct and operate a state-of-the-art 805 megawatt ("MW") natural gas-powered, combined cycle, electric generating facility on a 26-acre site in the Woodruff Hill Industrial Park.	CPV plans to have the facility online in 2018. Construction is expected to take 28 to 30 months.	0 mile from the Oxford Compressor Station	G, S, L, R, C, V, SW, GW, WT, VG, WD, VI. A, and N
ANE Project	As part of the ANE Project, the existing Oxford Compressor Station would be modified to facilitate the transportation of additional gas volumes resulting from the ANE Project. The ANE Project would replace 17.6 miles of natural gas pipeline from Danbury to Southbury and 13.6 miles of natural gas pipeline from Oxford to Southington.	Pre-filing process approved by FERC November 17, 2015. Project construction is expected to begin in 2018.	0 mile from the Oxford Compressor Station	G, S, L, R, C, V, SW, GW, WT, VG, WD, A, and N
Chaplin Compressor Station				
AIM Project	As part of the AIM Project, the existing Chaplin Compressor Station will be modified to facilitate the transportation of additional gas volumes resulting from the AIM Project.	Project completion is expected for November of 2016.	0 mile from the Chaplin Compressor Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N
ANE Project	As part of the ANE Project, the existing Chaplin Compressor Station would be modified to facilitate the transportation of additional gas volumes resulting from the ANE Project.	Pre-filing process approved by FERC November 17, 2015. Project construction is expected to begin in 2018.	0 mile from the Chaplin Compressor Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N
Salem Pike M&R Station				
AIM Project	As part of the AIM Project, the existing Salem Pike M&R Station will be modified to accept the new gas flows associated with the AIM Project.	Project completion is expected for November of 2016.	0 mile from the Salem Pike M&R Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N
Needham Regulator Station				
AIM Project	As part of the AIM Project, the existing Needham Regulator Station will be modified to accept new gas flows associated with the AIM Project.	Project completion is expected for November of 2016.	0 mile from the Needham Regulator Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N
Weymouth Compressor Station				
ANE Project	As part of the ANE Project, the Weymouth Compressor Station, proposed for the Atlantic Bridge Project, would be modified to satisfy additional ANE Project requirements. Additionally, the ANE Project would install 4.0 miles of natural gas pipeline from Braintree to Weymouth.	Pre-filing process approved by FERC November 17, 2015. Project construction is expected to begin in 2018.	0 mile from the Weymouth Compressor Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N

TABLE 2.10-1

Existing/Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the Atlantic Bridge Project

Facility/Project	Description	Status	Approximate Location Relative to Atlantic Bridge Project [a]	Resources Potentially Cumulatively Affected[b]
Fore River Bridge Replacement Project (No. 604382)	The project includes the replacement of the Fore River Bridge (State Route 3A) over the Fore River in Quincy and Weymouth. The new bridge will be a double leaf bascule or vertical lift bridge. The project also includes approach roadway work and possible intersection improvements/improved geometrics.	Construction is expected to be completed in winter of 2016/2017.	0.2 mile from the Weymouth Compressor Station	G, S, L, R, C, SW, GW, WT, VG, WD, A, and N
Fore River Energy Center	Existing Fore River Energy Center is a 731 MW, combined-cycle plan consisting of two combustion turbines, two heat recovery steam generators, and one steam turbine.	In operation	0.1 mile from Weymouth Compressor Station	A, N, VI
Braintree Electric and Light Potter 2 Plant	Existing Braintree Electric Potter 2 Plant was built in 1975 and is a combined-cycle plant with a maximum output of 96 MW. It is a dual-fired plant with oil and natural gas.	In operation	0.3 mile from Weymouth Compressor Station	A, N, VI
Braintree Electric and Light Thomas A. Watson Generating Station	Existing Braintree Electric and Light Thomas A. Watson facility has been in operation since 2009. Simple-cycle gas –fired plant powered by two Rolls-Royce Trent 60 gas turbines.	In operation	0.2 mile from Weymouth Compressor Station	A, N, VI
Twin Rivers Technology	Existing Twin Rivers Technology Plant is a fatty acid and glycerin production site.	In operation	0.3 mile from Weymouth Compressor Station	A, N, VI
MWRA Pumping Station	Existing MWRA sewage pumping station.	In operation	<0.1 mile from the Weymouth Compressor Station	A, N, VI

[a] All projects listed in this table are located (at least partially) within a HUC 12 sub-watershed shared with the Atlantic Bridge Project

[b] G=Geology, S=Soils, L=Land Use, R=Residential Areas, VI=Visual, C=Cultural, T=Traffic, SW=Surface Water, GW=Ground Water, WT=Wetlands, VG=Vegetation, WD=Wildlife, A=Air Quality, N=Noise

Sources: New York State Department of Transportation, 2015; NYSDEC, 2015f; City of Danbury, 2015; Connecticut Department of Transportation, 2015; Massachusetts Department of Transportation, 2015; CPV Towantic Energy Center, 2015; and Town of Yorktown, 2015.

Algonquin Incremental Market Project

Algonquin is currently constructing the AIM Project which includes 37.4 miles of pipeline (29.2 miles of replacement and 8.2 miles of loops and laterals) in New York, Connecticut, and Massachusetts. The AIM Project also includes modifications to six existing compressor stations and 24 existing M&R Stations in New York, Connecticut, Rhode Island, and Massachusetts. The construction schedule of the AIM Project does not coincide with the anticipated Atlantic Bridge Project construction schedule. The AIM Project would be constructed and the rights-of-way restored before construction of the Atlantic Bridge Project would commence.

The two proposed take-up and relay pipeline segments for the Atlantic Bridge Project are directly adjacent to portions of the AIM Project pipeline facilities (see table 2-10-1) resulting in two areas of construction workspace overlap. The first overlap occurs along the Atlantic Bridge Project Stony Point

Discharge Take-up where a workspace overlaps with the construction workspace area for the AIM Project Stony Point Lift and Relay segment west of Stoney Street in Yorktown. The second overlap is on the eastern end of the AIM Project Southeast Lift and Relay pipeline segment and the western end of the Atlantic Bridge Project Southeast Discharge Take-up and Relay at MLV Site 19 in Danbury, Connecticut. The AIM Project also includes work at two of the existing compressor stations (Oxford and Chaplin), which are also a part of the Atlantic Bridge Project scope. Modifications to the Oxford Compressor Station under the AIM Project only included the restaging of one existing compressor unit and did not involve any ground disturbing activities. There were no changes in horsepower at this compressor station and therefore no impacts on air quality or noise. Work at the Oxford Compressor Station associated with the AIM Project is complete and work at the Chaplin Compressor Station is currently reported at 86 percent complete.

While there is a small overlap in construction workspace between the two projects construction of AIM Project facilities will be completed in these areas and in-service before any construction work for the Atlantic Bridge Project would start. Additional discussion of the AIM Project is included in the cumulative impact assessment by resource below.

Access Northeast Project

Algonquin is also currently evaluating proposals to modify other parts of its existing interstate natural gas pipeline system to meet the growing market demand for natural gas. We are aware of one planned expansion known as the ANE Project. Algonquin, with two partner companies, filed a pre-filing request letter for the ANE Project on November 3, 2015 and FERC responded approving the request on November 17, 2015. We note that because this project is still under development, the information provided below presents the conservative, larger scope under consideration. Similar to the AIM Project and Atlantic Bridge Project, upon requesting use of the pre-filing process, during the pre-filing process, or upon submitting an application, the ANE Project may be reduced in scope to reflect its purpose and the refined developed facilities or facilities may be modified to address scoping comments.

The ANE Project may include 123.2 miles of new loop and replacement of existing pipeline, construction of one new compressor station and additional compression at seven existing compressor stations, and construction of a new LNG peaking facility.

Specifically, the ANE Project may involve:

- replacing 13.9 miles of existing 26-inch-diameter with 42-inch-diameter pipeline in Rockland, Westchester, and Putnam Counties, New York;
- replacing 31.1 miles of existing 26-inch-diameter pipeline with 42-inch-diamter pipeline in Fairfield, New Haven, and Hartford Counties, Connecticut;
- constructing 22.7 miles of new 36-inch-diameter pipeline loop extension in Windham, Hartford, and Tolland Counties Connecticut;
- constructing 25.9 miles of new 30-inch-diameter pipeline lopping and lateral in Norfolk County, Massachusetts;
- constructing 26.8 miles of new 16-inch-diameter pipeline in Norfolk and Worcester Counties, Massachusetts;

- constructing 2.9 miles of new 24-inch-diameter pipeline in Bristol County, Massachusetts;
- additional compression and cooling at Algonquin's existing Southeast Compressor Station in Putnam County, New York;, Stony Point Compressor Station in Rockland County, New York; Chaplin Compressor Station in Windham County, Connecticut; and Burrillville Compressor Station in Providence County, Rhode Island;
- restaging at Algonquin's existing Oxford and Cromwell Compressor Stations in New Haven and Middlesex Counties, Connecticut;
- additional compression and cooling at the proposed Weymouth Compressor Station in Norfolk County, Massachusetts; and
- construction of a new compressor station and a new LNG peaking facility in Bristol County, Massachusetts.

The majority of the ANE Project facilities listed above are outside of the region of influence for cumulative impacts associated with the Atlantic Bridge Project. The facilities that would be within the same region of influence are listed in table 2.10-1. Workspaces for the ANE Project have not been fully developed, however there may be workspace overlap at the eastern end of the Stony Point Discharge Take-up and Relay pipeline on the Atlantic Bridge Project and the western end of the Somers to Southeast Take-up and Relay segment of the ANE Project. Workspace overlap could also occur near MP 2.1 and 2.3 of the Southeast Discharge Take-up and Relay on the Atlantic Bridge Project and MP 0.0 to 0.2 of the Danbury to Oxford Take-up and Relay for the ANE Project. The construction schedule of the ANE Project does not coincide with the anticipated Atlantic Bridge Project construction schedule. The Atlantic Bridge Project would be constructed and the rights-of-way restored before construction of the ANE Project would commence.

The ANE Project would also include work at two of the existing compressor stations (Oxford and Chaplin) that are also a part of the Atlantic Bridge Project, and additional modifications to the Weymouth Compressor Station which is currently being proposed as a new compressor station as part of the Atlantic Bridge Project. If the ANE Project gets constructed, air emissions and noise during operation of compressor stations would overlap with the operational air emissions and noise of the Atlantic Bridge Project. Additional discussion of the ANE Project is included in the cumulative impact assessment by resource below.

Marcellus Shale Development

We received comments during scoping for the Project about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus shale region. Marcellus shale development activities may be considered under the category above for major transportation and energy development projects; however, activities associated with Marcellus shale development would occur well over 10 miles from the Project construction area, outside of the sub-watersheds crossed by the Project facilities, and outside of the AQCRs for the Project compressor stations. As a result, the local resources that may be affected by Marcellus shale development would not be affected by the Project, and local resources affected by the Project would not be affected by development in the Marcellus shale region. Therefore, cumulative impacts associated with Marcellus shale development are not discussed further.

2.10.1 Geology and Soils

The facilities associated with the Project are expected to have a direct but temporary impact on near-surface geology and soils. Clearing and grading activities could expose the soils to erosive elements such as precipitation and wind. About 50 percent of the soils associated with the Project are susceptible to water erosion. Trench excavation and any associated blasting would directly impact near surface geology. About 4.4 acres associated with Project pipeline construction have shallow depth to bedrock where blasting may be needed. Impacts on geological and soil resources would be minimized by implementation of the Applicants' E&SCP and Rock Removal Plan.

The effects on geology and soil would be highly localized and limited primarily to the period of construction; therefore, cumulative impacts on geology and soils would only occur if other projects are constructed within 0.25 mile of the proposed facilities. The construction of some of the projects listed in table 2.10-1, such as the Fore River Bridge Replacement Project could coincide with the schedule proposed for the Atlantic Bridge Project. Projects that require significant excavation or grading would also have temporary, direct impacts on near-surface geology and soils. However, states along with some local agencies regulate stormwater and have erosion control requirements designed to minimize impacts of moderate to large size construction projects. Should hazardous materials or contaminated soils and/or sediments be encountered during construction, they would be disposed of at fully licensed and permitted disposal facilities in accordance with applicable state and federal laws and regulations.

If the ANE Project moves forward as currently planned, the impacts of the ANE Project on geology and soils would be similar to those for the Atlantic Bridge Project (i.e., short-term and localized). Although many of the same general areas would be affected, the temporal scale of the projects is different. Construction of the AIM Project will be completed about a year before construction of the Atlantic Bridge Project would begin (2017) and the disturbed areas associated with the Atlantic Bridge Project would be restored prior to any start of the ANE Project construction, which at its earliest would begin in June 2018. This assumes that the Applicants file an application and that the project is approved by the appropriate federal and state agencies. For this reason, and because we do not anticipate any major long-term effects on geology and soils, there would be no significant cumulative impact on geology or soils.

2.10.2 Waterbodies, Groundwater and Aquatic Resources

Cumulative effects on surface water resources affected by the Atlantic Bridge Project would be limited to waterbodies that are affected by other projects within the same HUC 12 sub-watershed. A total of 16 waterbody crossings would be required for the Project, including 8 perennial streams, 3 intermittent streams, and 5 ephemeral streams. All of the projects listed in table 2.10-1 would be within the same sub-watersheds crossed by portions of the Atlantic Bridge Project, but only a small number of these (e.g., AIM Project and ANE Project) would likely involve direct in-stream impacts. The AIM Project will involve 102 waterbody crossings, two of which (Hudson River and Still River) will be crossed using the HDD construction method. Based on current preliminary plans, about 167 waterbodies would be crossed during construction of the ANE Project for ANE Project facilities which are at least partially within the Atlantic Bridge region of influence. Waterbody crossing methods are not known at this time, however it is expected that dry crossing methods would be used for most of the flowing waters and some of the larger waterbodies would be crossed using the HDD construction method.

The greatest potential impacts of pipeline construction on surface waters would result from an increase in sediment loading to surface waters and an increase in internal sediment loading due to channel/floodplain instability as a result of a change in erosion/deposition patterns. The level of impact would depend on precipitation events, sediment loads, stream area/velocity, channel integrity, bed material, and the proposed construction method. The impacts of the Project on surface water would be avoided or minimized by the use of the measures contained in the Applicants' E&SCP and SPCC Plan. Algonquin would hydrostatically test the new pipeline segments in accordance with PHMSA pipeline safety regulations in 49 CFR 192 prior to placing the pipeline facilities into service. As discussed in this EA, we do not anticipate any long-term impacts on surface water sources as a result of the proposed Project crossings or hydrostatic testing activities. We expect the cumulative impacts on surface waters of the other projects listed in table 2.10-1 would be adequately minimized by the implementation of required erosion and stormwater control measures by the proponents of these projects.

The potential for cumulative effects on groundwater resources would be limited to areas that are affected by other projects within the same HUC 12 sub-watershed as Atlantic Bridge Project facilities. The Yorktown M&R station and 3.2 miles of the Stony Point Discharge Take-up and Relay pipeline segment would be in the Croton Watershed. The AIM Project crosses about 12.3 miles of the Croton Watershed and portions of the proposed ANE Project would also be located within the watershed. Groundwater impacts could include increased turbidity, reduced water levels, and contamination. For the Atlantic Bridge Project Algonquin, would sequence construction activities to minimize the amount and duration of open right-of-way and therefore the potential for construction related run-off and erosion within the watershed. Algonquin is also working with the NYCDEP to develop a SWPPP that addresses NYCDEP's requirements for constructing within a New York City watershed. Similar mitigation measures are in place for construction through the watershed on the AIM Project and would likely also be used on the ANE Project. Nearby water wells could also be damaged by construction. If a water supply well is damaged as a result of Project construction, Algonquin would ensure that a temporary source of water is provided until the damaged water well is restored to its preconstruction capacity and quality, a replacement water source is provided, or the landowner would be fairly compensated for damages. The impacts on groundwater would be avoided or minimized by the use of both standard and specialized construction techniques, including those specific in the Applicants' E&SCP and SWPPPs, therefore the Project is not expected to contribute to cumulative impacts on groundwater resources.

Construction of the Atlantic Bridge Project and other projects listed in table 2.10-1 that are within 0.25 mile of the Project could result in cumulative impacts on aquatic resources. Three of the waterbodies that would be crossed by the Project support fisheries of special concern, all of which are designated as trout spawning waters in New York. It is unclear how many of those streams could be effected by other projects listed in table 2.10-1, but given that the AIM and ANE Projects would include in water construction in some of the same HUC 12 sub-watersheds, there is a potential for cumulative aquatic resource impacts. Potential impacts on aquatic resources include sedimentation and turbidity, destruction of stream cover, introduction of water pollutants, interruption of fish migration and spawning, and entrainment of fish. The potential impacts of the AIM and ANE projects would be minimized through the implementation of the Applicants' E&SCP, SPCC Plan, and site-specific crossing plans as required by FERC and other agencies. The potential for cumulative impact would also be minimized due to the short duration of the proposed in-stream activities and the 1-year separation in time between the construction schedules of the Atlantic Bridge and the AIM and ANE Projects. If any of the other projects listed in table 2.10-1 would involve direct in-stream impacts on waterbodies, they would be required to obtain permits from the USACE and other appropriate federal and state agencies. If any of these projects has the potential for substantive aquatic impacts, these agencies would require the proponents of these projects to implement mitigation measures to minimize these impacts. Collectively, these measures would avoid significant and minimize cumulative impacts on aquatic resources.

2.10.3 Wetlands

There would be a temporary loss of some existing wetland features as a result of the construction and operation of the proposed Atlantic Project facilities and the other reasonably foreseeable projects in the States of New York and Connecticut as listed in table 2.10-1. No wetlands would be affected by the Project in Massachusetts. Construction of the Atlantic Bridge Project would result in about 11.0 acres of temporary wetland impacts (9.0 PEM and 2.0 PFO) but the operation of the Project would result in minimal (less than 0.1 acre) permanent wetland impacts.

Portions of the AIM Project within the same region of influence as the Atlantic Bridge Project will temporarily impact about 27 acres of wetlands. Of these, about 0.8 acre of PFO wetlands will be permanently converted to non-forested wetlands during operation of the project. As currently scoped, the pipeline facilities associated with the ANE Project that at least a portion of which would be within the region of influence of the Atlantic Bridge Project would impact about 81.1 acres of wetland. Algonquin would mitigate unavoidable construction-related impacts on wetlands associated with the Atlantic Bridge Project by implementing the wetland protection and restoration measures contained in its E&SCP and by complying with the conditions of the wetland permits that could be issued by the USACE, NYSDEC, and CTDEEP. Similar mitigation would be required for any unavoidable wetland impacts associated with the AIM and ANE projects and may be required of the other projects listed in table 2.10-1. Collectively, these measures would avoid significant and minimize cumulative impacts on wetland resources.

We received comments from the EPA during scoping regarding cumulative temporal impacts in relation to the development of compensatory mitigation. Although construction of the Atlantic Bridge Project along with the other projects in the area could result in the conversion or reduction in the amount of existing wetlands in the vicinity, the creation of new wetlands and restoration or enhancement of existing wetlands as required by the USACE would mitigate for these impacts on wetland resources and minimize any cumulative wetland effects. Compensatory mitigation, including cumulative projects, is determined through the USACE and state level wetland permitting process and specific mitigation requirements, including compensatory mitigation, would be discussed in more detail in these permits.

2.10.4 Vegetation, Wildlife and Habitat, and Protected Species

Construction of the Project would temporarily impact about 74.5 acres of open upland vegetation and 11.4 acres of forested upland vegetation. The Project would result in the permanent impact on about 8.6 acres of vegetation (6.4 acres of open upland, 2.1 acres of forested upland, and less than 0.1 acre of forested wetland), primarily open land associated with the operation of aboveground facilities. Right-of-way clearing and grading and other construction activities associated with the Project along with some of the other projects listed in table 2.10-1 would result in the removal of vegetation; alteration of wildlife habitat; displacement of wildlife; and other potential secondary effects such as increased population stress, predation, and the establishment of invasive species. These effects would be greatest where the other projects are within 0.25 mile of the Atlantic Bridge Project, are constructed within the same timeframe as the proposed Atlantic Bridge Project, and where the recovery time of the vegetation/habitat takes longer to restore to its preconstruction state (e.g., forested areas).

The AIM and ANE Projects, for example, would include pipeline facilities within 0.25 mile of the Atlantic Bridge Project and in some cases overlapping construction workspaces. As noted in table 2.10-1, other projects are also located within the same region of influence, however, exact acres of vegetation disturbance are unknown for these projects. The pipeline and aboveground facilities associated with the AIM Project that are within the region of influence for the Atlantic Bridge Project will impact about 76 acres of forest land. As currently scoped, the pipeline facilities associated with the ANE Project that at least a portion of which would be within the region of influence of the Atlantic Bridge Project would impact about 263 acres of forested land. These effects would be separated in time by about a year, but the long-term effects of tree clearing and associated change in habitats would persist for decades.

Algonquin proposes to locate the majority of the Atlantic Bridge pipeline facilities within or adjacent to existing previously disturbed rights-of-way, which would minimize the area of previously undisturbed vegetation that would be affected, and reduce the additional cumulative effects on vegetation communities and wildlife habitats, including migratory birds. The potential for habitat fragmentation resulting from the Project would be reduced because the majority of the disturbed areas would be allowed to return to pre-existing conditions following construction. The geographic extent and duration of disturbances caused by construction of the Project would be minimal and further reduced by implementation of the Applicants' E&SCP and other construction, restoration, and mitigation plans. Based on our understanding of the ANE Project, the majority of the proposed pipeline facilities would also be within or adjacent to existing rights-of-way and most disturbed areas would be allowed to return to pre-existing conditions, which would minimize impacts. Based on the above information we find that these measures would minimize cumulative impacts on vegetation and wildlife resources.

A total of seven federally listed species, under the jurisdiction of the FWS, are known to potentially occur in the Atlantic Bridge Project area. Through consultation with the state agencies, two state-listed threatened, endangered, or special concern species (that are not also federally listed) were identified as potentially occurring in the area near the Connecticut and Massachusetts portions of the Project. No state-listed species were identified as a concern for the Project in New York. The Atlantic Bridge Project would have no effect on four of these species. We have concluded that the other five species may be affected, but would not be adversely affected by the Project. These include the federally listed Indiana bat, northern long-eared bat, and bog turtle. We determined that the AIM Project may affect but was not likely to adversely affect these same three federally listed species. Given its location, the ANE Project may also affect these species. Cumulative impacts could result if portions of the other reasonably foreseeable future projects within 0.25 mile of the Atlantic Bridge Project affect these same species or their habitats. The Applicants would adhere to conservation measures to avoid, minimize, and mitigate impacts on any listed species affected by the Project. Similar mitigation was required for the AIM Project and it is likely that similar conservation measures would be required by the jurisdictional agencies as well for the ANE Project and the other projects listed in table 2.10-1. These conservation measures would reduce impacts such that the projects cumulatively would not adversely affect special status species or jeopardize the continued existence of any species or cause adverse modification of critical habitat.

2.10.5 Land Use and Visual Resources

Land Use

The Atlantic Bridge Project in combination with other foreseeable future projects listed in table 2.10-1 would result in temporary and permanent changes on current land uses. Construction of the Atlantic Bridge Project would impact a total of about 215.7 acres. The primary land uses types impacted during construction would be industrial, open land, and residential land. The majority of the land use impacts associated with the Atlantic Bridge Project would be temporary, and most land uses would be allowed to revert to prior uses following construction. However, about 8.9 acres of new land outside of Algonquin's existing right-of-way would be permanently encumbered by the operation of the Project, primarily for the new Weymouth Compressor Station. The primary land use types that would be permanently encumbered would be open land (68 percent), forest land (26 percent), industrial/commercial land (5 percent), and residential land (less than 1 percent).

Construction of the AIM Project will impact about 240 acres of land within the region of influence for the Atlantic Bridge Project. Of these 240 acres, about 13.6 acres will occur outside of Algonquin's existing permanent right-of-way and will be permanently impacted by operation of the AIM Project. The ANE Project would affect about 1,863 acres of land during construction and require about

494 acres of new permanent easement outside of Algonquin's current operating footprint. However, the overwhelming majority of this land (affected by the ANE project) would be outside of the area of potential cumulative impact (i.e., the region of influence) for the Atlantic Bridge Project, and thus would not contribute to cumulative impacts. Additionally, like the Atlantic Bridge Project, most of the land use impacts associated with the AIM and ANE projects would be temporary and most land would revert to its prior uses following construction. If any of the other utility and commercial/residential development projects listed in table 2.10-1 would also affect similar land uses, then some additional cumulative impacts would result.

Recreation and Special Interest Areas

A number of recreational or areas of special interest would be affected by the Atlantic Bridge Project and cumulative impacts on recreational or special interest areas could result if the other projects listed in table 2.10-1 located within 0.25 mile of the Atlantic Bridge Project affect the same areas at the same time. The AIM and ANE Projects would include facilities within the region of influence of the Atlantic Bridge Project and some of these facilities would be in the same location as or adjacent to the Atlantic Bridge Project facilities. Two recreation areas (Granite Knolls Park West and King's Cove parcel) would be impacted by both the Atlantic Bridge Project and either the AIM Project or ANE Project. None of the other projects listed in table 2.10-1 appear to cross the same recreation areas as those affected by the Atlantic Bridge Project.

The Atlantic Bridge Project pipeline would cross the Granite Knolls Park property along Algonquin's existing permanent right-of-way. Construction and operation of the Atlantic Bridge Project would not cross any trails within the park, would not interfere with existing uses of the park, and would not require any new permanent right-of-way within the park. However, construction would temporarily impact about 1.4 acres of open land and about 0.1 acre of forested land within Granite Knolls Park, adding to the impact of the AIM Project on the park. Algonquin would implement measures in the Project E&SCP to minimize disturbance to Granite Knolls Park. Following construction of the Atlantic Bridge Project, disturbed areas would be revegetated and allowed to revert to their former uses. Although there would be a long-term impacts associated with tree clearing, the effect would be small due to Algonquin's use of its existing right-of-way and would not contribute substantially to cumulative impacts on Granite Knolls Park.

The development and operation of the Weymouth Compressor Station for the Atlantic Bridge Project would not directly impact the use of the Kings Cove parcel by the public. Given the smaller scope of the ANE Project at the Weymouth Compressor Station site, we expect the same would be true for the ANE Project (i.e., it would not impact the public's use of the Kings Cove parcel). However, construction and operation activities associated with both projects, particularly construction, would result in noise, dust, and visual impacts that could impact the quality of the recreational experience on the parcel. The proposed construction schedules for the Atlantic Bridge and ANE Projects would not overlap, but the noise, visual, dust and other construction impacts experienced at the Kings Cove parcel could be prolonged if both projects are approved. Algonquin would implement measures in the Project E&SCP to minimize disturbance to the Kings Cove parcel. Algonquin would also coordinate with the Town of Weymouth to address specific issues related to construction and operation of the proposed facility. We anticipate that Algonquin would propose to implement similar measures for the ANE Project. As such, we find that cumulative impact on the Kings Cove parcel would be sufficiently minimized.

Visual Resources

The visual character of the existing landscape is defined by historic and current land uses such as recreation, conservation, and development. The visual qualities of the landscape are further influenced by existing linear installations such as highways, railroads, pipelines, and electrical transmission and distribution lines. Temporary visual impacts would be evident during Project construction due to clearing, grading, and construction activities. The majority of aboveground facilities associated with the Atlantic Bridge Project would consist of modifications to existing structures. The modifications to the existing compressor stations and M&R Stations would be conducted within or adjacent to the Applicants' existing station buildings and within the footprint of an existing commercial/industrial property. The Atlantic Bridge Project would add two new aboveground facilities; the Weymouth Compressor Station and the Salem Pike M&R Station. Construction of the aboveground facilities would not result in significant visual impacts on the surrounding areas given the proposed site-specific mitigation measures such as maintaining vegetative buffers and designing the Weymouth Compressor Station to visually blend in with the existing MWRA building. Modifications to the proposed Weymouth Compressor Station under the ANE Project would be constructed in a building extension on the east side of the proposed Weymouth Compressor Station. Appendix G includes a visual simulation of the Weymouth Compressor Station including the components of the Atlantic Bridge and ANE Projects. As shown in the visual simulation, the extension would also be constructed to visually blend with the MWRA building, therefore there would be no permanent cumulative visual impact associated with the ANE Project at the proposed Weymouth Compressor Station site.

Of the projects listed in table 2.10-1, the proposed transportation and commercial/industrial projects would have the greatest impact on visual resources in the Project area. The Towantic Energy Center would add a new visual impact on the area near the Oxford Compressor Station; however, the Atlantic Bridge Project would not make any modifications to the visual appearance of the Oxford Compressor Station. The majority of the AIM Project and the ANE Project would be buried and all but two of the known aboveground facilities associated with the ANE Project would be located at existing or proposed compressor stations. The Atlantic Bridge Project facilities would add incrementally to this impact but the overall contribution would be relatively minor given that the majority of the Atlantic Bridge Project facilities would be buried (i.e., the pipeline) or adjacent to existing facilities of similar appearance (i.e., the aboveground facilities). Additionally, the majority of areas that would be disturbed by the Atlantic Bridge Project would be revegetated as appropriate after construction, thereby limiting permanent visual impacts to a small number of areas where previously existing forest would not be allowed to reestablish within the new permanent right-of-way due to pipeline safety and operational requirements. Therefore, we find that cumulative visual impacts would be adequately minimized to the extent practicable.

2.10.6 Socioeconomics

Present and reasonably foreseeable future projects and activities could cumulatively impact socioeconomic conditions in the Atlantic Bridge Project area. As described below, employment, housing, infrastructure, and public services would experience both beneficial and negative impacts.

Economy and Employment

The projects considered in this section would have cumulative effects on employment during construction if more than one project is built at the same time. It is estimated that the Atlantic Bridge Project would temporarily employ up to 752 workers during the peak construction months, of which a peak of about 152 workers would be local hires. These local hires would include surveyors, welders, equipment operators, and general laborers. The counties affected by the Project have a combined civilian labor force of about 1,711,145 people and an average unemployment rate of 4.5 percent. This suggests that the local labor force could meet much of the employment needs required for construction of these projects, although it is unknown whether a sufficient number of local unemployed persons have the necessary skills to work on these projects. If several of these projects are built at the same time, the demand for workers could exceed the local supply of appropriately skilled labor.

The schedules for some of the smaller construction projects listed in table 2.10-1 may overlap with the construction schedule for the Atlantic Bridge Project; however, cumulative impacts are not anticipated given the size and smaller construction workforce likely to be required for these projects. The schedule for the AIM Project would be a year prior to the construction of the Atlantic Bridge Project. Similarly, the schedule for construction of the ANE Project, if approved, would be a year after the Atlantic Bridge Project facilities would be placed in service. As such, none of the projects listed in table 2.10-1 are expected to compound any potential shortage of appropriately skilled labor. However, because portions of these projects are in the same area as the Atlantic Bridge Project they may collectively extend the term of employment for many temporary workers. None of the pipeline projects individually or in combination would have a measurable long-term impact on the economy or employment. Three full-time employees are anticipated to be hired to operate the AIM facilities and three permanent employees would be hired to operate the proposed Atlantic Bridge Project facilities, and it is likely that a similar number of new permanent employees would be hired for the ANE Project. The long-term employment opportunities associated with the other projects in table 2.10-1 is unknown but they are likely to provide a moderate amount of other permanent employment opportunities.

In addition to impacts on local employment, the AIM, Atlantic Bridge, and ANE projects would provide an increase in tax revenue for New York, Connecticut, and Massachusetts, and other local economies through the payment of payroll tax, sales tax, property tax, and other taxes and fees. As discussed in section 2.5.6, the estimated payroll for the Atlantic Bridge Project would be about $75,415,585 during the construction phase and the annual property taxes attributable to the Project are anticipated to be about $4,665,447 in New York, $6,429,507 in Connecticut, and $1,886,885 in Massachusetts, which includes construction of the new Weymouth Compressor Station. The estimated payroll during the construction phase of the AIM Project is $264,316,027. The AIM Project will also provide a total of $29,170,000 in annual property taxes. Given the larger size and later start date for the ANE Project (and the likelihood of some inflation over the time period separating the two projects), the estimated construction payroll for the ANE Project may be larger. The annual property taxes attributable to the ANE Project are also likely to be similar to the AIM Project. A net increase in payroll and tax revenues is also likely to occur from the other projects listed in table 2.10-1 as well. Cumulatively, these projects would have both short- and long-term beneficial impacts on state, county, and local economies.

Public Services

The cumulative impact of the Atlantic Bridge Project and the other projects listed in table 2.10-1 on infrastructure and public services would depend on the number of projects under construction at one time. The small incremental demands of several projects occurring at the same time could become difficult for police, fire, and emergency service personnel to address. This problem could be long-term, lasting from construction of the AIM Project through construction of the ANE Project and could be mitigated by the various project sponsors providing their own personnel to augment the local capability or by providing additional funds or training for local personnel. Because no long-term impacts on infrastructure and public services are anticipated due to the Atlantic Bridge Project, we find no long-term cumulative effects would occur.

Traffic and Transportation

Construction of the proposed Project would have a temporary impact on road traffic in some areas and could contribute to cumulative traffic, parking, and transit impacts if other projects are scheduled to take place at the same time and in the same area as the Atlantic Bridge Project. Traffic impacts associated with the Atlantic Bridge Project are expected along the Southeast Discharge Take-up and Relay segment in Connecticut and near the Weymouth Compressor Station in Massachusetts. However, these traffic impacts would be limited because the proposed railroad, highways, and major road crossings would be accomplished by drilling, boring, or other methods that do not affect the road or rail surface.

The addition of traffic associated with construction personnel commuting to and from the Project construction work areas could also contribute to cumulative regional traffic congestion. However, any contribution of the Atlantic Bridge Project to cumulative traffic impacts would be temporary and short term. Workers associated with the Atlantic Bridge Project would generally commute to and from the pipeline rights-of-way, pipe and contractor ware yards, or aboveground facility sites during off-peak traffic hours 6 days a week (e.g., before 7:00 a.m. and after 6:00 p.m.). Depending on the completion date for the Fore River Bridge Replacement Project, construction of the Atlantic Bridge Project may overlap with the final stages of construction for the bridge. If this were to occur, there could be a temporary cumulative impact on traffic associated with commuting workers in the vicinity of the Weymouth Compressor Station. The AIM Project and ANE Project would not contribute to the traffic impacts of the Atlantic Bridge Project because they would be constructed a year prior to and a year after the Atlantic Bridge Project, however if the ANE Project were to be approved and constructed as currently proposed it would prolong the traffic related impacts at the Weymouth Compressor Station. It is unlikely that other projects listed in table 2.10.1 would have similar commuting schedules or reach peak traffic conditions simultaneously.

Other factors would also minimize the potential for cumulative traffic impacts due to the Atlantic Bridge Project. Algonquin stated that construction work within roadways and specific crossings would be scheduled to avoid commuter traffic and schedules for school buses and local city transit buses to the greatest extent practical. To minimize traffic delays at open-cut road crossings, Algonquin would establish detours before cutting these roads. If no reasonable detours were feasible, at least one traffic lane of the road would be left open, except for brief periods when road closure would be required to lay the pipeline. Some of the road work would also be conducted during night time hours when traffic volumes are lower. Impacts associated with in-street construction would be minimized through implementation of the Algonquin's site-specific Traffic Management Plans. Appropriate traffic management and signage would be set up and necessary safety measures would be developed in compliance with applicable permits for work in the public roadway. Therefore, we find that cumulative impacts on traffic and transportation would be adequately minimized to the extent practicable.

Environmental Justice

As discussed in section 2.5.7 the primary issues associated with Environmental Justice Communities for the Project are air quality, noise, and visual impacts. For more detailed information specific to cumulative impacts associated with these resource topics refer to the appropriate subsection within this cumulative impact discussion. As noted in these sections, visual resource impacts would be minimal and cumulative air quality and noise impacts (including existing infrastructure and the ANE Project) would be below established thresholds to protect human health and welfare. Therefore, there is no significant cumulative impact on Environmental Justice Communities.

Overall, the Atlantic Bridge Project would have short-term, but positive effects on the economy in the Project area, such as increased employment thus lowering local unemployment rates and increased sales and tax revenues. Other major projects in the area would likely have similar impacts on the economy. Thus, short-term cumulative effects on socioeconomics in the Project area are possible.

2.10.7 Cultural Resources

The region of include for cultural resources is 0.25 mile, however, cumulative impacts on cultural resources would only occur if other projects were to affect the same historic properties or archaeological sites as the Atlantic Bridge Project. During surveys, a total of two historic properties either listed of potentially eligible for listing were identified; the Taconic Parkway in New York and the Procter and Gamble Manufacturing building in Massachusetts. As discuss in section 2.6 above there would be no adverse effect on either of these resources. The Applicants have developed Project-specific plans to address unanticipated discoveries of cultural resources and human remains in the event they are discovered during construction. Therefore, no adverse impacts are anticipated on cultural resources from the Project.

Projects located within the same region of influence for cultural resources are included in table 2.10-1. These projects would be required by federal and/or state regulations to avoid or minimize additional direct impacts on cultural resources. Where direct impacts on cultural resources are unavoidable, mitigation (e.g., recovery and curation of materials) would occur before construction. Therefore, the proposed Atlantic Bridge Project may incrementally add to the cumulative effects of other projects that may occur at the same time. However, this incremental increase would not be significant.

2.10.8 Air Quality and Noise

Construction of most of the reasonably foreseeable future projects and activities listed in table 2.10-1 would involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise. Construction and operation of the Atlantic Bridge Project would contribute cumulatively to air quality impacts. The combined impact of multiple construction projects occurring in the same airshed and timeframe as the Atlantic Bridge Project could temporarily add to the ongoing air impacts in the Project area. The entire Atlantic Bridge Project area is designated attainment or unclassifiable for SO_2, NO_2, PM_{10}, and lead. Certain counties within the Project area are designated as nonattainment and/or maintenance for CO, ozone, and $PM_{2.5}$ as described in section 2.7.1. Construction activities for the proposed Project facilities and pipeline replacement activities would result in temporary increases in emissions of some pollutants due to the use of equipment powered by diesel or gasoline engines. Construction activities would also result in the temporary generation of fugitive dust due to land clearing, ground excavation, and cut and fill operations. The construction equipment emissions would result in short-term fugitive emissions that would be highly localized, temporary, and intermittent. Construction of many of the projects listed in table 2.10-1 would not occur at the same time as construction of the Atlantic Bridge Project facilities or are located sufficiently far away as to not result in cumulative air impacts.

Construction of new and modifications to the compressor stations and some of the M&R stations would be sources of air emissions during operation of the Project. Non-combustion related emissions would also occur from the pipeline and at the proposed M&R stations during normal operation. The air modeling presented in section 2.7.4 for each of the compressor stations demonstrates that impacts of the stations along with the existing air quality would not be significant. With the mitigation measures proposed by the Applicants, the construction and operation of the proposed Project facilities are not expected to have a significant impact on air quality in the Project area or in the region itself. The potential emissions associated with the operation of the majority of other projects in table 2.10-1 are unknown, but because the projects listed in the table are located over a large area; have varying construction schedules; and must adhere to federal, state, and local regulations for the protection of ambient air quality, significant cumulative impacts on air quality are not anticipated.

The two projects that are likely to have a greater impact are the AIM Project and the ANE Project. The AIM Project included modifications to six existing compressor stations to add 81,620 hp to the pipeline system. The air quality analysis conducted for the Atlantic Bridge Project included the AIM Project compressor station modifications that occur at the same stations, thereby completing a cumulative analysis for the two projects. For the Weymouth Compressor Station the modeling conducted for Atlantic Bridge included large emission sources near the compressor station that were identified by the MassDEP as potentially significantly impacting air quality near the proposed compressor station.

Algonquin has provided preliminary compression amounts that would be required for the Weymouth and Chaplin Compressor Stations as part of the ANE Project. Modeling based on the current designs has been included as part of the air quality modeling for Atlantic Bridge, thereby completing cumulative air quality modeling for the two projects. Both projects would be subject to federal and state regulations designed to protect ambient air quality (thereby protecting public health and welfare) and prevent significant cumulative impacts. Prior to issuance of air quality permits, the authorities must make a determination that the cumulative effect of both projects would not cause or contribute to an exceedance of the AAQS, that the appropriate level of control of new air emissions would be installed, and that the compressor stations would be in compliance with all applicable federal and state air quality regulations and permit conditions. Additionally, the ANE Project may result in some air quality and climate benefits as a portion of the additional natural gas that would be delivered to the region as part of the ANE Project would be used to off-set the use of oil-fired electrical generating units during time periods when cleaner-burning natural gas-fired electrical generating units are not able to procure sufficient fuel to meet electrical demands. Based on the results of the air quality modeling (section 2.7) and the regulatory requirements stated above we find that there would not be any significant cumulative impacts on regional air quality.

The Atlantic Bridge Project could contribute to cumulative noise impacts. The analysis in section 2.8 quantifies future noise levels, which include Project related noise and ambient noise levels. Noise impacts were analyzed by looking at NSAs nearest to the three proposed existing compressor station modifications, one new compressor station, the six existing M&R and regulator stations, the one new M&R station, and HDD sites. This analysis included assessing current background noise levels and estimating future noise levels based upon the proposed equipment to be operated. Noise impacts during construction would be highly localized and attenuate quickly as the distance from the noise source increases. The one exception to this would be certain HDD activities at the Taconic Parkway crossing. Algonquin performed ambient noise surveys at the HDD site, and the assessments indicate that mitigation would be necessary at all proposed HDD entrance locations to reduce the predicted noise generated by the HDD operations below the FERC noise requirement (i.e., L_{dn} of 55 dBA) at the closest NSAs. The Atlantic Bridge Project, together with the other projects listed in table 2.10-1, would all produce noise during construction; however, this noise would be temporary in the vicinity of each of the proposed projects.

Cumulative noise impacts are possible in the areas surrounding the new and existing compressor stations that would be impacted by the addition of compression associated with both the AIM Project and ANE Project (assuming the ANE Project is approved and constructed). These include the Stony Point Compressor Station in Rockland County, New York; Cromwell Compressor Station in Middlesex County, Connecticut; Chaplin Compressor Station in Windham County, Connecticut; and the Weymouth Compressor Station in Norfolk County, Massachusetts. The Applicants' noise assessment for the Atlantic Bridge Project added Project related noise impacts to the existing noise levels, including background noise and operational noise associated with AIM Project facilities. We reviewed the Applicants' noise assessment for the Atlantic Bridge Project and found that the proposed facilities could increase the existing noise levels at some NSAs between 0.1 and 2.5 dBA. Generally, these increases would be imperceptible to the human ear. Additionally, the mitigation measures discussed in the assessment and committed to by the Applicants would ensure that the FERC's noise criterion of 55 dBA would not be exceeded. The Applicants would follow our recommendations outlined in section 4.0 of this EA. Based on the analyses conducted, mitigation measures proposed, and our additional recommendations, we conclude that the Project would not result in significant noise impacts on residents, and the surrounding communities during construction and operation of the Atlantic Bridge Project.

We anticipate that the ANE Project would result in noise impacts similar to the Atlantic Bridge Project. As part of its evaluation of the project, we would conduct a noise assessment of the ANE Project facilities. It is possible that this analysis could identify the potential for the ANE Project to increase the noise levels at some NSAs near compressor stations above what is predicted if only the Atlantic Bridge Project is constructed. However, Algonquin would be required, like it was for the AIM Project and Atlantic Bridge Project, to propose and apply appropriate mitigation at the Chaplin, Oxford, or Weymouth Compressor Station to ensure that the total noise from the compressor stations at NSAs from the ANE Project stays below the 55dBA. For these reasons, we do not anticipate significant noise impacts associated with construction and operation of the Atlantic Bridge Project, when considered together with the other projects.

2.10.9 Climate Change

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

The Intergovernmental Panel on Climate Change (IPCC) is the leading international, multi-governmental scientific body for the assessment of climate change. The United States is a member of the IPCC and participates in the IPCC working groups to develop reports. The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP). Thirteen federal departments and agencies[30] participate in the USGCRP, which began as a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990.

The IPCC and USGCRP have recognized that:

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

In May 2014, the USGCRP issued a report, *Climate Change Impacts in the United States*, summarizing the impacts that climate change has already had on the United States and what projected impacts climate change may have in the future (USGCRP, 2014). The report includes a breakdown of

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[30] The following departments comprise the USGCRP: EPA, DOE, U.S. Department of Commerce, U.S. Department of Defense, USDA, U.S. Department of the Interior, U.S. Department of State, PHMSA, Department of Health and Human Services, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and Agency for International Development.

overall impacts by resource and impacts described for various regions of the United States. Although climate change is a global concern, for this cumulative analysis, we will focus on the potential cumulative impacts of climate change in the Atlantic Bridge Project area.

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

- average temperatures have risen about 2 °F between 1895 and 2011 and are projected to increase another 1 to 8 °F over the next several decades with more frequent days above 90 °F;
- areas that currently experience ozone pollution problems are projected to experience an increase in the number of days that fail to meet the federal air quality standards;
- an increase in health risks and costs for vulnerable populations due to projected additional heat stress and poor air quality;
- precipitation has increased by about 5 inches and winter precipitation is projected to increase 5 to 20 percent by the end of the century;
- extreme/heavy precipitation events have increased more than 70 percent between 1958 and 2010 and are projected to continue to increase;
- sea levels have risen about 1 foot since 1900 and are projected to continue increasing 1 to 4 feet by 2100 stressing infrastructure (e.g. communications, energy, transportation, water and wastewater);
- severe flooding due to sea-level rise and heavy downpours is likely to occur more frequently;
- crop damage from intense precipitation events, delays in crop plantings and harvest, and heat stress negatively affect crop yields;
- invasive weeds are projected to become more aggressive due to their benefit of higher CO_2 levels;
- a change in range, elevation, and intra-annual life cycle events of vegetation and wildlife species; and
- an increase in carrier habitat and human exposure to vector-borne diseases (e.g. Lyme disease or West Nile).

The GHG emissions associated with construction and operation of the Atlantic Bridge Project are discussed in more detail in section 2.7.2.1. Several commenters requested that a more in-depth cumulative impact analysis be prepared for GHG emissions, including requesting the prediction of future climate change impacts. On December 18, 2014, the CEQ released a revised draft GHG emission guidance memo. As recommended in this new guidance, to the extent practicable, FERC staff incorporated additional guidance provided by this memo into the GHG analysis completed for the Atlantic Bridge Project. As such, FERC staff has presented the GHG emissions associated with the Project, potential impacts of GHG emissions, and mitigation proposed by the Applicants to minimize GHG emissions associated with the Project. Construction of the AIM Project will result in the generation of about 40,096 tons (36,374 metric tons) of GHG emissions, as measured in CO_2e. Operation of the modified compressor stations and non-routine and fugitive emissions from M&R stations and pipelines associated with the AIM Project will result in a maximum of 1,038,096 tpy (941,745 metric tons) of GHG emissions, as measured in CO_2e, if operated at full capacity (i.e., 8,760 hours per year). Exact amounts of GHG emissions as part of the ANE Project are not known at this time, however as currently scoped the operation of the modified Chaplin Compressor Station and Weymouth Compressor Station would result in the generation of about 101,841 tpy of GHG emissions, as measured in CO_2e. The GHG emissions from the other projects listed in table 2.10-1 are unknown. However, based on the relative size of the ANE Project and the number of new or existing compressor stations associated with it, it alone would likely result in more GHG emissions than the Atlantic Bridge Project. Emissions of GHGs from the proposed Project and other regional projects would not have any direct impacts on the environment in the Project area. Currently, there is no standard methodology to determine how a project's relatively small incremental contribution to GHGs would translate into physical effects on the global environment. Additionally, natural gas emits less CO_2 compared to other fuel sources (e.g., fuel oil or coal). As discussed in section 2.1.1 we received comments regarding the potential impacts that climate change could have on the Project, particularly as a result of sea level rise and storm surge. The Project facilities have been designed to minimize the risk of sea level rise and storm surges on the Weymouth Compressor Station.

The CTDEEP issued its Comprehensive Energy Strategy that includes specific recommendations for increasing the use of natural gas in Connecticut (Comprehensive Energy Strategy, 2013). In Massachusetts, the MAEEA produced a strategic plan for 2013 to 2015 that includes reliable, clean, and cost-effective energy in their vision statement, and recommends "initiatives to increase availability of low-cost natural gas, like getting more natural gas into distribution systems and more pipeline capacity across the Commonwealth…." (MAEEA, 2013). In December 2013, the governors of the six New England states agreed to an energy initiative designed to bring affordable, cleaner, and more reliable power to homes and businesses across the northeast. This would be accomplished through cooperative investments in energy efficiency, renewable generation, natural gas pipelines, and electric transmission (New England Governors, 2013). Also, the USGCRP's Report states that additional investment into power generating infrastructure may be necessary to offset increasing demand associated with increased temperatures.

As discussed above, we have disclosed the potential climate change impacts associated with the Project, the impacts of climate change on the Project, and provided a comparison of the Project against state and regional climate change goals. As emissions have been minimized and the Project would be consistent with state plans, we find no significant impacts associated with climate change.

2.10.10 Reliability and Safety

Impact on reliability and public safety would be mitigated through the use of PHMSA Minimal Federal Safety Standards in Title 49 CFR 192, which are intended to protect the public and to prevent natural gas facility accidents and failures. In additional, the Applicants' construction contractors would be required to comply with the Occupational Safety and Health Administration and Heath Regulations for Construction in Title 29 CFR 1926. Other FERC regulated projects would also be held to the same standards as the Applicants for constructing and operating the Atlantic Bridge Project facilities.

As discussed in section 2.9.1, we received several comments about potential for cumulative safety risks associated with the proximity of the Weymouth Compressor Station to the existing industrial infrastructure in the area. We concluded in that section that the proposed Project would increase the risk to public safety slightly, but this effect would not be significant, and it would not result in a cumulative operational or public safety hazard.

2.10.11 Conclusion

Recently completed, ongoing, and planned projects in the Atlantic Bridge Project area were identified for inclusion in this cumulative impact analysis (refer to table 2.10-1). The majority of cumulative impacts would be temporary and minor when considered in combination with past, present, and reasonably foreseeable activities. However, some long-term cumulative impacts could occur on upland vegetation and associated wildlife habitats. Some long-term cumulative benefits to the community would be realized from the increased tax revenues. Short-term cumulative benefits would also be realized through jobs and wages and purchases of goods and materials. There is also the potential that the Project would contribute to a cumulative improvement in regional air quality if a portion of the natural gas associated with the Atlantic Bridge Project displaces the use of other more polluting fossil fuels. In summary, due to the implementation of specialized construction techniques, the relatively short construction timeframe in any one location, and carefully developed resource protection and mitigation plans designed to minimize and control environmental impacts for the Atlantic Bridge Project as a whole, we conclude that cumulative effects resulting from the construction and operation of the Atlantic Bridge Project and other past, present, and future projects in the regions of influence of the Atlantic Bridge Project would be minor.

3.0 ALTERNATIVES

As required by NEPA, FERC policy, and Clean Water Act 404(b)(1) Alternative Analysis, we evaluated alternatives to the Project to determine whether an alternative would be environmentally preferable and/or technically and economically feasible to the proposed action. We evaluated the no action alternative, system alternatives, route alternatives and variations, and aboveground facility alternatives. We compared each alternative to the Project using three key criteria.

1. Does the alternative have the ability to meet the objectives of the proposed action?
2. Is the alternative technically and economically feasible and practical?
3. Does the alternative offer a significant environmental advantage over the Project?

With regard to the first criterion and for the purposes of NEPA, the Applicants' stated objectives for the Project are to eliminate capacity constraints on existing pipeline systems in New York State and New England, provide access to the growing supply areas in the Northeast region, and provide additional firm pipeline capacity needed to deliver natural gas supplies to meet the supply and load growth requirements in the Northeast market area. The Project would create additional capacity between a receipt point in Mahwah, New Jersey and the Project shippers' delivery points primarily in Massachusetts, Maine, and at the U.S.–Canadian border. The Project would provide additional capacity on the Algonquin system and facilitate south-to-north flow on the Maritimes system to provide additional gas supply to New England and the Maritime provinces of Canada. The Project would increase Algonquin's mainline capacity by an additional maximum 132,705 Dth/d.

It is important to note that not all conceivable alternatives are technically feasible or practical. Some alternatives may be incapable of being implemented due to limits on existing technologies, constraints of system capacities, or logistical considerations, while others may be impractical because sites are unavailable or cannot be developed for the proposed use. Additionally, it is necessary to recognize the environmental advantages and disadvantages of the proposed action in order to focus the analysis on reasonable alternatives with the potential to provide a significant environmental advantage over the Project. Some alternatives may reduce impacts on resources that are not relevant to the analysis or do not provide a significant environmental advantage over the proposed action. Other alternatives may reduce impacts on one resource but increase impacts on others.

Our analysis of each alternative as described in the subsections below is based on information provided by the Applicants and reviewed by FERC staff; public comments; our review of aerial photographs, USGS topographic maps, and other publicly available information; input from cooperating and other agencies; and our site visits of the Project area. Unless otherwise noted, we used the same desktop sources of information to standardize comparisons between the Project and each alternative. As a result, some of the information presented in this section relative to the Project may differ from information presented in section 2.0, which is based on Project-specific data derived from field surveys and engineered drawings.

The Applicants participated in our pre-filing process, which facilitates early identification of issues, and alternatives that could avoid or minimize impacts. During this process, we identified a number of alternatives and design modifications that could address stakeholder concerns and/or avoid or minimize environmental impacts. Many of these changes and modification were adopted by the Applicants and made part of the Project when the Applicants filed their FERC application. The changes and modifications that Algonquin adopted are described in section 1.5.3, and are evaluated as part of the proposed facilities in this EA. Other alternatives and modifications considered in our analysis are presented in the following subsections. Each of these alternatives was considered until it was clear that the alternative was not reasonable or would result in greater environmental impacts that could not be readily mitigated.

3.1 NO-ACTION OR POSTPONED ACTION ALTERNATIVE

The Commission has two courses of action in processing applications under section 7 of the NGA: 1) deny the requesting action (the no-action alternative), or 2) grant a Certificate, with or without conditions. Under the no-action alternative, the short- and long-term environmental impacts described in this EA would not occur, but the objectives of the Project would not be met. The Project would meet the supply and load growth requirements by adding additional firm pipeline capacity between a receipt point in Mahwah, New Jersey and Project shippers' delivery points primarily in Massachusetts, Maine, and at the U.S.–Canadian border, eliminating capacity constraints on existing pipeline systems in New York State and New England, increasing the capacity of Algonquin's mainline system by up to 132,705 Dth/d, and facilitating south-to-north flow on the Maritimes system.

If the Applicants' proposed facilities are not constructed, the Project shippers would presumably need to obtain an equivalent supply of natural gas from new or existing pipeline systems. In response, the Applicants or another natural gas transmission company would likely develop a new project or projects to provide the volume of natural gas contracted through the Project's binding precedent agreements with the Project shippers. As more fully evaluated below, construction of new pipelines or other natural gas infrastructure would result in environmental impacts equal to or greater than those of the Project, and therefore would not be preferable to the proposed Project.

The Commission received numerous comments suggesting that electricity generated from renewable energy sources could eliminate the need for the Project and that the use of these energy sources as well as gains realized from increased energy efficiency and conservation should be considered as alternatives to the Project. The generation of electricity from renewable energy sources is not a reasonable alternative since it would not meet the Project purpose of supplying customers with the additional natural gas they need. Authorizations related to how the northeast will meet demands for electricity are not part of the application before the Commission and their consideration is outside the scope of this EA. Therefore, the generation of electricity from renewable or other energy sources (e.g., fuel oil, nuclear, etc.) or the gains realized from increased energy efficiency and conservation are not considered or evaluated further in this analysis.

3.2 SYSTEM ALTERNATIVES

System alternatives would utilize existing, modified, or proposed natural gas pipeline systems to meet the objectives of the Project. Implementation of a system alternative would make it unnecessary to construct all or part of the Project, although modifications or additions to existing or proposed systems could be required. These modifications or additions would result in environmental impacts that could be less than, similar to, or greater than those associated with construction and operation of the Project. The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with construction and operation of the Project could be avoided or reduced by using another pipeline system, while still meeting the objectives of the proposed action.

A viable system alternative to the Project would have to provide the pipeline capacity necessary to transport up to 132,705 Dth/d of natural gas at the contracted volumes and to the delivery points required by the precedent agreements signed by the Applicants and the Project shippers, in addition to that system's current capacities. A viable system alternative additionally would need to eliminate capacity constraints on existing pipeline systems in New York State and New England, and provide access to the growing supply areas in the Northeast region. A viable system alternative would also need to provide these services within a timeframe reasonably similar to the Project.

Our analysis of system alternatives includes an examination of existing and proposed natural gas transportation systems that currently or eventually would serve the markets targeted by the Project, and considers whether those systems could meet the Project's objectives while providing an environmental advantage over the proposed action. A brief assessment of each of the existing and proposed systems is provided in the subsections below.

3.2.1 Status of Existing Systems

In addition to the existing Algonquin system, three other existing interstate pipelines provide natural gas transmission service into New England: Tennessee Gas Pipeline Company (Tennessee), Iroquois Gas Transmission (Iroquois), and Portland Natural Gas Transmission (PNGTS). Like the Algonquin system, each of these pipelines is currently at or near capacity. Consequently, use of any of these systems would require modifications, including the construction of new pipelines, to transport the volume of gas to the delivery points required by the Project shippers. Figures 3.2.1-1 and 3.2.1-2 depict the location of the Tennessee, Iroquois, and PNGTS systems relative to the Applicants' existing systems in New England.

None of the other regional natural gas transmission systems can deliver to all of the customers that would be served by the Project. The existing Iroquois pipeline system currently serves southwestern Connecticut and Long Island and New York City, New York, but does not serve eastern Connecticut or Massachusetts. The existing PNGTS system enters the U.S. near East Hereford, Quebec, Canada, and connects with the Maritimes pipeline in Westbrook, Maine, but does not connect to Mahwah, New Jersey (the supply point for the Project) or the delivery points requested by the Project shippers. Tennessee's existing pipeline system currently reaches western Connecticut, northern Rhode Island, and central Massachusetts, but does not serve southeastern Connecticut or southeastern Massachusetts. It is also connected to Maritimes system in Dracut, Massachusetts, but due to pressure differentials cannot deliver into Maritimes without the construction of a new compressor station. To provide service to the Applicant's customers, these existing systems would need to be expanded. This would require the construction of many miles of new pipeline (hundreds of miles in the case of the Iroquois and PNGTS systems) and likely additional compression, which would result in more environmental impacts than the modifications and enhancements proposed for the Project. Therefore, we do not consider expansions of the any of the existing Iroquois, PNGTS, and Tennessee systems to be reasonable alternatives that would provide an environmental advantage over the Project.

3.2.2 Proposed Systems

We identified one planned project in New England which, if modified, could provide additional volumes of natural gas to the Project shippers in New England. This is Tennessee's NED Project in New York, Connecticut, and Massachusetts.

The NED Project, as currently envisioned, has been designed to provide up to 1.3 billion cubic feet per day of natural gas to southern New England by November 2018. However, it may require additional infrastructure or design modifications to accommodate the additional volumes of the Atlantic Bridge Project. While the NED Project can reach the markets on the Maritimes system as it is currently configured by making deliveries into the Dracut, Massachusetts, it does not extend into the areas of southeastern Connecticut and southeastern Massachusetts that would be served by the proposed Atlantic Bridge Project. To make the deliveries required by the Atlantic Bridge Project shippers, the NED Project would need to be modified to include many miles of additional lateral pipelines, duplicating much of the existing Algonquin system in southern New England. Construction of this additional pipeline would result in greater environmental impact than the Project. Moreover, the NED Project would not be in-service before November 2018 at the earliest, so it would not meet the objectives of the Project within a reasonable timeframe. For these reasons, the NED Project would not be preferable or provide a significant environmental advantage over the Project.

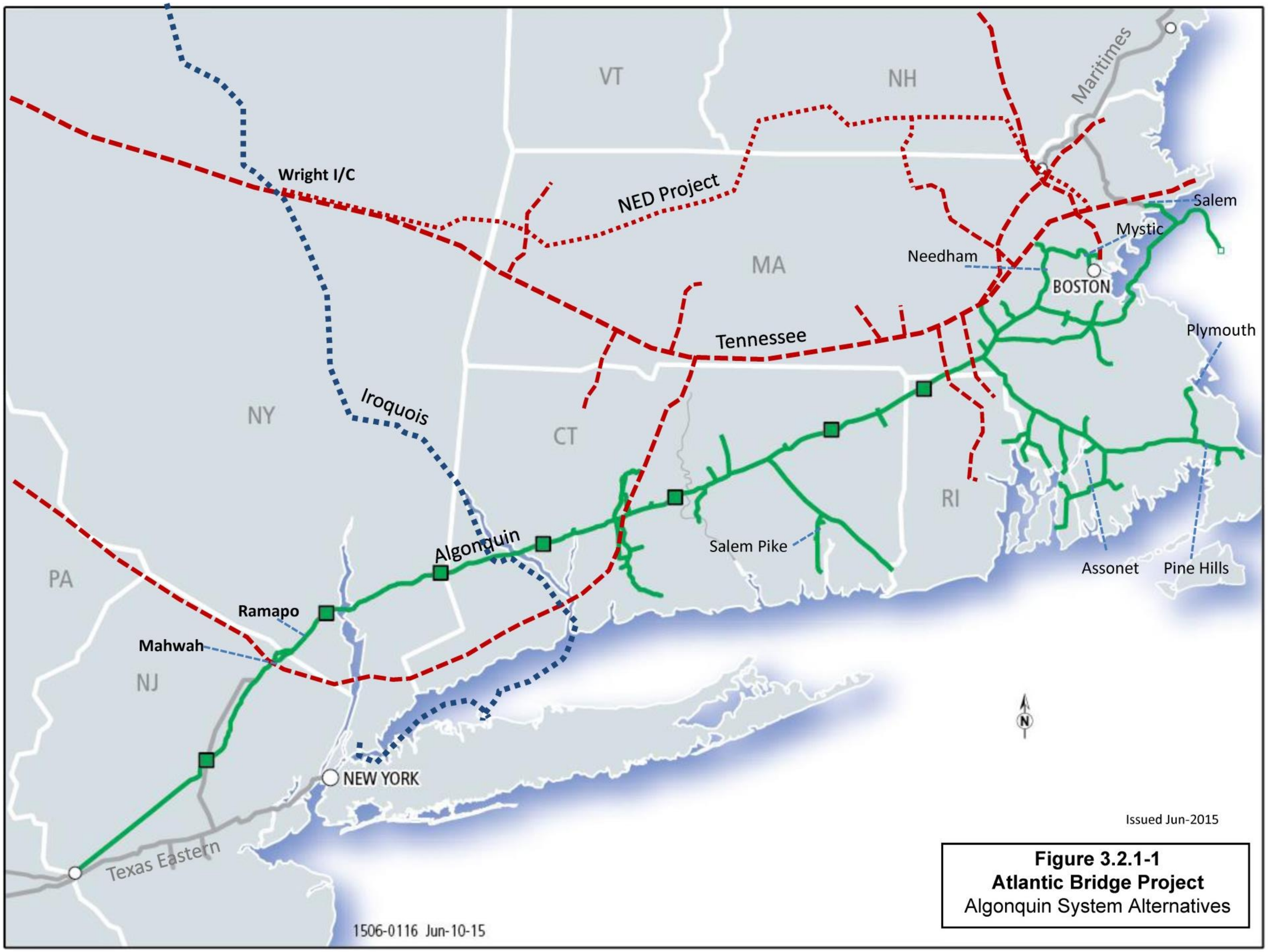


Figure 3.2.1-1
Atlantic Bridge Project
Algonquin System Alternatives

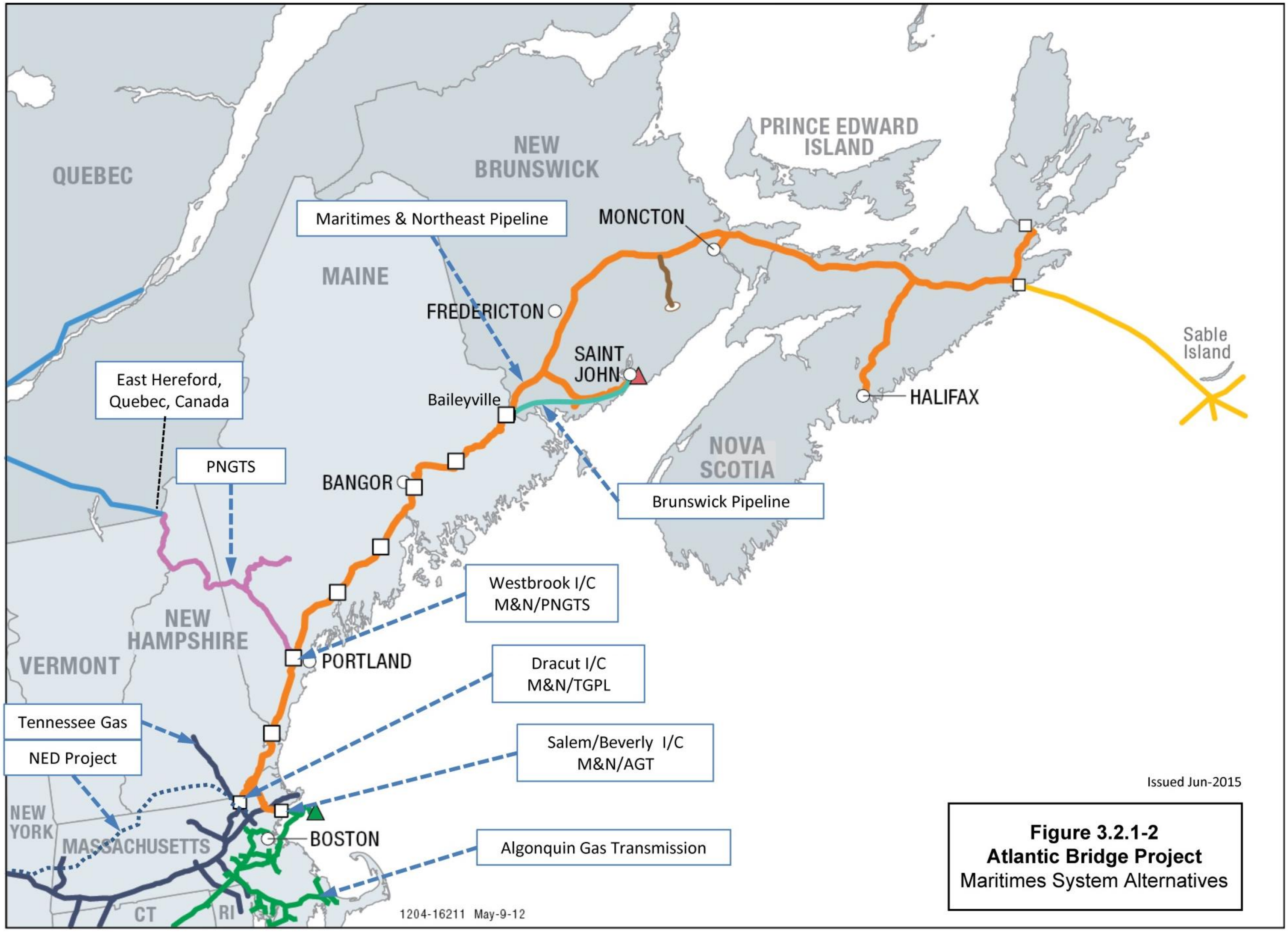


Figure 3.2.1-2
Atlantic Bridge Project
Maritimes System Alternatives

3.3 FACILITY DESIGN ALTERNATIVES

We received several comments from stakeholders regarding facility design and siting for the replacement pipelines and compressor stations. The Applicants' design for the proposed facilities is based on the flow dynamics and pressure of natural gas as it moves through the pipeline system. Natural gas is pressurized at compressor stations to create flow within the mainline and lateral pipelines within the system. As the gas exits a compressor station and moves along a pipeline, the pressure of the gas decreases due to turbulence, friction, and deliveries. The pressure continues to drop until the gas is re-compressed at the next compressor station along the system. In some of the segments of Algonquin's system, the additional volume of natural gas required by the Project shippers can be provided by increased compression without the need for a larger diameter pipeline or a new pipeline loop. Along other segments of Algonquin's system, there is little or no capacity available to transport additional volumes of natural gas because of existing flow rates and pressures within the pipelines. In these areas, the installation of new pipeline (either replacement of existing pipeline with larger diameter pipeline or installation of pipeline looping) is necessary to create additional capacity to transport the volume of natural gas required by the Project shippers.

Because the locations of the new pipeline and compression are based on flow dynamics within the system, the potential for alternative locations or configurations is limited. For example, shifting the proposed facilities upstream or downstream of their currently proposed locations would fail to create the additional capacity or pressure profiles within each pipeline segment to provide capacity for the additional volumes of natural gas and operate the system efficiently.

Many stakeholders have expressed concern about the location and emissions of the proposed Weymouth Compressor Station. We evaluated several site alternatives for this station. Our assessment of these alternative sites is included in section 3.5.1.

In order to reduce environmental impacts, we evaluated several design alternatives for the Project. We asked Algonquin to assess a design alternative that would reduce the compression and therefore emissions at the Weymouth Compressor Station. We also considered the potential to use electric-driven compressors instead of natural gas compressors to reduce air emissions. Lastly, we evaluated a design alternative for the potential to use the HDD crossing method instead of open cut trench methods to install the pipeline through a residential neighborhood. A more detailed discussion of these design alternatives is provided in the subsections below.

3.3.1 Reduced Compression

To reduce the amount of compression at the Weymouth Compressor Station, we evaluated whether it would be possible to replace the proposed Taurus 60, 7,700 hp unit with a Centaur 50 unit, which operates at 6,300 hp. The lower horsepower unit would generate fewer emissions than the proposed Weymouth Compressor Station, but it would also require 2.0 miles of 30-inch-diameter pipeline loop adjacent to Algonquin's existing Q-1 System in Medway, Bellingham, and Franklin, Massachusetts. The reductions in emissions associated with the lower horsepower unit are summarized in table 3.3.1-1.

TABLE 3.3.1-1

Comparison of Operational Emissions from the Proposed Taurus 60 Compressor Versus the Centaur 50 Compressor at the Weymouth Compressor Station Site

Pollutant	Proposed Taurus 60 Compressor (tpy)	Centaur 50 Compressor (tpy)	Change in Potential to Emit (tpy)
NO_X	9.96	8.44	–1.52
CO	16.76	18.26	1.50
SO_2	1.03	0.86	–0.17
$PM_{10/2.5}$	1.99	1.67	–0.32
$CO_{2\text{-}e}$	35,800	30,069	–5,731
VOC	1.26	1.13	–0.13
Total HAPs	0.28	0.26	–0.02

With respect to air emissions, the reduced compression design would have about the same impacts in Weymouth as the proposed compressor station design. However, construction of an additional 2.0 miles of pipeline loop in Medway, Bellingham, and Franklin would increase land disturbance by an estimated 18 to 25 acres. It would also increase the amount of new permanent right-of-way required for operation and maintenance, and an increase in the number of residences and landowners affected. Additionally, it would result in 6.9 acres of new forest clearing, 3.0 acres of wetland impacts, and three new waterbody crossings. For these reasons and because the alternative would only minimally reduce emissions and not eliminate the need for a compressor station at the proposed Weymouth site, we find that the reduced compression alternative would not be preferable to the proposed Project design.

3.3.2 Electric-driven Compressor Unit Alternative

In order to minimize air emissions, we evaluated installing electric-driven compressor units in lieu of gas-fired units at the new and modified compressor station sites. Several factors were considered in evaluating the type of unit to install at each site, including: proximity to existing electric power sources; the need for new or modified electric power sources or transmission facilities; the need for additional ancillary facilities, such as substations; the ability of power companies to design, permit, and construct new facilities in a timeframe reasonably close to the Project; additional environmental impacts associated with construction of new facilities; and the ability to comply with emissions standards during operations at each site.

The installation of an electric-driven compressor unit would require additional facilities to be constructed such as electric transmission lines and substations, as currently there is not enough electric transmission infrastructure in place to accommodate the additional power supply. For each station, the construction and operation of electric-driven units would increase the environmental impacts of the Project including increasing the amount of land disturbed and creating new permanent visual impacts. It is also unlikely from a regulatory and construction standpoint that electric-driven compressor units could be installed in time to meet the needs of the Project shippers. Another issue with the installation of electric-driven compressor units is the availability of backup power to each site. Back-up generators at gas-fired compressor stations provide the lighting, small motor loads, and the ability to power the 125 hp electric motor to start a gas turbine in the event the turbine is off line when utility power is lost. In contrast, electric-driven compressors are solely dependent on the electric grid for their power source. Emergency generators are not sized to be a primary back-up electrical source for large electric drive motors like the 7,700 hp units that would installed at the Weymouth and Oxford Compressor Station sites.

While the use of electric-driven compressor units would lower operating emissions, the proposed gas-driven compressor units can continue to meet the NAAQS, and electric-driven units would result in other environmental impacts (see table 3.3.2-1). Also, installation of electric-driven compressors would limit Algonquin's ability to satisfy the Project's schedule due to the time needed to permit, design, and construct these non-jurisdictional facilities; and would introduce new reliability concerns in the event of an electric power outage. In addition, indicated in table 3.3.2-1, the construction of new distribution lines would likely have additional visual impacts in the project area. In consideration of all these factors, we conclude that use of electric-driven compressor units would not be preferable to or offer a significant environmental advantage over the proposed Project facilities.

TABLE 3.3.2-1

Additional Power Facilities Required to Install Electric-Driven Compressor Units at Compressor Station Sites for the Atlantic Bridge Project

New Electric Transmission Facilities	Additional Area Affected by Construction	Land Uses	Minimum Time to Permit, Design, and Construct	Potential Issues
Weymouth Compressor Station – Norfolk County, Massachusetts				
One 5,800 kilowatt electric-motor-driven compressor; 0.5 mile of buried 69-138 kV transmission line; construction of a new substation; upgrade of existing electrical substation	3+ acres	Industrial – 100 percent	18-36 months	No forest, wetland, or waterbody impacts
Chaplin Compressor Station – Windham County, Connecticut				
Two 5,800 kilowatt electric-motor-driven compressors and one 4,700 kilowatt electric-motor-driven compressor; 6.4 miles of aboveground 23 kV distribution line along an existing electric transmission line corridor and 10.7 miles of a 23kV distribution line for backup power; construction of a new substation	~15 acres	Rural – 43 percent Residential – 57 percent	18-36 months	Visual impacts associated with installation of new distribution line in residential and rural areas; the route would cross Mansfield Hollow State Park; the route would cross 12 streams and 2 wetlands; the route would affect habitat for state-listed species
Oxford Compressor Station – New Haven County, Connecticut				
One 5,800 kW electric-motor-driven compressor; either 1.6 miles of aboveground 23 kV distribution line along an existing electric transmission line corridor or 2.8 miles of aboveground 23kV distribution line along roads; construction of a new substation	~3 acres	Rural – 100 percent	18-36 months	Visual impacts on a rural area associated with installation of new distribution line; the shorter route would cross two stream and three wetlands; the longer route would cross at least one stream and one CTDEEP-mapped natural diversity area

3.3.3 Horizontal Directional Drill Alternative

Construction of the Southeast Discharge Take-up and Relay pipeline segment would occur in a congested area of Danbury, Connecticut. The proposed route would entail installation of the pipeline down Maple Ridge Road and Berkshire Drive, which are densely settled residential streets bordered by single family homes. The route also crosses Pandanaram Brook and several parking lots associated with commercial businesses along Pandanaram Road. We requested that Algonquin evaluate the feasibility of using the HDD method to minimize impacts on these homes, businesses, and the brook between MPs 0.0 and 0.7.

In order to HDD the area in question, staging areas, about one acre is size would be required on each end of the HDD section at the drill entry and exit points. An additional staging area would also be required to fabricate the HDD pipe string and complete a pre-installation hydrostatic test of the pipe prior to pull-back (installation). This staging area would generally need to be in-line with the HDD alignment. No sufficient areas on either end of the HDD alignment were identified for these staging areas. Another issue was finding an HDD alignment that would avoid installation of the pipe under buildings. Because of the density of development in the surrounding area and the bend radius constraints associated with installation of a 42-inch-diameter pipeline by the HDD method (the curvature of the HDD alignment is limited by the diameter of the pipe and the length and depth of the HDD), any feasible alignment would likely result in the pipeline being installed under residences and other structures.

A further constraint is the elevation difference (about 190 feet) that exists between the proposed HDD entry and exit points. Algonquin indicates this elevation difference would result in an increased risk of bore hole instability. The elevational difference between the drill entry and exit points would also likely require the installation of casing pipe on the upper end of the HDD to support the soils and prevent the bore hole from collapsing. The length of casing pipe needed (estimated to be over 800 feet) would greatly exceed the length of casing pipe commonly installed to support HDD operations. Also, upon completion of the installation it may not be possible to remove the casing pipe due to its length. This could increase the potential for pipe corrosion. Additionally, because of the elevation difference, the risk of inadvertent returns of drilling fluid would be high on the lower end of the HDD crossing in the vicinity of Padanaram Road. For these reasons, the use of the HDD method between MP 0.0 and 0.7 is not feasible. While the proposed method would impact residences and businesses, these impacts would be temporary and short-term during the construction phase. We conclude that given the challenges and risk associated with the use of the HDD method at this location, it would not be preferable to the proposed take up and relay method.

3.4 ROUTE ALTERNATIVES AND VARIATIONS

Environmental impacts associated with the pipelines would be minimized by Algonquin's proposal to take up sections of its existing 26-inch-diameter pipeline and replace these sections with 42-inch-diameter pipeline in the same location and within the same permanent right-of-way as the existing pipeline. Where practicable, this method avoids the creation of new rights-of-way; reduces the widening of existing rights-of-way; minimizes impacts on new landowners; avoids or minimizes the need for new permanent right-of-way, and reduces temporary impacts. Because of these advantages, pipelines involving the take-up and relay method generally warrant analyses of route alternatives only in limited instances.

Both the Stony Point Discharge Take-up and Relay and the Southeast Discharge Take-up and Relay cross residential areas, where the pipeline would require in-street work or workspace in close proximity to residences. We evaluated route alternatives to determine if they might be able to reduce residential impacts without substantially increasing impacts on other sensitive resources. Our assessment of these alternatives is discussed below. A number of minor route variations and work space changes were identified to address site specific issues and concerns identified by us or other stakeholders. These minor route variations are described in section 1.5.3.

3.4.1 Stony Point Discharge Take-up and Relay Alternative Routes

We evaluated two alternatives (Alternative Route 1 and Alternative Route 2) along the Stony Point Discharge Take-up and Relay. Table 3.4.1-1 compares the resources and potential impacts of these route alternatives to the corresponding segment of the proposed route. A more detailed discussion of each alternative follows.

TABLE 3.4.1-1

Comparison of Stony Point Discharge Take-up and Relay Alternative Routes 1 and 2 to the Corresponding Segment of the Proposed Route

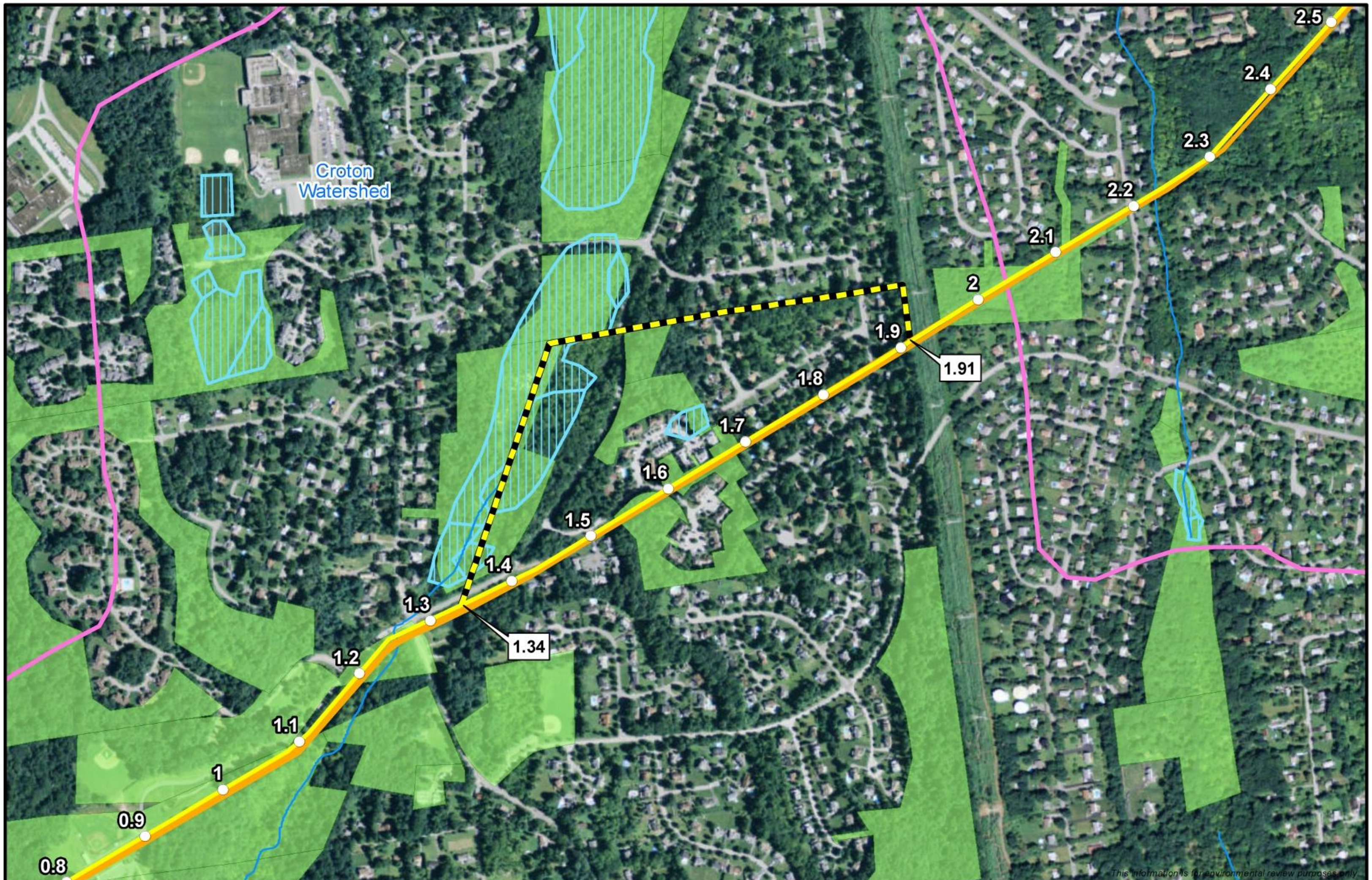
Environmental/ Engineering Factor	Unit	Proposed Route	Alternative Route 1	Alternative Route 2
Length	miles	4.0	4.2	4.7
Length adjacent to the existing right-of-way	miles	4.0	3.5	4.1
Construction Workspace	acres	49.0	53.6	59.0
Permanent Easement	acres	0.8	4.6	20.1
Residences within 50 feet of pipeline centerline	number	4	6	2
Forested Impacts	acres (temp/perm)	8.5/0.0	22.5/0.0	16.3/3.0
Wetland Impacts [a]	acres (temp/perm)	<0.1/0.0	1.7/1.7	1.4/1.4
Waterbody Crossings	number	3	4	4
Croton Watershed Crossing Distance	miles	3.2	3.4	2.2
In-Street Construction	miles	<0.1	<0.1	0.0
Pipeline Street and Rail Crossings	number	13 streets, 0 railways	14 streets, 0 railways	10 streets, 0 railways
Public Lands Crossed	number	11	13	11

[a] Wetland impacts for the proposed and alternative pipeline routes are based on NWI data so as to not bias the analysis.

Alternative Route 1

The Stony Point Discharge Take-up and Relay Alternative Route 1 (Alternative Route 1) was evaluated to determine if it would reduce residential impacts without substantially increasing impacts on other sensitive resources. Alternative Route 1 would deviate from the proposed route near MP 1.4 and cross Strang Boulevard (see figure 3.4.1-1). From there, it would proceed north between Route 132 and Strang Boulevard for about 1,450 feet before turning east and crossing Strang Boulevard a second time. From there, the route would continue east across Barkley Lane, and between Oakside Road to the north and Challinor Drive to the south until it crosses North Deerfield Avenue. After crossing the avenue, it would pass between two residences and continue east for a few hundred feet until it reaches an existing electric transmission line corridor. The alternative would then follow the transmission corridor south until it rejoins the proposed pipeline route near MP 1.9.

The alternative would avoid the residential area that is crossed by the proposed route between MPs 1.4 and 1.9 but would not reduce residential impacts. Instead it would shift impacts from this residential area to residences located along Oakside Road and Challinor Drive. As such, it would not achieve the primary purpose for evaluating alternatives in this area, which was to avoid or minimize residential impacts.



Project Milepost
Proposed Pipeline Centerline
Alternative Route 1
Existing Algonquin Gas Transmission
Stream
Public Land and Designated Recreation, Scenic or Other Areas
Croton Watershed
NWI Wetland

N

0 400 800 Feet

Figure 3.4.1-1
Atlantic Bridge Project
Stony Point Discharge
Take-up and Relay
Alternative Route 1

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DRAWN BY: Flannery

The alternative would also be slightly longer than the corresponding segment of the proposed route, require disturbance of more land, and increase the crossing of the Croton Watershed, which is part of the New York City public water supply system. Additionally, because it would be outside of Algonquin's existing right-of-way, it would impact additional landowners[31] and require additional new permanent easement. This contrasts with the proposed route, which would not require any new permanent easement. The alternative would also result in more acres of forest clearing than the proposed route and impact more acres of wetland, an impact that is essentially avoided by the proposed route. Given that the alternative route would only displace impacts on one residential area with another and would require more new permanent easement, and result in more forest land and wetland impacts, we conclude that it would not be preferable to the proposed route.

Alternative Route 2

The Stony Point Discharge Take-up and Relay Alternative Route 2 (Alternative Route 2) was evaluated to determine if it would reduce residential impacts without substantially increasing impacts on other sensitive resources. As shown on figure 3.4.1-2, Alternative Route 2 would deviate from the proposed pipeline route at MP 1.4, and cross Strang Boulevard. It would then proceed north generally following the western side of Strang Boulevard until it reaches Lee Boulevard. From there, the alternative would proceed southeast along the southern side of Lee Boulevard until it intersects with an electric transmission line corridor. The alternative would follow the transmission corridor north until it reaches Route 6. It would then proceed east and north along the southern side of Route 6 for about 1.7 miles, crossing Hill Boulevard, Curry Street and another road. After that, the alternative would head southeast until it rejoins the proposed route at MP 4.0.

As indicated on table 3.4.1-1, Alternative Route 2 would reduce the number of residences close to the pipeline but not eliminate residential impacts. It would also shorten the crossing of the Croton Watershed by about a mile. However, these potential benefits would be negated by other impacts. Because it is longer than the proposed route, Alternative Route 2 would require disturbance of more land. Additionally, because it is outside of Algonquin's existing right-of-way, it would require more new permanent easement; whereas, no new permanent easement would be required for the corresponding segment of the proposed route. The alternative route would also result in more acres of forest clearing, include one more waterbody crossing, and impact more wetlands than the proposed route. Given this information, we conclude that it would not be preferable to the proposed alignment.

3.4.2 Southeast Discharge Alternative Route (Alternative Route 3)

The Southeast Discharge Alternative Route (Alternative Route 3) was evaluated to see if it would reduce residential impacts without substantially increasing impacts on other sensitive resources. Alternative Route 3 would begin at MP 0.0 and follow Algonquin's existing Line 30B northeast between Maple Ridge Road and Farm Street (see figure 3.4.1-3). The alternative would then cross Golden Hill Road and proceed along Line 30B, crossing Route 37, and a residential area before reconnecting to the proposed route at MP 0.8. Table 3.4.1-2 compares the resources and potential impacts of Alternative Route 3 to the corresponding segment of the proposed route.

[31] Algonquin has not indicated what would happen to the existing pipeline easement if an alternative route were authorized, but it is likely that Algonquin would abandon the existing pipeline in place to avoid residential impacts associated with removing the pipeline. Companies that abandon pipeline in place often retain their permanent easements. If Algonquin were to retain its existing permanent easement, any restrictions concerning the use of the land would likely continue to be enforced.

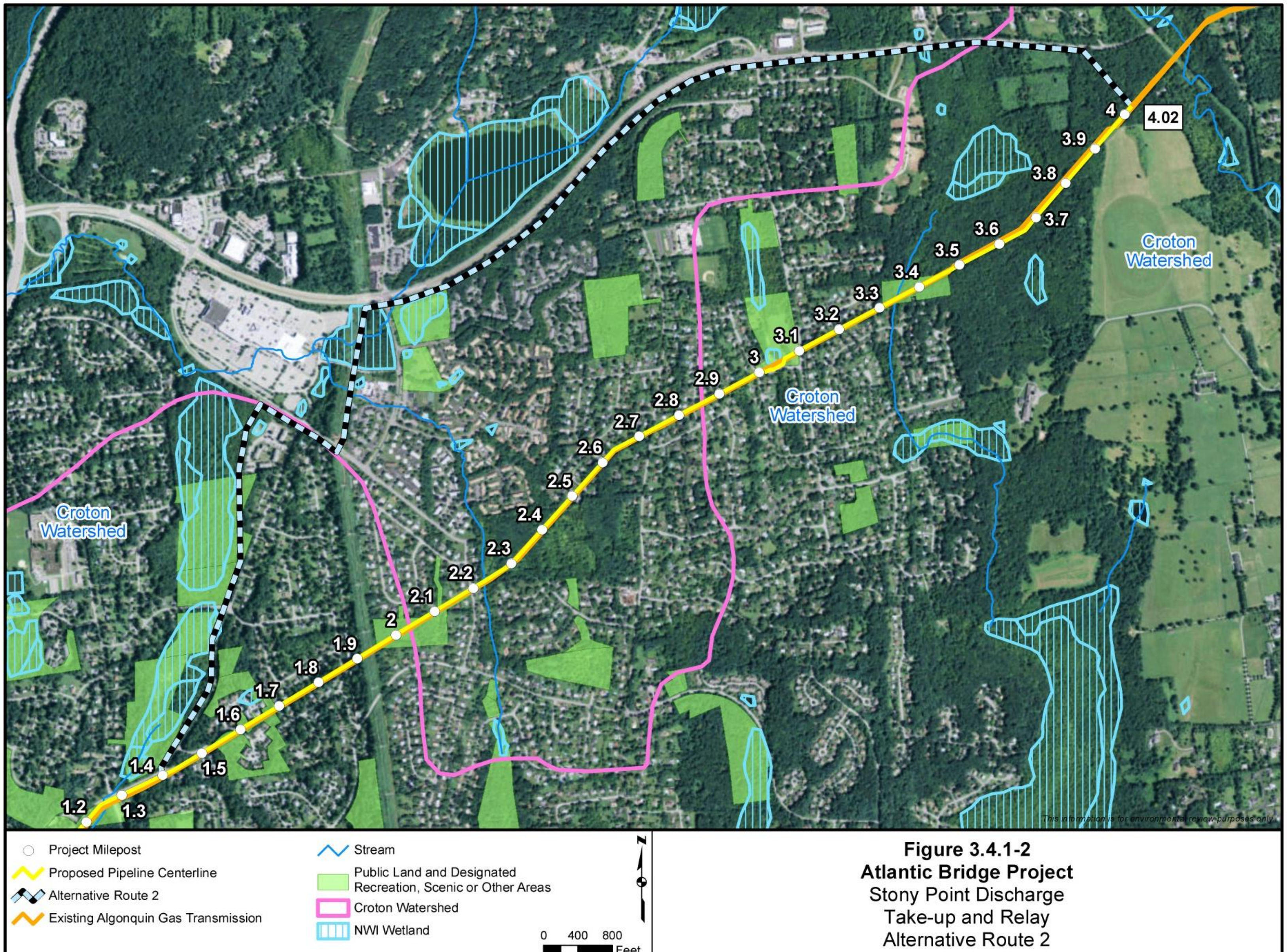

Figure 3.4.1-2
Atlantic Bridge Project
Stony Point Discharge
Take-up and Relay
Alternative Route 2

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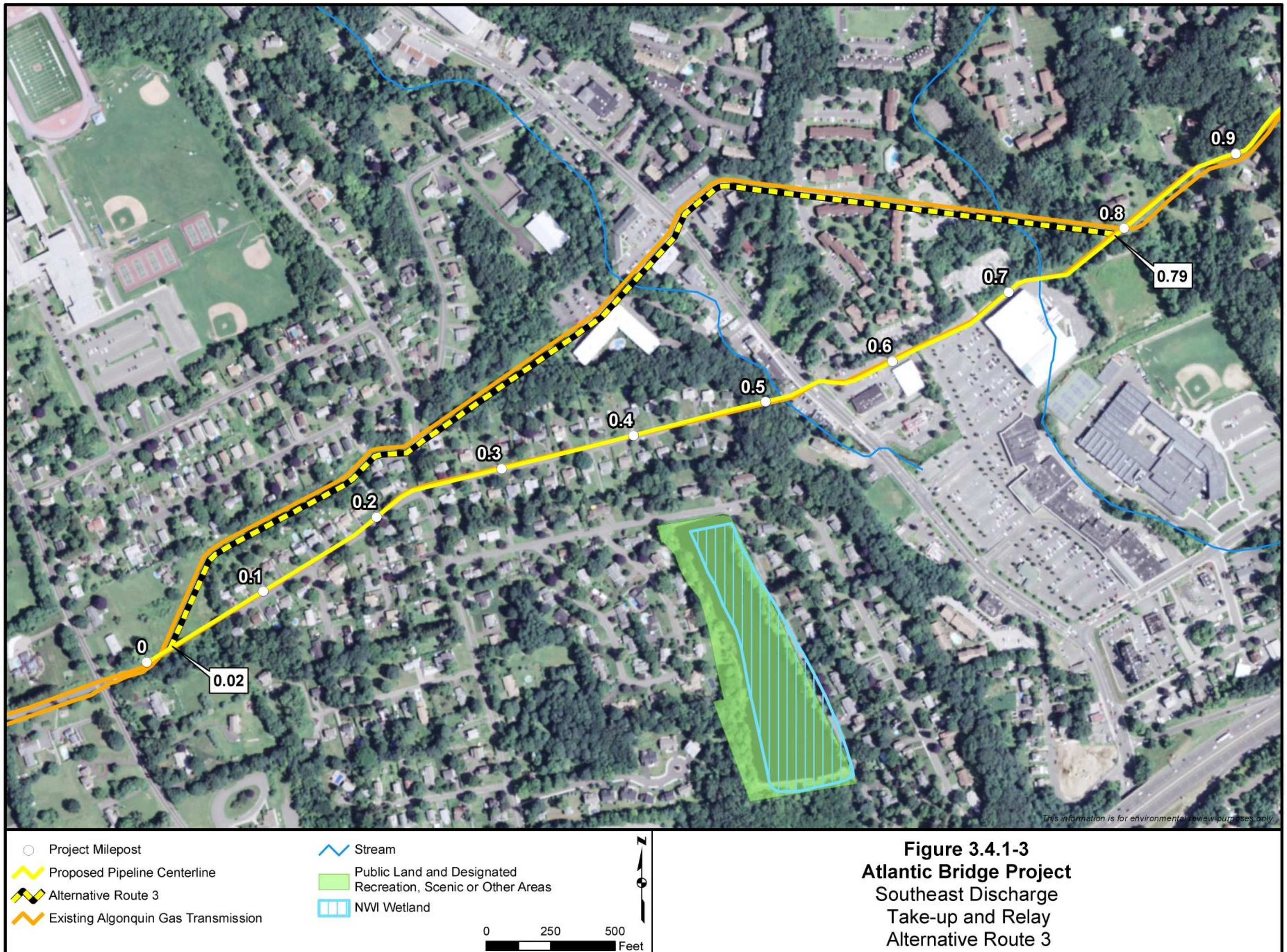

Figure 3.4.1-3
Atlantic Bridge Project
Southeast Discharge
Take-up and Relay
Alternative Route 3

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TABLE 3.4.1-2

Comparison of the Southeast Discharge Alternative Route with the Corresponding Segment of the Proposed Route

Environmental/Engineering Factor	Unit	Proposed Route	Alternative Route 3
Pipeline Length	miles	2.3	2.4
Total Construction Workspace	acres	30.9	31.1
New Pipeline Permanent Easement	acres	1.0	3.4
Number of Residences within 50 feet of pipeline centerline	number	25	25
Forested Impacts	acres (temp/perm)	2.7/0.4	4.7/0.6
Wetland Impacts [a]	acres (temp/perm)	0.0/0.0	0.0/0.0
Waterbody Crossings	number	2	2
In-Street Construction (miles)	miles	0.4	0.0
Pipeline Street and Rail Crossings	number	11 streets, 0 railways	13 streets, 0 railways
Public Lands Crossed	number	0	0

[a] Wetland impact for the proposed and alternative pipeline route is based on NWI data so as to not bias the analysis.

Alternative Route 3 and corresponding segment of the proposed route would be similar in length and both routes would follow existing rights-of-way, require the same number of waterbody crossings, impact the same amount of NWI-mapped wetlands, and avoid crossing public lands. The alternative would require more new permanent right-of-way than the proposed route and more acres of forest clearing. However, Alternative Route 3 would avoid the in-street construction along Maple Ridge Road and Berkshire Drive, but it would not reduce residential impacts. Instead, it would shift impacts from this residential area to residences between Maple Ridge Road and Farm Street. As such, it would not achieve one of the primary purposes for evaluating alternatives in this area, which was to avoid or minimize residential impacts.

There are also engineering and constructability issues along the alternative route. Algonquin indicates, based on a preliminary review, that there may be too little workspace on the east end of Maple Ridge Road and Farm Street to install a new 42-inch-diameter pipeline. Further east, the alternative would cross a linear drainage basin, associated with a nearby residential area, which discharges into Padanaram Brook. Extensive redesign of this existing drainage system would be required to install the pipeline along the alternative route in this location. East of this location, the alternative would cross a commercial area and bisect a parking lot. It would also bisect parking lots associated with several multi-unit apartment buildings on the east side of Pandanaram Road. While it is undetermined if all of these construction challenges could be resolved, it is clear that the construction challenges along Alternative Route 3 would be comparable if not more difficult than along the proposed route.

Alternative Route 3 would reduce wetland impacts, but given that it would only displace impacts on one residential area with another and would require more new permanent easement, and result in more forest land impacts, we conclude that it would not be preferable to the proposed route.

3.5 ABOVEGROUND FACILITY SITE ALTERNATIVES

The Applicants propose to construct one new compressor station and one new M&R station, and modify or uprate three existing compressor stations and modify six existing M&R and regulator stations along the existing Algonquin mainline system in New York, Connecticut, and Massachusetts, and the Maritimes pipeline system in Maine. The modifications at the Stony Point, Chaplin, and Oxford Compressor Stations would occur at existing facility sites and on property owned by Algonquin; and the modifications at the M&R and regulator stations would occur within or directly adjacent to the existing sites. Because the proposed aboveground facilities would primarily occur at existing facilities along Algonquin's and Maritimes' systems, our assessment of alternative sites was limited to the new compression or meter station facilities. See section 3.3 above for discussions regarding facility design and siting considerations for the Project.

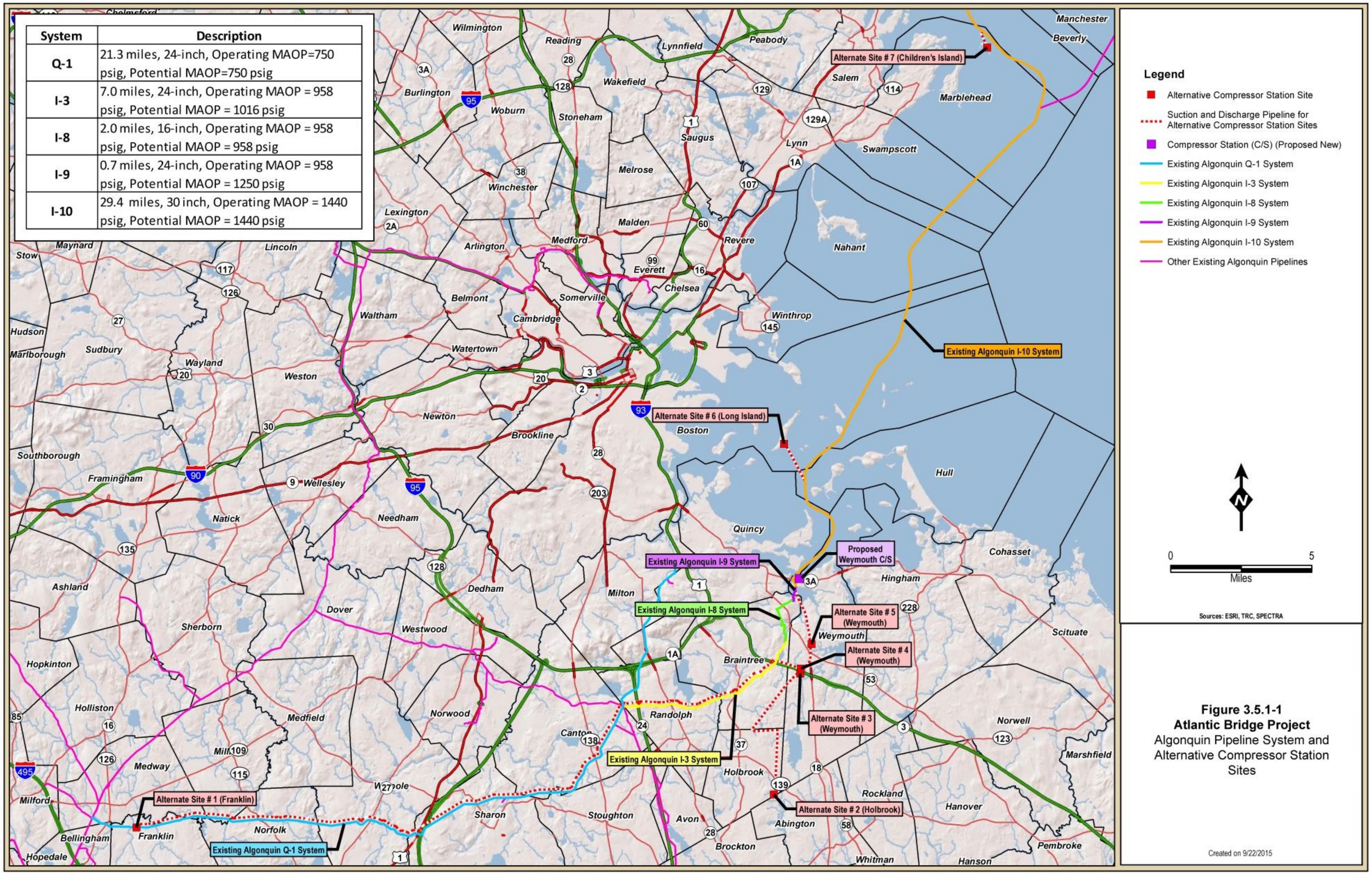
3.5.1 Alternatives to the Weymouth Compressor Station Site

We received numerous requests during scoping to consider alternative compressor station sites that were either outside of Weymouth, Massachusetts, or would be located in a less populated area.

Algonquin's existing pipeline system extends through eastern Massachusetts to East Braintree. It then crosses the Weymouth Fore River and the peninsula of land where the proposed compressor station would be located before proceeding offshore across Massachusetts Bay for many miles and then returning to land in the Beverly/Salem area on the north shore of Massachusetts (see figure 3.5.1-1). Algonquin's hydraulic modeling analysis determined that a new compressor station would be needed along or near Algonquin's existing I-10 System pipeline in order to maintain sufficient pressures to meet flow and pressure commitments at the Project delivery points in Maine and Canada.[32] Algonquin indicated that three other requirements must also be met for the new compressor station site. The first is a property large enough for the station, and a minimum of at least 10 acres of workspace available at the site to construct the facility. The second requirement is the need to receive natural gas via a connection with one of Algonquin's existing mainline natural gas pipeline systems. The pipeline that makes this connection is referred to as the suction pipeline. The third requirement is the need to connect the compressed natural gas that is discharged from the compressor station to Algonquin's existing, higher pressure I-10 System.

Using these siting criteria, compressor station site alternatives as far south as Rehoboth, Massachusetts along Algonquin's existing G-System and as far north as the Maritimes System in northern Massachusetts were evaluated. The Atlantic Bridge Project gas needs to be delivered along Algonquin's Q-System, which runs through the municipalities of Bellingham, Medway, Millis, Franklin, Norfolk, Walpole, Sharon, Stoughton, and Canton, Massachusetts. A compressor station on the G-System in Rehoboth would require over 50 miles of additional pipeline to meet the purpose and need of the Project. The impact of this pipeline would significantly increase the environmental impact of the Project and thus would not be preferable to the proposed site. Algonquin determined that a compressor station on the Maritimes system would significantly constrain daily operations on the I-10 System and prevent Algonquin from meeting its delivery obligations to existing customers in the Salem and Beverly area. Furthermore, to move the gas into the Maritimes System, additional compression would be required beyond what is currently proposed at Weymouth. The Maritimes System would also have to lower its pressure, hindering its ability to carry gas along the Maritimes Phase III Pipeline. Given these operational constraints, locating the compressor station site on the Maritimes System is not a feasible option.

[32] According to the Applicants, the I-10 System operates at between 900 and 1,200 psig. The existing Algonquin systems located to the south and west of this point in Weymouth and Braintree (i.e., the I-9, I-8, and I-3 Systems) operates at a lower pressure (these systems would operate at between 400 and 650 psig if the Atlantic Bridge Project is constructed). Given that the current natural gas pressures from the north exceed the natural gas pressure from the south, no natural gas can move northerly into the I-10 System without a booster compressor.



System	Description
Q-1	21.3 miles, 24-inch, Operating MAOP=750 psig, Potential MAOP=750 psig
I-3	7.0 miles, 24-inch, Operating MAOP = 958 psig, Potential MAOP = 1016 psig
I-8	2.0 miles, 16-inch, Operating MAOP = 958 psig, Potential MAOP = 958 psig
I-9	0.7 miles, 24-inch, Operating MAOP = 958 psig, Potential MAOP = 1250 psig
I-10	29.4 miles, 30 inch, Operating MAOP = 1440 psig, Potential MAOP = 1440 psig

Figure 3.5.1-1
Atlantic Bridge Project
Algonquin Pipeline System and Alternative Compressor Station Sites

Algonquin considered the possibility of locating the compressor station along their existing I-8 System through Braintree, Massachusetts. In order to make the proposed deliveries in Maine and Canada the gas must flow north. A compressor station on Algonquin's I-8 pipeline system would not meet the needs of the Project shippers, because the I-8 pipeline system has a lower MAOP than the I-10 System pipeline and cannot operate at pressures sufficient to deliver into the higher-pressure I-10 System pipeline. The MAOP of the I-8 System pipeline could not be increased to the required level without replacing the entire 2.0-mile-long, 16-inch-diameter I-8 System pipeline through Braintree with a larger diameter pipeline. Algonquin evaluated the potential to construct a new pipeline within the I-8 System right-of-way for past projects and identified several issues. Specifically, Algonquin determined that there is not enough clearance above the numerous underground utilities along the I-8 System to lay a larger-diameter pipeline over the existing utilities. Thus the new pipeline would need to be installed substantially deeper than the existing and smaller diameter I-8 System pipeline. Algonquin also identified a number of locations where the alignment of the new pipeline may need to be shifted to increase the offset from existing manholes. The increased diameter and depth of the new pipeline and these deviations would require new right-of-way. Additionally, the installation of a larger diameter pipeline would be constrained by the existing commuter rail line and densely developed neighborhoods in the area.

We evaluated the potential to construct along the I-8 system route in section 3.3.2.3 of its draft EIS for the Hubline/East to West Project (Docket No. CP08-420-000).[33] FERC concluded in its analysis that given the environmental concerns and constructability challenges discussed above, construction of a new pipeline along the I-8 system would not be practicable. Based on these constraints, we do not find that a new compressor station along the I-8 system would have environmental benefits when compared to the proposed Weymouth Compressor Station site.

After narrowing the range for the compressor station, five alternative sites south and west of the proposed Weymouth Compressor Station were evaluated. At FERC staff's request, Algonquin also considered two alternative sites on islands north of the proposed site. These alternate sites are described in more detail in the sections below.

Southern and Western Site Alternatives

The alternate compressor station sites that we evaluated to the south and west of the proposed site are located in the Towns of Franklin, Holbrook, and Weymouth. Unlike the proposed Weymouth Compressor Station site, all five of these alternate sites would require the construction of additional new 30-inch-diameter suction and discharge pipelines. An environmental comparison of the five alternative sites to the proposed site is included in table 3.5.1-1. Descriptions of each site and our conclusions regarding the relative impacts of each site compared to the proposed site are included below.

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[33] A copy of this analysis can be found in section 3.3.2.3 of the draft EIS, which can be viewed on FERC's website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20081107-4000 in the "Accession Number" field. The figures are also available for public inspection at the FERC's Public Reference Room in Washington, DC (call (202) 502-8317 for instructions).

TABLE 3.5.1-1

Comparison of the Proposed Weymouth Compressor Station Site to Other Onshore Alternatives

Environmental/Engineering Factor	Unit	Proposed Site	Alternate Site 1 (Franklin Site)	Alternate Site 2 (Holbrook Site)	Alternate Site 3	Alternate Site 4	Alternate Site 5 (Weymouth North Site)
Municipality		Weymouth	Franklin	Holbrook	Weymouth	Weymouth	Weymouth
Compressor Station Construction Work Area	acres	12.9	13.0	13.0	13.0	13.0	13.0
Permanent Station Site Size	acres	4.0	4.5	4.5	4.5	4.5	4.5
Length of New Pipeline	miles	0.0	30.4	16.3	4.7	4.6	4.7
Pipeline Construction Work Area	acres	0.0	376.3	144.6	43.3	42.6	42.8
New Pipeline Permanent Easement	acres	0.0	188.1	81.2	21.6	21.3	21.4
Site Access		Existing access off of Route 3A.	Likely accessed from Elm Street via the existing right-of-way.	Likely accessed from Route 139 along an existing utility corridor.	Three access options as discussed in the text above.	Existing maintenance road. Upgrades would be required resulting in permanent wetland impacts.	Three access options as discussed in the text above.
Residential Structures within ½ Mile of Station Sites [b]	number	587	131	22	528	504	680
Residences within 50 feet of Pipeline Centerline	number	0	60	32	9	9	0
Schools within ½ Mile of Station Sites	number	0	0	0	0	1	1
Forested Impacts	acres	0	145.4	72.7	20.9	20.9	17.4
Wetland Impacts	acres	0	87.0	25.3	6.2	6.6	6.2
Waterbody Crossings	number	0	41	8	5	5	3
In-Street Construction Areas	number	None	2 areas	None	None	None	None
Pipeline Street/ Rail Crossings	number	None	88/ 11	21/ 3	7/1	6/1	3/1
Recreational Area Crossings	number	None	17	3	None	None	None

[a] The calculations for the alternate sites are based on conceptual designs and therefore represent approximated figures.

[b] The number is based on a count of residential structures within 0.5 mile of each station sites using GIS data. The number does not distinguish between single family residences and multi-family structures owned or occupied by more than one family.

Alternate Compressor Station Site 1 (Franklin Site)

Alternate Compressor Station Site 1 (Franklin Site) is located in the Town of Franklin, Massachusetts along Algonquin's existing Q-1 System (see figure 3.5.1-2 in appendix I). The Franklin Site is entirely forested. Permanent access to the site would likely be from Elm Street, located to the east. The Franklin Site would only require a small length of suction pipeline to connect to the Q-1 System. However, about 30.8 miles of 30-inch-diameter discharge pipeline would be needed to connect the compressor station to the I-10 System. This new pipeline would follow the Q-1 system east for several miles until it reaches the point where the Q-1 and I-3 Systems intersect at the Canton/Randolph town line. The pipeline would then follow the I-3 system into Braintree. About 0.7 mile before the intersection of the existing I-3 and I-8 Systems, the pipeline would deviate from the I-3 System and proceed east following a road way until it reaches a powerline corridor. It would then follow the powerline corridor north to the I-10 System.

The Franklin Site would substantially reduce the number of residences within 0.5 mile of the compressor station, but as indicated in table 3.5.1-1, the 30.4 miles of suction and discharge pipelines associated with the Franklin Site would increase land impacts, the amount of new permanent easement needed, and the clearing of forest land. These pipelines would also increase impacts on wetlands and waterbodies, which would be avoided by the proposed site.[34] They would also cross an Estimated Rare Wildlife Habitat area and a Priority Rare Species Habitat area, as identified by the NHESP. Additionally, it is estimated based on a review of aerial photography and GIS data that the pipelines would pass within 50 feet of 60 residences. While the proposed site would result in permanent air and noise impacts that are below standards established to protect human health and welfare, the pipeline associated with the Franklin Site would have more direct residential impacts including the short-term disturbance of properties during construction and the long-term encumbrance of land associated with new permanent right-of-way.

Another issue with the Franklin Site that was determined subsequent to its identification is that the land is not available. The property is owned by the Franklin County Day Camp, which is a summer day camp for children. On November 24, 2015, the Franklin County Day Camp submitted a letter to FERC requesting that the site be removed from further consideration. In contrast to the Franklin Site, the owner of the proposed Weymouth Compressor Station Site has not expressed any similar concerns and according to Algonquin the land is available for sale. Additionally, the Weymouth Site would not be inconsistent with other industrial uses in the immediate vicinity. Directly south of the proposed Weymouth Compressor Station site is the Fore River power plant, which is located on the south side of Route 3A and the east side of the Fore River. The power plant, owned by Calpine Fore River Energy Center, LLC, is one of the larger plants in the Boston area and consists of one natural gas-fired turbine that can generate up to 787 megawatts. Also in the immediate vicinity of the proposed Weymouth Compressor Station is a sewage pumping station operated by the MWRA. The pumping station is located directly adjacent to the Weymouth Fore River and is immediately north of the proposed compressor station location. Development of the Weymouth site would not require construction of any additional pipeline outside of the proposed station property and would avoid impacts on forested lands, wetlands, and waterbodies. For these reasons, we conclude that the Franklin Site would not be environmentally preferable to the proposed Weymouth Compressor Station site.

[34] It should be noted that all but about 5.7 miles of the pipeline required for the Franklin Site is part of Algonquin's planned ANE Project. The ANE Project, which is assessed in the cumulative impact section of this EA, has different customers and a later planned in-service date than the Atlantic Bridge Project. Thus, the ANE pipeline would not be available for use on the Atlantic Bridge Project. If the Franklin Site were selected, Algonquin would need to construct all 30.8 miles of pipeline as part of the Atlantic Bridge Project. According to the Applicants, the cost of this pipeline, which they estimate would be $435 million, would be too high for the Applicant's customers to support and would undermine the economic feasibility of the Project.

Alternate Compressor Station Site 2 (Holbrook Site)

Alternate Compressor Station Site 2 (the Holbrook Site) is located in the southeastern corner of the Town of Holbrook, Massachusetts (see figure 3.5.1-3 in appendix I). The Holbrook Site is entirely forested. The site is not close to any of the existing Algonquin pipeline systems. About 6.8 miles of 30-inch-diameter suction pipeline would be needed to connect the site to the I-3 System and another 9.5 miles of 30-inch-diameter discharge pipeline would be required to deliver gas flows from the Holbrook Site to the I-10 System. The new suction and discharge pipelines would be collocated with existing corridors, primarily electric transmission line corridors, and at its northern end the discharge pipeline would follow the same alignment as the discharge pipeline from the Franklin Site to the I-10 System.

As shown in table 3.5.1-1, the Holbrook Site would substantially reduce the number of residences within 0.5 mile of the compressor Station, but the 16.3 miles of suction and discharge pipelines associated with the Holbrook Site would increase other impacts similar to those described for the Franklin Site, but to a lesser degree.[35] The pipelines required for the Holbrook Site would also cross an area of Critical Environmental Concern, as designated by the Massachusetts Secretary of Energy and Environmental Affairs. For these reasons and other contrasting factors similar to those described for the Franklin versus Weymouth site above, we conclude that the Holbrook Site would not result in a significant environmental advantage to the proposed Weymouth Compressor Station site.

Alternate Compressor Station Sites 3 through 5

Alternate Compressor Station Sites 3, 4, and 5 (Alternate Sites 3, 4, and 5) are in Weymouth (see figure 3.5.1-1). Alternatives Sites 3 and 4 are located in the same general area about 3.4 miles south of the proposed Weymouth Compressor Station site. Both sites are predominantly forested and would require between 4.6 and 4.7 miles of suction and discharge pipeline. Alternate Site 5 is located about 2.4 miles south of the proposed Weymouth Compressor Station site on a former but now filled quarry site. The site is partially forested and partially open. As shown in table 3.5.1-1, all three of these sites and their associated suction and discharge pipelines would require more forest and wetland impacts than the proposed site. Additionally, none of these sites would address one of the primary public concerns about the proposed site, namely its proximity to densely populated areas. There would be more residential structures within 0.5 mile of Site 5 than the proposed site, and nearly as many residences within 0.5 mile of Site 3 and 4 as the proposed site. For these reasons we conclude that Sites 3, 4, and 5 would not be preferable to the proposed site.

Northern Site Alternatives

Based on comments received during the scoping period we requested Algonquin evaluate two off-shore sites (Alternate Sites 6 and 7) north of the proposed Weymouth Compressor Station site.[36] One of these sites is located on Long Island and the other site is located on Children’s Island. These two alternate sites are described below. An environmental comparison of the two alternative sites to the proposed site is included in table 3.5.1-2.

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[35] It should be noted that about 4.3 miles of the pipeline required for the Holbrook site is part of Algonquin’s planned ANE Project. The ANE Project, which is assessed in the cumulative impact section of this EA, has different customers and a later planned in-service date than the Atlantic Bridge Project. Thus, the Access Northeast pipeline would not be available for use on the Atlantic Bridge Project. If the Holbrook site were selected, Algonquin would need to construct all 16.3 miles of pipeline as part of the Atlantic Bridge Project. According to the Applicants, the cost of this pipeline, which they estimate would be $229 million, would be too high for the Applicant’s customers to support and would undermine the economic feasibility of the Project.

[36] The vast majority of the existing pipeline system north of the proposed Weymouth compressor Station site extends offshore through Massachusetts Bay; consequently, the only feasible alternate sites to the north but near the proposed site would be islands in Massachusetts Bay.

TABLE 3.5.1-2

Comparison of the Proposed Weymouth Compressor Station and Long Island and Children's Island Alternate Sites

Considerations	Proposed Weymouth Compressor Station Site	Long Island Site (Alternate Site 6) [a]	Children's Island Site (Alternate Site 7) [a]
Construction/Operation Considerations			
Municipality	Weymouth	Boston (Long Island)	Salem (Children's Island)
Compressor Station Construction Work Area (acres)	12.9	10.0	10.0
Permanent Station Site Size (acres)	4.0	4.3	4.3
Length of New Pipeline (miles)	0	2.9	1.3
HDD Length (miles)	N/A	2.5	1.1
Offshore Pipeline Trenching (miles)	0	0.4	0.2
New Pipeline Permanent Easement (acres)	0	3.0	1.3
Site Access	Existing access	Marine Transportation	Marine Transportation
Residential Structures within ½ Mile of Station Sites	587 [b]	0	3
Schools within ½ Mile of Station Sites	0	0	0
In-Street Construction	None	None	None
Pipeline Street and Rail Crossings	None	None	None
Recreational Area Impacts	None	NPS Boston Harbor Islands National Recreation Area	North Shore YMCA Kid's Camp
Environmental Considerations			
Forested Impacts (acres)	0.0	0.1	0.0
Freshwater Wetland Impacts (acres)	0.0	1.1	0.0
Marine Wetland Impacts (acres)	0.0	0.9	0.2
Marine Dredging Impacts (acres)	None	13.0	7.0
In-water blasting	None	Likely	Likely
NHESP Mapped Habitat [c]	None	Yes	No
Shellfish Bed Impacts	None	Yes	Yes
Marine Benthic Habitat Impacts	None	Yes	Yes
Marine Hard Bottom Substrate Impacts	None	Yes	Yes
Forested Impacts (acres)	0.0	0.1	0.0

[a] The calculations associated with the alternate sites are based on conceptual designs and therefore represent approximated figures.

[b] This number is based on a count of residential structures within ½ mile of the stations sites using GIS data. This does not account for residential structures containing multiple owners. For example, Algonquin has identified about 1,026 individual property owners within 0.5 mile of the Weymouth Compressor Station site.

[c] NHESP = Natural Heritage and Endangered Species Program (Massachusetts Division of Fisheries and Wildlife).

Alternate Site 6 would be located on the southeastern portion of Long Island (see figure 3.5.1-4 in appendix I). Long Island is located in Boston Harbor and is part of the City of Boston. The island is about 1.8 miles long and 225 acres in size. It is one of several islands that comprise the National Park Service Boston Harbor Islands National Recreation Area. The current land uses on the island include forested land and developed land. Alternate Site 7 is located on Children's Island, also known as Cat Island (see figure 3.5.1-5 in appendix I). Children's Island is located off the coast of Marblehead, Massachusetts and lies within the municipal boundary of the City of Salem. The island, which is not accessible by road, is about 0.4 mile long and consists of about 9 acres of predominantly open land.[37]

Long Island is mapped by the NHESP as an Estimated Rare Wildlife Habitat area and a Priority Rare Species Habitat. The entire perimeters of both Long Island and Children's Island are designated as Shellfish Suitability Areas (for blue mussels, razor clams, and soft-shelled clams at Long Island and for blue mussels at Children's Island (Massachusetts Division of Marine Fisheries, 2011).

If either site was selected, Algonquin would need to construct new 30-inch-diameter suction and discharge pipelines between the compressor station on the island and the existing I-10 system. To minimize impacts, the HDD method could be used to install the suction and discharge lines to connect either the Long Island or Children's Island site to the I-10 System (each pipe would require a separate HDD). The exit points for these HDDs would be located in about 25 to 30 feet of water. Algonquin estimates that even with the HDD method, the suction and discharge pipelines, along with associated connections, would require the dredging of about 13 acres of the seafloor for the Long Island site and 7 acres for the Children's Island site. Additional seafloor impacts would result from the use of anchors by tugs and other construction vessels. This dredging and anchoring would impact the marine benthic habitats, including EFH. Potentially affected resources would include marine fisheries, shellfish, benthic fauna, and marine mammals. Construction of an offshore pipeline could also disturb hard/complex seafloor areas that are considered valuable marine habitat. Algonquin has indicated that blasting may be required in hard bottom substrates to excavate the trench, which could result in additional impacts on marine fisheries and mammals. As shown on table 3.5.1-2, construction of the compressor station on either island would also increase near shore impacts compared to the proposed Weymouth Compressor Station site.

It is likely that the offshore construction of the pipelines to and from either island would have to adhere to the time-of-year restrictions for marine fisheries and shellfish. If imposed, these restrictions would limit the available time windows for construction work in the water and would likely cause the work to be performed over multiple time periods. Currently, the estimated duration of construction activity to construct the compressor station at the Weymouth site is eight months. To address the various fishery issues, Algonquin believe two calendar years would be required to complete the construction of the compressor station and marine pipelines for a compressor station on either Long Island or Children's Island. It is also possible that Algonquin would not be able to obtain the necessary federal and state permits required to construct at the island sites given that the proposed site would avoid the marine resource and water quality impacts. Therefore, the proposed site would likely be considered by permitting agencies to be the least environmentally damaging site.

There are also construction and operational constraints associated with locating a compressor station on an offshore island. Algonquin would need to depressurize a portion of the I-10 system, which would constrain the operations of the Algonquin's (see the discussion of these constraints at the start of section 3.5.1). There would also be access constraints if the compressor station were on either Long

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[37] For the past 60 years, the island has been home to the North Shore YMCA Kid's Camp providing day, week, and weekend camping experiences for kids and families. Access to Children's Island is via marine transportation only.

Island or Children's Island. Neither island is accessible by road.[38] There are existing docks on both islands, but Algonquin does not believe these docks would be sufficient for the daily offloading of equipment and materials that would be required during construction of the compressor station. Therefore, a temporary docking facility would need to be constructed. This would require additional dredging in the intertidal and subtidal habitats, which would add to the marine impacts of the Long Island and Children's Island site. In addition, the lack of direct access to the islands raises concerns related to the ability to access the facility during operation or the ability to respond quickly if there were an emergency at the compressor station.

Given the environmental issues and operational constraints associated with locating the compressor station site on either Long Island or Children's Island, these sites would not be preferable to the proposed Weymouth site.

3.5.2 New M&R Station

Algonquin proposes to construct a new M&R station in Massachusetts. Two sites were considered for the new station: the proposed site, which is on open land owned by Norwich Public Utilities (NPU), and an alternative site at Algonquin's existing Salem Pike M&R Station, which is 300 feet from and across the street from the proposed M&R Station site. After further review, Algonquin rejected the existing M&R station site because the flow capacity of the existing station cannot accommodate the deliveries requested by NPU (Algonquin's customer) without expansion and there is not enough space at the existing site to install the necessary upgrades. NPU's system also requires uninterruptable service to the Salem Pike M&R Station; therefore, the existing station cannot be taken out of service to install the necessary upgrades. Building the new M&R station allows Algonquin to maintain existing flows while the new station is being constructed to achieve NPU's requests for increased future deliveries.

The new facility would be located on open land and would not affect any streams or wetlands, but it would be near two residences. One of these residences would be closer to the proposed site than it is to the existing site while the other would be further away. Algonquin would retain the existing vegetation bordering the street to reduce the visual impact of the facility on these homes. Impacts on these homes would also be mitigated by the removal of the existing station after the new station is placed in service. Given that a new station site is necessary, construction of the new facility on the open, NPU-owned land directly across the street from the existing station would be preferable to other alternatives since it avoids sensitive resources and minimizes the need for additional piping and station infrastructure.

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[38] Prior to October 2014, Long Island was accessible by road over a 4,175-foot causeway from the Squantum peninsula of North Quincy to Moon Island, and from there, over a 3,050-foot two-lane steel bridge from Moon Island to Long Island. In October 2014, road access to Long Island was cut off due to concerns about the safety of the Long Island Bridge. The bridge was demolished in early 2015. Since then access to Long Island has be limited to marine transportation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if the Applicants were to construct and operate the proposed facilities in accordance with its application, supplements, Project specific plans, and staff's recommended mitigation measures below, approval of the Project would not constitute a major federal action significantly affecting the quality of the human environment.

The staff recommends that the Commission Order contain a finding of no significant impact and the following mitigation measures be included as conditions of any Certificate the Commission may issue.

1. The Applicants shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), and as identified in the EA, unless modified by the Commission's Order. The Applicants must:

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

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

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

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

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

    a. the modification of conditions of the Commission's Order; and

    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to ensure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from construction and operation of the Project.

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

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

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

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

   This requirement does not apply to extra workspace allowed by the Applicants' E&SCP and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

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

   a. implementation of cultural resources mitigation measures;

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

   c. recommendations by state regulatory authorities; and

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

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

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

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

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

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

e. the location and dates of the environmental compliance training and instructions Algonquin will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel changes), with the opportunity for OEP staff to participate in the training session;

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

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

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

   i. the completion of all required surveys and reports;
   ii. the environmental compliance training of on-site personnel;
   iii. the start of construction; and
   iv. the start and completion of restoration.

7. Algonquin shall employ one or more EIs per construction spread. The EIs shall be:

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

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

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

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

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

   f. responsible for maintaining status reports.

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

   a. an update of Algonquin's efforts to obtain the necessary federal authorizations;

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

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

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

e. the effectiveness of all corrective actions implemented;

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

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

9. **Prior to receiving written authorization from the Director of OEP to commence construction of any Project facilities**, Algonquin shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

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

11. **Within 30 days of placing the authorized facilities for the Project into service**, Algonquin shall file an affirmative statement, certified by a senior company official:

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

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

12. **Within 30 days of placing the facilities in service,** Algonquin shall file a report with the Secretary identifying all water supply wells/systems damaged by construction and how they were repaired. The report shall also include a discussion of any other complaints concerning well yield or water quality and how each problem was resolved. ***(Section 2.2.1)***

13. **In the event of an unsuccessful HDD at the Taconic Parkway,** Algonquin shall file with the Secretary a plan for the crossing of the waterbody. This shall be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. Algonquin shall file this plan concurrent with the submission of its application to applicable agencies for a permit to construct using this alternative path. The Director of OEP must review and approve this plan in writing before construction of the alternative crossing. ***(Section 2.2.2)***

14. **Prior to construction,** Algonquin shall file with the Secretary any updated consultations with the FWS regarding migratory birds including any additional avoidance or mitigation measures developed. ***(Section 2.3.3)***

15. The Algonquin shall not begin construction activities in New York **until**:

    a. the staff receives comments from the FWS regarding the Indiana bat and northern long-eared bat;

    b. the staff completes formal ESA consultation with the FWS, if required; and

    c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin. ***(Section 2.3.3)***

16. Algonquin shall not begin construction activities in New York or Connecticut **until**:

    a. the staff receives comments from the FWS, NYSDEC, and CTDEEP regarding the bog turtle;

    b. the staff completes formal ESA consultation with the FWS, if required; and

    c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin. ***(Section 2.3.3)***

17. **Prior to construction in Connecticut**, the Algonquin shall file with the Secretary any additional correspondence from the CTDEEP regarding the survey results for the hairy-fruited sedge and whether any additional avoidance measures in potentially suitable habitat would be implemented. ***(Section 2.3.3)***

18. **Prior to construction.** Algonquin shall file with the Secretary for the review and written approval of the Director of OEP a revised set of Residential Construction Plans that incorporate and address the comments Algonquin received from affected landowners. ***(Section 2.4.3)***

19. **Prior to construction of the Weymouth Compressor Station,** Algonquin shall file with the Secretary a copy of the MACZM's determination of consistency with the CZMA. ***(Section 2.4.5)***

20. Algonquin shall not begin construction activities in Massachusetts, New York, or Connecticut **until**:

    a. Algonquin files with the Secretary the Massachusetts SHPO comments on the archaeological assessment that was submitted to the SHPO for review and comment;

    b. Algonquin files with the Secretary the Connecticut SHPO comments regarding the revised cultural resources survey reports submitted for review on February 9, 2016;

    c. Algonquin files other reports, evaluations studies, plans, or special studies not yet submitted;

    d. the ACHP is provided an opportunity to comment on the undertaking if historic properties would be adversely affected; and

    e. FERC staff reviews and the Director of OEP approves all cultural resources survey reports and plans, and notifies Algonquin in writing that any necessary treatment plans/mitigation measures may be implemented or that construction may proceed.

All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."** ***(Section 2.6.4)***

21. Algonquin shall file **in the weekly construction status reports** the following for the Taconic Parkway HDD entrance site**:**

    a. the noise measurements from the nearest NSA for each drill entry site, obtained at the start of drilling operations;

    b. the noise mitigation that Algonquin implemented at the start of drilling operations; and

    c. any additional mitigation measures that Algonquin will implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is over ambient conditions greater than 10 dB. ***(Section 2.8.2)***

22. **Prior to construction during nighttime hours (10:00 p.m. to 7:00 a.m.) between MPs 0.5 and 0.7 along the Southeast Discharge Take-up and Relay**, Algonquin shall file with the Secretary for review and written approval by the Director of OEP, a nighttime construction noise analysis and mitigation plan for all NSAs areas within one half mile of the construction work areas where nighttime construction is requested. The plan shall include:

    a. the length of time nighttime construction would occur;

    b. clear identification of all NSAs within one half mile of the construction work areas where nighttime construction is requested, and the projected noise levels of construction activities at night at the NSAs;

    c. specifications regarding the input parameters that were modeled (particularly the number of each equipment and the consideration of back-up alarms); and

    d. details for mitigation measures that Algonquin commits to implementing (e.g. height and material of movable barriers, use of a spotter over back up alarms, the availability of lower pitched back up alarm). ***(Section 2.8.2)***

23. Algonquin shall file a noise survey with the Secretary **no later than 60** days after placing the new Weymouth Compressor Station in service. If a full load condition noise survey of the entire station is not possible, Algonquin shall file an interim survey at the maximum possible horsepower load and file the full load survey **within 6 months**. If the noise attributable to the operation of the new compressor station at full or interim power load conditions exceeds an L_{dn} of 55 dBA, Algonquin shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Algonquin shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls ***(Section 2.8.3)***

24. Algonquin shall file noise surveys with the Secretary **no later than 60** days after placing the authorized units at the Stony Point, Oxford, and Chaplin Compressor Stations in service. If a full load condition noise survey of the entire station is not possible, Algonquin shall file an interim survey at the maximum possible horsepower load and file the full load surveys **within 6 months**. If the noise attributable to the operation of the modified compressor station at full or interim

power load conditions exceeds existing noise levels at any nearby NSAs that are currently at or above an L_{dn} of 55 dBA, or exceeds 55 dBA L_{dn} at any nearby NSAs that are currently below 55 dBA L_{dn}, Algonquin shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Algonquin shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 2.8.3)***

25. Algonquin shall file noise surveys with the Secretary **no later than 60 days** after placing the modified Yorktown and Danbury M&R Stations, the modified Needham Regulator Station, and the proposed new Salem Pike M&R Station in service. If the noise attributable to the operation of any M&R station or regulator station at full load exceeds an L_{dn} of 55 dBA at any nearby NSA, Algonquin shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Algonquin shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 2.8.3)***

5.0 REFERENCES

Altamura, R.J. 1987. Bedrock Mines and Quarries of Connecticut. Connecticut Geological and Natural History Survey.

City of Danbury Connecticut. 2015. Office of Economic Development. Available online at http://www.ci.danbury.ct.us/content/22097/21099/default.aspx. Accessed November 2015.

Columbia University. 2015. Email correspondence between Paul Olsen (Lamont Doherty Geological Observatory of Columbia University at Palisades, NY) and Ayla Heinze Fry (TRC) on March 24, 2015. See appendix 1E of the Atlantic Bridge Application.

Comprehensive Energy Strategy. 2013. 2013 Comprehensive Energy Strategy for Connecticut. Online: http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf. Accessed November 2015.

Connecticut Department of Economic and Community Development. 2015. Publications. Available online at http://www.ct.gov/ecd/cwp/view.asp?a=1105&q=251248. Accessed November 2015

Connecticut Department of Energy and Environmental Protection. 2010. Endangered, Threatened, and Special Concern Birds. Available online at [http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323472&deepNav_GID=1628]. Accessed November, 2015.

Connecticut Department of Energy and Environmental Protection. 2012. Aquifer Protection Areas. Available online at http://www.cteco.uconn.edu/guides/aquifer_protection_area.htm. Accessed November 2015.

Connecticut Department of Energy and Environmental Protection. 2014. Eastern Box Turtle. Available online at http://www.ct.gov/deep/cwp/view.asp?a=2723&q=416520. Accessed November, 2015.

Connecticut Department of Energy and Environmental Protection. 2015a. Groundwater Quality Classifications. Available online at http://cteco.uconn.edu/guides/Water_Quality_Class.htm. Accessed November 2015.

Connecticut Department of Energy and Environmental Protection. 2015b. Letter from Dawn McKay (CTDEEP) to Richard Paquette (TRC) on November, 2015.

Connecticut Department of Energy and Environmental Protection. 2015c. Connecticut Noise Regulations. Regulations of Connecticut State Agencies Section 22a-69. Available online at http://www.ct.gov/deep/lib/deep/regulations/22a/22a-69-1through7.pdf. Accessed November 2015.

Connecticut Department of Transportation. 2015. Moses Wheeler Bridge. Available online at http://www.moseswheelerbridge.com/projoverview/. Accessed November 2015.

Connecticut Environmental Justice Policy. 2012a. Available online at http://www.ct.gov/deep/cwp/view.asp?a=2688&q=322378&deepNav_GID=1511. Accessed October 2015.

Connecticut Environmental Justice Policy. 2012b. Available online at http://www.ct.gov/deep/lib/deep/environmental_justice/EJ_Guid.pdf. Accessed October 2015.

Connecticut Office of Tourism. 2015. Visit Connecticut. Available online at http://www.ctvisit.com/. Accessed October 2015.

Consumer Price Index Bureau of Labor Statistics. 2015. CPI Inflation Calculator. Available online at: http://data.bls.gov/cgi-bin/cpicalc.pl?cost1=50%2C000.00&year1=1984&year2=2014. Accessed October 2015.

Council on Environmental Quality. 1997a. Environmental Justice: Guidance under the National Environmental Policy Act. Available at http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf. Accessed October 2015.

Council on Environmental Quality. 1997b. Considering Cumulative Effects under the National Environmental Policy Act. January 1997.

Council on Environmental Quality. 2005. Guidance on the Consideration of Past Actions in Cumulative Effects Analysis. June 2005.

Cowardin, L.M., V. Carter, F.C. Golet, E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. Available online at http://www.fws.gov/wetlands/documents/classification-of-wetlands-and-deepwater-habitats-of-the-united-states.pdf. Accessed November 2015.

CPV Towantic Energy Center. 2015. About the CPV Towantic Energy Center. Available online at http://www.cpvtowantic.com/about.html. Accessed December 2015.

Diskin, B.A., J.P. Friedman, S.C. Peppas, and S.R. Peppas. 2011. The Effects of Natural Gas Pipelines on Residential Value. Available online at http://irwaonline.org/eweb/upload/web_jan_NaturalGas.pdf. Accessed October 2015.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/29392.html. Accessed November, 2015.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Federal Emergency Management Agency. 2015. National Flood Hazard Layer (Official). Available online at http://fema.maps.arcgis.com/home/. Accessed November 2015.

Federal Energy Regulatory Commission. 2008. Mid Continent Express Final Environmental Impact Statement. (Docket No. CP08-6.). Washington, DC.

Fruits, E. 2008. Natural Gas Pipelines and Residential Property Values: Evidence from Clackamas and Washington Counties. ECONorthwest. Accessed November 2015.

GZA GeoEnvironmental, Inc. 2015. Geotechnical Data Report No. 2. Attachment RR6 – Response 2 in the February 10, 2016 Applicant Response to January 21, 2016 Data Request.

Hansen, J.L., E.D. Benson, and D.A. Hagen. 2006. *Environmental Hazards and Residential Property Values: Evidence from a Major Pipeline Event*. November 2006. 82 (4):529-541.

Hatch Mott MacDonald. 2015. Feasibility Report Atlantic Bridge Project Taconic Parkway HDD Crossing. See Appendix 6C of Resource Report 6.

Hotels and Motels. 2015. Find Hotels and Motels. Available online at http://www.hotelmotels.info/. Accessed October 2015.

Interstate Natural Gas Association of America Foundation. 2016. Pipeline Impact to Property Value and Property Insurability. Available online at http://www.ingaa.org/File.aspx?id=25622. Accessed February 2016.

Kozlowski, T. 2013. Watershed Forestry Plan for the Property of Sylvan Glen and Granite Knolls Park Preserves, Yorktown Heights, New York. Available online at http://www.yorktownny.org/sites/default/files/fileattachments/general/page/439/sylvan-glen-fmp-reduced.pdf. Accessed October 2015.

Maine Department of Environmental Protection. 2013. Public Water Resources Information System. Available online at http://www.maine.gov/dep/gis/datamaps/DWP_Wells/. Accessed November 2015.

Maine Department of Environmental Protection. 2015. Mining Sites. Available online at http://www.maine.gov/dep/gis/datamaps/lawb_mining/lawb_mining.html. Accessed November 2015.

Maine Department of Inland Fisheries and Wildlife. 2011. Species of Special Concern. Available online at http://www.maine.gov/ifw/wildlife/endangered/listed_species_me.htm. Accessed November 2015.

Maine Geological Survey. 2015. Significant Sand and Gravel Aquifer Maps Digital Data. Available online at http://www.maine.gov/dacf/mgs/pubs/digital/aquifers.htm. Accessed November 2015.

Massachusetts Department of Environmental Protection. 2007. Aquifers. Available online at http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/aquifers-.html. Accessed November 2015.

Massachusetts Department of Environmental Protection. 2015a. MassDEP Wellhead Protection Areas (Zone II, Zone I, IWPA). Available online at http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/layerlist.html. Accessed November 2015.

Massachusetts Department of Environmental Protection. 2015b. Massachusetts Noise Standards. 310 Code of Massachusetts Regulations 7.10. Available online at http://www.mass.gov/eea/docs/dep/service/regulations/310cmr07.pdf. Accessed November 2015.

Massachusetts Department of Transportation. 2015. Project Data Look-Up. Available online at http://www.massdot.state.ma.us/highway/HighlightedProjects. Accessed November 2015.

Massachusetts Division of Fisheries & Wildlife. 2015. Massachusetts List of Endangered, Threatened and Special Concern Species. Available online at http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/mesa-list/list-of-rare-species-in-massachusetts.html. Accessed October, 2015.

Massachusetts Division of Fisheries and Wildlife 2008. Northern red-bellied cooter (*Pseudemys rubriventris*). Available online at http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/pseudemys-rubriventris.pdf. Accessed October, 2015.

Massachusetts Division of Marine Fisheries. 2011. Shellfish Suitability Areas Shapefile. Available online at http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/shlfshsuit.html. Accessed December 2015.

Massachusetts Executive Office of Energy and Environmental Affairs. 2013. Strategic Plan 2013–2015. Available online at: http://www.mass.gov/eea/docs/eea/eea-2013-2015-strategic-plan-17-january-2013.pdf. Accessed November 2015.

Massachusetts Executive Office of Energy and Environmental Affairs. 2015a. Available online at http://www.mass.gov/eea/agencies/dcr/massparks/recreational-activities/massparks-camping-info-generic.html. Accessed October 2015.

Massachusetts Executive Office of Energy and Environmental Affairs. 2015b. Massachusetts Environmental Justice Policy. Available Online at http://www.mass.gov/eea/grants-and-tech-assistance/environmental-justice-policy.html. Accessed October 2015.

Massachusetts Office of Coastal Zone Management. 2011. Massachusetts Office of Coastal Zone Management Policy Guide. Available online at http://www.mass.gov/eea/docs/czm/fcr-regs/czm-policy-guide-october2011.pdf. Accessed November 2015.

Massachusetts Office of Coastal Zone Management. 2015. Federal Consistency Review Program. Available online at http://www.mass.gov/eea/agencies/czm/program-areas/federal-consistency-review/. Accessed November 2015.

Melvin, R. L., S. J. Grady and D. F. Healy. 1988. Connecticut Ground-Water Quality. U.S. Geological Survey Open-File Report 87-0717.

Metzler, K.J. and J.P. Barrett. 2006. The Vegetation of Connecticut: A Preliminary Classification. State Geological and Natural History Survey of Connecticut, Report of Investigations No. 12. CTDEEP, Hartford, CT.

Miller, J.A. 1999. Ground Water Atlas of the United States Introduction and National Summary. Available online at http://pubs.usgs.gov/ha/ha730/ch_a/index.html. Accessed November 2015.

National Oceanic and Atmospheric Administration. 2012. State Coastal Zone Boundaries. Available online at http://coastalmanagement.noaa.gov/mystate/docs/StateCZBoundaries.pdf. Accessed November 2015.

National Oceanic and Atmospheric Administration. 2016. National Hazard Statistics Weather Fatalities. Available online at http://www.nws.noaa.gov/om/hazstats.shtml. Accessed January 2016.

National Park Service. 2004. Connecticut Segments. Available online at http://www.nps.gov/ncrc/programs/rtca/nri/states/ct.html. Accessed November 2015.

National Park Service. 2009. New York Segments. Available online at http://www.nps.gov/ncrc/programs/rtca/nri/states/ny.html. Accessed November 2015.

National Wild and Scenic Rivers System. 2014. Explore Designated Rivers. Available online at http://www.rivers.gov/wsr-act.php. Accessed November 2015.

New England Governors. 2013. New England Governor's Commitment to Regional Cooperation on Energy Infrastructure Issues. Online: http://www.nescoe.com/uploads/New_England_Governors_Statement-Energy_12-5-13_final.pdf.

New York State Department of Environmental Conservation. 2015a. DEC Environmental Navigator. Available online at http://www.dec.ny.gov/imsmaps/minerals/viewer.htm. Accessed November 2015.

New York State Department of Environmental Conservation. 2015b. Primary & Principal Aquifers. Available online at http://www.dec.ny.gov/lands/36119.html. Accessed November 2015.

New York State Department of Environmental Conservation. 2015c. List of Endangered, Threatened, and Special Concern Fish & Wildlife Species of New York State. Available online at http://www.dec.ny.gov/animals/7494.html. Accessed April 23, 2015.

New York State Department of Environmental Conservation. 2015d. Bog Turtle. Available online at http://www.dec.ny.gov/animals/7164.html. Accessed March 13, 2015.

New York State Department of Environmental Conservation. 2015e. Environmental Resource Mapper. Available online at http://www.dec.ny.gov/imsmaps/ERM/viewer.htm. Accessed March 16, 2015.

New York State Department of Environmental Conservation. 2015f. ENB Current and Archives for January – December 2015. Available online at http://www.dec.ny.gov/enb/100181.html. Accessed December 2015.

New York State Department of Health. 2015a. Freedom of Information Law request 15-04-351. See appendix 1E of the Atlantic Bridge Project application.

New York State Department of Health. 2015b. Personal communication between Jane Thapa of NYSDOH and Matthew Cardin of TRC. See appendix 1E of the Atlantic Bridge Project application.

New York State Department of Transportation. 2015. Projects in Your Neighborhood. Available online at http://www.dot.ny.gov/projects. Accessed November 2015.

NY-NJ Trail Conference. 2015. Available online at http://www.nynjtc.org/park/granite-knolls-park http://wmba.org/blog/wp-content/uploads/2010/09/Yorktown-Trails-flyer.pdf. Accessed November 2015.

O'Rourke, T.D, M.C. Palmer. 1996. Earthquake Performance of Gas Transmission Pipelines. Earthquake Spectra: August 1996, Vol. 12, No. 3, pp. 493-527.

Olcott, P.G. 1995. U.S. Geological Survey Ground Water Atlas of the United States Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont HA 730-M. Available online at http://pubs.usgs.gov/ha/ha730/ch_m/index.html. Accessed November 2015.

Pennsylvania Department of Environmental Protection. 2015. Technologically Enhanced Naturally Occurring Radioactive Materials (Tenorm) Study Report. Available online at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study_Report_Rev._0_01-15-2015.pdf Accessed November 2015.

PGP Valuation Inc. 2008. Updated Market Analysis – The Impact of Natural Gas Pipelines on Property Values. February 21, 2008. Available online at http://pstrust.org/docs/Pipeline_Impact_on_Property_Values.pdf. Accessed April 2015.

Radbruch-Hall, Dorothy H., Roger B. Colton, William E. Davies, Ivo Lucchitta, Betty A. Skipp, and David J. Varnes. 1982. *Landslide Overview Map of the Conterminous United States*, U.S. Geological Survey, 1982.

Recreational Vehicle-Clubs and Campgrounds. 2015. Available online at http://www.rv-clubs.us/. Accessed October 2015.

Rich, T. D., C. J. Beardmore, H. Berlanga, P.J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Inigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, and T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Available online at http://www.partnersinflight.org/cont_plan/PIF2_Part1WEB.pdf. Accessed August 21, 2015.

Soil Survey Division Staff. 1993. Soil Survey Manual. U.S. Department of Agriculture Agricultural Handbook 18.

Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture. 2015a. Web Soil Survey. Available online at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed November 2015.

Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture. 2015b. Official Soil Series Descriptions. Available online at https://soilseries.sc.egov.usda.gov/osdname.asp. Accessed November 2015.

Town of Stony Point, New York. 2015. Noise. Town of Stony Point Code Chapter 148. Available online at http://www.ecode360.com/11117885. Accessed November 2015.

Town of Yorktown. 2015. Costco Wholesale Club Site Plan Application SEQRA Page. Available online at http://www.yorktownny.org/planning/costco-wholesale-club-site-plan-application-seqra-page. Accessed December 2015.

U. S. Geological Survey. 1999. Water Quality Assessment of the New England Coastal Basins in Maine, Massachusetts, New Hampshire, and Rhode Island: Chapter 4 Environmental Setting. Report 98-4249. Available online at http://pubs.usgs.gov/wri/wri984249/pdf/. Accessed November 2015.

U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual 2.0: Northcentral and Northeast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Army Corps of Engineers. 2015. Climate Change Adaptation – USACE Sea Level Change Curve Calculator. Available online at http://www.corpsclimate.us/ccaceslcurves.cfm. Accessed November 2015.

U.S. Bureau of Labor Statistics. 2015a. Unemployment Rates for States. Available online at http://www.bls.gov/web/laus/laumstrk.htm. Accessed November 2015.

U.S. Bureau of Labor Statistics. 2015b. Labor force by county. Available online at http://www.bls.gov/lau/laucntycur14.txt. Accessed November 2015.

U.S. Census Bureau. 2010a. U.S. Census Bureau 2010 Total Population. Available online at http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml#none. Accessed November 2015.

U.S. Census Bureau. 2010b. U.S. Census Bureau 2013 Interactive Population Map. Available online at http://www.census.gov/2010census/popmap/. Accessed October 2015.

U.S. Census Bureau. 2013a. U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates. Available online at http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed November 2015.

U.S. Census Bureau. 2013b. Available online at http://quickfacts.census.gov/qfd/. Accessed October 2015.

U.S. Census Bureau. 2014. Population Estimates. Available online at http://www.census.gov/popest/data/counties/totals/2014/CO-EST2014-03.html. Accessed November 2015.

U.S. Department of Agriculture. 2014. Natural Resources Conservation Service Geospatial Data Gateway. Available online at https://gdg.sc.egov.usda.gov/. Accessed May 3, 2015.

U.S. Department of Health and Human Services Centers for Disease Control. 2016. Deaths: Final Data for 2013. Available online at http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf. Accessed January 2016.

U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA). 2015. Pipeline Significant Incident 20 Year Trend. Available online at https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages&NQUser=PDM_WEB_USER&NQPassword=Public_Web_User1&PortalPath=%2Fshared%2FPDM%20Public%20Website%2F_portal%2FSC%20Incident%20Trend&Page=Significant. Accessed April 2015.

U.S. Environmental Protection Agency. 2011. Plan EJ 2014. Available online at http://www3.epa.gov/environmentaljustice/resources/policy/plan-ej-2014/plan-ej-2011-09.pdf. Accessed November 2015.

U.S. Environmental Protection Agency. 2014. 2014 Waterbody Report for Padanaram Brook-01. Available online at http://ofmpub.epa.gov/waters10/attains_waterbody.control?p_au_id=CT6603-00_01&p_list_id=CT6603-00_01&p_cycle=2014#sources. Accessed November 2015.

U.S. Environmental Protection Agency. 2015a. Plymouth/Carver FR. Available online at http://www3.epa.gov/region1/eco/drinkwater/soleplym.html. Accessed November 2015.

U.S. Environmental Protection Agency. 2015b. EJScreen – Environmental Justice Screening and Mapping Tool. Available online at http://ejscreen.epa.gov/mapper/. Accessed November 2015.

U.S. Environmental Protection Agency. 2015c. Current Nonattainment Counties for All Criteria Pollutants. Available online at http://www3.epa.gov/airquality/greenbook/ancl.html. Accessed November 2015.

U.S. Environmental Protection Agency. 1999. Consideration of Cumulative Impacts in EPA Review of NEPA Documents. EPA 315-R-99-002. May 1999.

U.S. Fish and Wildlife Service. 2006. Northern red-bellied cooter (*Pseudemys rubriventris*). Available online at http://www.fws.gov/northeast/pdf/cooter.pdf. Accessed May 18, 2015.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. Available online at http://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf. Accessed August 20, 2015.

U.S. Fish and Wildlife Service. 2011. Birds of Management Concern and Focal Species. U.S. Fish and Wildlife Service, Migratory Bird Program. November 2011. Available online at http://www.fws.gov/migratorybirds/currentbirdissues/management/BMC%20Focal%20Species%20November%202011.pdf. Accessed August 21, 2015.

U.S. Fish and Wildlife Service. 2013. Letter from the New England Field Office (NEFO) to Richard Paquette (TRC) on November 7, 2013.

U.S. Fish and Wildlife Service. 2014. Northern Long-Eared Bat Interim Conference and Planning Guidance, FWS Regions 2, 3, 4, 5, & 6. January 6, 2014. Available online at http://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf. Accessed May 7, 2015.

U.S. Fish and Wildlife Service. 2015a. Critical Habitat. Available online at http://www.fws.gov/endangered/esa-library/pdf/critical_habitat.pdf. Accessed March 13, 2015.

U.S. Fish and Wildlife Service. 2015b. FWS New York Ecological Services Field Office Consultation for Atlantic Bridge Project Stony Point Segment. Consultation Code: 05E1NY00-2015-SLI-0557. Generated March 13, 2015

U.S. Fish and Wildlife Service. 2015c. 2015 Range-Wide Indiana Bat Summer Survey Guidelines. April 2015. Available online at http://www.fws.gov/northeast/pafo/PDF/2015IndianaBatSummerSurveyGuidelines01April2015.pdf. Accessed May 7, 2015.

U.S. Fish and Wildlife Service. 2015d. FWS New York Ecological Services Field Office Consultation for Atlantic Bridge Project Stony Point Segment. Consultation Code: 05E1NY00-2015-SLI-0557. Generated March 13, 2015.

U.S. Geological Survey. 2006a. ShakeMap Manual: Technical Manual, Users Guide, and Software Guide. Available online at http://pubs.usgs.gov/tm/2005/12A01/pdf/508TM12-A1.pdf. Accessed November 2015.

U.S. Geological Survey. 2006b. Quaternary Fault and Fold Database of the United States. Available online at http://earthquake.usgs.gov/hazards/qfaults/. Accessed November 2015.

U.S. Geological Survey. 2014. Documentation for the 2014 Update of the United States National Seismic Hazard Maps. Open-File Report 2014-1091. Available online at http://pubs.usgs.gov/of/2014/1091/. Accessed October 2015.

U.S. Geological Survey. 2015a. Mineral Resources On-Line Spatial Data. Geology by state. Available online at http://mrdata.usgs.gov/geology/state/map.html. Accessed November 2015.

U.S. Geological Survey. 2015b. Mineral Resources On-Line Spatial Data. Mineral Resources Data System. Available online at http://mrdata.usgs.gov/mrds. Accessed November 2015.

U.S. Geological Survey. 2015c. Active Mines and Mineral Processing Plants in the United States in 2003. Available online at http://mrdata.usgs.gov/mineplant/. Accessed October 2015.

U.S. Geological Survey. 2015d. 2010–2011 Minerals Yearbook, New York [Advance Release]. U.S. Geological Survey. April 2015.

U.S. Geological Survey. 2015e. 2010–2011 Minerals Yearbook, Connecticut [Advance Release]. U.S. Geological Survey. April 2015.

U.S. Geological Survey. 2015f. 2010–2011 Minerals Yearbook, Massachusetts [Advance Release]. U.S. Geological Survey. March 2015.

U.S. Geological Survey. 2015g. 2010–2011 Minerals Yearbook, Maine [Advance Release]. U.S. Geological Survey. May 2015.

U.S. Global Change Research Program. 2014. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. Available online at http://nca2014.globalchange.gov/.

Weary, D.J. and D.H. Doctor. 2014. Karst in the United States: A Digital Map Compilation and Database, USGS Open-File Report 2014-1156, 23 p.

Yellow Pages. 2015. Available online at http://www.yellowpages.com. Accessed October 2015.

6.0 LIST OF PREPARERS

Federal Energy Regulatory Commission

Suter, Magdalene – Environmental Project Manager, Proposed Action, Alternatives, Geology, Soils, and Paleontology, Land Use, Recreation, and Visual Resources, Socioeconomics, Air Quality, Noise, Reliability and Safety, Cumulative Impacts

B.S., Environmental Systems Engineering, 2004, Pennsylvania State University

Laffoon, Danny – Deputy Project Manager, Proposed Action, Land Use, Recreation, and Visual Resources, Socioeconomics

B.S., Fisheries and Wildlife, 2000, Virginia Polytechnic Institute and State University

Howard, Eric – Cultural Resources

M.A., Anthropology, 1997, University of Tennessee
B.A., Anthropology, 1992, University of Tennessee

Wachholder, Joanne – Water Resources and Wetlands, Vegetation, Wildlife, and Fisheries

M.S., Crop and Soil Sciences/Environmental Toxicology, 1997, Michigan State University
B.S., Environmental Biology, 1994, University of Wisconsin, Stevens Point

Natural Resource Group, LLC

Brown, Larry – Project Manager, Proposed Action, Alternatives

B.S., Biology, 1981, Bates College

Thornton, Andrea – Deputy Project Manager, Quality Assurance Review, Proposed Action, Cumulative Impacts, Land Use, Socioeconomics

B.A., Environmental Geology, 2006, Northeastern University
B.A., Environmental Studies, 2006, Northeastern University

Buckless, Mike – Geology, Soils, and Paleontology, Groundwater

B.S., Environmental Science and Management, 2013, University of Rhode Island

Edwards, Nevin – Air Quality and Noise

B.S., Chemical and Petroleum Engineering, 2009, University of Pittsburgh

Enright, Troy – Air Quality and Noise

B.S., Environmental Science, 2003, University of Minnesota, Twin Cities

Jean, Melissa – Land Use, Recreation, and Visual Resources, Socioeconomics

B.S., Environmental Studies, 2011, St. Cloud State University

Jones, DeeAn – Vegetation, Wildlife, and Fisheries

B.S., Wildlife and Fisheries Biology, 1993, University of California Davis

Lee, Jennifer – Land Use

B.A., Environmental Studies and Geography, 1995, University of St. Thomas

Lyons, Tina – Quality Assurance Review and Technical Editor

B.S., Genetics and Cell Biology, 1999, University of Minnesota, Twin Cities
B.S., Ecology, Evolution, and Behavior, 1996, University of Minnesota, Twin Cities

Nickel, Dave – Reliability and Safety

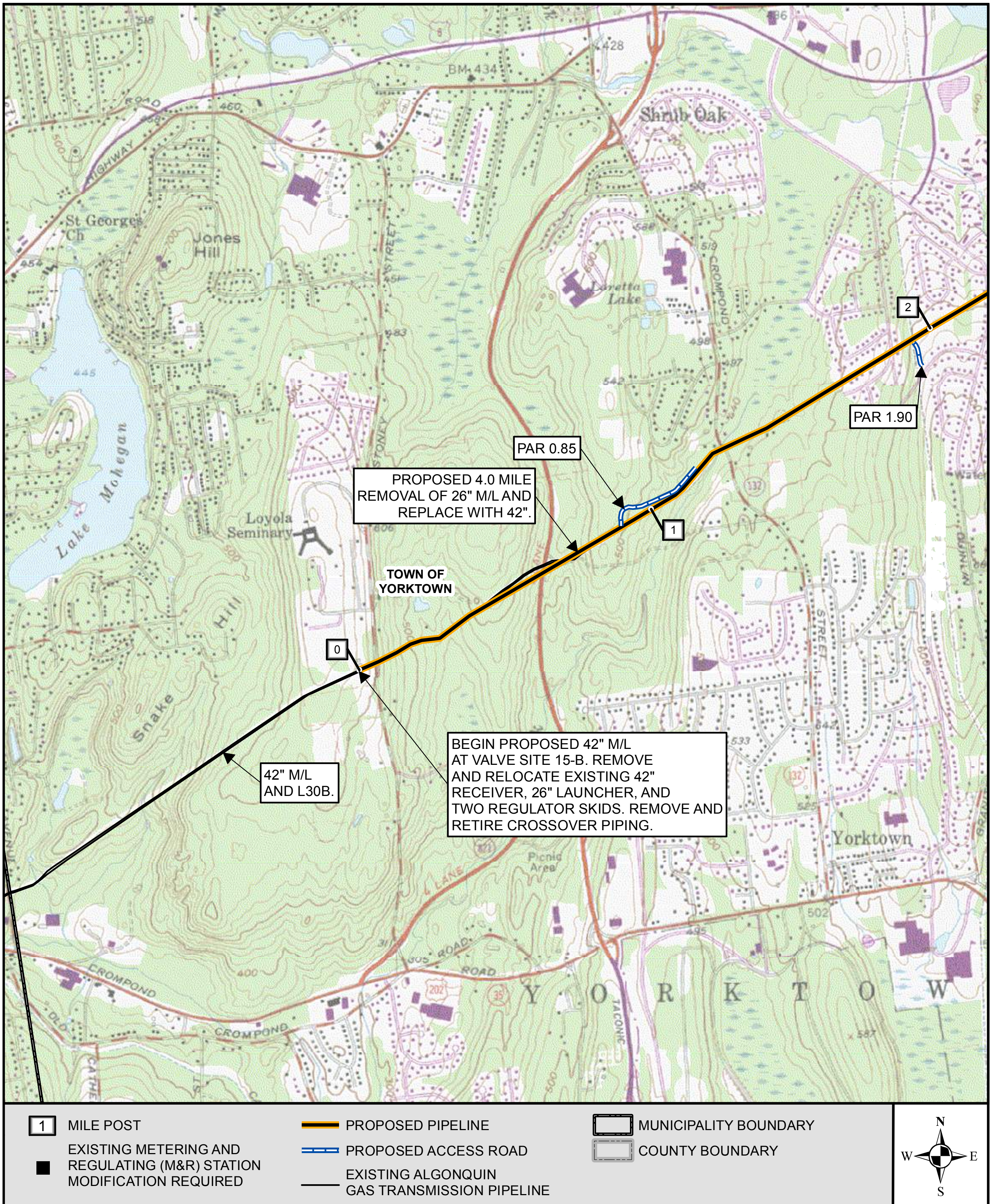
B.L.A., Environmental Studies, 2002, University of Minnesota Duluth

Pincoske, Jeremy – Cultural Resources

B.A., Anthropology, 1988, State University of New York - Stony Brook

APPENDIX A

PIPELINE AND ABOVEGROUND FACILITY MAPS

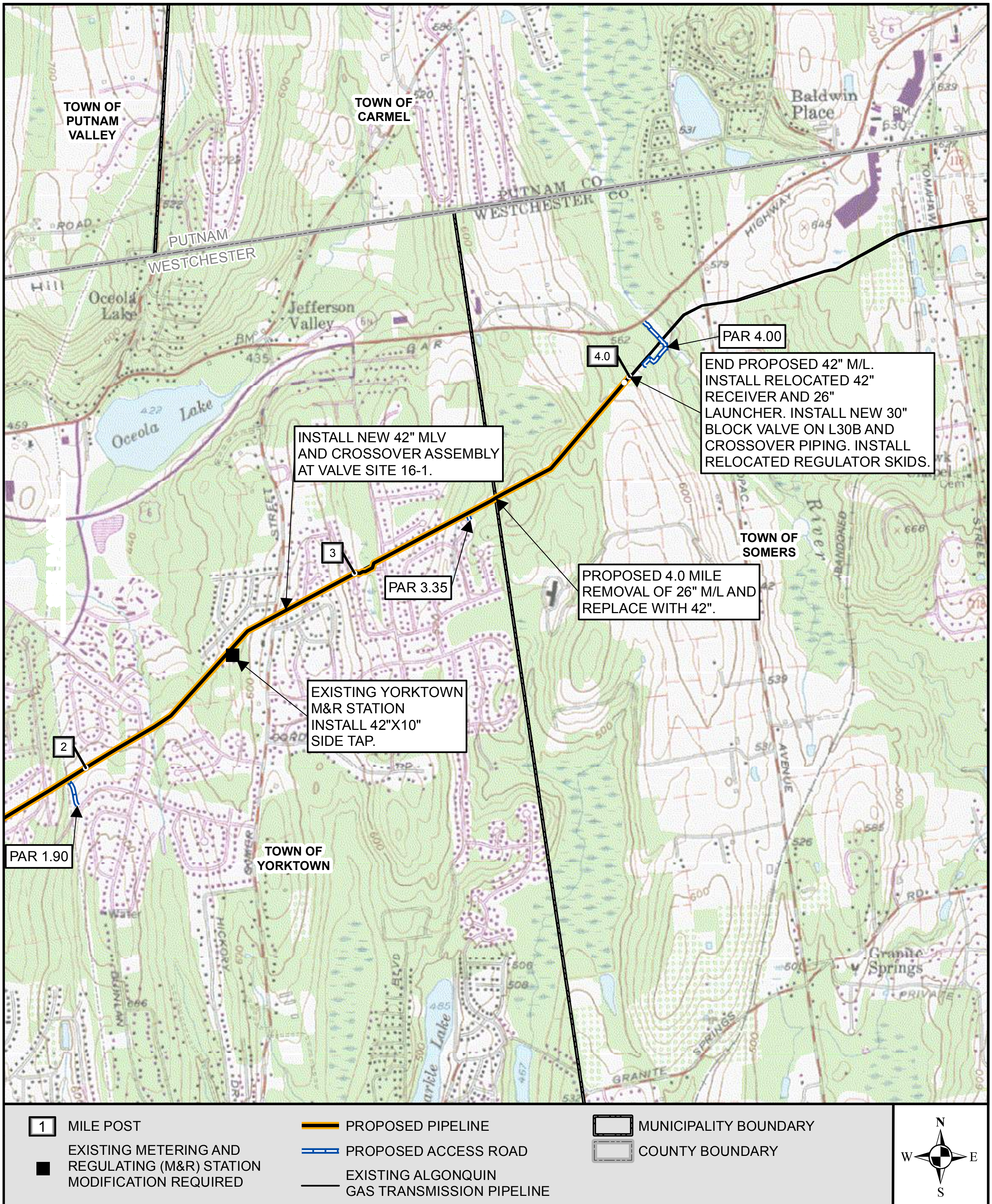


Appendix A

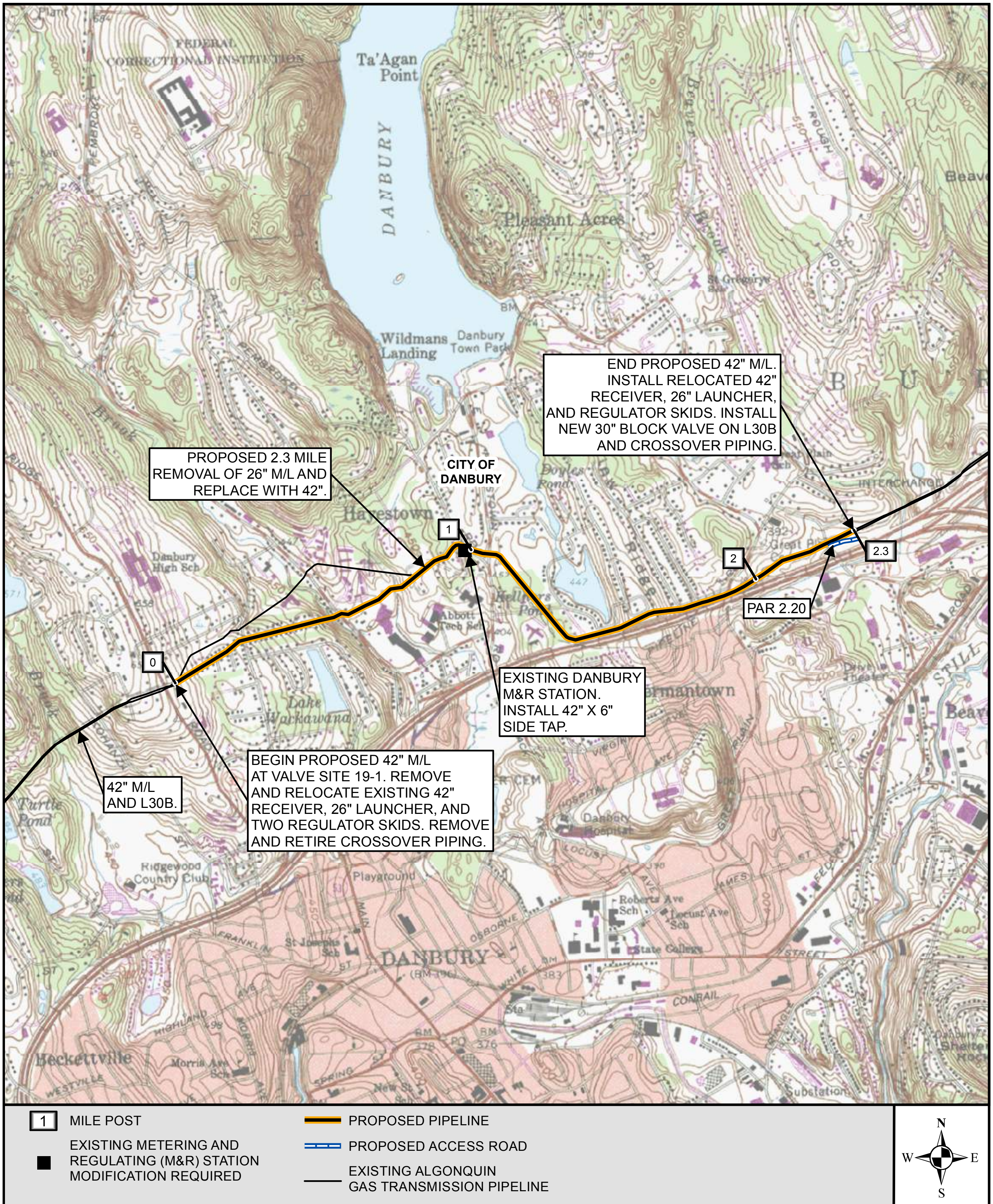
Atlantic Bridge Project

Pipeline and Aboveground Facility Maps

Stony Point Discharge Take-up and Relay



Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Stony Point Discharge and Relay

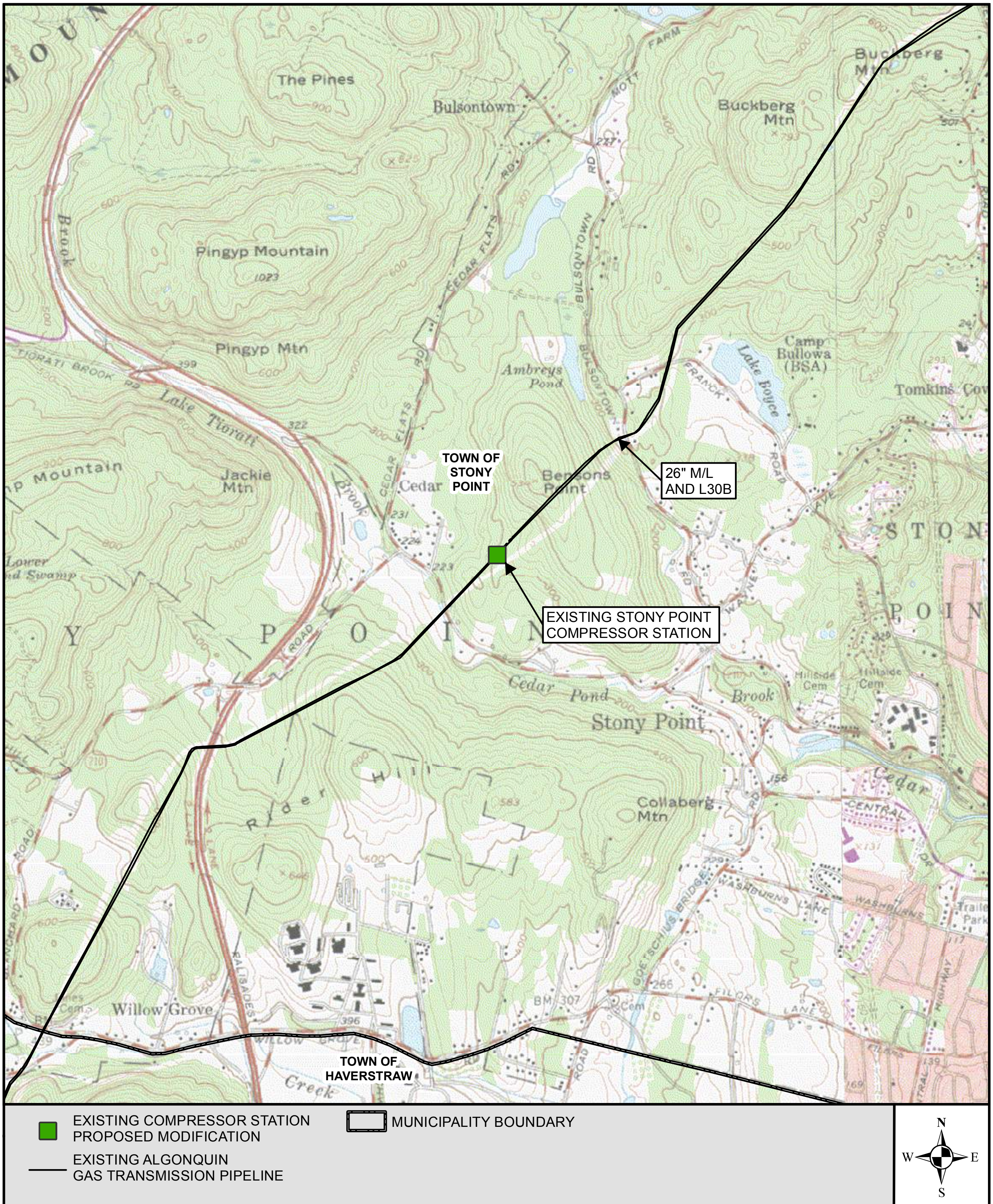


Appendix A

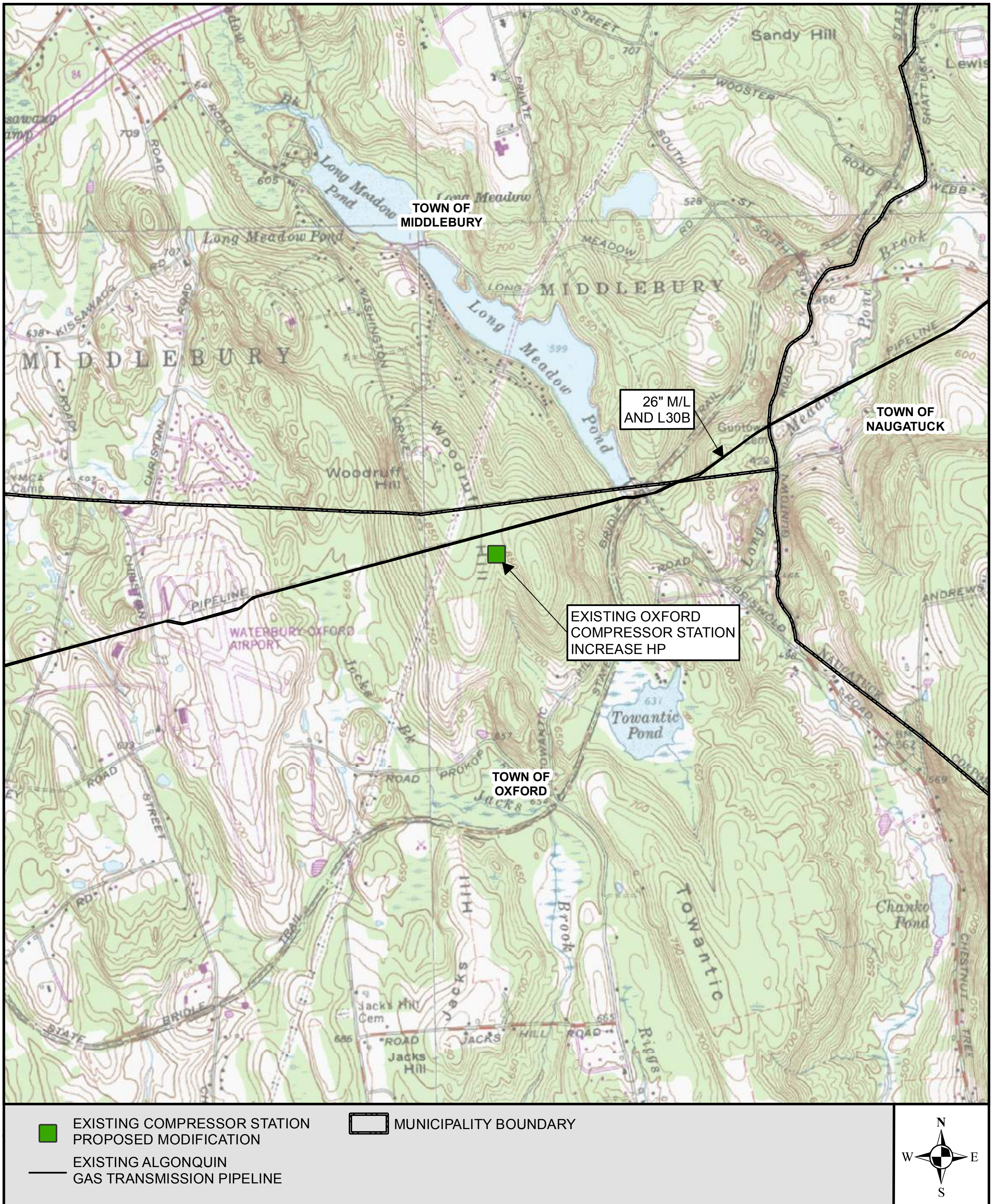
Atlantic Bridge Project

Pipeline and Aboveground Facility Maps

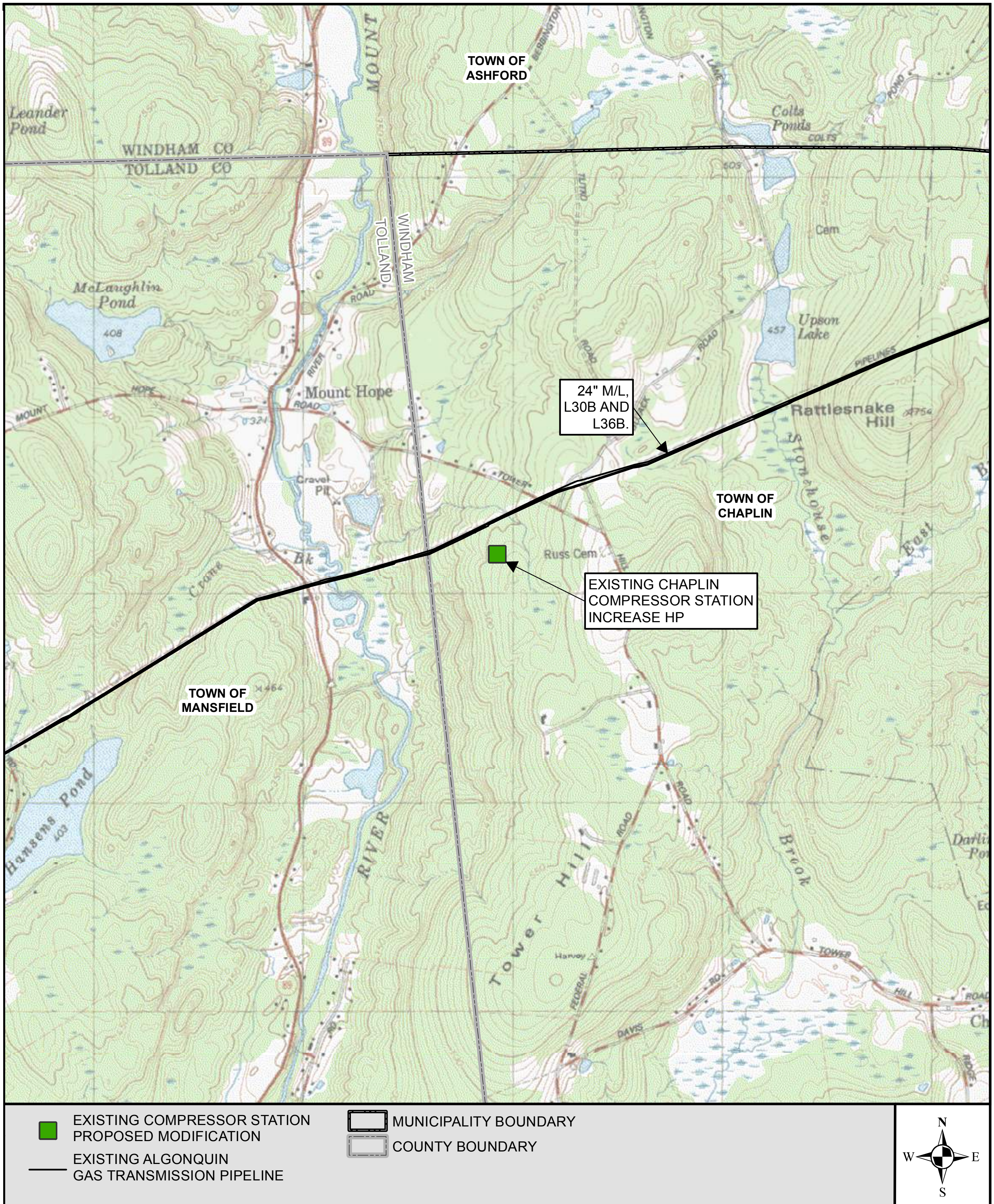
Southeast Discharge and Relay



Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Stony Point Compressor Station



Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Oxford Compressor Station



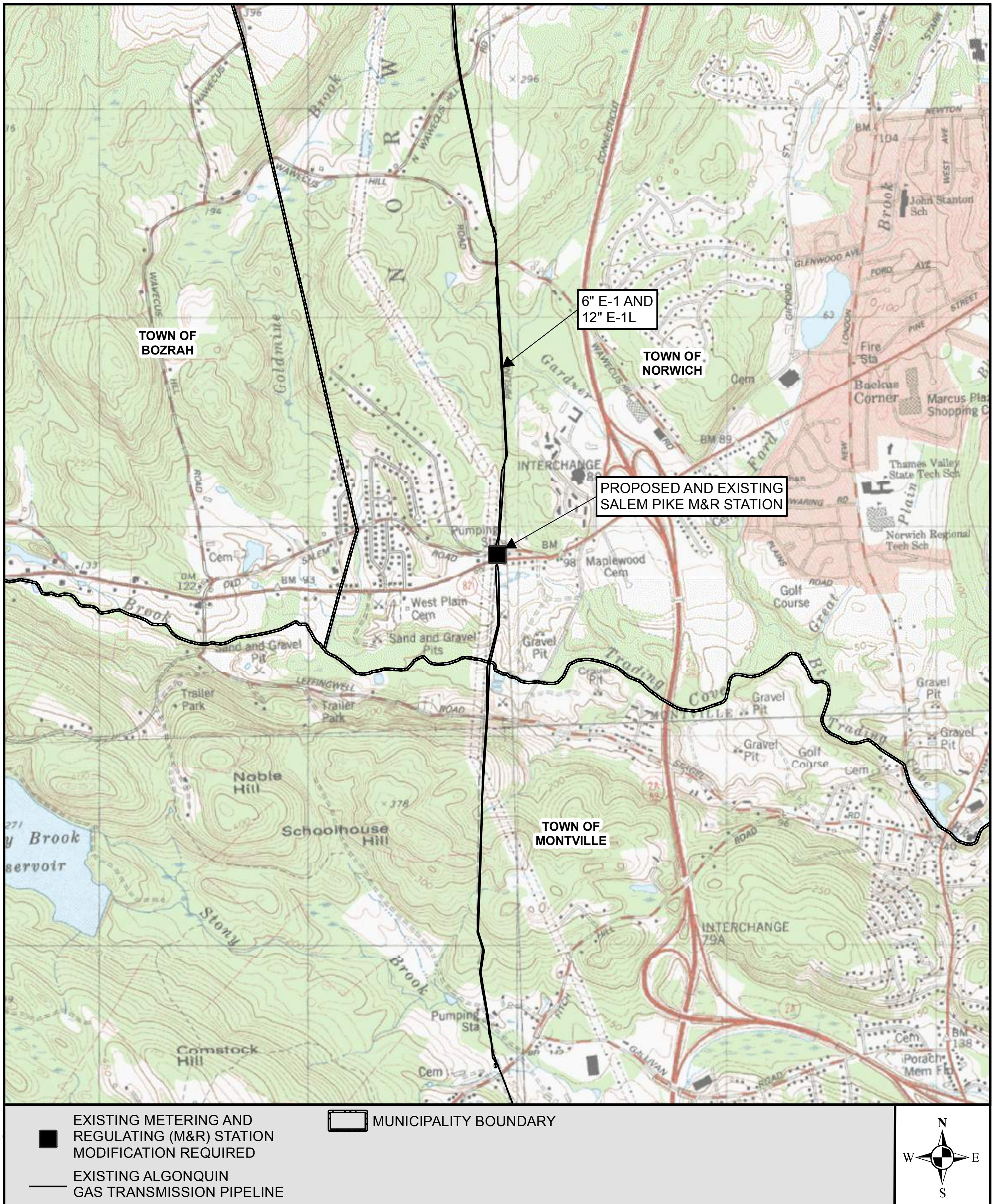
Appendix A

Atlantic Bridge Project

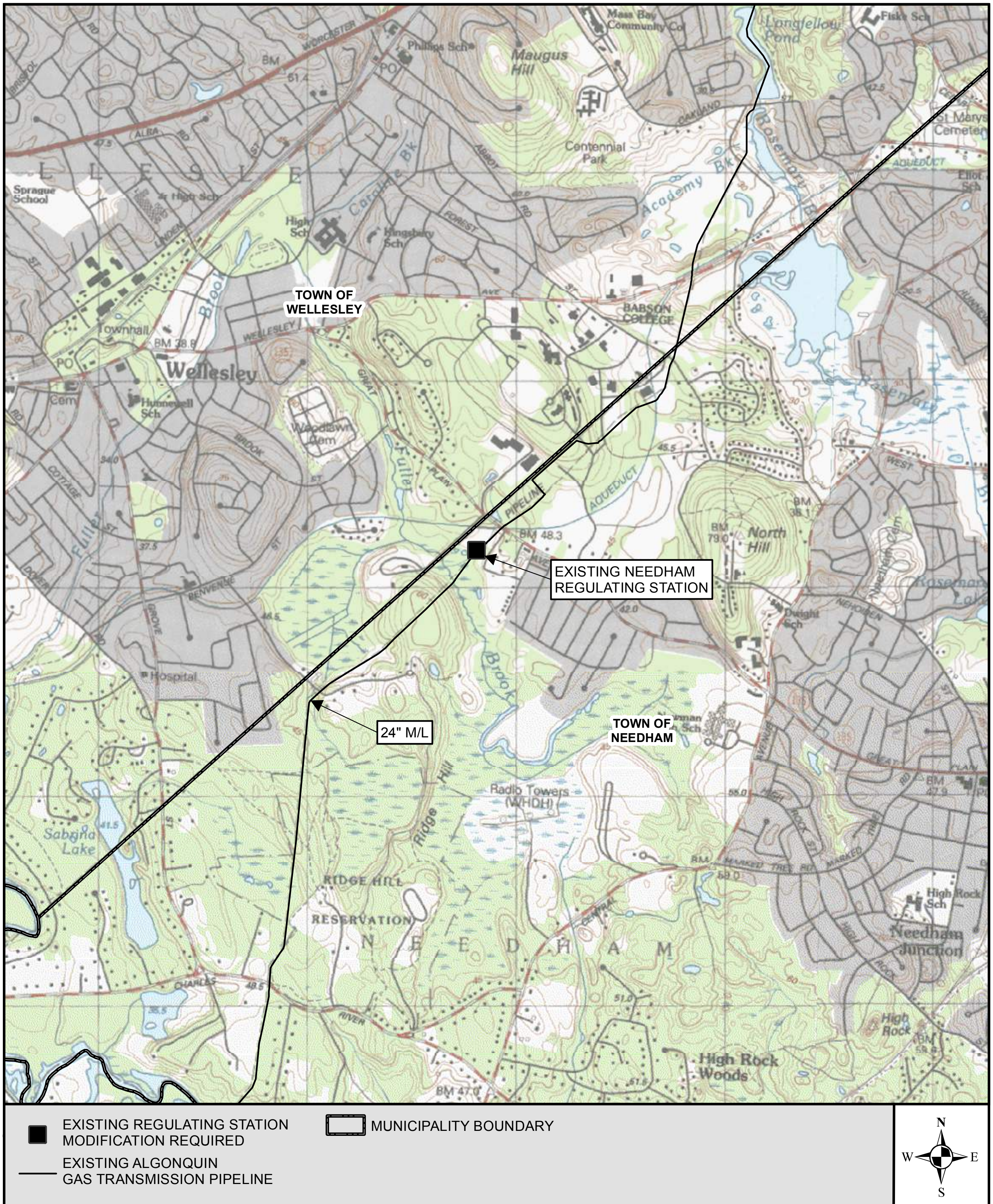
Pipeline and Aboveground Facility Maps

Chaplin Compressor Station

Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Proposed Weymouth Compressor Station

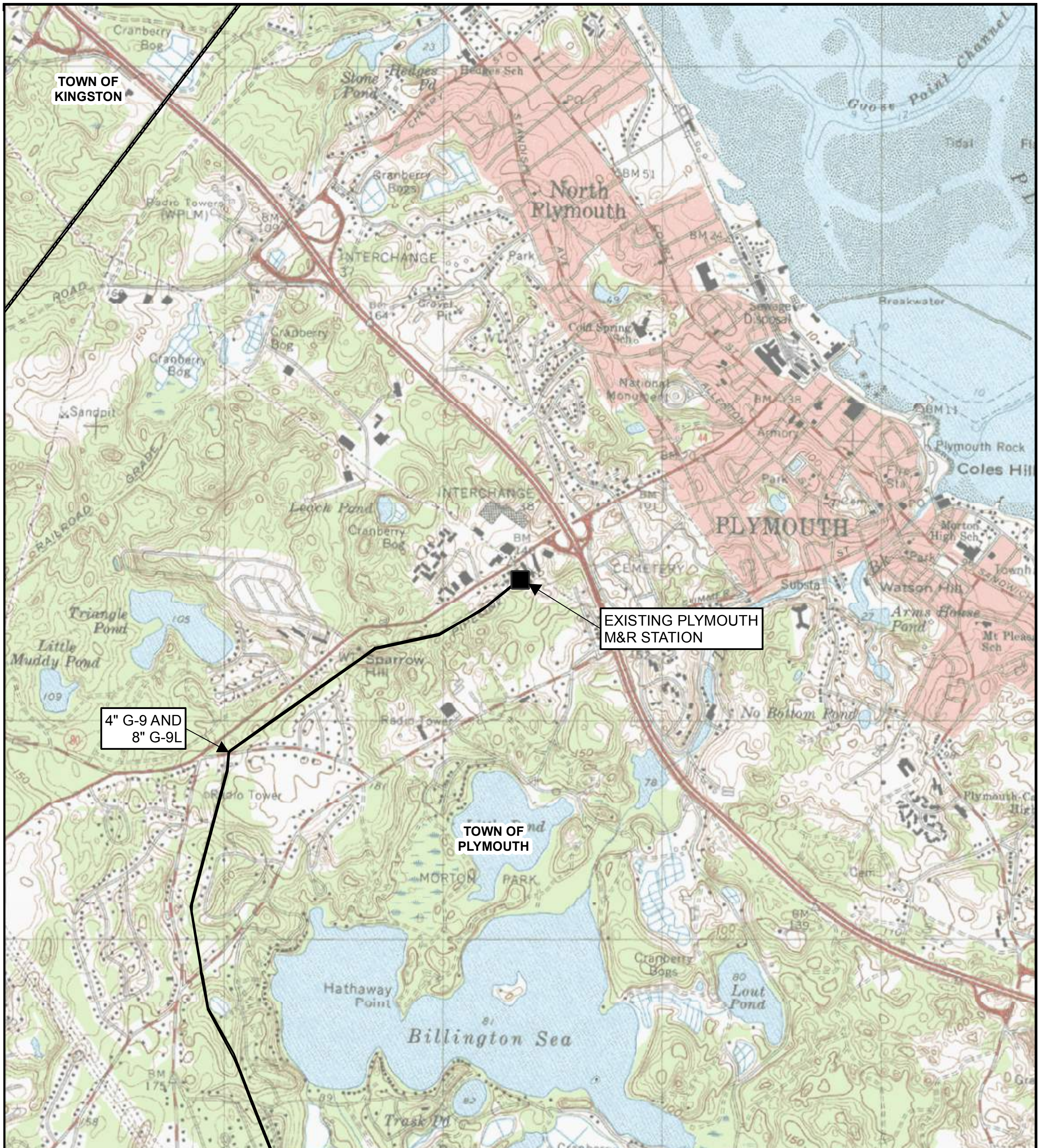


Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Salem Pike M&R Station



Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Needham Regulating Station

Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Pine Hills M&R Station



EXISTING METERING AND REGULATING (M&R) STATION MODIFICATION REQUIRED

EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE

MUNICIPALITY BOUNDARY

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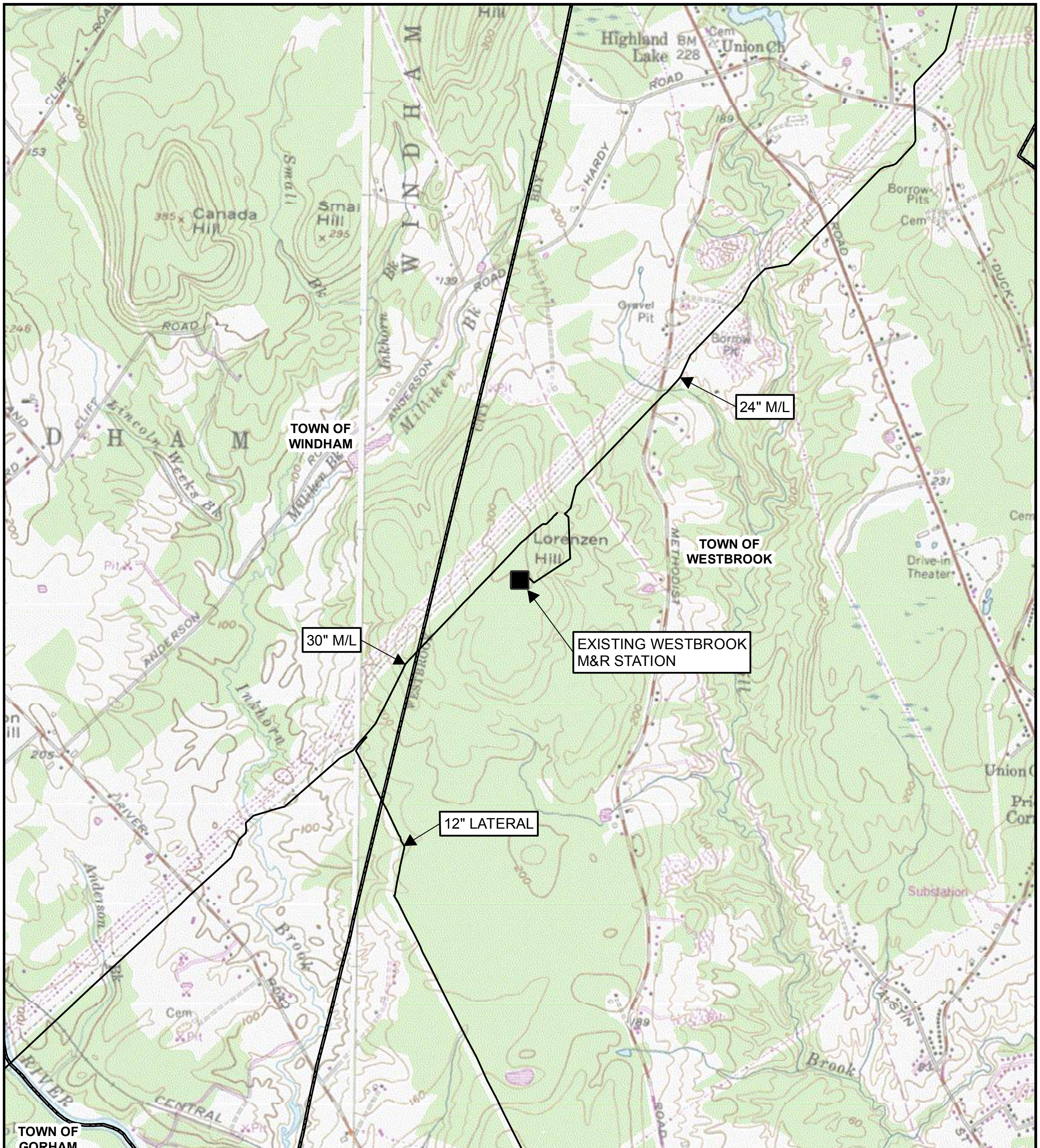
Appendix A

Atlantic Bridge Project

Pipeline and Aboveground Facility Maps

Plymouth M&R Station



EXISTING METERING AND REGULATING (M&R) STATION MODIFICATION REQUIRED

EXISTING MARITIMES & NORTHEAST GAS TRANSMISSION PIPELINE

MUNICIPALITY BOUNDARY

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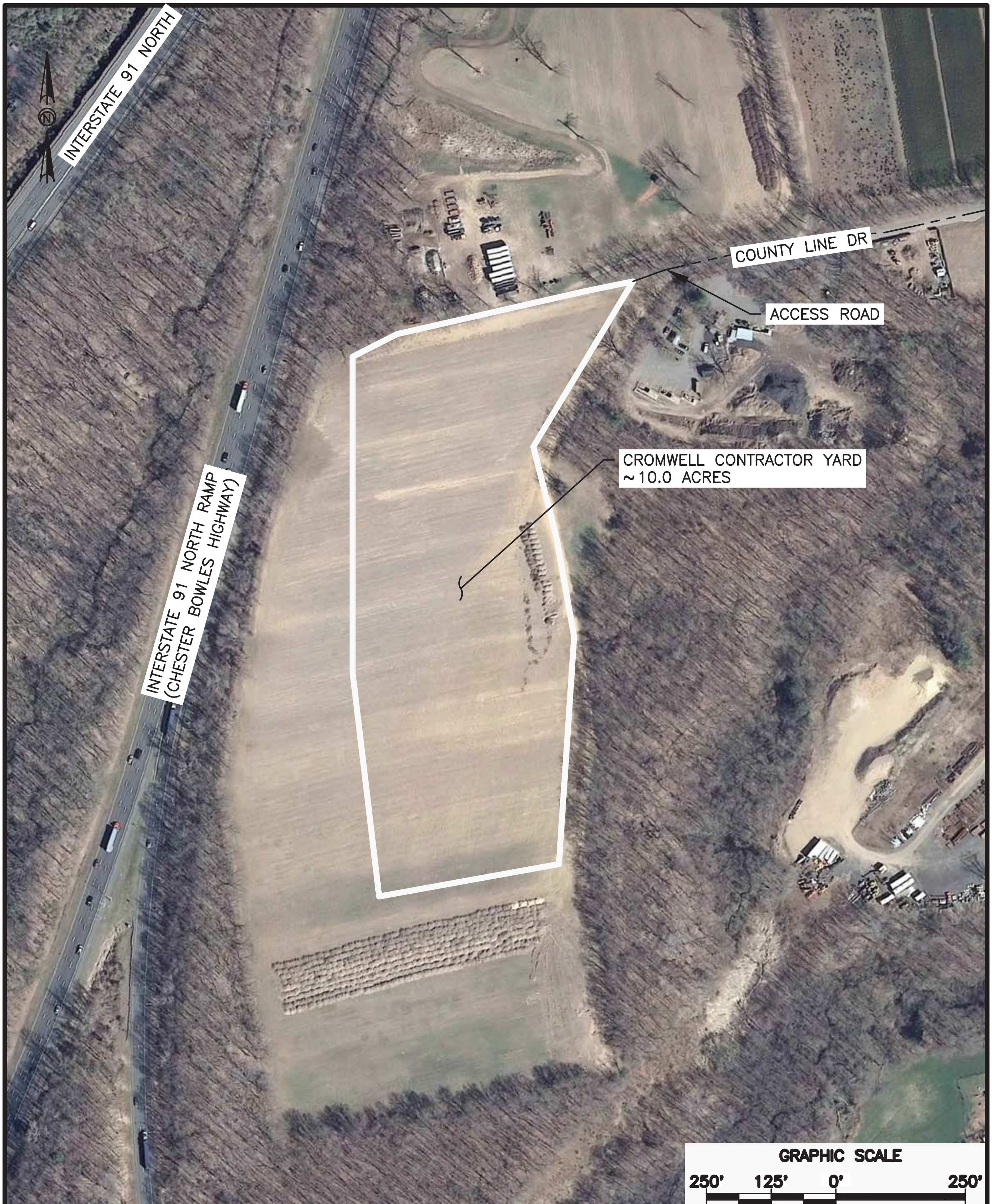
Appendix A
Atlantic Bridge Project
Pipeline and Aboveground Facility Maps
Westbrook M&R Station

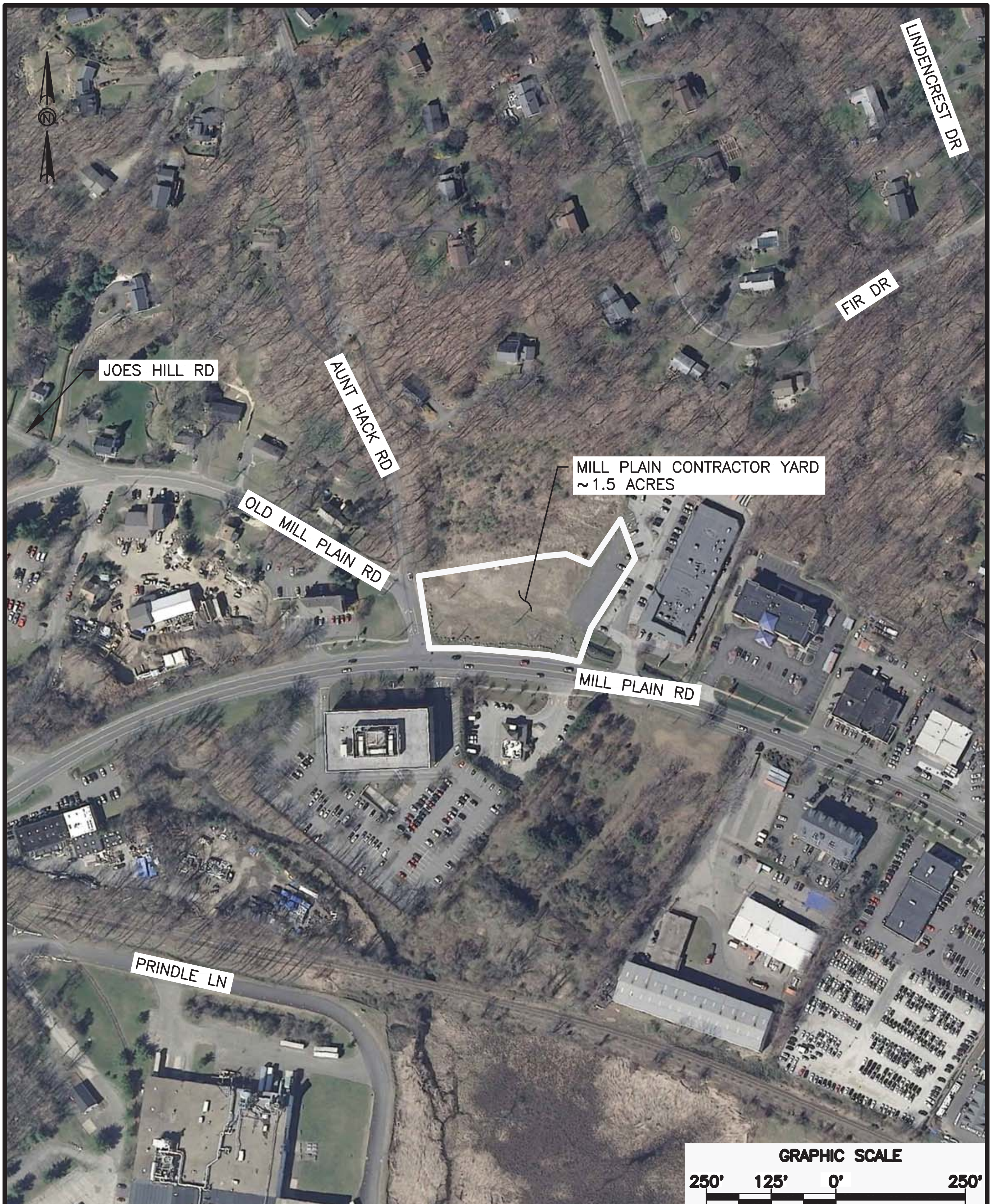
APPENDIX B

PIPE AND CONTRACTOR WARE YARDS MAPS

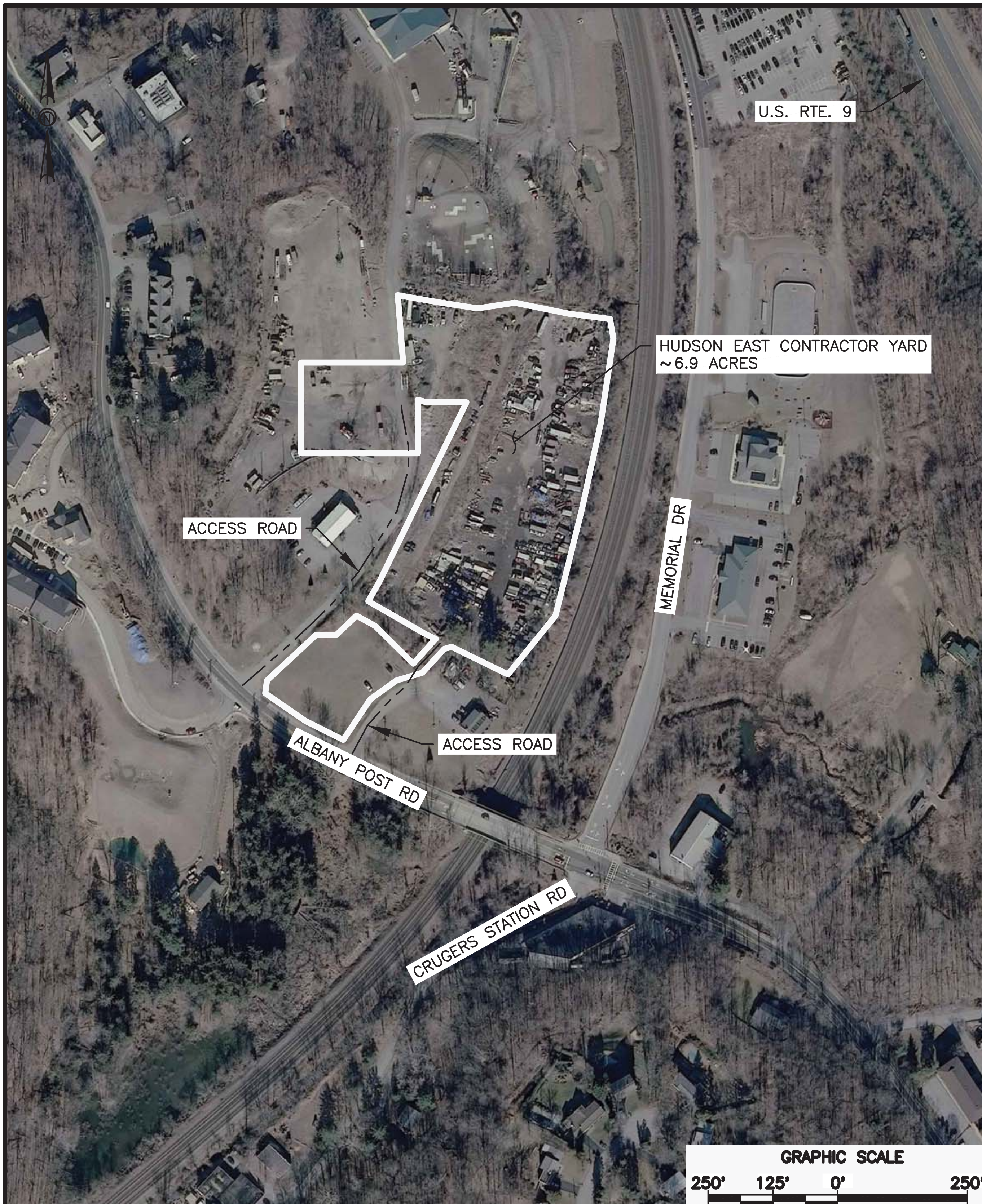
Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Algonquin Cheshire Yard



Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Cromwell Yard



Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Mill Plain Yard



Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Hudson East Yard

Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
LMC Yard

Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Global Foundries Yard

Appendix B
Atlantic Bridge Project
Pipe and Contractor Ware Yards
Westchester County Yard

APPENDIX C

ROCK REMOVAL PLAN

Spectra Energy Partners®

ATLANTIC BRIDGE PROJECT

Rock Removal Plan

February 2016

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin") and Maritimes & Northeast Pipeline, L.L.C. ("Maritimes") have developed this Rock Removal Plan ("Plan") to be implemented during construction and operation of the Atlantic Bridge Project ("Project"). The Plan provides information on the type of bedrock likely to be encountered during construction, bedrock locations along the Project route, and estimated depth to bedrock. Information on the characteristics of the bedrock may be evaluated, at least in a general sense, and applied towards an appropriate bedrock excavation method.

This information was obtained from the local published soil maps as acquired from the Natural Resources Conservation Service and State resources.

A map depicting the location of the Atlantic Bridge Project is presented in Attachment 1.

2.0 BEDROCK CHARACTERISTICS

The hard and intact nature of the unweathered igneous bedrock (basalts and granites) and metamorphic bedrock (slates, phyllites, schists, and quartzites) dictate the removal methods that will be utilized. Soft bedrock, such as sedimentary or weathered igneous and metamorphic rock, may possibly be removed by ripping. Other geologic features may also control the effects of removal. Rock fabric, or the arrangements of minerals, determines intrinsic rock strength, and thus influences rock excavation. Joint spacing, bedding, and foliation also influence rock excavation. Lithologic generalizations of the Atlantic Bridge Project area rock type include:

- Granitic rock is invariably resistant, except where weathered;
- Granulitic (high temperature-high pressure metamorphic rock with gneissic texture) and migmatitic (cooled rock having reached the boundary between metamorphism and magmatism) rock are also equally resistant;
- Ultramafic (rich ferromagnesium) rocks are highly fractured and almost always require blasting. Other metamorphic rock along the geothermal gradient may have a wide range of susceptibility to blasting or ripping. It is the most difficult to predict of the hard rocks. Degrees of intensity of metamorphism can be further deduced from the minerals that schists contain; and
- Weathered or thinly bedded sedimentary rock is generally amenable to ripping.

Distinct paralithic zones of partially weathered bedrock or weakly consolidated bedrock were not identified in the publicly available databases reviewed for the Project area.

Attachment 2 presents the estimated depth to bedrock along the pipeline route where shallow bedrock may be encountered during construction. Attachment 3 presents a summary of bedrock types present at the Atlantic Bridge Project facilities.

3.0 ROCK REMOVAL CONSIDERATIONS

The Rock Removal Plan will be utilized for each site when solid rock is encountered as part of the pipeline trench excavation, the grading to prepare a level linear work area, or the excavation for aboveground facilities. Refer to the tables in Attachment 2 and Attachment 3 for a summary of bedrock characteristics for the Atlantic Bridge Project. Site specific geotechnical information is provided in facility specific reports for new aboveground facilities.

If rock is encountered, the experienced contractor will analyze the rock type and hardness and consider all other contributing factors such as location, surrounding environment, nearby facilities, residences, and/or resources. The procedures outlined in the Rock Removal Plan will then be used to determine a suitable rock removal procedure, subject to Algonquin approval.

Should rock be encountered during grading or trench excavation, the contractor will assess the rock properties and attempt to remove rock using simple mechanical processes, such as a bulldozer mounted rock ripping attachment or rock teeth on an excavator bucket. If alternative methods are considered, including an excavator mounted hydraulic breaker, line drilling and ripping, or drilling and blasting, approval from Algonquin will be required.

For rock removal adjacent to other utilities, information will be gathered on the depth of trench, proximity to the existing utility, the type of rock, and other factors. Following an evaluation by Algonquin, the contractor will be notified of all approved rock removal methods for the site that adhere to Algonquin specifications.

The contractor will then assess proximity to structures, resources, facilities, and residences. Federal and state regulations will be consulted to determine acceptable removal methods within the area. If blasting is allowed, all necessary steps will be taken to protect existing conditions. Such procedures may include pre- and/or post-blast surveys at residences and structures, water well testing as applicable, and utilization of blasting mats.

The contractor will make a reasonable effort to first mechanically remove the rock in congested or densely residential areas. If the mechanical methods of removal fail to properly fragment the rock, then blasting will be used (where allowed by Algonquin and applicable regulations). For all other areas, the contractor will ultimately select the rock removal method from the methods approved by Algonquin and applicable regulations. The decision will be based upon the factors listed above, along with additional factors including, but not limited to, volume of rock to be removed, availability of equipment and personnel, and site-specific considerations. If blasting is selected, then site-specific, detailed blasting plans will be developed for each site to meet Algonquin's specifications and standard practices.

4.0 ROCK REMOVAL METHODS

As per Algonquin specifications, all forms of mechanical rock removal will occur between the hours of 7 a.m. and 6 p.m. (unless otherwise specified by Algonquin or restricted by permit). Additionally, a fragmentation rate of at least 75 percent of trench rock to less than 6 inches in diameter is required.

There are several possible methods to remove rock from within an excavation. Each method is best suited for specific situations due to individual advantages and limitations. A general overview of each method is provided below.

4.1 Excavation

During normal trenching activities, the contractor will use excavators to remove soil from the path of the pipeline. If the excavator encounters small to medium boulders, then it may be possible for the machine to remove the rock. However, it is expected that the excavator may encounter bedrock while trenching. The contractor may be able to "rip" the bedrock using rock teeth on an excavator bucket or a ripping attachment on a bulldozer. When ripping of rock is not practical or possible, other means of rock fragmentation are necessary as described below.

4.2 Hammering

Hammering is the use of any tool that fragments rock using a percussion hammer. Two common pieces of construction equipment used in hammering are hand held jack-hammers and hydraulic breakers attached to excavators (referred to as a "hammer hoe").

Hand-held jack-hammers can be useful for fragmenting pavement, concrete, or rock. However, hand-held jack-hammers are only practical for small amounts of rock removal because the process is labor intensive and has limited percussive strength. Hydraulic breakers are more useful in fragmenting rock due to the increased size, efficiency, and power. Rock removal progress for hydraulic breakers is generally slow for large amounts of rock.

Hammer hoe or jack-hammer operations require planning and execution of applicable precautionary measures. Initially, all adjacent utilities must be verified and protected, including Algonquin pipelines and facilities. Fortunately, the rock immediately adjacent to existing utilities would have already been removed during installation of the utility. Appropriate Personal Protective Equipment ("PPE") including hearing protection, breathing protection, and eye protection in conjunction with standard PPE will be required. Hand signals or other alternative plans/methods must be used to mitigate complications with heightened noise and dust levels.

4.3 Drilling

Drilling will be integral to achieving proper bedrock fragmentation. Two main types of rock drills may be used during construction. The primary rock drilling equipment will be an excavator mounted drill. The second possible piece of equipment is a crawler drill, which is a mobile rock drill. These machines use a rotating drill bit as well as a percussive force to create a cylindrical hole within the bedrock. The fragmented rock is then flushed out of the hole by an air compressor within the drill.

Excavator mounted drills and crawler drills are integral in creating a hole within rock for blasting, as both machines are quick and efficient. However, the drilling machines can also drill a formation of holes to weaken the rock. When the rock is properly drilled, hammering or ripping may then be attempted to fragment the rock. While this approach is typically the most successful form of mechanical removal, there are several associated limitations including the following: increasing the quantity and variety of equipment running at the job site to maximize the progress from this method; production is much slower than if blasting was used; and as with other mechanical methods, proper fragmentation of the rock cannot be guaranteed.

4.4 Blasting

Blasting is another method of rock removal that may be utilized. This method is supported by drilling, which is described above. After the hole is drilled, blasting operations are carried out as described within a site-specific blasting plan that addresses all of the specifications below.

5.0 BLASTING PLAN

5.1 Pre-Blast Inspection

As required by the FERC, Algonquin shall conduct pre-blast surveys, with landowner permission, to assess the conditions of structures, wells, springs, and utilities within 150 feet of the proposed construction ROW. Should state regulations require inspections in excess of 150 feet from the work, the more stringent ordinances shall prevail. The survey will include:

- Informal discussions to familiarize the adjacent property owners with blasting effects and planned precautions to be used on the Project;
- Determination of the existence and location of site-specific structures, utilities, septic systems, wells, and springs;
- Detailed examination, photographs, and/or video records of adjacent structures and utilities; and
- Detailed mapping and measurement of large cracks, crack patterns, and other evidence of structural distress.

The results will be summarized in a condition report that will include photographs and be completed prior to the commencement of blasting.

5.2 Monitoring of Blasting Activities

During blasting, Algonquin contractors will take precautions to prevent damage to adjacent areas and structures. Precautions include:

- Display warning signage, signals, flags, and/or barricades;
- Use of matting or other suitable cover, as necessary;
- Following federal and state regulations for safe storage, handling, loading, firing, and disposal of explosive materials; and
- Staffing existing utilities with operations personnel during blasting operations.

Blasting will be performed only by state-licensed experts (where required) and monitored by experienced blasting inspectors. As appropriate, the effects of each discharge will be monitored at the nearest adjacent facility using seismographs.

5.3 Post-Blast Inspection

To maximize its responsiveness to the concerns of affected landowners, Algonquin will evaluate all complaints of well or structural damage associated with construction activities, including blasting. A toll-free landowner hotline will be established by Algonquin for landowners to use in reporting complaints or concerns. An independent contractor engaged by Algonquin will examine, with landowner permission, the condition of structures, wells, springs, and utilities within 150 feet of the construction area after completion of blasting operations to identify any changes in the conditions of these properties or confirm any damages noted by the landowner. Similar inspections may be required by federal or state regulations. Algonquin will conduct pre-blasting yield and quality testing of any well or spring within 150 feet of the blast site and document these conditions. Sampling will consist of turbidity and bacteriological analysis (total coliform). Should any damage or change occur during the blasting operations, Algonquin will coordinate with the landowner to seek a remedy, including an additional survey of the affected property.

5.4 Waterbody Crossing Blasting Procedures

To facilitate planning for blasting activities for waterbody crossings, rock drills or test excavations may be used in waterbodies to test the ditch-line during mainline blasting operations to evaluate the presence of rock in the trench-line. The excavation of the test pit or rock drilling is not included in the time window requirements for completing the crossing. For testing and any subsequent blasting operations, streamflow will be maintained through the site. When blasting is required, the FERC timeframes for completing in-stream construction begin when the removal of blast rock from the waterbody is started. If additional blasting is required after removing the blast rock, a new timing window will be determined in consultation with the Environmental Inspector. If blasting impedes the flow of the waterbody, the contractor can use a backhoe to restore the stream flow without triggering the timing window. The complete waterbody crossing procedures are included in the *Atlantic Bridge Project Erosion and Sedimentation Control Plan*.

5.5 Blasting Specifications

The potential for blasting along the pipeline to affect any wetland, waterbody, municipal water supply, waste disposal site, well, septic system, or spring will be prevented by controlled blasting techniques and by using mechanical methods for rock excavation where reasonable. Controlled blasting techniques have been effectively employed for decades by Algonquin and other companies to protect active utilities.

The following text presents details of Algonquin's procedures for blasting. Ultimately, the contractor is responsible for securing and complying with all necessary permits required for the transportation, storage, and use of explosives. The contractor will also be responsible for following the specifications below.

5.5.1 Pre-requisites for Use of Explosives

Prior to the use of any explosives, the contractor will submit a blasting procedure and receive Algonquin's approval. The blasting procedure will consider adjacent pipelines and specific requirements outlined in the Contract Documents and will include the following as a minimum:

- Storage of explosives;
- Transportation of explosives;
- Inspection of drilling areas;
- Loading of explosives;
- Non-electric detonation methods (electric detonation methods are not acceptable);
- Prevention of fly-rock during blasting, including mat placement if used;
- Security procedures;
- Sequence of events leading up to the detonation of explosives;
- Proposed hours of blasting;
- True distances to buildings or operating pipelines;
- Maximum charge mass per delay interval;
- Borehole diameters;
- Hole pattern, burden, and spacing;
- Borehole depth, subgrade depth, and unloaded collar length;
- Sketch showing borehole loading details;
- Explosive names, properties, and delay sequences;
- Calculated powder factor (weight per volume of rock), based on explosive energy of 1000 calories per gram;
- Geology description;

- Borehole stemming depth;
- Special conditions or variations for grade rock, trench rock, underwater blasting, and blasting at undercrossings of existing utilities;
- Blast to open face;
- Algonquin's approval and a notice of 72 hours prior to detonation of any explosives;
- Algonquin's approval if the blasting parameters vary from the requirements set out in this specification or the Contract Documents;
- Use of explosives;
- The Contractor shall secure and comply with all the applicable permits required for the handling, transportation, storage, and use of explosives;
- The Contractor shall not endanger life, livestock, or adjacent properties;
- The Contractor shall minimize inconveniences to the property owners or tenants during all phases of blasting;
- The Contractor shall provide physical protection to any above-grade utilities and equipment in the area of the blast;
- Algonquin shall set up required monitoring equipment;
- The Contractor shall provide monitoring equipment to ensure vibrations are limited to two inches per second (50 mm/s) PPV, when measured at dwellings, buildings, structures, and power line towers. For power line towers, this limit applies to the greatest of the three vectors; otherwise this limit is the vector sum of the three planes. The Contractor limits vibrations to one inch per second (25 mm/s) PPV for vibration-sensitive structures specified by Algonquin. In no case shall vibration amplitude exceed 0.004 in (0.15 mm);
- Any blasting in close proximity to existing in-service piping is to be in accordance with the Contract Documents;
- Charge loading is to be spread in order to obtain the optimum breakage of rock. The Contractor shall attempt to achieve a fragmentation rate of at least 75 percent of the trench rock to less than 6 inches (150 millimeters) in diameter;
- All delay connectors used shall have a delay interval of at least 17 milliseconds; and
- There are to be no loaded holes left overnight, and the site will be inspected after each blast for any un-detonated charges.

The Contractor shall discuss the blasting plan with Algonquin prior to each blast, including the maximum charge weight per delay, hole sizes, spacing, depths, and layout. Algonquin will employ a qualified Blasting Inspector to confirm and document that the Contractor is following the approved blasting plan at each blast site. Upon completion of blasting each day, the Contractor shall provide Algonquin with the following for each blast:

- Blasting Contractor license number;
- Date, time, and location of blast;
- Hole sizes, spacing, depths, layout, and volume of rock in blast;
- Delay type, interval, total number of delays, and holes per delay;
- Explosive type, specific gravity, energy release, weight of explosive per delay, and total weight of explosive per shot;
- Powder factor; and
- Copies of any seismographic data.

5.5.2 Evaluation of Close-In Blasts

The following additional limitations apply for blasting at distances of less than 25 feet from the pipeline. These criteria were extrapolated from a 1970 U.S. Bureau of Mines study on cratering in granite and were refined based on a 2004 failure investigation. Other blasting limitations based upon extensive research by the Pipeline Research Committee International, blasting consultants, and the U.S. Bureau of Mines regarding blasting adjacent to pipelines is also included in the Spectra Energy blasting criteria.

5.5.3 Blasting on Pipeline Right-of-Way

Blasting should not be allowed on the pipeline right-of-way except when conducted for the benefit of the Company and under the supervision of a Company representative or qualified Blasting Inspector familiar with the Company's blasting requirements.

5.5.4 Minimum Offset from Blast Holes to Pipeline

No blast holes should be loaded at an offset of less than 25 feet from the centerline of an in-service pipeline except in cases where precise measurements are taken to ensure that the pipeline will have at least one foot of clearance from the theoretical area surrounding the blast hole in which the ground could be permanently deformed by the blast under worst case conditions. This theoretical area is a conical shape originating at the bottom of the blast hole and extending out at an angle up to the ground surface.

When blast holes are angled from the vertical, this can have the effect of directing the disruption from the blast in one direction (the surface acts as a free face, allowing movement in that direction). For this reason, blast holes within 25 feet of an existing pipeline must be drilled vertically or angled away from the pipeline as the hole gets deeper. In all cases, the absolute minimum horizontal offset from the blast hole to the side of the pipe is 12 feet.

6.0 REFERENCES

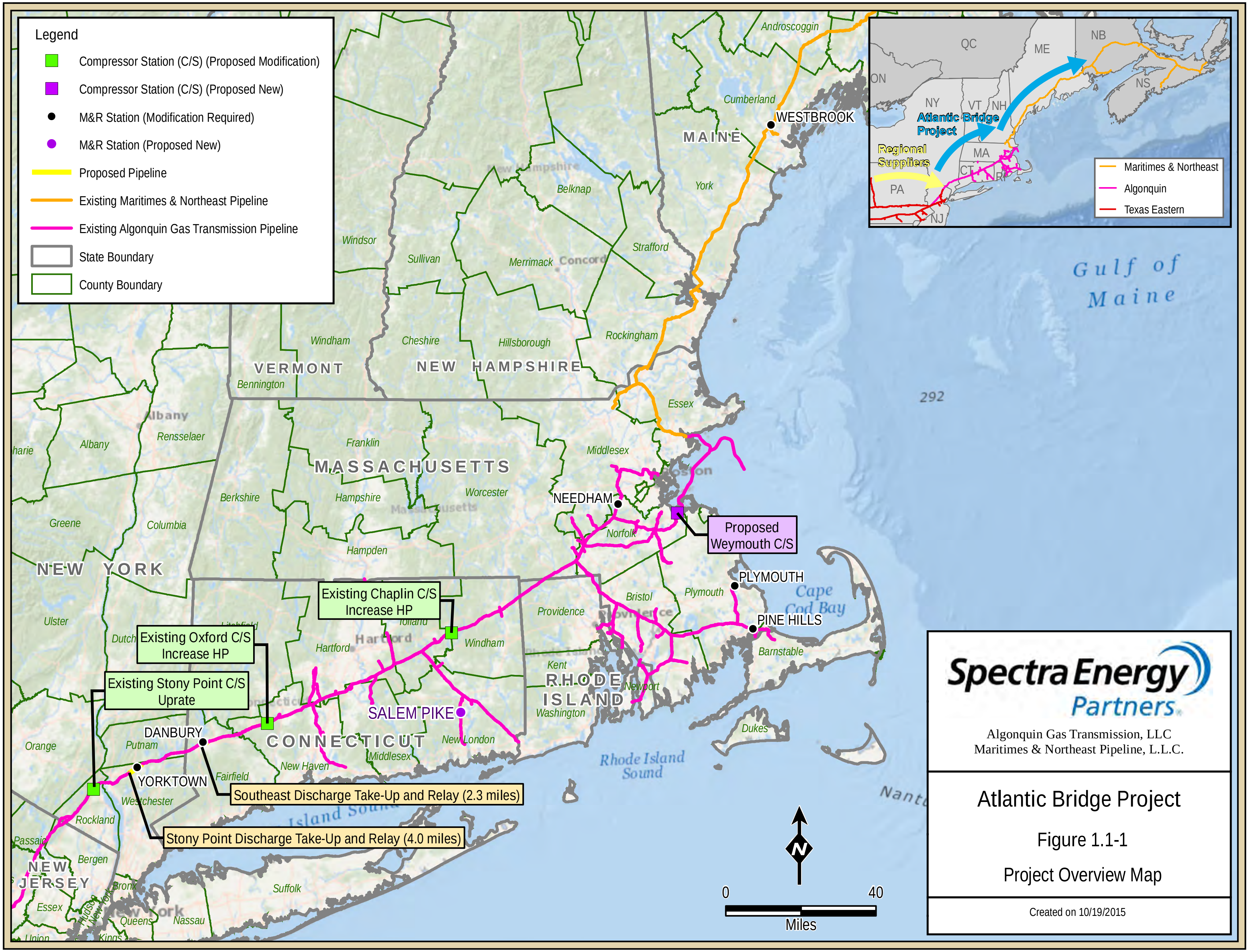
Fisher D.W., Y. W. Isachsen, and L. V. Rickard. 1970. Geologic Map of New York State, consisting of 5 sheets: Niagara, Finger Lakes, Hudson-Mohawk, Adirondack, and Lower Hudson, New York State Museum and Science Service, Map and Chart Series No. 15, scale 1:250000.

Rodgers, J. 1985. Bedrock Geological Map of Connecticut. Connecticut Geological and Natural History Survey, in cooperation with U.S. Geological Survey, Scale 1:125,000. 1985.

Zen, E.A. (editor), R. Goldsmith, N. M. Ratcliffe, P. Robinson, R. S. Stanley, N. L. Hatch Jr., A. F. Shride, E. G. A. Weed, and D. R. Wones. Bedrock Geologic Map of Massachusetts: U.S. Geological Survey Special Geologic Map. 1983.

ATTACHMENT 1

MAP OF ATLANTIC BRIDGE PROJECT


Legend
Compressor Station (C/S) (Proposed Modification)
Compressor Station (C/S) (Proposed New)
M&R Station (Modification Required)
M&R Station (Proposed New)
Proposed Pipeline
Existing Maritimes & Northeast Pipeline
Existing Algonquin Gas Transmission Pipeline
State Boundary
County Boundary
WESTBROOK
MAINE
NEW HAMPSHIRE
VERMONT
MASSACHUSETTS
NEW YORK
CONNECTICUT
RHODE ISLAND
NEW JERSEY
NEEDHAM
Proposed Weymouth C/S
PLYMOUTH
PINE HILLS
Existing Chaplin C/S Increase HP
Existing Oxford C/S Increase HP
Existing Stony Point C/S Uprate
SALEM PIKE
DANBURY
YORKTOWN
Southeast Discharge Take-Up and Relay (2.3 miles)
Stony Point Discharge Take-Up and Relay (4.0 miles)
Gulf of Maine
Cape Cod Bay
Rhode Island Sound
292
QC
ME
NB
NS
ON
NY
VT
NH
MA
CT
RI
PA
NJ
Atlantic Bridge Project
Regional Suppliers
Maritimes & Northeast
Algonquin
Texas Eastern
0
40
Miles
Spectra Energy Partners
Algonquin Gas Transmission, LLC
Maritimes & Northeast Pipeline, L.L.C.
Atlantic Bridge Project
Figure 1.1-1
Project Overview Map
Created on 10/19/2015

ATTACHMENT 2

TABLE 1 - ESTIMATED DEPTH TO BEDROCK

TABLE 1

Estimated Depth to Bedrock Along the Atlantic Bridge Project

Proposed Pipeline Segment	Mile Posts Crossed	Soil Name	Soil Name Symbol	Average Approximate Depth to Bedrock (inches) a/
Stony Point Discharge Take-up and Relay				
	0.00-0.06; 0.15-0.21	Woodbridge loam, 8 to 15 percent slopes	WdC	>60
	0.06-0.15; 1.90-1.91; 2.93-2.99; 3.26-3.29; 3.82-3.83	Paxton fine sandy loam, 15 to 25 percent slopes	PnD	>60
	0.21-0.32; 3.86-4.00	Ridgebury loam, 2 to 8 percent slopes, very stony	RgB	>60
	0.32-0.40	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	PoD	>60
	0.40-0.50; 0.90-1.02; 1.37-1.44; 1.82-1.86; 1.91-2.10; 2.13-2.33; 2.62-2.80; 3.09-3.12; 3.81-3.82; 3.83-3.84	Paxton fine sandy loam, 8 to 15 percent slopes	PnC	>60
	0.50-0.59; 1.86-1.90; 2.59-2.62	Charlton loam, 25 to 35 percent slopes	ChE	>60
	0.59-0.71, 3.36-3.40; 3.51-3.56; 3.63-3.79	Charlton-Chatfield complex, rolling, very rocky	CrC	**<60**
	0.71-0.79	Charlton loam, 15 to 25 percent slopes	ChD	>60
	0.79-0.90	Paxton fine sandy loam, 3 to 8 percent slopes	PnB	>60
	1.02-1.09; 1.44-1.50; 2.80-2.93; 3.12-3.26; 3.84-3.86; 4.00-4.03;	Paxton fine sandy loam, 3 to 8 percent slopes	PnB	>60
	1.09-1.20	Leicester loam, 2 to 8 percent slopes, very stony	LeB	>60
	1.20-1.28; 2.40-2.44	Fluvaquents-Udifluvents complex, frequently flooded	Ff	>60
	1.28-1.37	Sun loam	Sh	>60
	1.50-1.56; 2.10-2.13; 2.44-2.46; 3.29-3.36	Ridgebury loam, 3 to 8 percent slopes	RdB	>60
	1.56-1.82; 2.33-2.40; 2.46-2.59; 2.99-3.03; 3.07-3.09; 3.79-3.81	Woodbridge loam, 3 to 8 percent slopes	WdB	>60
	3.03-3.04	Water	W	NA
	3.04-3.07	Udorthents, wet substratum	Uc	>60

TABLE 1

Estimated Depth to Bedrock Along the Atlantic Bridge Project

Proposed Pipeline Segment	Mile Posts Crossed	Soil Name	Soil Name Symbol	Average Approximate Depth to Bedrock (inches) a/
	3.40-3.48; 3.48-3.51	Chatfield-Hollis-Rock outcrop complex, hilly	CuD	**<60**
	3.56-3.63	Chatfield-Charlton complex, hilly, very rocky	CsD	**<60**
Southeast Discharge Take-up and Relay				
	0.00-0.06	Woodbridge fine sandy loam, 8 to 15 percent slopes	45C	>60
	0.06-0.35; 0.39-0.48; 1.28-1.44; 1.62-1.65	Paxton-Urban land complex, 3 to 8 percent slopes	284B	>60
	0.35-0.39	Paxton-Urban land complex, 8 to 15 percent slopes	284C	>60
	0.48-0.51	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	84D	>60
	0.51-0.64; 1.48-1.62; 1.65-1.92; 2.15-2.27	Udorthents-Urban land complex	306	>60
	0.64-0.66; 1.05-1.14	Urban land	307	>60
	0.66-0.78	Udorthents, smoothed	308	>60
	0.78-0.84; 1.92-1.96; 2.06-2.15	Hinckley gravelly sandy loam, 3 to 15 percent slopes	38C	>60
	0.84-0.95	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	75C	**<60**
	0.95-1.05	Canton and Charlton soils, 8 to 15 percent slopes, very stony	61C	>60
	1.05-1.05; 1.14-1.17; 1.44-1.48	Haven-Urban land complex, 0 to 8 percent slopes	232B	>60
	1.17-1.28	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	84B	>60
	1.96-2.06	Scarboro muck	15	>60

a/ Depth to bedrock includes paralithic materials was determined from available NRCS data for each soil series or association. For urban and other manmade or influenced soils (e.g., udorthents), a depth to bedrock of >60" was assigned, as this metric is used to determine the potential for rock introduction to topsoil and these areas generally do not have support topsoil. For complexes and associations, the shallower of the map units were used to determine depth to bedrock. In order to capture potential exposed rock areas, all complexes consisting of partial "Rock Outcrops" were noted to have a depth to bedrock of <60".

ATTACHMENT 3

TABLE 2 - BEDROCK ALONG THE ATLANTIC BRIDGE PROJECT

TABLE 2

Bedrock Geology within the Atlantic Bridge Project Area

Project Facility / Location	Begin MP	End MP	Formation	Description Primary	Description Secondary	Map Symbol
PIPELINE FACILITIES						
New York						
Stony Point Discharge Take-up and Relay						
	0.00	0.69	Muscovite-biotite granite	Granite	--	Dpgr
	0.69	4.03	Biotite-quartz-plagioclase gneiss	Gneiss	Granitic Gneiss	bqpc
Connecticut						
Southeast Discharge Take-up and Relay						
	0.00	0.99	Pink Granitic Gneiss	Granitic Gneiss	--	Ygr
	0.99	2.27	Dalton Formation	Gneiss	Quartzite	Cd
ABOVEGROUND FACILITIES						
New York						
Yorktown M&R Station						
	--	--	Biotite-quartz-plagioclase gneiss	Gneiss	Granitic Gneiss	bqpc
Connecticut						
Oxford Compressor Station						
	--	--	Waterbury Gneiss	Schist	Gneiss	Cwb
Chaplin Compressor Station						
	--	--	Hebron Gneiss	Schist	Calc-Silicate Rock	SOh
Salem Pike M&R Station						
	--	--	Tatnic Hill Formation	Gneiss	Schist	Ota
Danbury M&R Station						
	--	--	Pink Granitic Gneiss	Granitic Gneiss	--	Ygr
Massachusetts						
Weymouth Compressor Station						
	--	--	Cambridge Argillite	Argillite	Quartzite	PzZc
Plymouth M&R Station						
	--	--	Granite, gneiss and schist, undivided	Granite	Gneiss	Zgg
Pine Hills M&R Station						
	--	--	Granite, gneiss and schist, undivided	Granite	Gneiss	Zgg
Needham Regulator Station						
	--	--	Roxbury Conglomerate	Conglomerate	Sandstone	PzZr
Maine						
Westbrook M&R Station						
	--	--	Carboniferous alkali feldspar granite	Granite	--	C1b(m)

References: Fisher et al., 1970; Rodgers, 1985; Zen et al., 1983.

APPENDIX D

WETLANDS CROSSED OR OTHERWISE AFFECTED BY THE ATLANTIC BRIDGE PROJECT

APPENDIX D

Wetlands Crossed or Otherwise Affected by the Atlantic Bridge Project

Facility, County, State/Wetland ID	National Wetlands Inventory Classification [a]	Hydrology [b]	Enter Milepost [c]	Exit Milepost [c]	Crossing Length (feet) [d]	Total Wetland Acreage Affected [e]		Total Forested Wetland Acreage Affected [e]	Proposed Crossing Method
						Within Existing Right-of-Way	Outside Existing Right-of-Way		
Stony Point Take-up and Relay – Westchester County, New York									
B13-SPLR-W30 [f]	PSS/PEM	SAT	--	--	--	0.01	0.00	0.00	Workspace only
B15-SPL-36W	PEM1/PFO1	SAT	0.06	0.07	42.47	1.64	1.45	1.47	Open cut
			0.08	0.10	81.81				
			0.12	0.12	15.44				
			0.13	0.15	111.54				
			0.17	0.23	301.36				
			0.26	0.31	209.39				
			0.30	0.30	26.02				
A15-SPL-3B-W2	PEM1/PFO1	SAT	0.59	0.60	34.08	0.00	0.00	0.00	Horizontal directional drill (HDD)
A15-SPL-3W	PEM1/PFO1	SAT	0.66	0.67	28.64	0.00	0.00	0.00	HDD
A14-SPL-2W	PEM1/PFO1	SF	1.05	1.05	29.57	2.14	0.09	0.01	Open cut
			1.05	1.10	227.97				
			1.11	1.27	860.50				
			1.29	1.38	454.92				
A14-SPL-5W	PEM1/PFO1	Other	1.52	1.55	139.99	0.24	0.00	0.00	Open cut
A14-SPL-6W	PEM1	Other	1.60	1.61	21.52	0.04	0.00	0.00	Open cut
A14-SPL-7W	PEM1	Other	1.68	1.84	807.71	1.07	0.03	0.00	Open cut
A14-SPL-8W	PEM1/PFO1	SAT	2.10	2.13	204.35	0.35	0.05	0.05	Open cut
A14-SPL-9W	PEM/PFO1	SAT/SF	2.40	2.43	197.28	0.64	0.00	0.00	Open cut
			2.44	2.44	33.38				
			2.45	2.47	70.85				
A14-SPL-10W [f]	PEM1	Other	--	--	--	0.03	0.00	0.00	Workspace only
A14-SPL-11W	PEM1	Other	2.98	2.99	59.76	0.08	0.00	0.00	Open cut
A14-SPL-12W [f]	PEM1	SAT/SF	--	--	--	0.10	0.03	0.00	Workspace only
A14-SPL-13W	PEM1/PFO1	SAT/SF	3.32	3.32	27.28	0.33	0.04	0.04	Open cut
			3.33	3.36	135.38				
A14-SPL-14W	PEM1/PFO1	SAT	3.87	3.93	324.47	0.70	0.11	0.11	Open cut
			4.00	4.01	99.22				
		Stony Point Take-up and Relay Subtotal			**4,544.90**	**7.37**	**1.80**	**1.68**	

APPENDIX D (cont'd)

Wetlands Crossed or Otherwise Affected by the Atlantic Bridge Project

Facility, County, State/Wetland ID	National Wetlands Inventory Classification [a]	Hydrology [b]	Enter Milepost [c]	Exit Milepost [c]	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e] Within Existing Right-of-Way	Total Wetland Acreage Impacted [e] Outside Existing Right-of-Way	Total Forested Wetland Acreage Affected [e]	Proposed Crossing Method
Southeast Discharge Take-Up and Relay – Fairfield County, Connecticut									
C14-SL-2W [f, g]	PFO1	SAT	0.72	0.72	0.00	0.00	0.00	0.00	Open cut
C15-SL-4W	PEM1/PFO1	SAT	1.98	2.07	428.23	0.51	0.21	0.21	Open cut
			2.14	2.20	320.28	0.41	0.19	0.08	
B14-SL-5W	PEM1/PFO1	SAT	2.28	2.32	183.46	0.27	0.10	0.03	Open cut
Southeast Discharge Take-Up and Relay Subtotal					**931.97**	**1.19**	**0.50**	**0.32**	
Pipeline Facilities Total					**5,476.87**	**8.56**	**2.30**	**2.00**	
Access Roads – Westchester County, New York									
A15-SPL-15W [f]	PEM1	Other	--	--	--	0.04	0.00	0.00	Workspace only
Access Roads Total						**0.04**	**0.00**	**0.00**	
Salem Pike Metering and Regulating Station— New London County, Connecticut									
C14-SPM-2W [f]	PEM1	SF/SAT	--	--	--	0.00	0.07 [h]	0.00	Workspace only
Aboveground Facilities Total							**0.07 [h]**	**0.00**	
Project Total					**5,476.87**	**8.60**	**2.37**	**2.00**	

a Wetland types based on Cowardin et al., 1979: PEM = palustrine emergent wetland; PFO= palustrine forested wetland.
b Hydrology: SAT = saturated; SF = seasonally flooded; Other = other primary indicators and/or secondary indicators.
c Where the pipeline crosses the wetland, enter milepost and exit milepost are the first and last mileposts where this occurs.
d Crossing length of the pipeline where the centerline crosses the wetland.
e Total wetland/forested wetland acreage affected includes impacts associated with all areas within the construction workspace limits, temporary and permanent. Wetlands crossed by HDD will not be affected outside of designated construction workspace areas.
f Indicates temporary impacts, but not crossed by pipeline.
g Wetland impact is less than 0.005 acre.
h Wetland impacts are outside of existing metering and regulating station footprint.

APPENDIX E

RESIDENCES AND OTHER STRUCTURES WITHIN 50 FEET OF THE CONSTRUCTION WORK AREA FOR THE ATLANTIC BRIDGE PROJECT

APPENDIX E

Residences and Other Structures Within 50 Feet of the Construction Work Area for the Atlantic Bridge Project

Facility/County, State/Nearest Milepost	Type of Structure	Direction from Pipeline	Distance from Edge of Workspace (feet)	Distance from Pipeline Centerline (feet)
STONY POINT DISCHARGE TAKE-UP AND RELAY				
Westchester County, NY				
0.83	Commercial building	Left	17	22
1.41	Residence	Right	11	66
1.43	Residence	Right	11	66
1.47	Residence	Right	2	57
1.51	Residence	Right	1	56
1.63	Residence	Right	11	66
1.64	Residence	Left	23	43
1.65	Residence	Left	6	26
1.65	Residence	Right	17	72
1.66	Residence	Left	31	81
1.70	Pool	Right	27	82
1.70	Shed	Left	0	16
1.70	Pool	Left	17	67
1.71	Shed	Left	2	22
1.71	Residence	Right	9	64
1.72	Pool	Left	12	32
1.73	Pool	Right	19	74
1.73	Shed	Left	15	35
1.76	Shed	Right	0	38
1.79	Shed	Left	6	29
1.81	Residence	Right	47	102
1.83	Residence	Right	19	74
1.84	Shed	Right	7	62
1.85	Shed	Left	0	10
1.87	Residence	Right	21	76
1.89	Residence	Left	44	70
2.10	Shed	Left	0	17
2.15	Residence	Left	22	61
2.15	Residence	Right	4	59
2.17	Residence	Right	21	76
2.18	Residence	Left	41	65
2.20	Residence	Right	44	99
2.22	Residence	Left	11	57
2.49	Shed	Right	5	60
2.51	Shed	Left	0	20
2.51	Residence	Right	9	53
2.51	Shed	Left	0	18
2.54	Residence	Right	29	136
2.55	Shed	Left	0	20
2.55	Yorktown M&R	Right	0	55
2.58	Shed	Left	0	15
2.60	Pool	Left	34	54
2.60	Shed	Left	0	13
2.61	Shed	Right	28	98
2.61	Shed	Right	43	113
2.61	Shed	Left	0	14

APPENDIX E (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the Atlantic Bridge Project

Facility/County, State/Nearest Milepost	Type of Structure	Direction from Pipeline	Distance from Edge of Workspace (feet)	Distance from Pipeline Centerline (feet)
2.62	Pool	Left	38	58
2.69	Shed	Left	45	65
2.72	Shed	Left	14	34
2.75	Pool	Right	27	82
2.77	Residence	Left	11	36
2.79	Shed	Left	11	31
2.80	Pool	Right	0	38
2.80	Shed	Left	29	49
2.81	Shed	Right	34	89
2.82	Residence	Left	11	31
2.86	Shed	Right	0	50
2.87	Pool	Right	26	81
2.87	Residence	Left	46	91
2.87	Pool	Right	0	36
2.88	Shed	Left	0	44
2.89	Residence	Right	11	66
2.91	Shed	Left	0	15
2.92	Shed	Left	0	42
2.92	Shed	Right	28	83
2.94	Pool	Left	34	79
2.95	Shed	Left	0	26
3.01	Shed	Left	1	73
3.02	Residence	Left	48	147
3.12	Residence	Right	25	81
3.14	Residence	Left	18	64
3.17	Pool	Right	6	61
3.20	Shed	Left	2	22
3.22	Shed	Left	14	34
3.22	Shed	Right	51	106
3.23	Shed	Right	0	41
3.23	Residence	Right	38	94
3.25	Shed	Right	0	38
3.25	Pool	Left	40	60
3.26	Residence	Right	50	106
3.28	Shed	Left	4	24
3.28	Shed	Right	4	59
3.28	Shed	Left	0	17
3.29	Residence	Left	19	39
3.30	Residence	Right	25	115
3.31	Residence	Right	9	99
3.32	Shed	Right	46	101
SOUTHEAST DISCHARGE TAKE-UP AND RELAY				
Fairfield County, CT				
0.00	Residence	Left	29	100
0.04	Residence	Left	31	203
0.07	Residence	Right	35	70
0.08	Residence	Left	12	42
0.08	Residence	Right	33	68

APPENDIX E (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the Atlantic Bridge Project

Facility/County, State/Nearest Milepost	Type of Structure	Direction from Pipeline	Distance from Edge of Workspace (feet)	Distance from Pipeline Centerline (feet)
0.09	Residence	Left	11	41
0.10	Residence	Right	36	71
0.10	Residence	Left	29	59
0.11	Residence	Right	35	70
0.12	Residence	Left	22	52
0.12	Residence	Right	38	73
0.13	Residence	Left	17	47
0.14	Residence	Left	15	45
0.16	Residence	Left	13	43
0.16	Residence	Left	13	43
0.16	Residence	Right	36	71
0.17	Residence	Right	36	71
0.17	Residence	Left	15	45
0.20	Residence	Left	11	41
0.20	Residence	Right	23	58
0.21	Residence	Left	11	40
0.22	Residence	Right	25	60
0.23	Shed	Left	0	21
0.25	Residence	Left	11	38
0.26	Residence	Right	15	50
0.27	Residence	Left	28	58
0.28	Residence	Right	39	74
0.29	Residence	Right	40	75
0.29	Residence	Left	23	53
0.30	Residence	Left	30	60
0.30	Residence	Right	41	76
0.31	Residence	Left	30	60
0.32	Residence	Right	38	73
0.33	Residence	Right	49	84
0.33	Residence	Left	39	69
0.34	Residence	Left	14	44
0.35	Residence	Right	37	72
0.36	Residence	Left	34	64
0.37	Residence	Right	38	73
0.37	Residence	Left	33	63
0.38	Residence	Right	44	79
0.39	Residence	Right	44	79
0.39	Residence	Left	36	66
0.40	Residence	Left	42	72
0.41	Residence	Right	46	81
0.41	Residence	Left	43	73
0.42	Residence	Right	46	81
0.43	Residence	Left	49	79
0.43	Residence	Right	43	78
0.44	Residence	Right	47	82
0.45	Residence	Left	48	78
0.46	Residence	Left	19	49
0.48	Residence	Left	17	37

APPENDIX E (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the Atlantic Bridge Project

Facility/County, State/Nearest Milepost	Type of Structure	Direction from Pipeline	Distance from Edge of Workspace (feet)	Distance from Pipeline Centerline (feet)
0.48	Residence	Right	48	83
0.54	Commercial building	Right	4	85
0.56	Commercial building	Left	11	48
0.58	Commercial building	Right	28	58
0.61	Commercial building	Right	1	32
0.71	Commercial building	Right	6	36
0.81	Pool	Left	7	27
0.81	Residence	Left	11	59
0.85	Detached garage	Right	25	85
0.89	Residence	Left	13	55
0.90	Residence	Right	36	71
0.91	Shed	Left	0	19
0.91	Residence	Right	9	42
0.91	Shed	Right	23	58
0.92	Shed	Right	0	19
0.94	Shed	Right	14	49
0.94	Residence	Right	23	58
0.95	Shed	Left	0	7
0.96	Shed	Left	6	57
0.96	Residence	Left	21	72
0.97	Residence	Right	47	130
0.99	Residence	Left	11	58
0.99	Danbury M&R	Right	0	46
0.99	Residence	Right	44	79
1.02	Residence	Left	0	18
1.05	Commercial building	Right	0	27
1.05	Residence	Left	0	18
1.07	Residence	Right	48	157
1.09	Residence	Left	9	28
1.09	Residence	Left	9	29
1.09	Residence	Left	12	32
1.10	Shed	Left	19	39
1.10	Shed	Right	4	39
1.11	Residence	Left	27	98
1.12	Residence	Right	27	62
1.13	Residence	Left	40	109
1.14	Residence	Left	11	67
1.16	Residence	Left	0	20
1.17	Residence	Left	24	89
1.21	Residence	Left	11	41
1.23	Residence	Left	23	48
1.26	Residence	Right	24	59
1.26	Residence	Left	21	45
1.27	Residence	Left	11	63
1.29	Residence	Left	11	63
1.30	Residence	Right	30	65
1.32	Residence	Left	11	39
1.33	Residence	Right	15	50

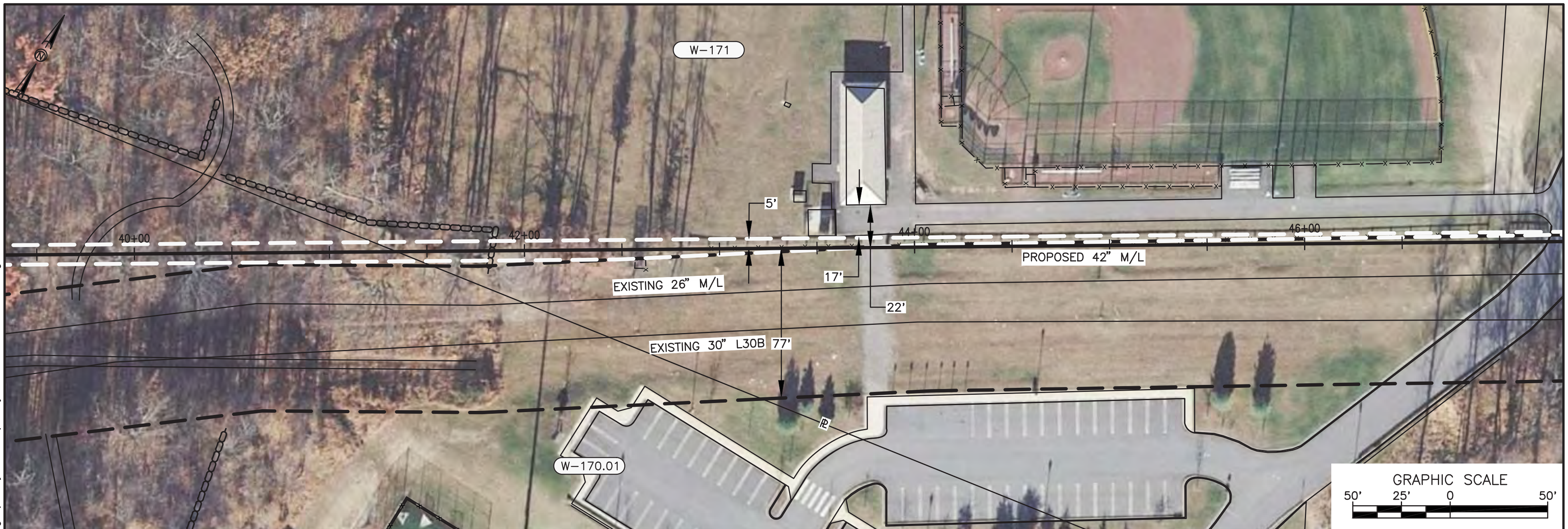
APPENDIX E (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the Atlantic Bridge Project

Facility/County, State/Nearest Milepost	Type of Structure	Direction from Pipeline	Distance from Edge of Workspace (feet)	Distance from Pipeline Centerline (feet)
1.34	Shed	Left	0	19
1.34	Shed	Left	0	31
1.36	Shed	Left	0	42
1.40	Shed	Left	0	64
1.41	Shed	Left	0	56
1.43	Residence	Left	5	59
1.47	Residence	Left	5	54
1.48	Shed	Left	0	41
1.48	Residence	Left	18	73
1.52	Shed	Left	46	103
1.60	Residence	Left	49	104
1.68	Residence	Left	5	52
1.73	Residence	Left	11	43
1.76	Residence	Left	42	97
1.79	Residence	Left	37	92
1.82	Residence	Left	47	102
1.95	Pool	Left	0	33
1.95	Residence	Left	12	74
1.95	Shed	Left	0	22
1.96	Detached garage	Left	0	1
1.97	Shed	Left	11	53
1.98	Shed	Left	12	62

APPENDIX F

RESIDENTIAL CONSTRUCTION PLANS



STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
43+65	0.83	COMMERCIAL BUILDING	LEFT	17'	22'

LEGEND

PROPOSED PIPELINE
CONSTRUCTION WORK AREA (CWA)
PROPOSED PERMANENT RIGHT OF WAY (ROW)
EXISTING PERMANENT RIGHT OF WAY (ROW)
SAFETY FENCE
PROPERTY LINE
EXISTING FENCE
℄ ACCESS ROAD

NOTES:
1. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7001

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
74+57	1.41	RESIDENCE	RIGHT	11'	66'
75+45	1.43	RESIDENCE	RIGHT	11'	66'
77+41	1.47	RESIDENCE	RIGHT	2'	57'
79+74	1.51	RESIDENCE	RIGHT	1'	56'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: **WESTCHESTER COUNTY, NY** REV.: **REV**

YR.: **2017** W.B.S. DWG. NO. **STON-E-7002**

Spectra Energy Partners.

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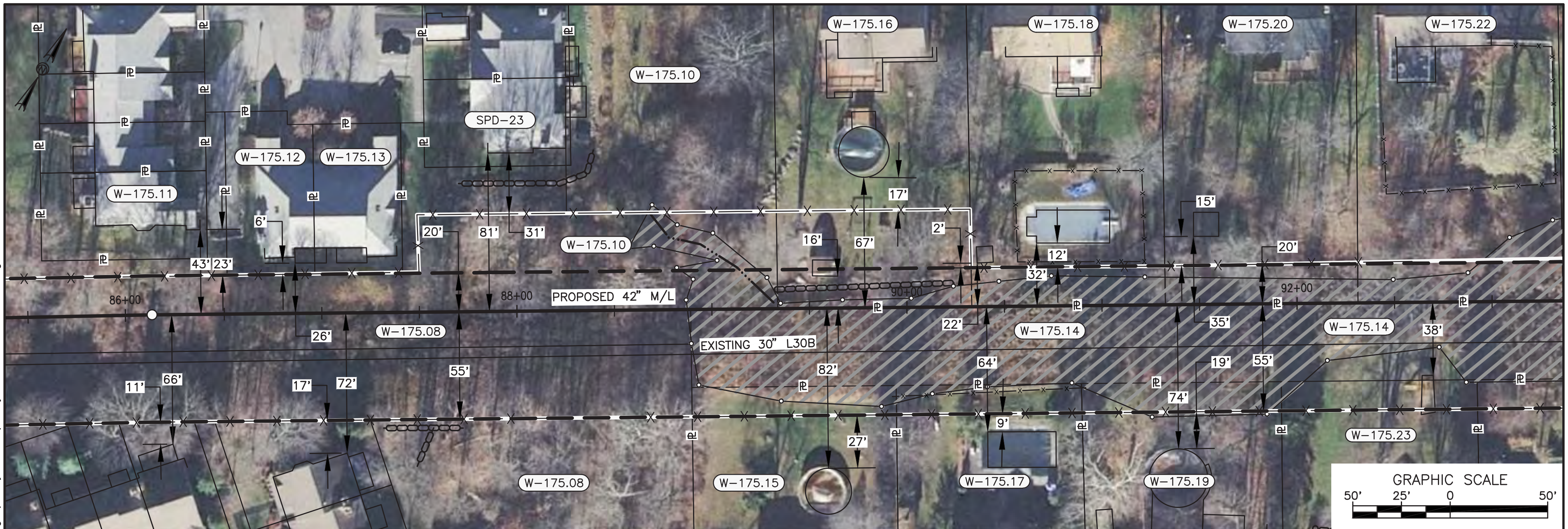

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
86+24	1.63	RESIDENCE	RIGHT	11'	66'
86+39	1.64	RESIDENCE	LEFT	23'	43'
86+87	1.65	RESIDENCE	LEFT	6'	26'
87+12	1.65	RESIDENCE	RIGHT	17'	72'
87+86	1.66	RESIDENCE	LEFT	31'	81'
89+59	1.70	POOL	RIGHT	27'	82'
89+65	1.70	SHED	LEFT	0'	16'
89+78	1.70	POOL	LEFT	17'	67'
90+36	1.71	SHED	LEFT	2'	22'
90+41	1.71	RESIDENCE	RIGHT	9'	64'
90+67	1.72	POOL	LEFT	12'	32'
91+39	1.73	POOL	RIGHT	19'	74'
91+47	1.73	SHED	LEFT	15'	35'
92+69	1.76	SHED	RIGHT	0'	38'

LEGEND

PROPOSED PIPELINE

CONSTRUCTION WORK AREA (CWA)

PROPOSED PERMANENT RIGHT OF WAY (ROW)

EXISTING PERMANENT RIGHT OF WAY (ROW)

SAFETY FENCE

PROPERTY LINE

EXISTING FENCE

℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. STON-E-7003

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F-3

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
94+71	1.79	SHED	LEFT	6'	29'
95+68	1.81	RESIDENCE	RIGHT	47'	102'
96+37	1.83	RESIDENCE	RIGHT	19'	74'
97+01	1.84	SHED	RIGHT	7'	62'
97+73	1.85	SHED	LEFT	0'	10'
98+75	1.87	RESIDENCE	RIGHT	21'	76'
99+73	1.89	RESIDENCE	LEFT	44'	70'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. STON-E-7004

Spectra Energy Partners.

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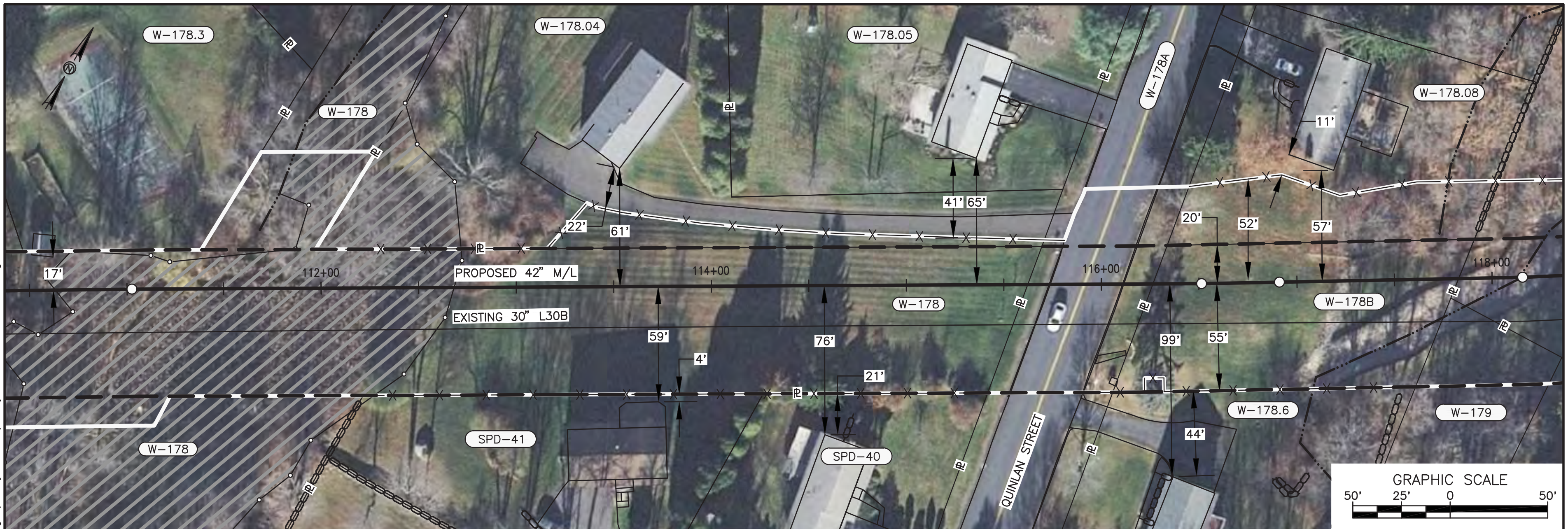

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
110+62	2.10	SHED	LEFT	0'	17'
113+53	2.15	RESIDENCE	LEFT	22'	61'
113+73	2.15	RESIDENCE	RIGHT	4'	59'
114+58	2.17	RESIDENCE	RIGHT	21'	76'
115+36	2.18	RESIDENCE	LEFT	41'	65'
116+36	2.20	RESIDENCE	RIGHT	44'	99'
117+20	2.22	RESIDENCE	LEFT	11'	57'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE —X—
- PROPERTY LINE —℄—
- EXISTING FENCE —x—x—x—
- ℄ ACCESS ROAD

NOTES:
1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: STONY POINT TO SOUTHEAST ATLANTIC BRIDGE PROJECT STONY POINT TAKE-UP AND RELAY PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. STON-E-7005

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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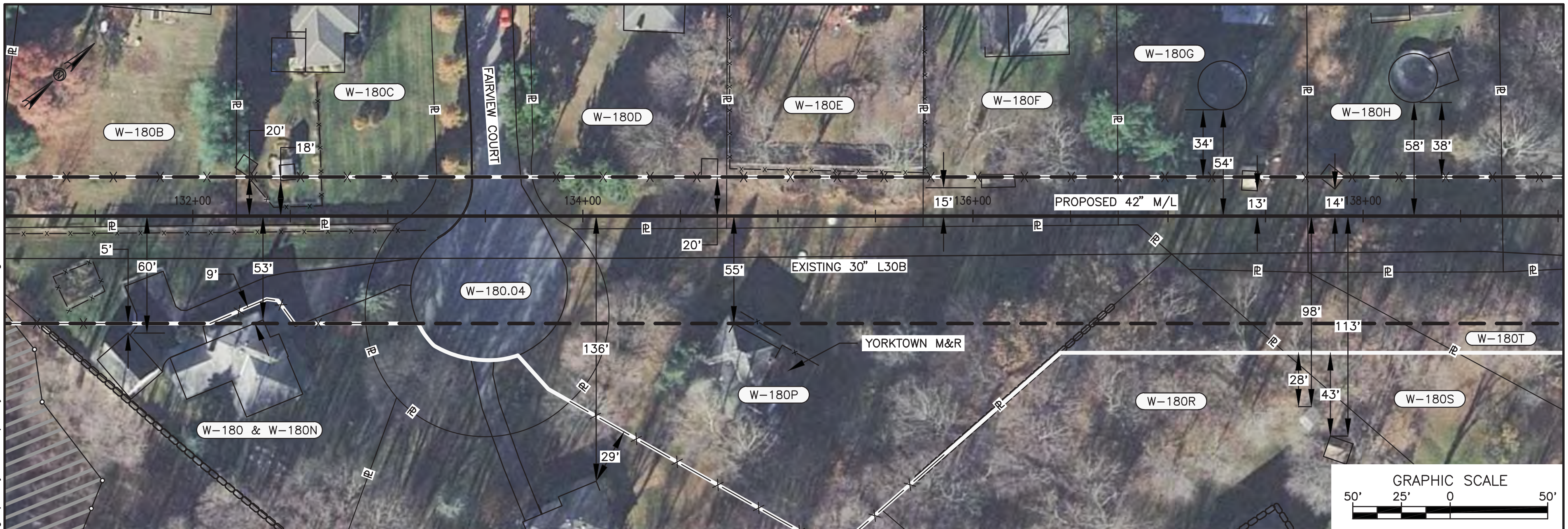

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
131+67	2.49	SHED	RIGHT	5'	60'
132+29	2.51	SHED	LEFT	0'	20'
132+36	2.51	RESIDENCE	RIGHT	9'	53'
132+45	2.51	SHED	LEFT	0'	18'
134+07	2.54	RESIDENCE	RIGHT	29'	136'
134+69	2.55	SHED	LEFT	0'	20'
134+77	2.55	YORKTOWN M&R	RIGHT	0'	55'
136+04	2.58	SHED	LEFT	0'	15'
137+28	2.60	POOL	LEFT	34'	54'
137+46	2.60	SHED	LEFT	0'	13'
137+74	2.61	SHED	RIGHT	28'	98'
137+83	2.61	SHED	RIGHT	43'	113'
137+86	2.61	SHED	LEFT	0'	14'
138+26	2.62	POOL	LEFT	38'	58'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE — X —
- PROPERTY LINE — ₱ —
- EXISTING FENCE —x—x—x—
- ℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7006

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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F-6

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
142+17	2.69	SHED	LEFT	45'	65'
143+54	2.72	SHED	LEFT	14'	34'
145+30	2.75	POOL	RIGHT	27'	82'
146+19	2.77	RESIDENCE	LEFT	11'	36'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE —X—
- PROPERTY LINE —PL—
- EXISTING FENCE –x—x—x–
- ℄ ACCESS ROAD —— – ——

NOTES:
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			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7007

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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F-7

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
147+05	2.79	SHED	LEFT	11'	31'
147+69	2.80	POOL	RIGHT	0'	38'
148+02	2.80	SHED	LEFT	29'	49'
148+13	2.81	SHED	RIGHT	34'	89'
148+97	2.82	RESIDENCE	LEFT	11'	31'
150+93	2.86	SHED	RIGHT	0'	50'
151+51	2.87	POOL	RIGHT	26'	81'
151+53	2.87	RESIDENCE	LEFT	46'	91'
151+60	2.87	POOL	RIGHT	0'	36'
152+09	2.88	SHED	LEFT	0'	44'
152+35	2.89	RESIDENCE	RIGHT	11'	66'
153+67	2.91	SHED	LEFT	0'	15'
154+22	2.92	SHED	LEFT	0'	42'

LEGEND

PROPOSED PIPELINE

CONSTRUCTION WORK AREA (CWA)

PROPOSED PERMANENT RIGHT OF WAY (ROW)

EXISTING PERMANENT RIGHT OF WAY (ROW)

SAFETY FENCE

PROPERTY LINE

EXISTING FENCE

℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
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			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. STON-E-7008

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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F-8

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
154+22	2.92	SHED	LEFT	0'	42'
154+34	2.92	SHED	RIGHT	28'	83'
155+27	2.94	POOL	LEFT	34'	79'
155+65	2.95	SHED	LEFT	0'	26'
158+73	3.01	SHED	LEFT	1'	73'
159+32	3.02	RESIDENCE	LEFT	48'	147'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
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			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7009

Spectra Energy Partners.
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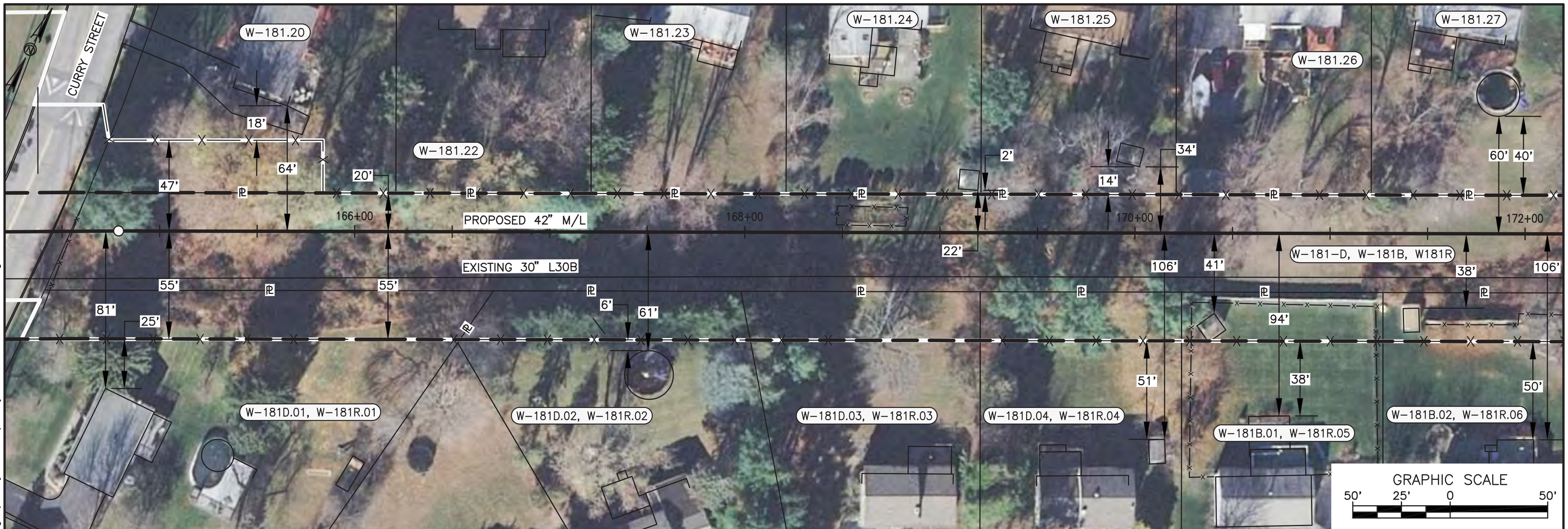
F-9



STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
164+72	3.12	RESIDENCE	RIGHT	25'	81'
165+65	3.14	RESIDENCE	LEFT	18'	64'
167+51	3.17	POOL	RIGHT	6'	61'
169+19	3.20	SHED	LEFT	2'	22'
170+02	3.22	SHED	LEFT	14'	34'
170+15	3.22	SHED	RIGHT	51'	106'
170+41	3.23	SHED	RIGHT	0'	41'
170+79	3.23	RESIDENCE	RIGHT	38'	94'
171+46	3.25	SHED	RIGHT	0'	38'
171+86	3.25	POOL	LEFT	40'	60'
172+05	3.26	RESIDENCE	RIGHT	50'	106'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:

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			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7010

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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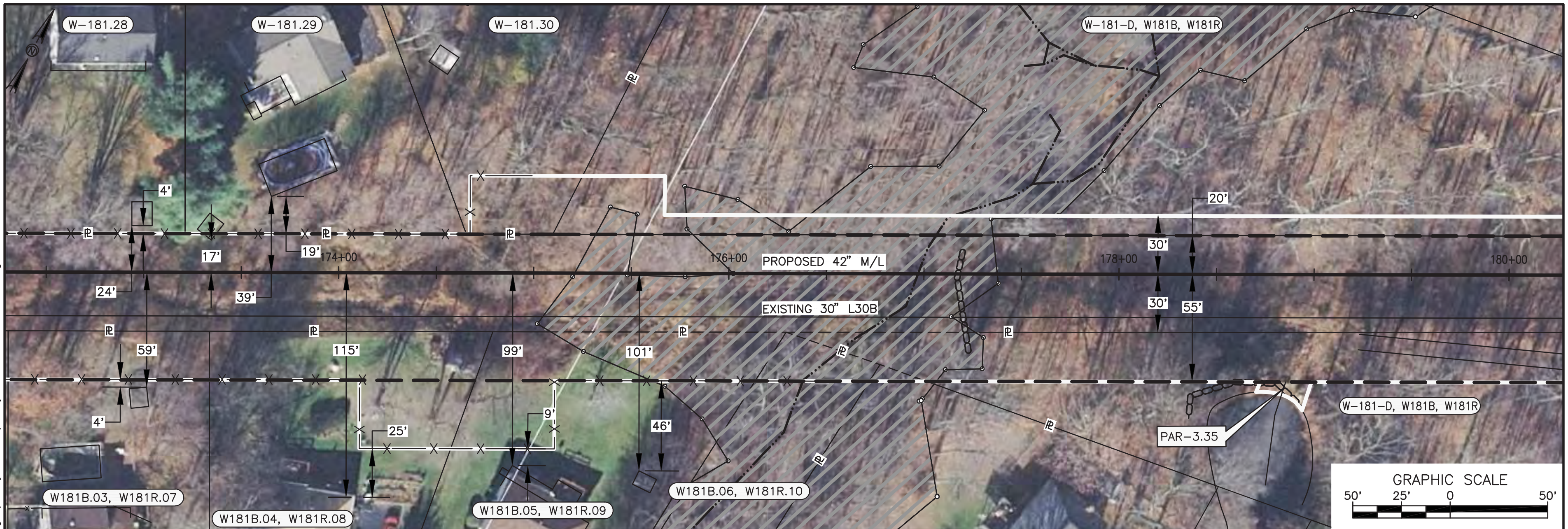
F-10



STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
172+94	3.28	SHED	LEFT	4'	24'
173+02	3.28	SHED	RIGHT	4'	59'
173+35	3.28	SHED	LEFT	0'	17'
173+65	3.29	RESIDENCE	LEFT	19'	39'
174+04	3.30	RESIDENCE	RIGHT	25'	115'
174+89	3.31	RESIDENCE	RIGHT	9'	99'
175+54	3.32	SHED	RIGHT	46'	101'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE —X—
- PROPERTY LINE —PL—
- EXISTING FENCE —x—x—x—
- ℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
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			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
REV.#	DESCRIPTION	DATE	SCALE: 1" = 50'	DATE

TITLE: STONY POINT TO SOUTHEAST
ATLANTIC BRIDGE PROJECT
STONY POINT TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: WESTCHESTER COUNTY, NY | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. STON-E-7011

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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F-11

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
N/A	N/A	RESIDENCE	LEFT	29'	N/A
2+27	0.04	RESIDENCE	LEFT	31'	203'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
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REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7001A

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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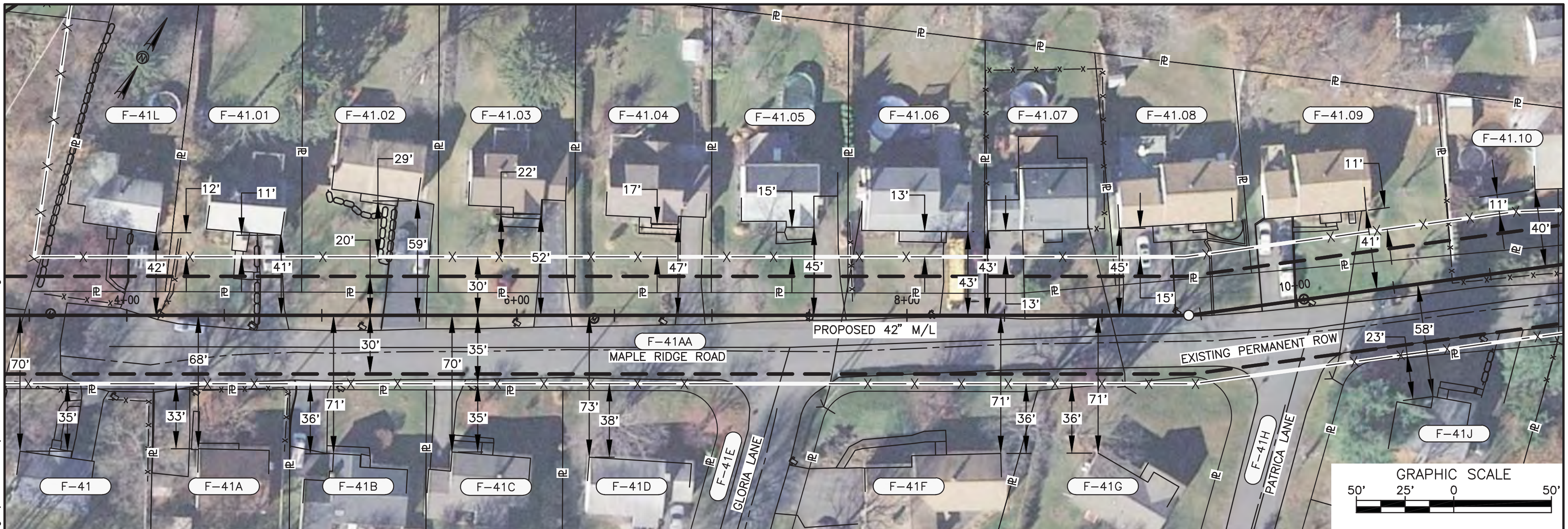

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
03+45	0.07	RESIDENCE	RIGHT	35'	70'
04+15	0.08	RESIDENCE	LEFT	12'	42'
04+37	0.08	RESIDENCE	RIGHT	33'	68'
04+79	0.09	RESIDENCE	LEFT	11'	41'
05+06	0.10	RESIDENCE	RIGHT	36'	71'
05+49	0.10	RESIDENCE	LEFT	29'	59'
05+67	0.11	RESIDENCE	RIGHT	35'	70'
06+12	0.12	RESIDENCE	LEFT	22'	52'
06+37	0.12	RESIDENCE	RIGHT	38'	73'

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
06+83	0.13	RESIDENCE	LEFT	17'	47'
07+52	0.14	RESIDENCE	LEFT	15'	45'
08+31	0.16	RESIDENCE	LEFT	13'	43'
08+41	0.16	RESIDENCE	LEFT	13'	43'
08+48	0.16	RESIDENCE	RIGHT	36'	71'
08+98	0.17	RESIDENCE	RIGHT	36'	71'
09+09	0.17	RESIDENCE	LEFT	15'	45'
10+41	0.20	RESIDENCE	LEFT	11'	41'
10+62	0.20	RESIDENCE	RIGHT	23'	58'
11+29	0.21	RESIDENCE	LEFT	11'	40'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	09/15
			DRAWN BY: HMM	09/15
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT — REV.: REV

YR.: 2017 — W.B.S. — DWG. NO. SEAS-E-7001

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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F-13

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
11+84	0.22	RESIDENCE	RIGHT	25'	60'
12+08	0.23	SHED	LEFT	0'	21'
13+38	0.25	RESIDENCE	LEFT	11'	38'
13+53	0.26	RESIDENCE	RIGHT	15'	50'
14+43	0.27	RESIDENCE	LEFT	28'	58'
14+82	0.28	RESIDENCE	RIGHT	39'	74'
15+30	0.29	RESIDENCE	RIGHT	40'	75'
15+56	0.29	RESIDENCE	LEFT	23'	53'
15+87	0.30	RESIDENCE	LEFT	30'	60'

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
16+04	0.30	RESIDENCE	RIGHT	41'	76'
16+63	0.31	RESIDENCE	LEFT	30'	60'
16+64	0.32	RESIDENCE	RIGHT	38'	73'
17+36	0.33	RESIDENCE	RIGHT	49'	84'
17+38	0.33	RESIDENCE	LEFT	39'	69'
18+21	0.34	RESIDENCE	LEFT	14'	44'
18+62	0.35	RESIDENCE	RIGHT	37'	72'
18+88	0.36	RESIDENCE	LEFT	34'	64'
19+32	0.37	RESIDENCE	RIGHT	38'	73'

LEGEND

PROPOSED PIPELINE

CONSTRUCTION WORK AREA (CWA)

PROPOSED PERMANENT RIGHT OF WAY (ROW)

EXISTING PERMANENT RIGHT OF WAY (ROW)

SAFETY FENCE

PROPERTY LINE

EXISTING FENCE

℄ ACCESS ROAD

NOTES:
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			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7002

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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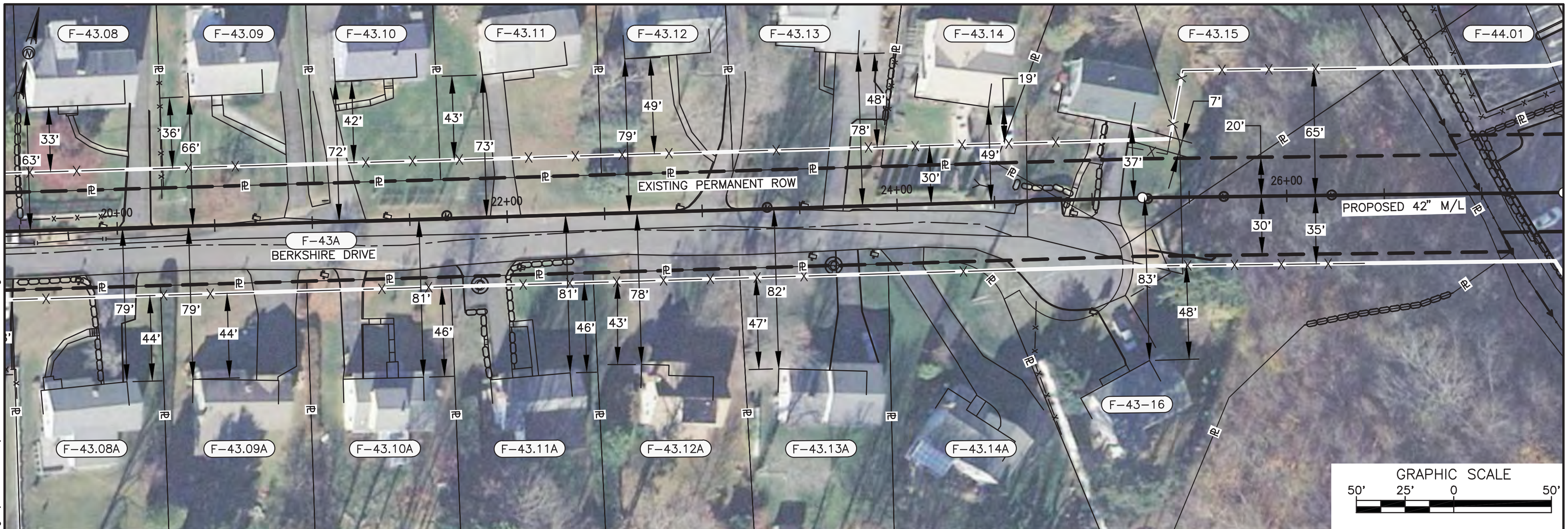

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
19+55	0.37	RESIDENCE	LEFT	33'	63'
20+03	0.38	RESIDENCE	RIGHT	44'	79'
20+37	0.39	RESIDENCE	RIGHT	44'	79'
20+39	0.39	RESIDENCE	LEFT	36'	66'
21+14	0.40	RESIDENCE	LEFT	42'	72'
21+55	0.41	RESIDENCE	RIGHT	46'	81'
21+89	0.41	RESIDENCE	LEFT	43'	73'
22+30	0.42	RESIDENCE	RIGHT	46'	81'

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
22+63	0.43	RESIDENCE	LEFT	49'	79'
22+67	0.43	RESIDENCE	RIGHT	43'	78'
23+37	0.44	RESIDENCE	RIGHT	47'	82'
23+82	0.45	RESIDENCE	LEFT	48'	78'
24+48	0.46	RESIDENCE	LEFT	19'	49'
25+21	0.48	RESIDENCE	LEFT	17'	37'
25+27	0.48	RESIDENCE	RIGHT	48'	83'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:

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			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7003

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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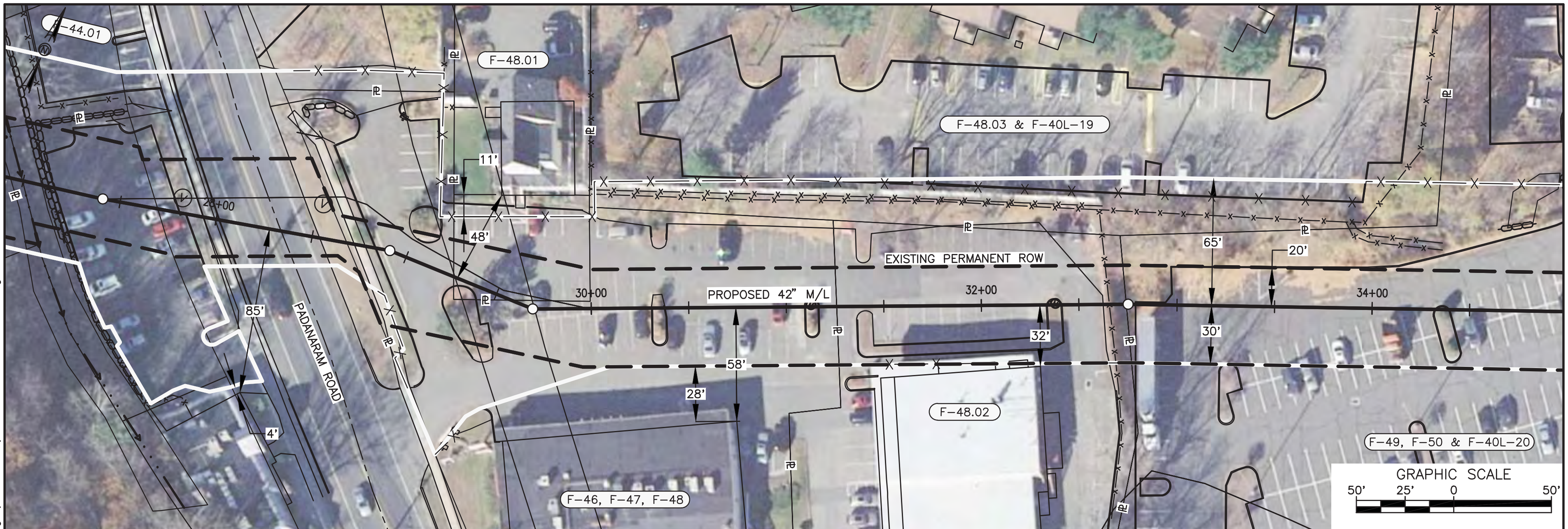

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
28+28	0.54	COMMERCIAL BUILDING	RIGHT	4'	85'
29+33	0.56	COMMERCIAL BUILDING	LEFT	11'	48'
30+74	0.58	COMMERCIAL BUILDING	RIGHT	28'	58'
32+30	0.61	COMMERCIAL BUILDING	RIGHT	1'	32'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
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			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7004

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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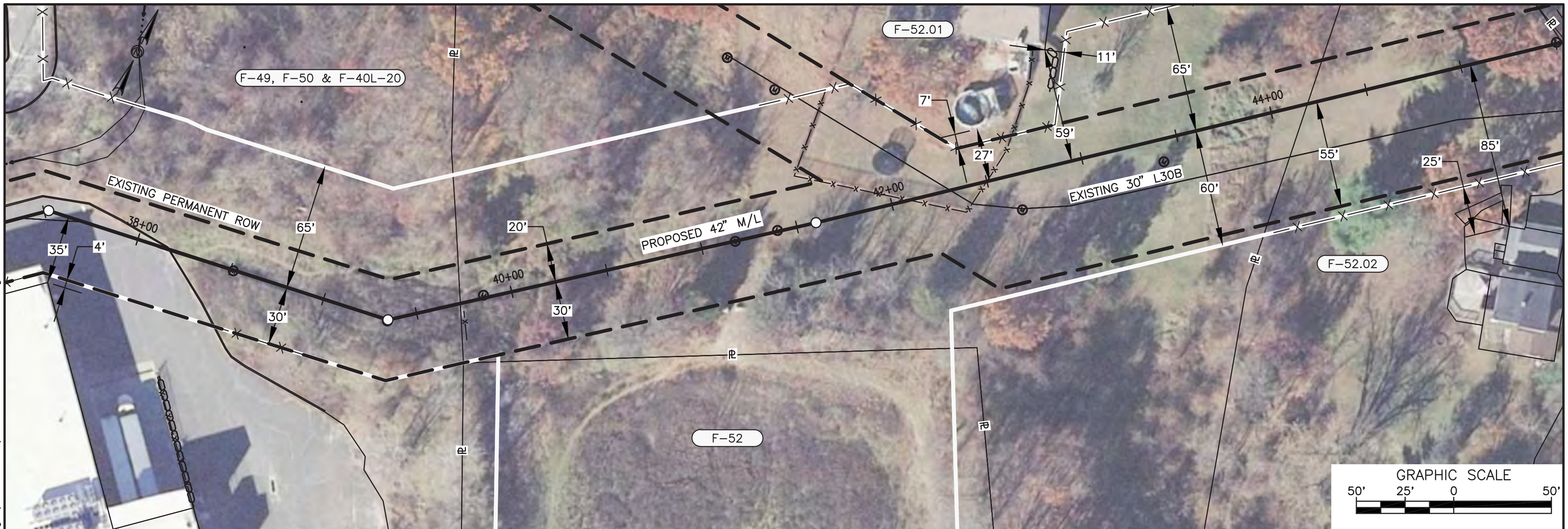

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
37+54	0.71	COMMERCIAL BUILDING	RIGHT	6'	36'
42+51	0.81	POOL	LEFT	7'	27'
42+95	0.81	RESIDENCE	LEFT	11'	59'
45+05	0.85	DETACHED GARAGE	RIGHT	25'	85'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA.
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE OR BUSINESS ESTABLISHMENT.
3. STRUCTURES WITHIN CWA WILL BE REMOVED, RELOCATED OR PROTECTED PER LAND OWNER AGREEMENT.

REV.#	DESCRIPTION	DATE		DATE
			PROJ. ENG.	
			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT — REV.: REV
YR.: 2017 — W.B.S. — DWG. NO. SEAS-E-7005

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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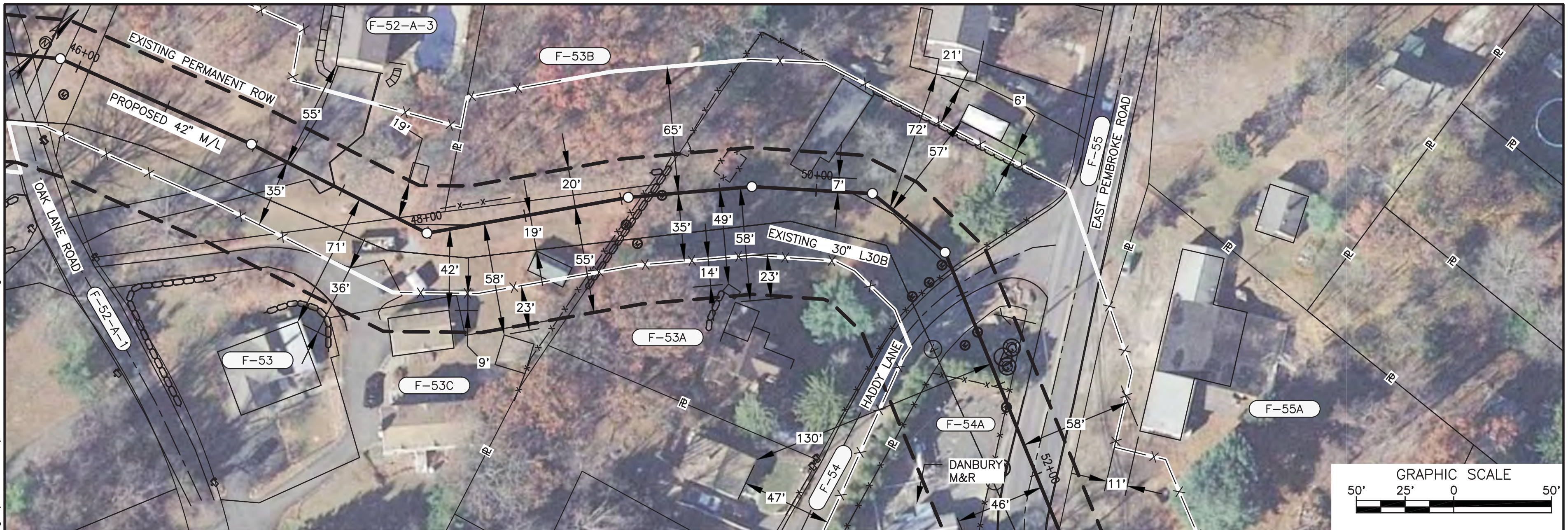

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
47+18	0.89	RESIDENCE	LEFT	13'	55'
47+60	0.90	RESIDENCE	RIGHT	36'	71'
47+83	0.91	SHED	LEFT	0'	19'
48+11	0.91	RESIDENCE	RIGHT	9'	42'
48+29	0.91	SHED	RIGHT	23'	58'
48+53	0.92	SHED	RIGHT	0'	19'

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
49+50	0.94	SHED	RIGHT	14'	49'
49+61	0.94	RESIDENCE	RIGHT	23'	58'
50+04	0.95	SHED	LEFT	0'	7'
50+44	0.96	SHED	LEFT	6'	57'
50+49	0.96	RESIDENCE	LEFT	21'	72'
51+39	0.97	RESIDENCE	RIGHT	47'	130'
52+02	0.99	RESIDENCE	LEFT	11'	58'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:
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			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7006

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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F-18

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
52+45	0.99	RESIDENCE	RIGHT	44'	79'
53+18	1.01	RESIDENCE	RIGHT	59'	94'
54+11	1.02	RESIDENCE	LEFT	0'	18'
55+26	1.05	COMMERCIAL BUILDING	RIGHT	0'	27'
55+34	1.05	RESIDENCE	LEFT	0'	18'
56+72	1.07	RESIDENCE	RIGHT	48'	157'
57+30	1.09	RESIDENCE	LEFT	9'	28'
57+42	1.09	RESIDENCE	LEFT	9'	29'

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
57+59	1.09	RESIDENCE	LEFT	12'	32'
58+04	1.10	SHED	LEFT	19'	39'
58+27	1.10	SHED	RIGHT	4'	39'
58+52	1.11	RESIDENCE	LEFT	27'	98'
59+28	1.12	RESIDENCE	RIGHT	27'	62'
59+55	1.13	RESIDENCE	LEFT	40'	109'
60+26	1.14	RESIDENCE	LEFT	11'	67'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

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			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7007

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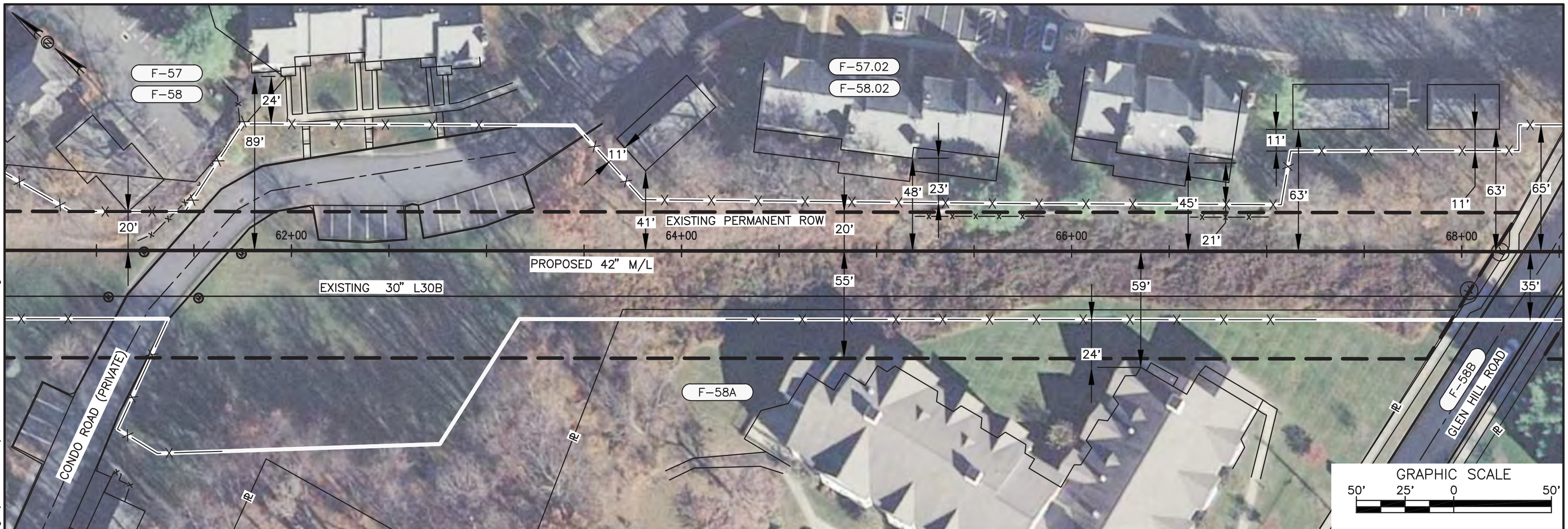

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
61+16	1.16	RESIDENCE	LEFT	0'	20'
61+95	1.17	RESIDENCE	LEFT	24'	89'
63+82	1.21	RESIDENCE	LEFT	11'	41'
65+18	1.23	RESIDENCE	LEFT	23'	48'
66+35	1.26	RESIDENCE	RIGHT	24'	59'
66+60	1.26	RESIDENCE	LEFT	21'	45'
67+13	1.27	RESIDENCE	LEFT	11'	63'
68+19	1.29	RESIDENCE	LEFT	11'	63'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

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			CHECKED BY: HMM	03/16
			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7008

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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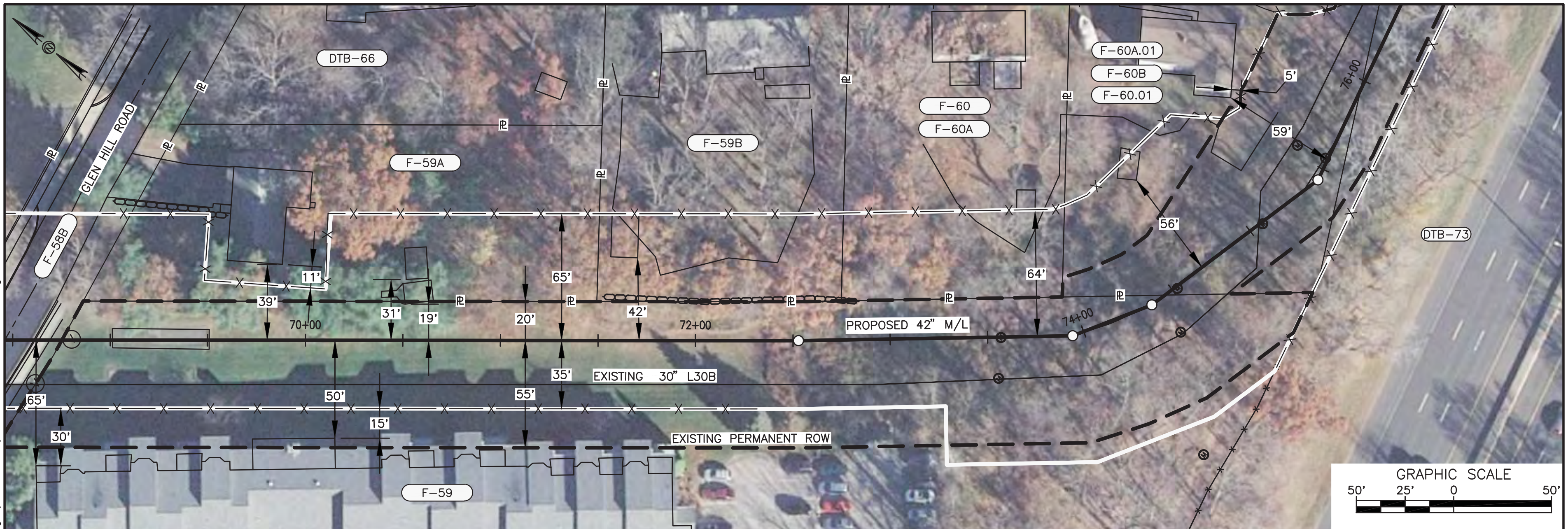

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
68+62	1.30	RESIDENCE	RIGHT	30'	65'
69+88	1.32	RESIDENCE	LEFT	11'	39'
70+15	1.33	RESIDENCE	RIGHT	15'	50'
70+51	1.34	SHED	LEFT	0'	19'
70+60	1.34	SHED	LEFT	0'	31'
71+71	1.36	SHED	LEFT	0'	42'
73+75	1.40	SHED	LEFT	0'	64'
74+69	1.41	SHED	LEFT	0'	56'
75+55	1.43	RESIDENCE	LEFT	5'	59'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

NOTES:

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			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	

TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7009

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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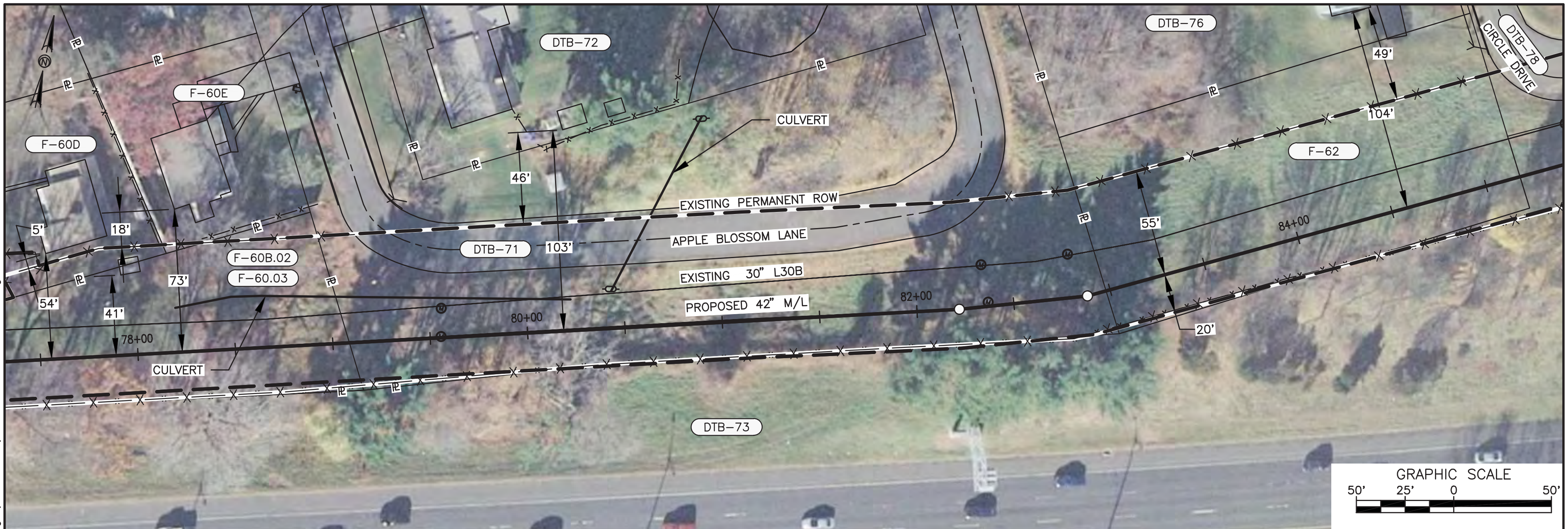

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
77+56	1.47	RESIDENCE	LEFT	5'	54'
77+93	1.48	SHED	LEFT	0'	41'
78+23	1.48	RESIDENCE	LEFT	18'	73'
80+24	1.52	SHED	LEFT	46'	103'
84+67	1.60	RESIDENCE	LEFT	49'	104'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
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ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV
YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7010

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Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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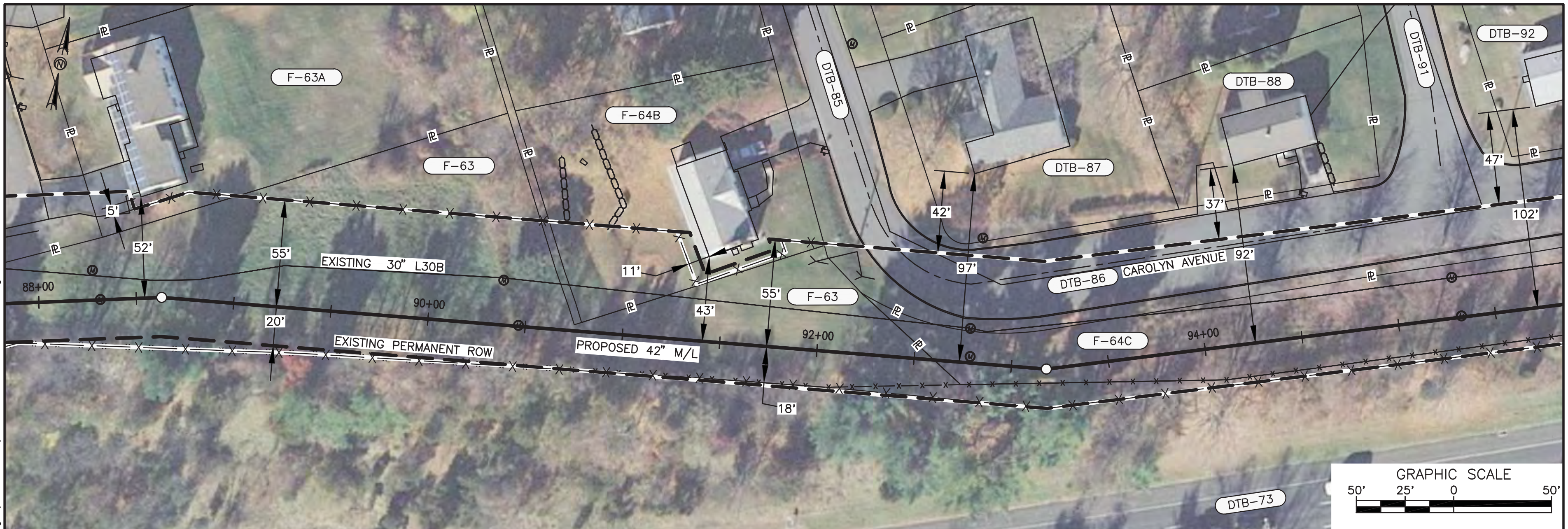

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
88+54	1.68	RESIDENCE	LEFT	5'	52'
91+41	1.73	RESIDENCE	LEFT	11'	43'
92+73	1.76	RESIDENCE	LEFT	42'	97'
94+26	1.79	RESIDENCE	LEFT	37'	92'
95+84	1.82	RESIDENCE	LEFT	47'	102'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE
- PROPERTY LINE
- EXISTING FENCE
- ℄ ACCESS ROAD

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TITLE: SOUTHEAST TO OXFORD
ATLANTIC BRIDGE PROJECT
SOUTHEAST TAKE-UP AND RELAY
PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT — REV.: REV
YR.: 2017 — W.B.S. — DWG. NO. SEAS-E-7011

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Algonquin Gas Transmission, LLC
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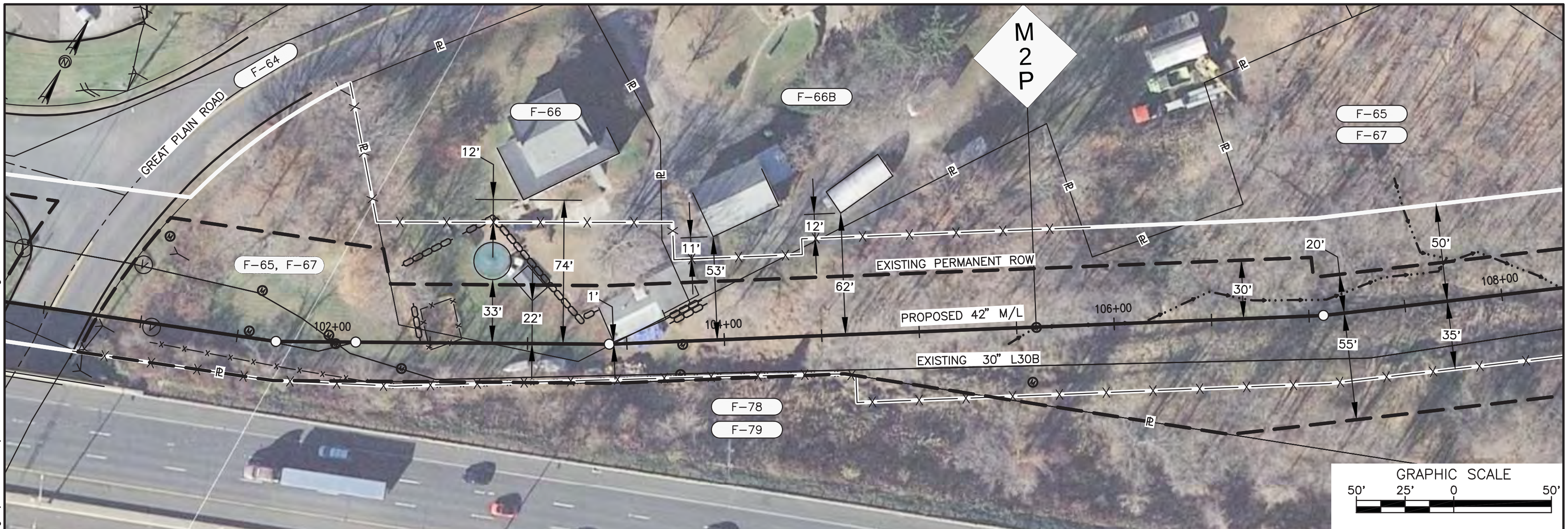

STATION	MILEPOST	STRUCTURE TYPE	DIRECTION	OFFSET FROM WORKSPACE	OFFSET FROM PIPELINE
102+82	1.95	POOL	LEFT	0'	33'
102+97	1.95	RESIDENCE	LEFT	12'	74'
103+02	1.95	SHED	LEFT	0'	22'
103+43	1.96	DETACHED GARAGE	LEFT	0'	1'
103+96	1.97	SHED	LEFT	11'	53'
104+62	1.98	SHED	LEFT	12'	62'

LEGEND

- PROPOSED PIPELINE
- CONSTRUCTION WORK AREA (CWA)
- PROPOSED PERMANENT RIGHT OF WAY (ROW)
- EXISTING PERMANENT RIGHT OF WAY (ROW)
- SAFETY FENCE —X—
- PROPERTY LINE —PL—
- EXISTING FENCE —x—x—x—
- ℄ ACCESS ROAD

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			DRAWN BY: HMM	03/16
			SCALE: 1" = 50'	DATE

TITLE: SOUTHEAST TO OXFORD ATLANTIC BRIDGE PROJECT SOUTHEAST TAKE-UP AND RELAY PROPOSED 42" M/L

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: REV

YR.: 2017 | W.B.S. | DWG. NO. SEAS-E-7012

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ATLANTIC BRIDGE PROJECT
RESIDENTIAL SITE SPECIFIC CROSSING PLANS – DETAIL SHEET

General

In general, the following measures will be taken on residential properties:

- Notify local residents in advance of construction activities.
- Install safety fence, a minimum 100' on either side of the residences as required, along the edge of the proposed Construction Work Area (CWA), to maintain equipment, material and spoil within the CWA.
- Preserve all mature trees and landscaping where practical, consistent with construction safety.
- Complete installation of welded pipeline sections as quickly as reasonably possible, consistent with prudent pipeline construction practices, to minimize construction time affecting a neighborhood.
- Backfill the trench as soon as the pipe is laid or place temporary steel plates or timber mats over the trench.
- Complete final cleanup (including final grading) and installation of permanent erosion control measures within 10 days after the trench is backfilled, weather conditions permitting.
- Configure use of CWA to provide access for emergency vehicles and to residential driveways, including materials available on site to provide temporary bridging across the pipeline trench if necessary.
- Road surfaces would be restored to drivable condition as soon as practicable so that normal access could resume.

Construction Techniques

One of the following techniques shall be utilized for a longitudinal distance of 100 feet either side of the residence:

- The Sewer Line Technique – this technique is a less efficient alternative to the mainline method of construction. It is typically used when the pipeline is to be installed in very close proximity to an existing structure or when an open ditch would adversely impact a residential or commercial structure. The technique involves installing a pipe one joint at a time whereby the welding, x–ray and coating activities are all performed in the open trench. At the end of each day the newly installed pipe is backfilled or the open trench is covered with steel plates or timber mats.
- Drag Section Technique – This technique is also a less efficient alternative to the mainline method. It is normally preferred over the sewer line alternative. This technique involves the trenching, installation and backfill of a prefabricated length of pipe containing several segments all in one day. At the end of each day the newly installed pipe is backfilled or the open trench is covered with steel plates or timber mats.
- In the take up and relay segments, the soil cover over the existing pipeline will be excavated to remove the existing pipe. The removed pipe will then be transported away from the construction work area and properly disposed of. The trench will be backfilled until such time as the construction crews are prepared to install the new pipeline. The replacement pipe will be installed in approximately the same location as the existing pipe using one of the above construction methods.
- Where the pipeline facilities cross residential properties, topsoil will be stripped and stockpiled separately from the subsoil during grading within the construction workspace as shown on the corresponding Typical ROW Configuration figure ES–0010.
- Reseed all disturbed lawns with a seed mixture acceptable to landowner or comparable to the adjoining lawn.
- Landowners shall be compensated for damages to ornamental shrubs and other landscape plantings based on the appraised value. Landowners shall be compensated for damages in a fair and reasonable manner, as specified in the damage provision within the controlling easement on each property.

Workspace Restrictions

- Existing structures including but not limited to; fences, sheds, swing–sets, trampolines, shrubbery, trees, gardens, flowerbeds, pools will be removed from the CWA. Landowners will be made aware of what will be relocated during negotiations for temporary workspace and damages.
- Structures within the existing permanent easement area will be allowed to be returned to the existing permanent easement provided they are not in violation of Algonquin's existing permanent easement rights that will be made available to landowners.
- Structures outside the existing permanent easement, however within the construction work space, will be replaced as close to as practicable to their previous locations.
- Removal and replacement responsibilites will be issues that are negotiated with each landowner.

Anticipated Construction Schedule

- Pipeline construction work is typically scheduled to take advantage of daylight hours, generally starting at 7:00 a.m. and completing at 6:00 p.m. (6 days a week).
- Pipeline installation progress should range from 40' to 200' each day.

Public Safety Considerations

- Traffic control will consist of devices outlined in state and local codes accompanied by local law enforcement details and qualified flagmen to safely coordinate transport of pipeline construction personnel, equipment, and material.
- Site Security will be evaluated on a case by case basis, employing daily and/or 24 hour qualified security services as required.
- Algonquin will staff a Landowner Hotline to receive landowner construction concerns. The toll–free Landowner Hotline is 866–873–2579. The Landowner Hotline will be staffed Monday through Friday from 7 AM to 5 PM and on Saturday from 7 AM to 12 PM by Algonquin personnel from the Cheshire, Connecticut field office. After these hours, a call forwarding system will be available to receive calls and page the Complaint Resolution Coordinator.

Other Considerations

- Fugitive dust will result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Algonquin will employ proven construction–related practices to control fugitive dust such as application of water or other commercially–available dust control agents on unpaved areas subject to frequent vehicle traffic. In addition, construction equipment will be operated only on an as–needed basis.
- Noise mitigation measures to be employed during construction include ensuring that sound muffling devices that are provided as standard equipment by the construction equipment manufacturer are kept in good working order.

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REV.#	DESCRIPTION	DATE	SCALE:	DATE

TITLE: ATLANTIC BRIDGE PROJECT
RESIDENTIAL SITE SPECIFIC CROSSING PLANS
DETAIL SHEET

LOC.:		REV.:
YR.: 2017	W.B.S.	DWG. NO. ATL–E–7201

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713/627-5400

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APPENDIX G

WEYMOUTH COMPRESSOR STATION VISUAL SIMULATIONS

APPENDIX G

Figure 1A. Existing view of compressor station site looking west from Kings Cove Beach Road area in Weymouth, MA.

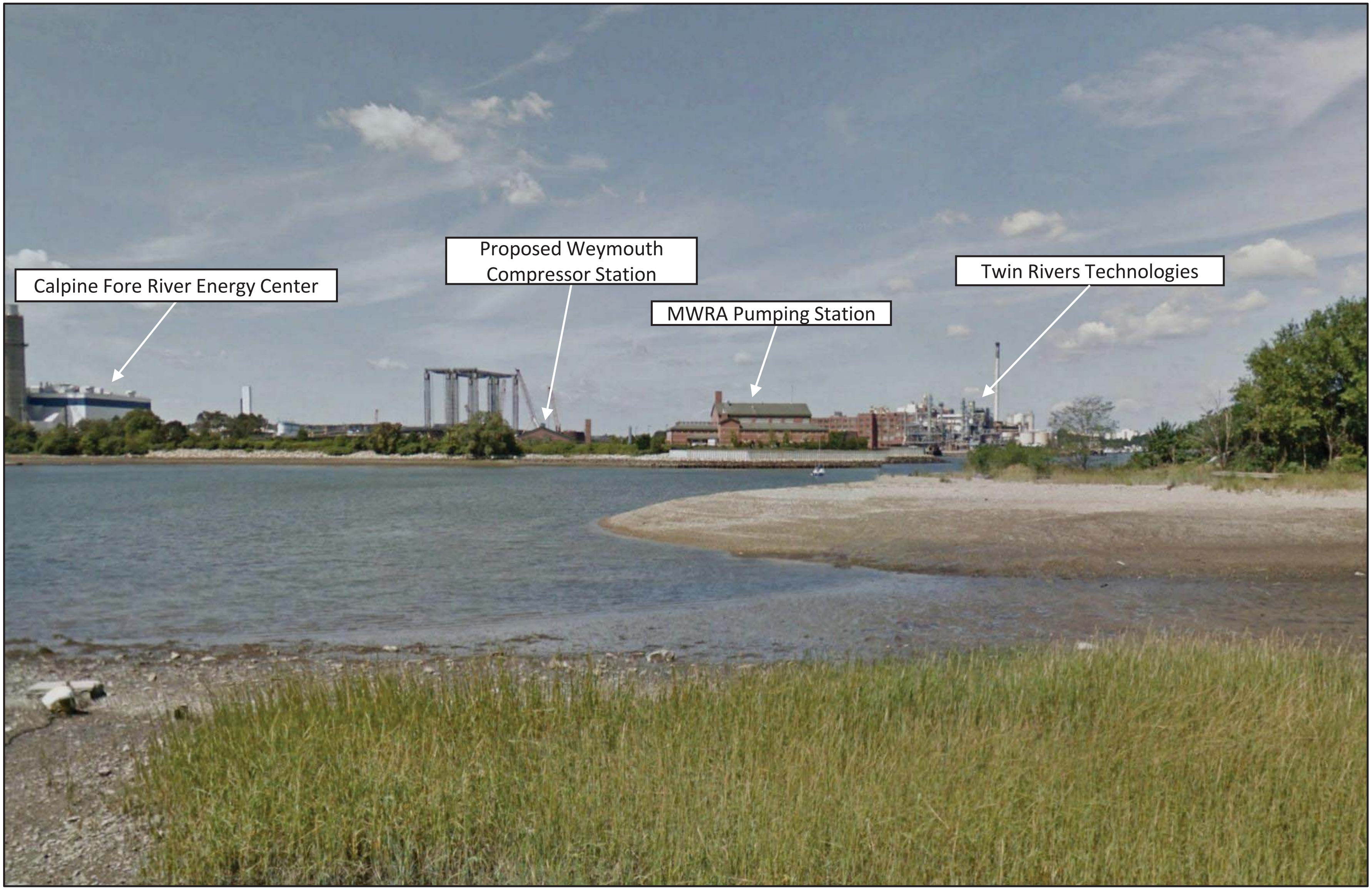


Figure 1B. Simulated view of proposed Weymouth Compressor Station looking west from Kings Cove Beach Road in Weymouth, MA.

Figure 2A. Existing view of compressor station site looking North from Bridge Street in Weymouth, MA.

Figure 2B. Simulated view of proposed Weymouth Compressor Station looking north from Bridge Street area in Weymouth, MA.

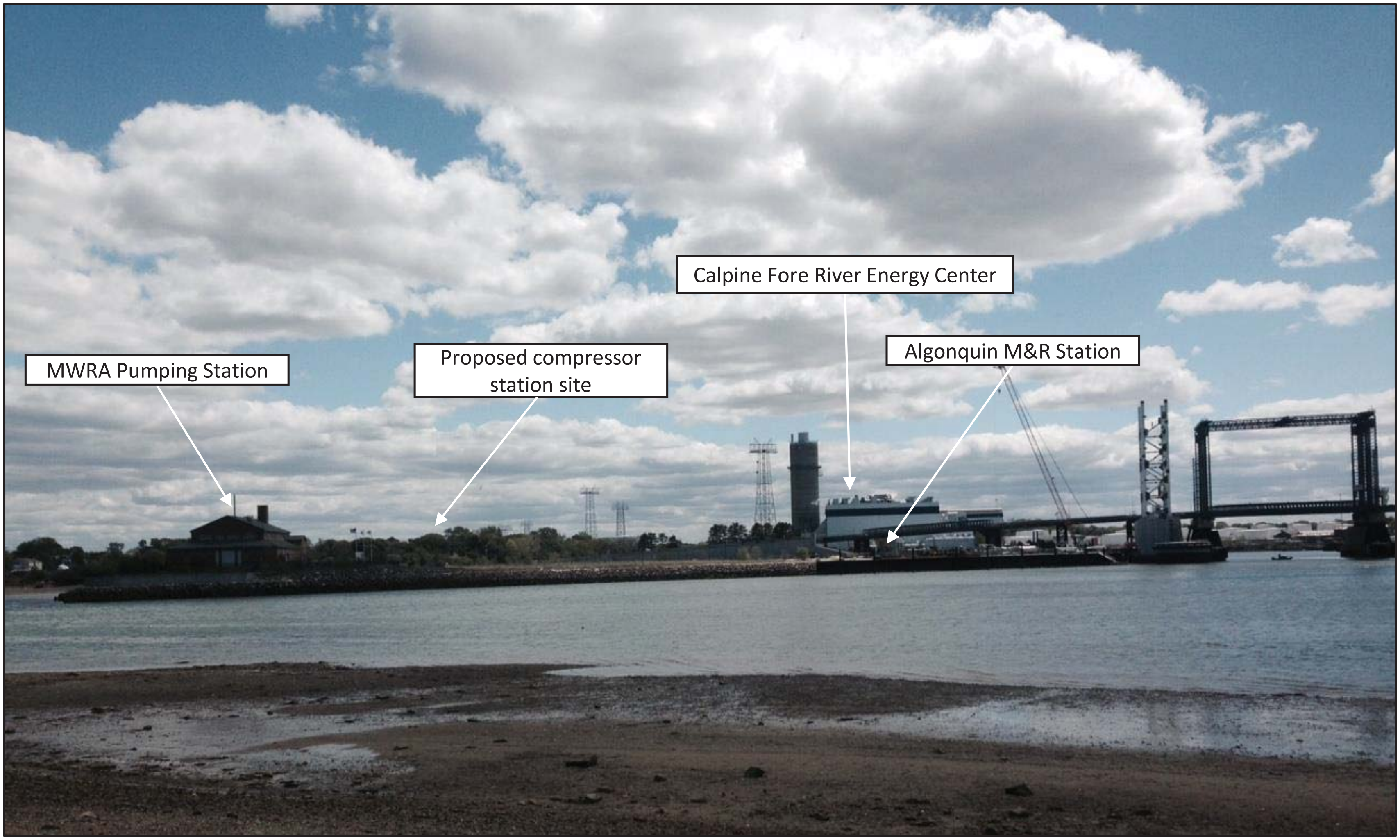


Figure 3A. Existing view of compressor station site looking Southeast from Traffail Road area in Quincy, MA.

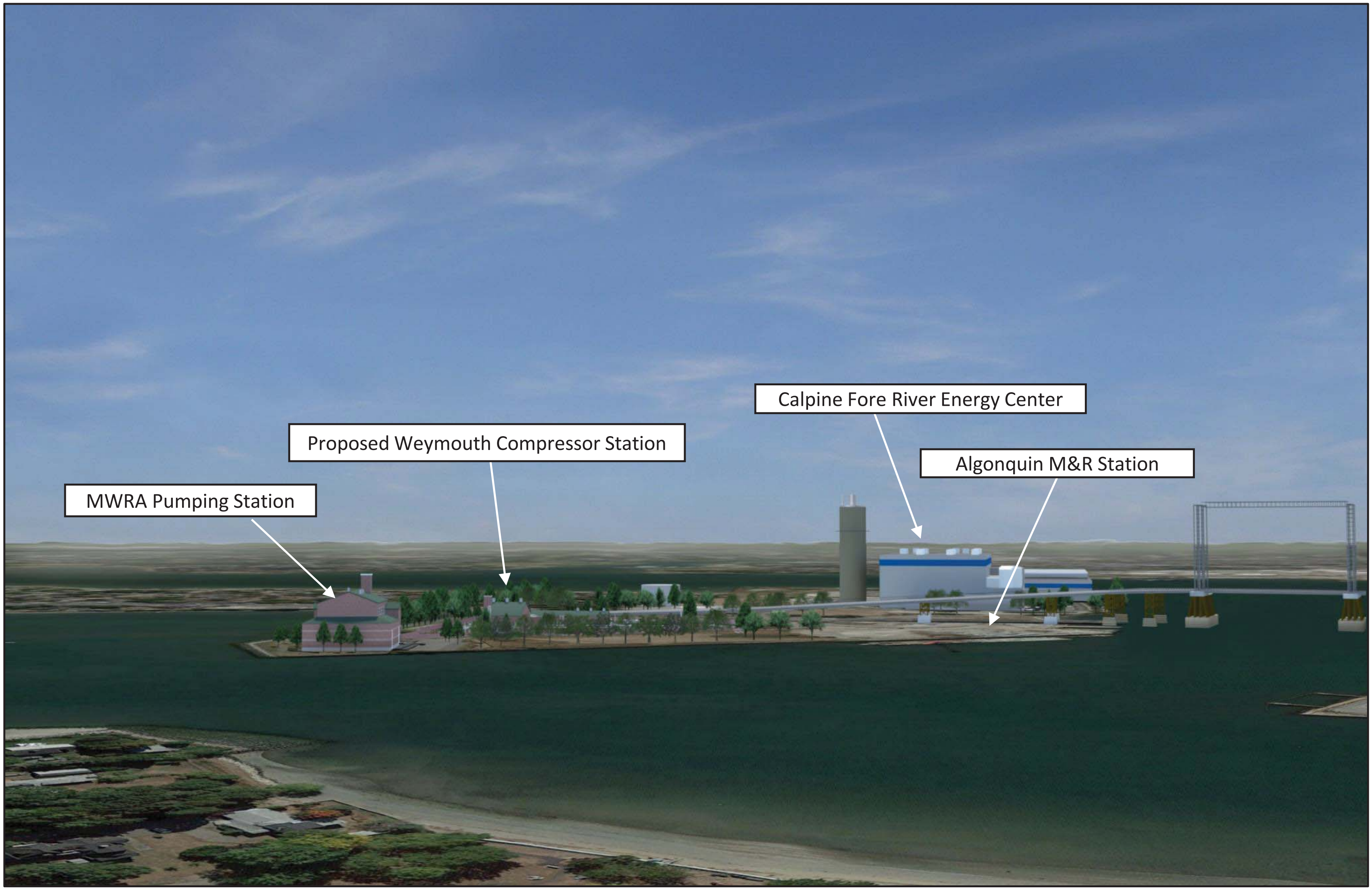


Figure 3B - Simulated view of proposed Weymouth Compressor Station looking southeast from Traffail Road area in Quincy, MA.

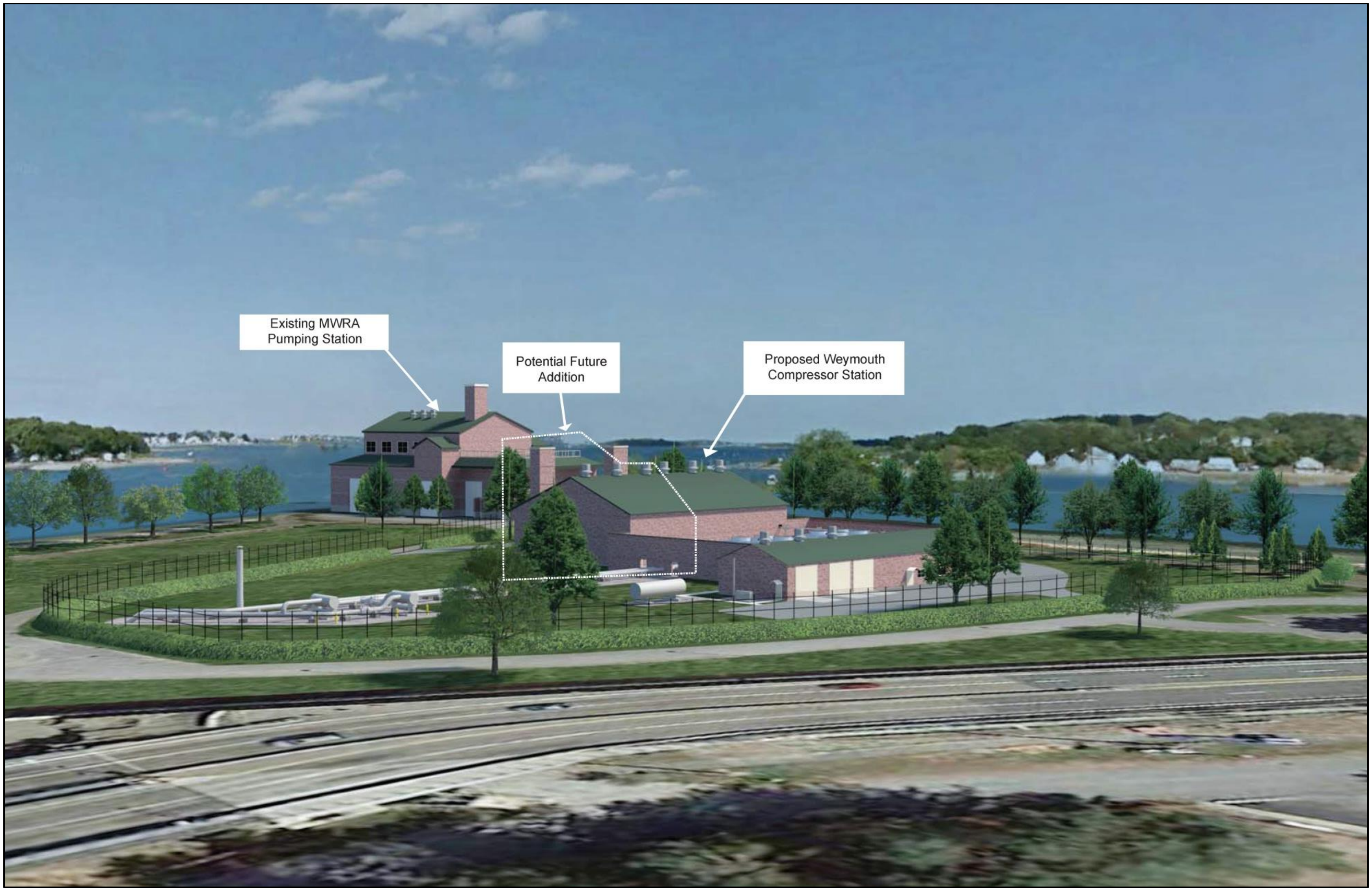


Figure 4. Simulated view of Weymouth Compressor Station including planned Access Northeast Project expansion.

APPENDIX H

CULTURAL RESOURCES CORRESPONDENCE

APPENDIX H

TABLE H-1

State Historic Preservation Office Correspondence for the Atlantic Bridge Project

State Office/Date	Summary
New York State Historic Preservation Office (SHPO)	
8/1/14	Algonquin Gas Transmission, LLC and Maritimes & Northeast Pipeline, LLC (collectively referred to as the Applicants) sent a letter introducing the Atlantic Bridge Project (Project).
10/24/14	The Applicants provided a technical proposal for archaeological identification (Phase IB) investigations.
11/20/14	The Applicants received comments on the technical proposal.
4/20/15	The Applicants provided draft Resource Reports 1 and 10 with a comprehensive Project description and a summary of the alternatives under consideration for the 222,000-dekatherm per day (Dth/d) facilities. The Applicants also provided notification that the Project scope had been reduced to 153,000 Dth/d and submitted a revised technical proposal to perform archeological investigations for pipeline facilities in New York.
6/29/15	The Applicants submitted a progress memo for the remaining facilities located in New York and a draft Unanticipated Discovery Plan. The Applicants also provided notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating the Upstream Ramapo Take-up and Relay segment from the Project.
7/8/15	The New York SHPO concurred with the procedures in the draft Unanticipated Discovery Plan.
10/13/15	The Applicants submitted an archaeological overview/identification survey and evaluation technical report and historic architectural properties overview/identification survey technical memorandum to the New York SHPO.
11/30/15	The New York SHPO concurred with the archaeological overview and identification survey and site evaluation technical report recommendations.
11/30/15	The New York SHPO concurred with the historic architectural properties overview and identification survey technical report recommendations.
2/9/16	The Applicants submitted Addendum no. 1 to the archaeological overview and identification survey and site evaluation technical report to the New York SHPO.
3/2/16	The New York SHPO concurred with the Addendum no. 1 to the archaeological overview and identification survey and site evaluation technical report recommendations.
Connecticut SHPO	
8/1/14	The Applicants sent a letter introducing the Project.
10/24/14	The Applicants provided a technical proposal for archaeological identification (reconnaissance) investigations.
11/18/14	The Applicants received comments on the technical proposal.
4/20/15	The Applicants provided draft Resource Reports 1 and 10 with a comprehensive Project description and a summary of the alternatives under consideration for the 222,000-Dth/d facilities. The Applicants also provided notification that the Project scope had been reduced to 153,000 Dth/d and submitted a revised technical proposal to perform archeological investigations for the pipeline facilities in Connecticut.
6/29/15	The Applicants submitted a progress memo for the remaining facilities located in Connecticut where Public Archaeology Laboratory performed fieldwork and a draft Unanticipated Discovery Plan. The Applicants also provided notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating the Cromwell Discharge Loop from the Project.
10/13/15	The Applicants submitted an archaeological overview/identification survey technical report, historic architectural properties overview/identification survey technical memorandum, and Unanticipated Discovery Plan to the Connecticut SHPO.
12/15/15	The Connecticut SHPO commented on the archaeological and historic architectural properties overview and identification survey technical reports.
2/9/16	The Applicants submitted revised technical reports along with a response matrix to the Connecticut SHPO for review.

APPENDIX H (cont'd)

TABLE H-1 (cont'd)

State Historic Preservation Office Correspondence for the Atlantic Bridge Project

State Office/Date	Summary
Massachusetts SHPO	
8/1/14	The Applicants sent a letter introducing the Project.
4/20/15	The Applicants provided draft Resource Reports 1 and 10 with a comprehensive Project description and a summary of the alternatives under consideration for the 222,000-Dth/d facilities. The Applicants also provided notification that the Project scope had been reduced to 153,000 Dth/d and submitted a technical proposal to perform archeological investigations for the proposed pipeline facilities in Massachusetts.
6/29/15	The Applicants submitted a draft Unanticipated Discovery Plan along with a notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating the Q-1 System Loop and the Fall River Metering and Regulating (M&R) Station from the Project. The Applicants also informed the Massachusetts SHPO that a comprehensive cultural resource assessment of the remaining facilities would be submitted in the third quarter of 2015 in advance of the Applicants' formal application to the Federal Energy Regulatory Commission.
10/13/15	The Applicants submitted the archaeological and historic architectural properties previous survey documentation, historic architectural properties overview/identification survey technical memorandum, and Unanticipated Discovery Plan for the Weymouth Compressor Station to the Massachusetts SHPO.
Maine SHPO	
8/14/15	The Applicants submitted a Project introduction letter and pre-filing application to the Maine SHPO.
10/13/15	The Applicants submitted archaeological and historic architectural properties previous survey documentation for the Westbrook M&R Station and the Unanticipated Discovery Plan to the Maine SHPO.
11/3/15	The Maine SHPO concurred with the Applicants recommendations in the October 13, 2015 submittal.

APPENDIX H (cont'd)

TABLE H-2

Communication with Federally Recognized Tribes for the Atlantic Bridge Project

Tribe/Date	Summary
Aroostook Band of Micmacs	
8/20/15	The Federal Energy Regulatory Commission (FERC) provided an Atlantic Bridge Project (Project) notification letter to the Tribe.
10/13/15	Algonquin Gas Transmission, LLC and Maritimes & Northeast Pipeline, LLC (collectively referred to as the Applicants) copied the Tribe on the transmittal letter to the Maine State Historic Preservation Office (SHPO) and provided a cultural resource assessment for the Westbrook Metering and Regulating (M&R) Station.
Delaware Nation of Oklahoma	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope has again been reduced to 132,705 dekatherms per day (Dth/d), thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs and also provided cultural resource documentation filed with the SHPOs.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.
Delaware Tribe of Indians	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
5/5/15	The Applicants exchanged emails with Susan Bachor regarding a request that she be the local point of contact for the Delaware Tribe because she is operating out of Temple University. She requested to be added to the email distribution list for weekly fieldwork updates.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.
Houlton Band of Maliseet Indians	
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letter to the Maine SHPO, and also provided a cultural resource assessment for the Westbrook M&R Station.
10/26/15	The Tribe provided comments to the Applicants via email regarding the Westbrook M&R Station.
Mashantucket (Western) Pequot Tribal Nation	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
8/9/14	Kathleen Knowles, representing the Mashantucket Pequot Tribal Nation as the Tribal Historic Preservation Officer, sent a response email to the Applicants communicating that the Tribe has an interest in the proposed Project. The Tribe requested the Project survey information when completed, and Section 106 consultation with FERC for the Project.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.

APPENDIX H (cont'd)

TABLE H-2 (cont'd)

Communication with Federally Recognized Tribes for the Atlantic Bridge Project

Tribe/Date	Summary
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
11/13/15	The Applicants met with the Tribe to discuss archaeological survey fieldwork completed to date as well as communications regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
12/21/15	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
1/11/16	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
10/28/15 to 2/22/16	Various email communications between the Tribe and the Applicants regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.
Mashpee Wampanoag Indian Tribe	
8/1/14	The Applicants sent an Initial Project outreach letter to the Tribe.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope has again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
Mohegan Tribe of Indians	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
9/8/15	The Applicants sent a letter to the Tribe requesting that they collaborate with the Applicants to identify Ceremonial Stone Landscapes within the Project study corridor.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
11/13/15	The Applicants met with the Tribe to discuss archaeological survey fieldwork completed to date as well as communications regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
12/21/15	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
1/11/16	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
10/28/15 to 2/22/16	Various email communications between the Tribe and the Applicants regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.

APPENDIX H (cont'd)

TABLE H-2 (cont'd)

Communication with Federally Recognized Tribes for the Atlantic Bridge Project

Tribe/Date	Summary
Narragansett Indian Tribe	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
9/8/15	The Applicants sent a letter to the Tribe requesting that they collaborate with the Applicants to identify Ceremonial Stone Landscapes within the Project study corridor.
9/18/15	The Applicants met with Doug Harris to discuss a draft Ceremonial Stone Landscape survey plan and the next steps for cultural resource coordination with the tribes.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
11/13/15	The Applicants met with the Tribe to discuss archaeological survey fieldwork completed to date as well as communications regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
12/21/15	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
1/11/16	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
10/28/15 to 2/22/16	Various email communications between the Tribe and the Applicants regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.
Passamaquoddy Tribe	
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letter to the Maine SHPO, Also provided cultural resource assessment for Westbrook M&R Station.
Penobscot Indian Nation	
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letter to the Maine SHPO, and also provided a cultural resource assessment for Westbrook M&R Station.
10/23/15	The Tribe provided a comment letter to the Applicants and email communication indicating that they concur with the Applicants' recommendations regarding the Westbrook M&R Station.
Saint Regis Mohawk Tribe	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.

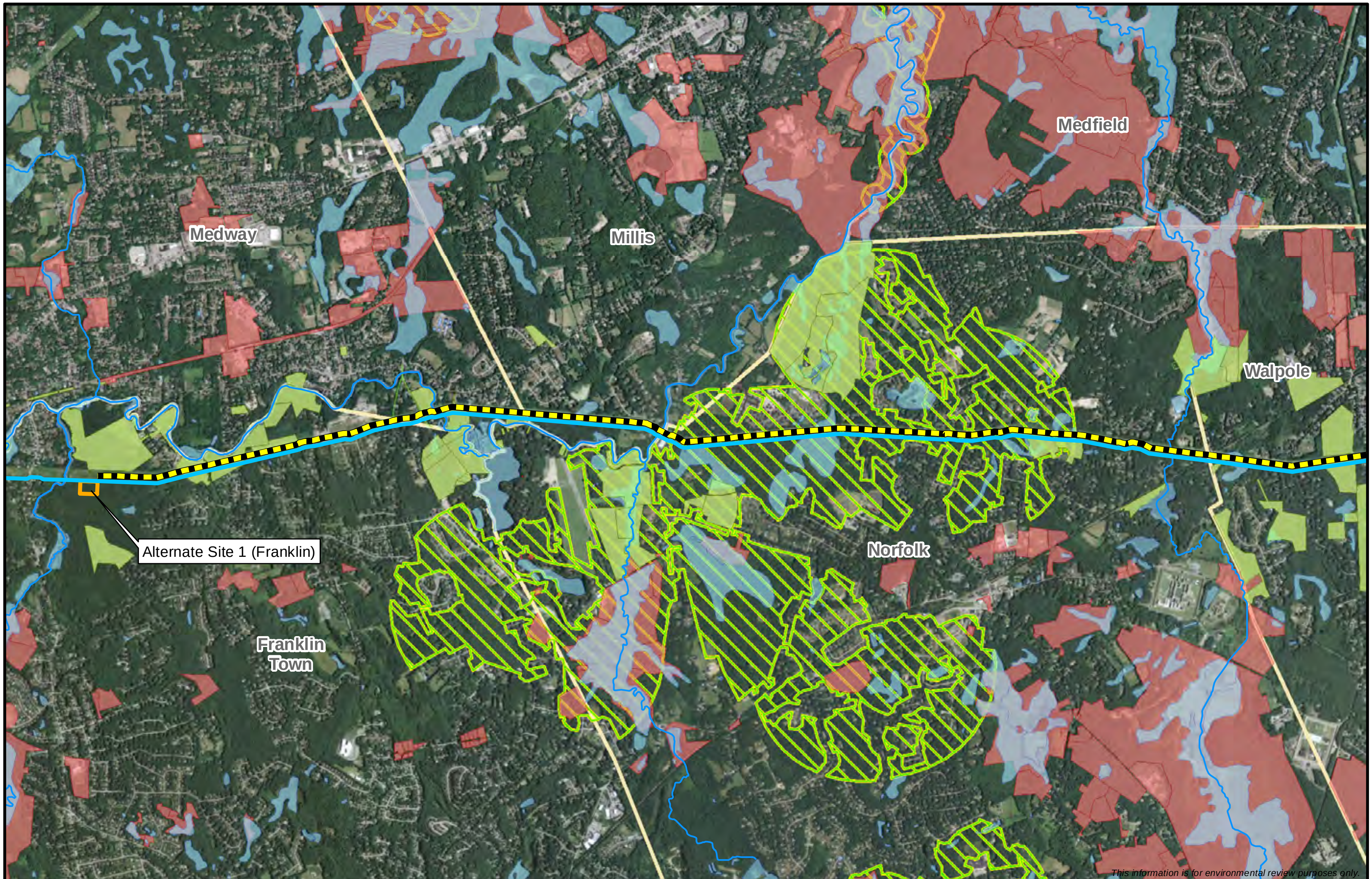
TABLE H-2 (cont'd)

Communication with Federally Recognized Tribes for the Atlantic Bridge Project

Tribe/Date	Summary
Stockbridge-Munsee Community Band of Mohican Indians	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
8/11/14	The Tribe sent an email to the Applicants indicating that it is interested in the Project facilities associated with the 8.3 miles of pipeline replacement in Rockland and Westchester Counties, New York.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/5/15	The Tribe provided comments to the Applicants on the New York progress memorandum and the draft Unanticipated Discovery Plan.
8/20/15	FERC provided a Project notification letter to the Tribe.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.
Wampanoag Tribe of Gay Head (Aquinnah)	
8/1/14	The Applicants sent an initial Project outreach letter to the Tribe.
8/22/14	The Tribe met with the Applicants to discuss the proposed Project.
6/29/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs, along with notification that the Project scope had again been reduced to 132,705 Dth/d, thereby eliminating certain facilities in New York, Connecticut, and Massachusetts.
8/20/15	FERC provided a Project notification letter to the Tribe.
9/8/15	The Applicants sent a letter to the Tribe requesting that they collaborate with the Applicants to identify Ceremonial Stone Landscapes within the Project study corridor.
10/13/15	The Applicants copied the Tribe on the transmittal letters to the SHPOs, and also provided cultural resource documentation filed with the SHPOs.
11/13/15	The Applicants met with the Tribe to discuss archaeological survey fieldwork completed to date as well as communications regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
12/21/15	The Applicants met with the tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
1/11/16	The Applicants met with the Tribe to discuss the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
10/28/15 to 2/22/16	Various email communications between the Tribe and the Applicants regarding the development of a Survey Agreement and Survey Plan to identify and document Ceremonial Stone Landscapes.
2/9/16	The Applicants copied the Tribe on the transmittal letters to the New York and Connecticut SHPOs, and also submitted archaeological reports to the Tribe.

APPENDIX I

WEYMOUTH COMPRESSOR STATION ALTERNATIVE FIGURES



Suction and Discharge Pipelines for Alternate Compressor Station Sites
Existing Algonquin Q-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-
Stream
Town Boundary
Alternate Compressor Station Site
Proposed Compressor Station Construction Workspace
Public Land and Designated Recreation, Scenic or Other Areas
MassDEP Wetland
Public Open Space
Area of Critical Environmental Concern
NHESP Natural Community
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species

N

0 2,000 4,000 Feet

Figure 3.5.1-2
Atlantic Bridge Project
Southern and Western
Site Alternatives
Alternate Compressor Station Site 1
Franklin Site

Page 1 of 4

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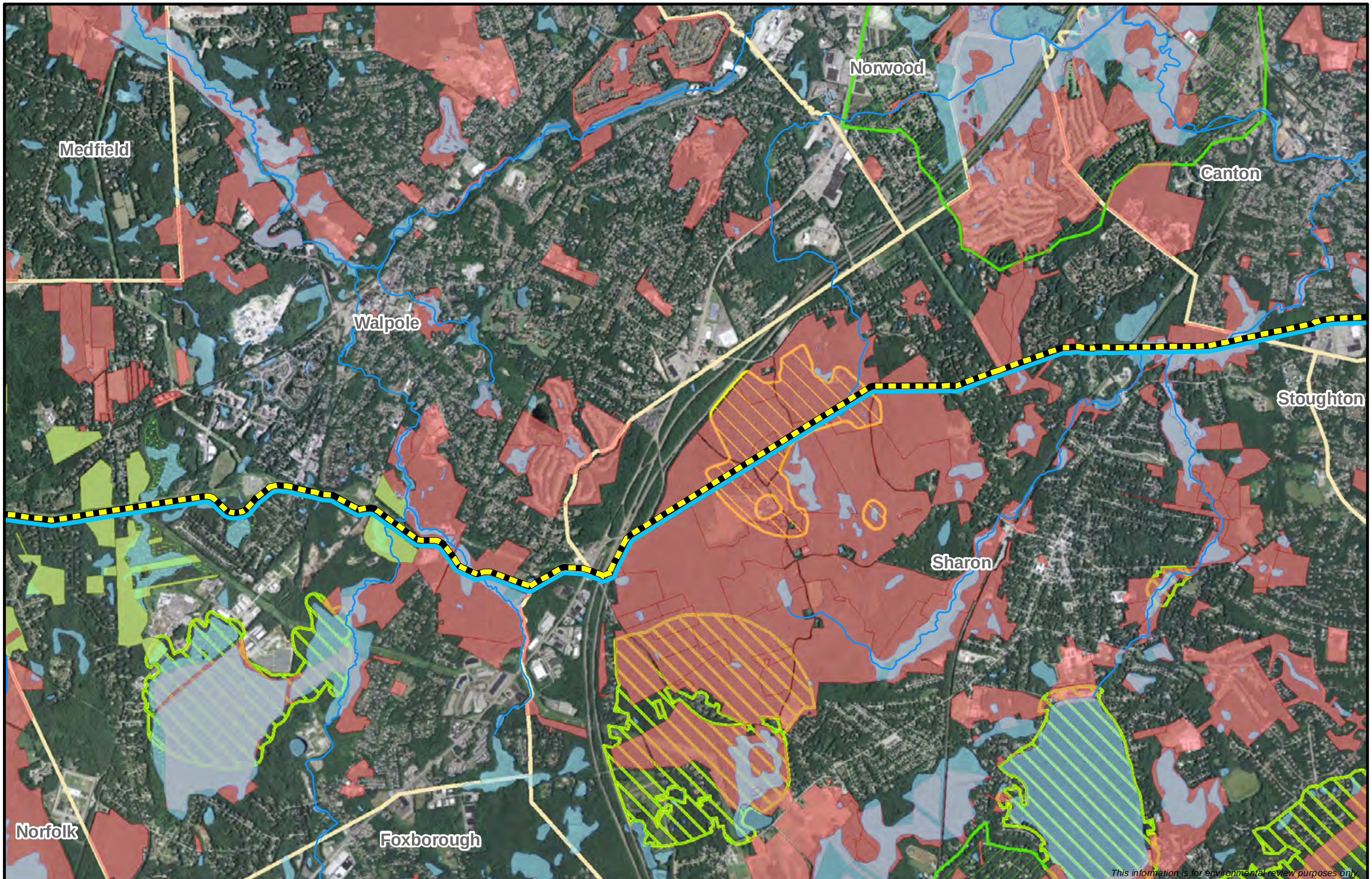

Suction and Discharge Pipelines for Alternate Compressor Station Sites
Existing Algonquin Q-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-

Stream
Town Boundary
Alternate Compressor Station Site
Proposed Compressor Station Construction Workspace
Public Land and Designated Recreation, Scenic or Other Areas

MassDEP Wetland
Public Open Space
Area of Critical Environmental Concern
NHESP Natural Community
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species

N

0 2,000 4,000
Feet

Figure 3.5.1-2
Atlantic Bridge Project
Southern and Western
Site Alternatives
Alternate Compressor Station Site 1
Franklin Site

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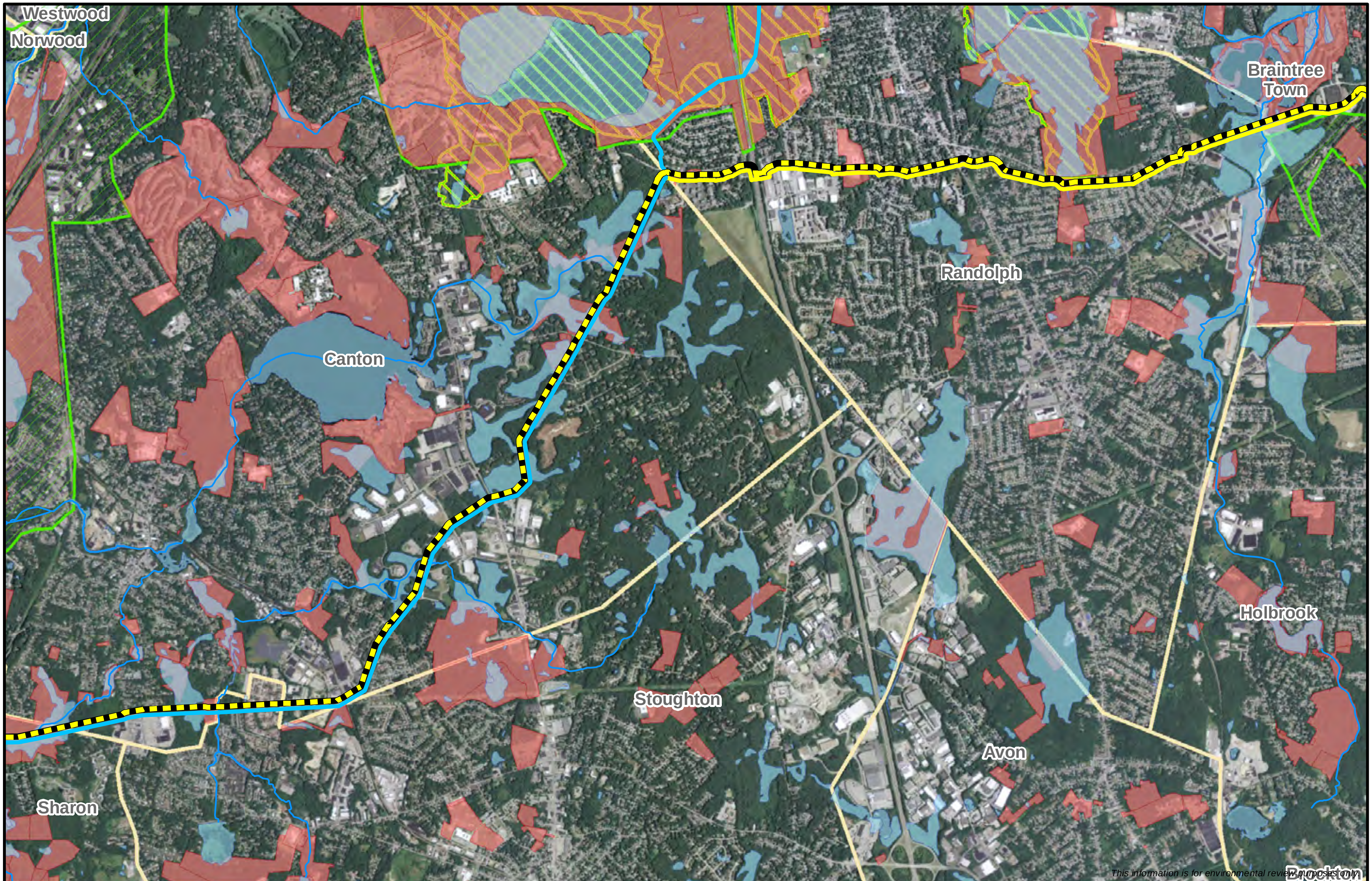

Figure 3.5.1-2
Atlantic Bridge Project
Southern and Western
Site Alternatives
Alternate Compressor Station Site 1
Franklin Site

Page 3 of 4

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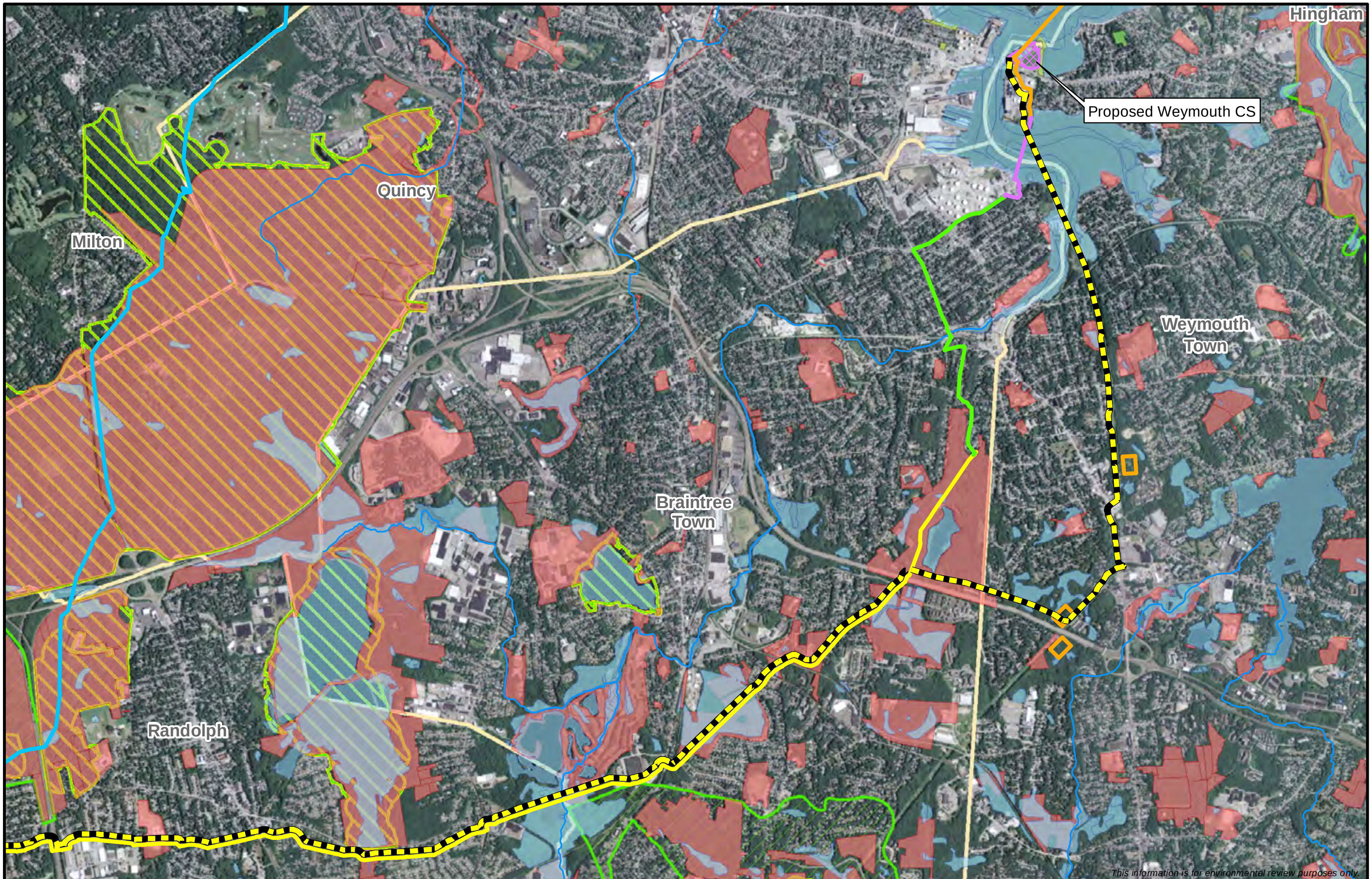

Suction and Discharge Pipelines for Alternate Compressor Station Sites
Existing Algonquin Q-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-
Existing Algonquin I-
Stream
Town Boundary
Alternate Compressor Station Site
Proposed Compressor Station Construction Workspace
Public Land and Designated Recreation, Scenic or Other Areas
MassDEP Wetland
Public Open Space
Area of Critical Environmental Concern
NHESP Natural Community
NHESP Estimated Habitats of Rare Wildlife
NHESP Priority Habitats of Rare Species

N

0 2,000 4,000 Feet

Figure 3.5.1-2
Atlantic Bridge Project
Southern and Western
Site Alternatives
Alternate Compressor Station Site 1
Franklin Site

Page 4 of 4

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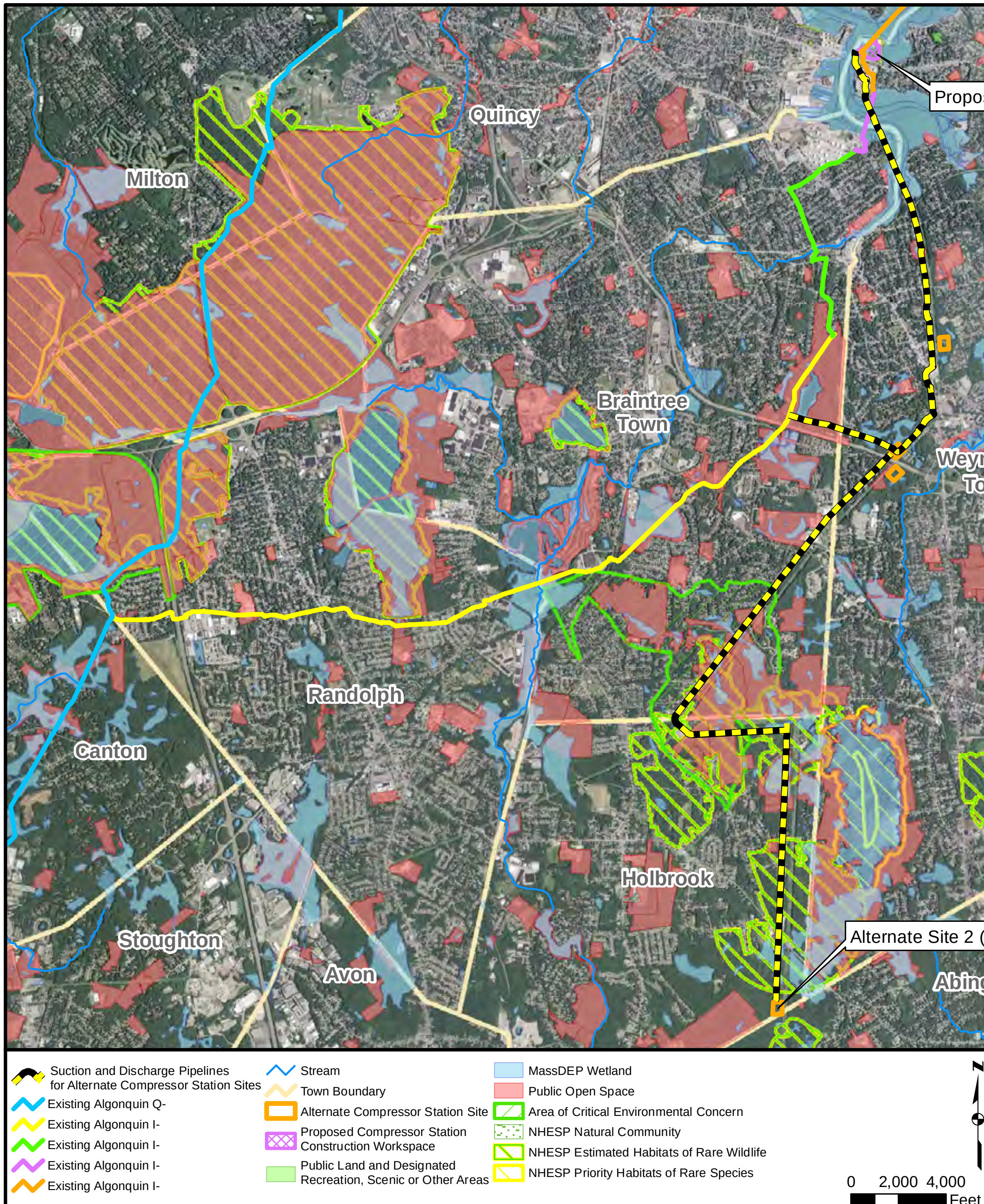

Figure 3.5.1-3
Atlantic Bridge Project
Southern and Western
Site Alternatives
Alternate Compressor Station Site 2
Holbrook Site

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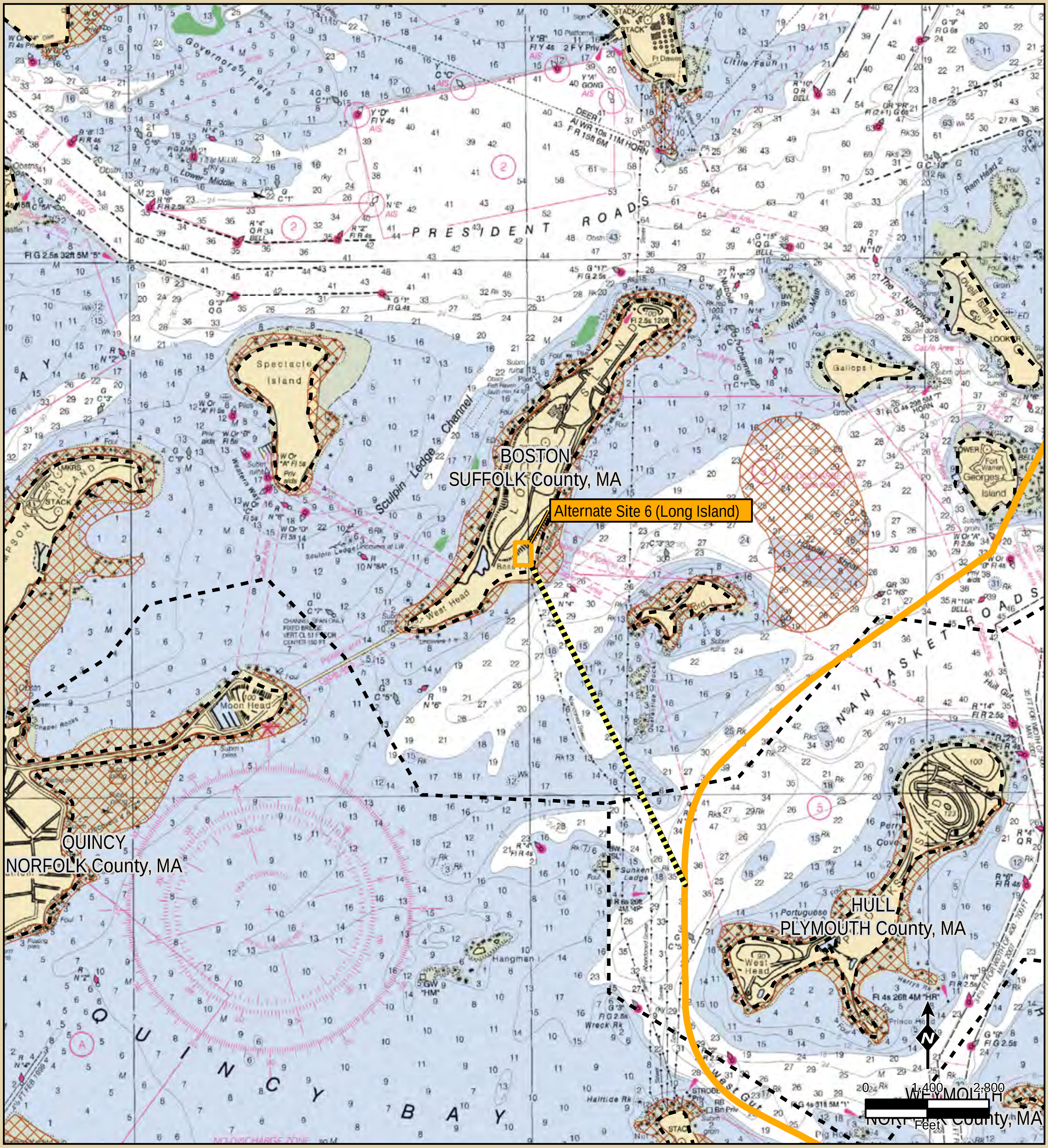

Suction and Discharge Pipelines for Alternate Compressor Station Sites

Existing Algonquin I-10 System

Alternate Compressor Station Site

Towns

Eelgrass

Shellfish Suitability Areas

Data Sources: ESRI, SPECTRA, MASSGIS, USGS, TRC

NOTE: Suction/Discharge Pipeline for Alternate Compressor Station Sites is for conceptual purposes only and has not been field surveyed.

Figure 3.5.1-4
Atlantic Bridge Project
Northern Site Alternatives Alternative Compressor Station Site 6 (Long Island)

Map 1 of 1

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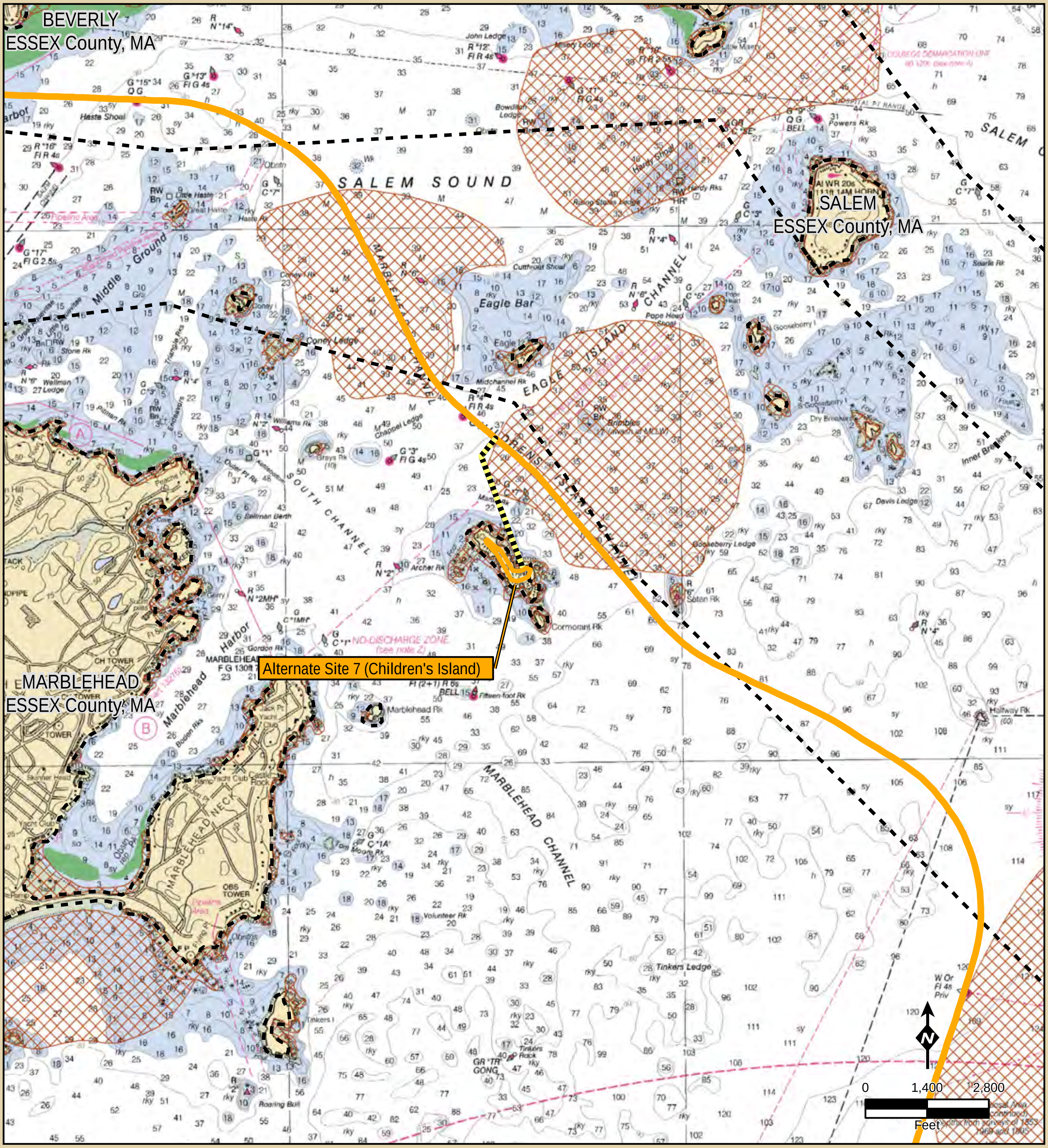

Suction and Discharge Pipelines for Alternate Compressor Station Sites

Existing Algonquin I-10 System

Alternate Compressor Station Site

Towns

Eelgrass

Shellfish Suitability Areas

Data Sources: ESRI, SPECTRA, MASSGIS, USGS, TRC

NOTE: Suction/Discharge Pipeline for Alternate Compressor Station Sites is for conceptual purposes only and has not been field surveyed.

Figure 3.5.1-5
Atlantic Bridge Project
Northern Site Alternatives
Alternate Compressor Station Site 7 (Children's Island)

Map 1 of 1

Created: 9/17/2015

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